VOLUME II

CONTENTS

LIST OF TABLES

1. INTRODUCTION

This FEIS Volume II was generated in response to public comments received by the Services pertaining to the public review of Washington State's Draft Forest Practices Habitat Conservation Plan (Draft FPHCP), dated December 2004, and the associated Draft Environmental Impact Statement (DEIS), dated January 2005.

The remainder of this document includes the following chapters:

Chapter 2 Overview of Public Comments Received

Chapter 3 Responses to Public Comments

References cited in this document are provided in Chapter 6 of Volume I.

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2. OVERVIEW OF PUBLIC COMMENTS RECEIVED

This chapter provides an overview of the public comments that were submitted following the public comment period for Washington State's Draft Forest Practices Habitat Conservation Plan (Draft FPHCP) and the associated Draft Environmental Impact Statement (DEIS).

2.1 OVERVIEW

The DEIS and Draft FPHCP were released for a 90-day public comment period, from February 11th through May 12th, 2005. During this time, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) received 743 individual comment letters on the DEIS and Draft FPHCP. Among these comment letters there were three distinct form letters that numerous individuals submitted. These three form letters represent 441 of the letters submitted, or 58 percent. Therefore, 302 or 42 percent of the comment letters submitted were unique letters. Variations of the three form letters were counted as unique letters. These letters can be viewed at the following website: http://www.fws.gov/westwafwo/consplan/docs.html.

Each public comment letter was assigned a unique identifying number and then individual comments within each letter were identified. These individual comments were entered into a database and categorized by Issue and Sub-Issue. A team was formed consisting of several individuals from the USFWS and NMFS (the Services) to draft responses to public comments. Input was sought from the Environmental Protection Agency (EPA), Washington Department of Natural Resources (DNR), the Washington Department of Ecology (Ecology), and the Washington Department of Fish and Wildlife (WDFW) on technical comments related to the State's Draft FPHCP application.

2.2 RANGE OF COMMENTS

Responses to public comments were categorized by Issue and Sub-Issue and then organized into the following topics in Chapter 3 of this volume, listed by their subsection reference.

3.1 Endangered Species Act

3.2 Environmental Impact Statement Process

3.3 Environmental Impact Statement Alternatives

3.4 Implementation Agreement

3.5 Adaptive Management

3.6 Riparian

3.7 Roads

3.8 Water Quality

3.9 Wildlife

3.10 Forest Chemicals

3.11 Compliance and Enforcement

3.12 Small Forest Landowners

3.13 20-Acre Exemption

3.14 Conversions

3.15 Cumulative Effects

3.16 Economics

3.17 Analysis

3.18 Tribal and Cultural Issues

2.3 PUBLIC COMMENT LETTERS RECEIVED

Table 2.1 identifies each numbered public comment letter, the name of the individual or organization that submitted the letter, the number of individual comments that the Services identified within each letter, and the specific responses (by subsection reference) that each commenter is encouraged to read to understand the Services' response to that comment. Further, the Services encourage all those that submitted public comments to read Chapter 3 (Response to Public Comments) in its entirety for a full understanding of all the comments that were received and the Services' response to these comments. Please note the following information pertaining to Table 2.1: (1) commenters who submitted unique comments that correspond with more than five subsection responses, as identified by the Services, are directed to read all of Chapter 3; and (2) the number of comments listed for each commenter may not correspond to an equal number of response subsections to read because multiple comments may be addressed within a particular subsection response, or a comment is addressed in more than one subsection.

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Table 2-1. Comments per Letter and Suggested Response Subsections to Read

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
1	B. Sachau	2	3.3 and 3.5
2	Douglas McDonald	2	3.3 and 3.5
3	Gerald Schwartz	1	3.3
4	Ralph Mason	1	3.3
5	Sandra MacDonald	1	3.3
6	James Papageorge	1	3.3
7	Roy Jensen	1	3.3
8	Orv Anderson	1	3.3
9	William Miller	1	3.3
10	David Miller	1	3.3
11	Robert McKelvey	1	3.3
12	Dennis Loewe	1	3.3
13	Marvin Merritt	1	3.3
14	Gene Warning	1	3.3
15	John May	1	3.3
16	William Eachen	1	3.3
17	James Treece	1	3.3
18	Richard Padilla	1	3.3
19	Donald Cooper	1	3.3
20	James Odendahl	1	3.3
21	Roddis Jones	1	3.3
22	Gerald Tucker	1	3.3
23	Rainey Mills	1	3.3
24	Richard Huston	1	3.3
25	Norman McDonell	1	3.3
26	Pete Landry	1	3.3
27	Dorothy Warford	1	3.3
28	Phillip Hoffman	1	3.3
29	Harold Lyons	1	3.3
30	Richard Bye	1	3.3
31	Kenneth Chisholm	1	3.3
32	Louis Imhof	1	3.3
33	Milton Barrett	1	3.3
34	Kendall Kramer	1	3.3
35	Barbara Mason	1	3.3
36	Greg Lapic	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
37	Clara Markland	1	3.3
38	Gary Fowler	1	3.3
39	Jack Chapman	1	3.3
40	Emerson Elder	1	3.3
41	John Gotshall	1	3.3
42	Harold Weathers	1	3.3
43	Daniel Rose	1	3.3
44	Don Iverson	1	3.3
45	Carl Middleton	1	3.3
46	Glenn Perry	1	3.3
47	Bill Kieffer	1	3.3
48	William Dunlap	1	3.3
49	Luke Curtis	1	3.3
50	Edward Van Zandt	1	3.3
51	Ray Craft	1	3.3
52	J. Harper	1	3.3
53	David Fisher	1	3.3
54	Jack Porter	1	3.3
55	Warren Roderick	1	3.3
56	John Musso	1	3.3
57	David Nicholson	1	3.3
58	Richard Foshage	1	3.3
59	Joe Dixon	1	3.3
60	Chris Ness	1	3.3
61	Douglas Harper	1	3.3
62	Robert Kimball	1	3.3
63	Evelyn Wilson	1	3.3
64	John Murphy	1	3.3
65	Illegible	1	3.3
66	Leroy Christenson	1	3.3
67	Obe M. Healea, Jr.	1	3.3
68	Gary Shelton	1	3.3
69	Norman Vogt	1	3.3
70	Pamo Bhatia	1	3.3
71	Tony Moore	1	3.3
72	Brian O'Dell	2	3.3 and 3.5
73	Richard Carle	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
74	Tim Blair	1	3.17
75	James Livengood	1	3.3 and 3.5
76	Lois Buchanan	1	3.3
79	Neil Wissing	1	3.3
80	Richard Artley	1	3.3
81	Friedrich Reese	1	3.3
82	Robert Sluman	1	3.3
83	Ted Nelson	1	3.3
84	Harthon Bill	1	3.3
85	Darrel Weiss	3	3.3 and 3.5
86	Michael McDermid	1	3.3
87	Lloyd Hupp	1	3.3
88	James Taylor	1	3.3
89	Emmett Platt	1	3.3
90	Keith Storey	1	3.3
91	Donald Smith	1	3.3
92	William Freeman	1	3.3
93	Geneva Smith	1	3.3
94	Lloyd and Elizabeth Taylor	1	3.17
95	Virginia Bailey	1	3.3
96	Robert Gay	2	3.3 and 3.5
97	William Peterson	1	3.3
98	John Rova	1	3.3
99	William Nearn	1	3.3
100	Bill McCay	1	3.3
101	Michael Lyders	1	3.3
102	David Robinson/ Concerned Friends of Ferry County	5	3.3, 3.4 and 3.5
103	Bob Jamison	1	3.3
105	Thomas Orr	1	3.3
106	Julia Spencer	1	3.3
107	Hollis W. Barber, Jr.	1	3.3
108	LaVerne Hall	1	3.3
109	Dr. Donald C. Johnson	1	3.3
110	Rex McKee	1	3.3
111	Floyd Gustafson	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
112	Ryan Hunter/ Gifford Pinchot Task Force	12	3.3, 3.5, 3.6, 3.10 and 3.17
113	Thomas P. Hammond	4	3.5, 3.7 and 3.17
115	Jim McGirk	2	3.1, 3.3 and 3.5
116	Norm and Toni Wade	3	3.3, 3.12, 3.14 and 3.15
117	Richard Sorenson	1	3.3
118	Robert Dunn	1	3.3
119	Colby Chester	3	3.1, 3.2, 3.3 and 3.5
121	Robert J. Meyer	5	3.1, 3.2, 3.3, 3.14 and 3.17
122	W.R. Deruman	1	3.3
123	James V. Prim	1	3.3
124	Stanley Jernigan	2	3.3 and 3.17
125	Jack Blair	1	3.3
126	Annie Masterson	1	3.3
127	Donald Fisher	1	3.3
128	Richard Susan	1	3.3
129	Frank Soderblom	1	3.3
130	Edward Langer	1	3.3
131	John McEwen	1	3.3
132	Robert Cockburn	1	3.3
133	Ken Hultgren	1	3.3
134	Helen Bates	1	3.3
135	Don Collins	1	3.3
136	Joseph Beckman	1	3.3
137	Norma Mesler	1	3.3
138	Joyce Davis	1	3.3
139	Parker Bolinger	1	3.3
140	Margaret Wilson	1	3.3
141	Albert Insel	1	3.3
142	John Olson	1	3.3
143	Alvin McBrayer	1	3.3
144	Olaf Grette	1	3.3
145	Craig Dishman	1	3.3
146	Donna Olsen	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
147	Clayton Jacobson	1	3.3
148	Joseph Baughman	1	3.3
149	Beverly Hinkson	1	3.3
150	Richard Kelly	1	3.3
151	Clyde Zettle	1	3.3
152	Loretta Chivers	1	3.3
153	Carl Cady	1	3.3
154	Christel Brunnenkant	1	3.3
155	Sue Martens	1	3.3
156	Donald Baxter	1	3.3
157	Adrian Nelson	1	3.3
158	Jim Baldes	1	3.3
159	Charles Wheeler	1	3.3
160	John Spark	1	3.3
161	Frank Clem	1	3.3
162	Linnaeus Laulainen	1	3.3
163	John Walkush	2	3.3 and 3.17
164	Nelson York	1	3.3
165	Kenneth Middleton	1	3.3
166	Michael Bacon	1	3.3
167	James Goodman	1	3.3
168	Ronald Duncan	1	3.3
169	Edward McLaughlin	1	3.3
170	Ken Ness	1	3.3
171	Dwight Gause	1	3.3
173	Betty Wilson	1	3.3
174	William Reed	1	3.3
175	Don Wilbur	1	3.3
176	Charlotte Olson	1	3.3
177	Leonard Wisner	1	3.3
179	Floyd Canfield	1	3.3
180	Jess Woolliscroft	1	3.3
181	Uena A. Moselle	1	3.3
182	Willie Miller	1	3.3
183	Joanne Zettle	1	3.3
184	Richard E. Crews	1	3.3
185	Herbert Karnofski	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
186	Stanley Greig	1	3.3
187	Dwaine Miller	1	3.3
188	Robert Chapman	1	3.3
189	Helene Hobbs	1	3.3
190	Douglas Franks	1	3.3
191	Leo Jussila	1	3.3
192	Bruce Patterson	1	3.3
193	Ernest O. Clark	1	3.3
194	John Treznoski	1	3.3
195	Dorothy Harrington	1	3.3
196	Melvin D. Sell	1	3.3
197	Donald Hofmann	1	3.3
198	Susan El - Hosseiny	1	3.3
199	Gary Adair	1	3.3
200	Fred Warra	1	3.3
201	Byron Hyde	1	3.3
202	V.O. Kuehner	1	3.3
203	Richard Cook	1	3.3
204	Maurice Hamer	1	3.3
205	Arthur Wimer	1	3.3
206	Charles Harders	1	3.3
207	Erna Brucker	1	3.3
208	Dorothy Schaan	1	3.3
209	A.M. Hilmo	1	3.3
210	Richard Ingersoll	1	3.3
211	Judy Ashley	1	3.3
212	Lester Bell	1	3.3
213	Michael Miller	1	3.3
214	Gerald W. Peterson	1	3.3
215	James A. Coleman	1	3.3
216	L.P. Zuvela	1	3.3
217	Walter Watt	1	3.3
218	Carrol Annyas	1	3.3
219	Frank Stimson	1	3.3
220	Walter A. Remak	1	3.3
221	Fred R. Caron	1	3.3
225	Manford T. Larson	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
227	Robert G. Glasgow	1	3.3
235	Allan Lomer	1	3.3
239	Preston A. Sleeger/ U.S. Department of the Interior	1	3.2
240	Gerald Macpherson	1	3.3
241	Freddie J. Duncan	1	3.3
243	Wayne A. Marcella	1	3.3
246	Dennis L. Schroeder	1	3.3
247	Ellen Hughes	1	3.3
248	James Kochanek	1	3.3
249	Grace Bretthauer	1	3.3
250	Charles Prestrud	1	3.3
251	Jon Traylor	1	3.3
253	Richard Sadler	1	3.3
256	Edwin Bulin	1	3.3
258	John Holtman	1	3.3
259	Eula Burke	1	3.3
260	Vernon Wegner	1	3.3
261	Charles Phillips	1	3.3
263	Marilyn Thordarson	1	3.3
268	Mathias Overton	1	3.3
269	Don and Florence Theoe	2	3.3
270	Alan Cain	2	3.3 and 3.5
271	Rodney Jacobson	1	3.3
272	Stephen Bellows	1	3.3
273	Vernal Moore	1	3.3
274	Charles Neal	1	3.3
276	Daniel Stryker	1	3.3
281	Bernice Moore	1	3.3
282	Barbara Dunbar	1	3.3
283	Dick and Diane Bressler	1	3.3
286	Jim Vadnais	1	3.3
287	Amy Dunn	1	3.3
291	John McClintock	1	3.3
292	Donald Sangesand	1	3.3
293	Dwayne Hinman	1	3.3
296	Walt Sweyer	2	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
297	Michelle Blake	2	3.3 and 3.12
298	Vernon Peterson	2	3.3 and 3.5
299	Carl Geist	1	3.3
300	William Rehdu	1	3.3
301	Keith Simmons	1	3.3
302	Bob Monahan	1	3.3
303	Steven Nelson	1	3.3
304	Donald Shank	1	3.3
305	Casey	1	3.3
306	Hudson Dodd	1	3.3
307	Joseph Young	1	3.3
308	Ilsa S. Wood	1	3.3
309	Barbara Schumacher	1	3.3
310	Ane Soriano	1	3.3
311	Matthew R. Jones	1	3.3
312	Colleen L. Carpenter	1	3.3
313	Travis Johnston	1	3.3
314	Sasch Stephens	1	3.3
315	Jeff Hayamoto	1	3.3
316	Sylvia Hales	1	3.3
317	Thomas McDaniel	1	3.3
318	Morris Williams	1	3.3
319	Dee A. Poulsen	1	3.3
320	Kristin Almskaar	1	3.3
321	Aliah Elaoud	1	3.3
322	Stephen Roberts	1	3.3
323	Sarah Rice	1	3.3
324	Gale Lurie	1	3.3
325	Denise M. Snyder	1	3.3
326	Jonathan Carnil	1	3.3
327	Renee Dimond	1	3.3
328	Jonas Yazzie	1	3.3
329	Laura Cardinal	1	3.3
330	Emily Johnson	1	3.3
331	Kathy	1	3.3
332	Judith Roberts	1	3.3
333	Emily Brooke	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
334	Shelby Robertson	1	3.3
335	Sarah Fowler	1	3.3
336	Corbin Brecha	1	3.3
337	L.	1	3.3
338	Corey McCartney	1	3.3
339	Adam Roberts	1	3.3
340	Kelly Harford	1	3.3
341	Elizabeth Hubley	1	3.3
342	Loren Senge	1	3.3
343	Sarah M. Bowers	1	3.3
344	Nathan Ramser	1	3.3
345	Sara Cendejas	1	3.3
346	Marinda Reed	1	3.3
348	Krista M. Rome	1	3.3
349	Ray Graybeal	1	3.3
350	Jackie McCall	1	3.3
351	Allison Sayre	1	3.3
352	Leanne Evans	1	3.3
353	Joanne Van Ert	1	3.3
354	Melissa Whitman	1	3.3
355	Johnny Lahr	1	3.3
356	Alanna Ahern	1	3.3
357	Heather Gurley	1	3.3
358	Shawn Herbold	1	3.3
359	Holly Flattery	1	3.3
360	Jake Massine	1	3.3
361	Anne Bjornstad	1	3.3
362	Charles P. Fisk	2	3.3
363	Frazier Coe	1	3.3
364	Sheldon Blauman	1	3.3
365	Erik Seidel	1	3.3
366	Tiffany Arawer	1	3.3
367	Dominique Graves	1	3.3
368	Chris Beamis	1	3.3
369	Alexander V. Baxter	1	3.3
370	Paul Rice	1	3.3
371	Carol Torchia	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
372	Linda Williams	1	3.3
373	Louis T. Terry-Keshner	1	3.3
374	Dawn Dailidenas	1	3.3
375	Eileen Hogg	1	3.3
376	Judi Lawrence	1	3.3
377	Doug Blubaugh	1	3.3
378	Shahna Smithson	1	3.3
379	Richard W. Saunders	1	3.3
380	Marisa Ordonic	1	3.3
381	Stephanie Gipson	1	3.3
382	David Retter	1	3.3
383	Nancy Mora	1	3.3
384	Lydia Erickson	1	3.3
385	James S. Williamson	1	3.3
386	Kevin Miller	1	3.3
387	John Van Leer	1	3.3
388	Robert Schultz	1	3.3
389	Ian Bush	1	3.3
390	Suzanne Bachler	1	3.3
391	Katrina Seidel	1	3.3
392	Nancy Krivanka	1	3.3
393	Paul Hoffman	1	3.3
394	Amy Waterman	1	3.3
395	Daniel Corcoran	1	3.3
396	Ernest Kanbilige	1	3.3
397	Katherine Zandanel	1	3.3
398	Laura Blauman	1	3.3
399	Matt Fassel	1	3.3
400	Tanya Brehm	1	3.3
401	Ted Matts	1	3.3
402	Trisha Tyas	1	3.3
403	Jeremy Salyer	1	3.3
404	Alice Drabik	1	3.3
406	Beverly Hinkson	1	3.3
407	Josh Weiss/ Washington Forest Protection Association	> 100	ALL

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
408	Claude Hoover	1	3.3
409	Verner N. Schmidt	1	3.3
410	Jim Buck/State of Washington House of Representatives	3	3.3 and 3.5
411	Francis Hoffman	1	3.3
413	Mrs. R.G. McCalden	1	3.3
417	Cheddar Cheese	3	3.4, 3.5, 3.9 and 3.15
418	H.J. Sikov	2	3.3, 3.5 and 3.17
419	Peter and Mary Alice Belov	1	3.3
420	Mark Hannifin	2	3.3 and 3.5
421	Andrew J. Luk	1	3.17
422	James Tweedie	1	3.3
424	Dinda Evans	2	3.3
426	Dawn Brown	1	3.3
427	Jeanne Richardson	1	3.17
428	Earl Emerson	2	3.2, 3.3, 3.5 and 3.11
429	Fred Pickering	1	3.3
430	Harry Jester	1	3.3
431	Clayton H. Throop	2	3.3
432	Greg Arnold	2	3.3 and 3.5
433	Mark Pearson	1	3.3
434	John P. McMahon	1	3.3
436	Jeff Jones	2	3.3
437	Mary E. Mullen	3	3.3 and 3.5
439	Arnie Arneson	4	3.3 and 3.5
440	David S. Gill	1	3.17
442	Mary J. Roberts	5	3.1, 3.5 and 3.11
443	Jan Kobak	1	3.3
444	Gary Castillane	1	3.3
445	Larry Mitchem	2	3.3
446	Mark L. Doumit/ Washington State Senate	3	3.3 and 3.5
447	James W. Plampin	1	3.3
448	Sherry Fox	2	3.3 and 3.12

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
449	Doug Cole	2	3.3
450	Jodi Broughton	4	3.3 and 3.5
451	David Kerlick	3	3.3 and 3.5
452	Eldon Ball	3	3.3 and 3.5
453	Jarrod Scott	3	3.3 and 3.5
454	Lisa Marcus	3	3.3 and 3.5
455	Elaine Erickson	3	3.3 and 3.5
456	Chris Hehman	3	3.3 and 3.5
457	Arland Swanson	3	3.3 and 3.5
458	Julia N. Allen	3	3.3 and 3.5
459	Joe Chasse	3	3.3 and 3.5
460	Kirk Francis	3	3.3 and 3.5
461	Sarah S. McCoy	1	3.3
462	Vincent Saulino	3	3.3 and 3.5
463	Biefke Vos Saulino	3	3.3 and 3.5
464	Michael John Keenan	1	3.3
465	Dan Gonsor	3	3.3 and 3.5
466	Ann Gibson	3	3.3 and 3.5
467	Steven Short	3	3.3 and 3.5
468	Joel	3	3.3 and 3.5
469	Stacey Glenewinkel	3	3.3 and 3.5
470	Richard Artley	3	3.3 and 3.5
471	Sam Mowe	3	3.3 and 3.5
472	David H. Jones	3	3.3 and 3.5
473	Wesley Schlenker	2	3.3 and 3.5
474	Marcy J. Golde	4	3.1, 3.5, 3.7 and 3.11
475	David Powell	4	3.3, 3.5 and 3.18
476	Cindy McGuiness	1	3.3
477	Mark Thompson	3	3.3 and 3.5
478	Ronald Ramey	3	3.3 and 3.5
479	Michael Anderson	1	3.3 and 3.5
480	Jason Allen	3	3.3 and 3.5
481	Dinda Evans	3	3.3 and 3.5
482	Len Elliott	3	3.3 and 3.5
483	David Moskowitz	3	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
484	Alan Fiermonte	3	3.3 and 3.5
485	Wolter van Doornick	3	3.3 and 3.5
486	Sam Garst	3	3.3 and 3.5
487	Klaus Rudolph	3	3.3 and 3.5
488	John Kaiser	3	3.3 and 3.5
489	Jean Downing	3	3.3 and 3.5
490	James Bracher	3	3.3 and 3.5
491	Peter Rimbos	3	3.3 and 3.5
492	Jeriene Walberg	3	3.3 and 3.5
493	Amy Gulick	2	3.3
494	Pam Engler	3	3.3 and 3.5
495	Joe Sambataro	3	3.3 and 3.5
496	Nathan Woodward	2	3.3
497	Pat Collier	3	3.3 and 3.5
498	Robert B. Scott	3	3.3 and 3.5
499	Paul Wittrock	3	3.3 and 3.5
500	Rick Brooker	2	3.3
501	Steve Hansen	3	3.3 and 3.5
502	Richard Haight	2	3.3 and 3.16
503	Jessica McNamara	4	3.3, 3.5 and 3.15
504	Louis Richard	3	3.3 and 3.5
505	Frazier Coe	3	3.3 and 3.5
506	Gordon Wood	3	3.3 and 3.5
507	Alissa	3	3.3 and 3.5
508	Alex Shapiro	3	3.3 and 3.5
509	Tyler Allen	1	3.3
511	Bridget Bown	3	3.3 and 3.5
512	Karl Pursley	3	3.3 and 3.5
513	Robert Schenkkan	3	3.3 and 3.5
514	Dawn Gauthier	1	3.3
515	Jerry Liebermann	3	3.3 and 3.5
516	Marcia Butchart	3	3.3 and 3.5
517	Martha Kongsgaard	3	3.3 and 3.5
518	Rein Attemann	3	3.3 and 3.5
519	Annalee Cobbett	3	3.3 and 3.5
520	Brooke Nelson	3	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
521	Jen Watkins	3	3.3 and 3.5
522	Rita Moore	3	3.3 and 3.5
523	Richard Kennon	3	3.3 and 3.5
525	John McConnaughey	4	3.3, 3.5 and 3.17
526	Patrick S. Smith	4	3.3, 3.14 and 3.16
527	Maurice Williamson	4	3.3 and 3.5
528	Darcy and Larry Mitchem	3	3.3 and 3.14
529	Tami Garrard	3	3.3 and 3.5
530	Jeff Daffron	3	3.3 and 3.5
531	Richard Rieman	3	3.3 and 3.5
532	Betti Johnson	3	3.3 and 3.5
533	James B. Davis	3	3.3 and 3.5
534	Sharon Swift	3	3.3 and 3.5
535	Norm P. Schaaf	1	3.3
536	Rick Dunning/ Washington Farm Forestry Association	4	3.3, 3.5 and 3.12
537	Terry G'Uyant	3	3.3 and 3.5
538	Mary Pat Larsen	3	3.3 and 3.5
539	Peter Loft	4	3.3, 3.5 and 3.15
540	Sue Chickman/ Olympic Peninsula Audubon Society	3	3.3 and 3.5
541	Scott Swanson	2	3.3
542	Joan Harrison	2	3.4, 3.5 and 3.11
543	Katie M. Carver	1	3.3
544	Kassie Swenson	1	3.3
545	Angie Dozer	1	3.3
546	Andrea Kire	1	3.3
547	Cindy Tortorelli	1	3.3
548	Chris Smith	1	3.3
549	Mariah Wevgel	1	3.3
550	Nancy Ann Smith	1	3.3
551	Howard Weise	1	3.3
552	Ryan O'Hara	1	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
553	Misty Litchfield	1	3.3
554	Meghan Lynch	1	3.3
555	David W. Bilsland	1	3.3
556	Leland Alkire, Jr.	1	3.3
557	Tady Woods	1	3.3
558	Brittney Myles	1	3.3
559	Paul Kampmeier/ Washington Forest Law Center	> 100	ALL
560	William M. Marre	3	3.3 and 3.14
561	Marti Leviel	1	3.3
562	Kevin Eddings	2	3.3 and 3.5
563	Christopher Childers	2	3.3 and 3.5
564	Brian Prater	2	3.3
565	Frederic Hall	2	3.3 and 3.5
566	Jim Thiemens	18	ALL
567	Merrily Curtis	1	3.3
568	Randall Winter and Rosemary Adamski	2	3.3 and 3.5
569	Steve Tift	1	3.3
570	Emily Farrell	3	3.3 and 3.5
571	David Robinson	3	3.3 and 3.5
572	Albert Postema	2	3.3 and 3.5
573	Steven A. Trudell	3	3.3 and 3.5
574	Jim G. Likes	13	ALL
575	Marilyn Disch	1	3.3
576	Patrick McCoy	4	3.3, 3.14 and 3.16
577	Ted Kennedy	1	3.3
578	Doyle Blankenship	1	3.3
579	Edith Moilanen	1	3.3
580	Howard Ritter	1	3.3
581	Robert Kelly/ Nooksack Indian Tribe	10	ALL
582	Bob Triggs	3	3.3 and 3.5
583	Evidio Molina	3	3.3 and 3.5
584	Stephen de Blois	3	3.3 and 3.5
585	Barbara Gross	3	3.3 and 3.5
586	Tim Kadrmas	3	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
587	Francis C. Wood, Jr.	3	3.3 and 3.5
588	Linda A. Ballantine	3	3.3 and 3.5
589	Lisa Davison	3	3.3 and 3.5
590	Julianne Jaz	3	3.3 and 3.5
591	Lesley Rigg	2	3.3
592	Nancy Lill	3	3.3 and 3.5
593	Austin Iles	3	3.3 and 3.5
594	Bonnie Miller	3	3.3 and 3.5
595	David Grimmer	3	3.3 and 3.5
596	Richard F. Longaker, III	3	3.3 and 3.5
597	Cindy McGuiness	3	3.3 and 3.5
598	Rob Masonis	3	3.3 and 3.5
599	Kevin Farrell	3	3.3 and 3.5
600	Gordon Adams	3	3.3 and 3.5
601	Dave Porter	3	3.3 and 3.5
602	Carol J. Rice	3	3.3 and 3.5
603	Fritz E. Wollett	3	3.3 and 3.5
604	Sanjeev Mehrotra	4	3.3 and 3.5
605	Tina Blade	3	3.3 and 3.5
606	Diane Smith	3	3.3 and 3.5
607	Kathleen Craig	3	3.3 and 3.5
608	Greg Hart	3	3.3 and 3.5
609	Jeff Ellingson	3	3.3 and 3.5
610	Richard Jacobs	3	3.3 and 3.5
611	Joel Sisolak	3	3.3 and 3.5
612	Brendan Kavanagh	3	3.3 and 3.5
613	Nathan Rice	3	3.3 and 3.5
614	Rene Senos	3	3.3 and 3.5
615	David Lien	3	3.3 and 3.5
616	Jacob Gown	3	3.3 and 3.5
617	Sharon Cody	3	3.3 and 3.5
618	Gail Cochran	3	3.3 and 3.5
619	Rain Eventoff	3	3.3 and 3.5
620	Steffen Fanger	3	3.3 and 3.5
621	Melissa Sanborn	3	3.3 and 3.5
622	Paul Piper	3	3.3 and 3.5
623	Richard Raisler	3	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
624	Chris Beamis	3	3.3 and 3.5
625	Zandra Saez	3	3.3 and 3.5
626	Brian Sullivan	3	3.3 and 3.5
627	Jason Orsin	3	3.3 and 3.5
628	David H. Jones	3	3.3 and 3.5
629	Jeff McGrath	3	3.3 and 3.5
630	Paul J. Bride	3	3.3 and 3.5
631	Christian Martin	3	3.3 and 3.5
632	Noreen Wedman	3	3.3 and 3.5
633	JoAnn Hunter	3	3.3 and 3.5
634	Richard Tinsley	3	3.3 and 3.5
635	Johonna Shea	3	3.3 and 3.5
636	Randy Houston	3	3.3 and 3.5
637	Melissa McClure	3	3.3 and 3.5
638	Charley Knox	3	3.3 and 3.5
639	Leslie H. Romer	3	3.3 and 3.5
640	Inga Drechsel	3	3.3 and 3.5
641	Yvette Olsen	3	3.3 and 3.5
642	Joanne Webb	3	3.3 and 3.5
643	John D. de Yonge	3	3.3 and 3.5
644	Ken Gilmour	3	3.3 and 3.5
645	Pam Bissonnette/ King County Department of Natural Resources and Parks	14	3.4, 3.5 and 3.17
646	Hilton Turnbull/ Jamestown S'Klallam Tribe	24	ALL
647	Mary Leilka/ Hoh Indian Tribe	16	ALL
648	Jeffrey Taylor	1	3.15
649	L.A. Heberlein	1	3.3
650	Mark Weick	1	3.3
651	Brad Buckwalter	1	3.3
652	David Schuchardt	1	3.3
653	Aaron Everett	2	3.3 and 3.5
654	Chris Roberts	3	3.5 and 3.11
655	Steve Scott	4	3.1, 3.4, 3.5 and 3.11
656	Wade Boyd	2	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
657	Nicholas A. Speed	3	3.4, 3.5 and 3.6
658	Kurt E. Armbruster	1	3.3
659	Jeff Madsen	2	3.3 and 3.5
660	Ian Kanair/ Snoqualmie Tribe	13	3.5, 3.15 and 3.18
661	Charles Laird	3	3.5, 3.15 and 3.16
662	Jesse Feathers	5	3.3, 3.5, 3.6 and 3.11
663	Jack E. Davis	1	3.3
664	Ronald L. Simon	1	3.3
665	Kevin Godbout	32	ALL
666	Carla Erb	1	3.3
667	Jeff Hull	2	3.3
668	Stacey Panek	2	3.3 and 3.5
669	Barbara Jepson	2	3.3 and 3.5
670	Curtis Christman	1	3.3
671	Charles Repath	1	3.3
672	Jonathan and Jennifer Wallace	1	3.3
673	Bill Mehl	1	3.3
674	Roger Hicks	2	3.7 and 3.11
675	Wade Boyd	1	3.3
676	Scott Ringgold	1	3.3
677	Everett Latch	1	3.17
678	Tim McNulty	2	3.5
679	Carol Johnson/ North Olympic Timber Action Committee	1	3.3
680	Jackie Devincent	1	3.3
681	Brent M. Young	1	3.3
682	Rob Purser/ Suquamish Tribe	18	ALL
683	Steve Meuter	1	3.3
684	Dimmit Smith	3	3.4, 3.5 and 3.11
685	Becky Kelley/ Washington Environmental Council	4	3.1, 3.3 and 3.5
686	Rob and Marcie Jones	1	3.17

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
687	Merrie Gough	4	3.3, 3.4, 3.11 and 3.15
688	D.W. Bouton	3	3.3, 3.5 and 3.11
689	Paul Parker/ Washington State Association of Counties	6	3.3 and 3.5
690	Julie Norbeck	3	3.3, 3.5, 3.11 and 3.16
691	Lorin Hicks	3	3.3 and 3.5
692	John Walenta	1	3.3
693	Ronlars B. Jones	1	3.5 and 3.11
694	Ben Barrie	2	3.5 and 3.16
695	Ken Miller	4	3.3, 3.12, 3.16 and 3.17
696	Paul W. Birkeland	3	3.3, 3.5 and 3.15
697	Teresa Fleener	1	3.3
698	William W. Davis	1	3.3
699	123 456	1	3.3
700	Will Morgan	2	3.5 and 3.6
701	Richard Jepson	2	3.4 and 3.5
702	Patricia Michaud	3	3.3 and 3.5
703	Paula Lindsay	4	3.3, 3.5 and 3.16
704	Christopher Lipton	9	3.3, 3.5, 3.14, 3.15 and 3.17
705	Barbara Christensen	3	3.3 and 3.5
706	Seth Cool	4	3.3, 3.5 and 3.16
707	Bob Sarver	3	3.3 and 3.5
708	Hudson Dodd	3	3.3 and 3.5
709	Joseph A. Losi	3	3.3 and 3.5
710	Derrick Knowles	3	3.3 and 3.5
711	Timothy J. Coleman	3	3.3 and 3.5
712	John Lukas	1	3.3
713	Conrad Singsaas	1	3.3
714	Wallace A. Goelzer	2	3.3 and 3.5
715	Erin Moore	3	3.3 and 3.14

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
716	Lisa Marcus	1	3.3
717	Joe Peone/ Colville Confederated Tribes	10	ALL
718	Cavin	4	3.3 and 3.5
719	Robert Roth	1	3.3
720	Louis L. Cloud/ Confederated Tribes and Bands of the Yakama Nation	17	ALL
723	Robert L. McKenzie	1	3.3
724	Janet E. Wainwright	1	3.3 and 3.5
725	Ozzie Bender	1	3.3
732	Wilfred Farley	1	3.3
733	Claude Hunter	1	3.3
735	Warren Seyler/ Upper Columbia United Tribes	12	ALL
736	Warren Seyler/ Upper Columbia United Tribes	10	ALL
737	Jeff Koenings/ State of Washington Department of Fish and Wildlife	4	3.3 and 3.5
738	Tina Schulstad/ Sierra Club Cascade Chapter	22	ALL
742	Rose Oliver	3	3.3 and 3.5
743	Tom Casey	1	3.17
744	Bonnie Netzel	2	3.3, 3.5 and 3.11
745	Michael Garrity	3	3.3 and 3.5
746	Christopher Mendoza	1	3.5 and 3.11
747	Bruce Blakeslee	1	3.3
748	Mason D. Morisset/ Attorneys for the Tulalip Tribes of Washington	50	ALL
749	Keith Preszler	1	3.3
750	Suanne Kauffman	1	3.3
751	C. Ziemnik	1	3.5
752	Leeona Klippstein/ Spirit of the Sage Council	32	ALL
755	Ty Tice	2	3.3

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
756	Sue Clark/Washington Forest Protection Association, transcripts from telephone hot-line	1	3.3
757	Merle Jefferson/ Lummi Indian Nation	32	ALL
758	Bonney Netzel	1	3.3
759	Ron Eng/ The Mountaineers	21	ALL
760	Glen St. Amant/ Muckleshoot Indian Tribe	22	ALL
761	Alice Flegel	1	3.3
762	Tim Hewitt	1	3.3
763	Toby Thaler/ Washington Forest Law Center	2	3.3 and 3.14
764	Garland and Linda Bellamy	3	3.3, 3.5 and 3.11
765	Christina B. Reichgott/ U.S. Environmental Protection Agency Region 10	25	ALL
766	Dwight C. Opp	11	3.3, 3.5, 3.16 and 3.17
767	Ed Danner	1	3.3
768	Debbie Regala/ Washington State Senate	3	3.3 and 3.5
769	Billy Frank, Jr./ Northwest Indian Fisheries Commission	21	ALL
770	Russell Sevec/ Makah Tribe	60	ALL
771	Charles Dahlgren	2	3.5
772	Roger Singer/ Sierra Club Pacific Northwest Office	1	3.3
773	Jill McGrath	1	3.3
774	John Gorman	2	3.3
775	Crystal Gartner	3	3.3 and 3.5
776	Timothy Randolph	3	3.3 and 3.5
777	Feryll Blanc	3	3.3 and 3.5
778	Bob and Amy Lutz	3	3.3 and 3.5

Table 2-1. Comments per Letter and Suggested Response Subsections to Read (continued)

Letter #	Name/Organization	Number of Comments Identified in Letter	Suggested Response Subsection(s) to Read
779	Olney Patt, Jr./ Columbia River Inter-Tribal Fish Commission	55	ALL
780	Brian O'Dell	1	3.3
781	Innes Lochlan	1	3.5 and 3.11
782	David G. Britten	1	3.17
783	David G. Britten	1	3.17
784	David E. Ortman/ Wise Use Movement	2	3.3
785	Louise Stonington	1	3.3
786	Janeen Porter and Don Hamerquist	8	3.5, 3.15 and 3.17
787	Janeen Porter and Don Hamerquist	25	ALL
788	Keith Wyman/ Skagit River System Cooperative	19	ALL
789	Ray Williams	3	3.3 and 3.5
790	Larry Sage	1	3.3
791	Raymond Emmerton	1	3.3
792	Herb Winward	1	3.3
793	Lois Powell	1	3.3
794	Al and Pat Lynk	1	3.3
795	Alex Goedhard	1	3.3
796	Byron Williams	1	3.3
797	David Vaagen	1	3.3
798	Douglas Hart	1	3.3
799	Edward Snyder	1	3.3
800	Eleanor Snyder	1	3.3
801	Frank N. Wanner	1	3.3
802	Dr. Gary Ritchie	1	3.3
803	Harry Hayward	1	3.3
804	Harold B. Brunstad	1	3.3
805	James Smith	1	3.3
806	Robert Fischbach	1	3.3
807	William Faulkner	1	3.3

3. RESPONSES TO PUBLIC COMMENTS

3.1 ENDANGERED SPECIES ACT

3.1.1 Overview

The Services received many comments that indicated that the Draft FPHCP is not sufficient to receive incidental take authorization under Section 10 of the Endangered Species Act (ESA). Each of the issuance criteria found in Section 10 was mentioned by at least one commenter as not being met by the Draft FPHCP.

The Services acknowledge that the interrelationship of the National Environmental Policy Act (NEPA) and the ESA is complex, in part because both laws deal with the protection of environmental values. However, each law has a distinct purpose. The purpose of an Environmental Impact Statement (EIS) under NEPA is to promote disclosure, analysis, and consideration of the broad range of environmental issues surrounding a proposed Federal action by looking closely at a full range of reasonable alternatives, including "no action." Public comment promotes this purpose, whether the action is the construction of a freeway or the issuance of an Incidental Take Permit (ITP). The alternative that is selected as the Federal action is chosen after consideration of public comments and is documented in a Record of Decision.

In particular, the purpose of the DEIS analyzing the Draft FPHCP and other alternatives is not to determine whether any of the alternatives meet the requirements necessary to receive incidental take authorization under the ESA -- and the DEIS is not written to document this determination. Similarly, the Record of Decision under NEPA determines which alternative will be selected as the Federal action but does not determine whether that chosen alternative complies with the ESA. At least one commenter devoted significant resources to an analysis of Kalama River steelhead to determine whether the FPHCP application should receive a "jeopardy" determination under ESA Section 7 or whether the application met the issuance criteria under ESA Section 10 for an ITP. Another commenter was critical of the DEIS because it did not quantify "take" associated with each alternative. The Services have noted all comments related to the question of whether or not any particular alternative meets various ESA standards found in Sections 7 and 10, but those comments are assertions or conclusions that are beyond the scope or purpose of NEPA. Again, the purpose of the DEIS, and the Final Environmental Impact Statement (FEIS), is to compare environmental effects of various alternatives, not to determine whether any particular alternative complies with the ESA.

ESA Sections 10 and 7 establish criteria that are independent of NEPA. Section 10 requires an applicant to ensure certain information is included in an application for an ITP. Section 10 requires the Services to make certain findings about the adequacy of the application. Many commenters stated their beliefs about whether the information provided by the State of Washington in the application met the Section 10 requirements, or stated their conclusions about whether that information warranted issuance of an ITP. Several commenters wanted the Services to examine the implementation of forest practices since the January 1, 1999, Washington Forest Practices Rules went into effect in

order to make their determinations. Some believed that DNR's specification of the impact of incidental take was inadequate. One felt that the conduct of forest practices under the FPHCP was not an "otherwise lawful activity" at required by Section 10. At least one wanted a determination that forest practices were not the dominant cause of salmon and bull trout being listed under the ESA, prior to issuance of any ITP. In many cases, commenters misstated the requirements of the ESA for ITP issuance. For example, some commenters suggested that all incidental take must be minimized and mitigated. The requirement of Section 10 is that the impacts of incidental take be minimized and mitigated to the maximum extent practicable. See the next subsection, Minimize and Mitigate, subsection 3.1.2. Some commenters believed that the FPHCP must result in recovery of covered species. The requirement of Section 10 is not that it results in recovery but that the plan is consistent with recovery, because many other factors outside the scope of an HCP are usually needed to actually result in recovery. Others felt that the mitigation strategy in the Draft FPHCP was inadequate because it did not provide "full" protection of riparian areas. Another urged employees of the Services make their determinations without concern for their own personal careers.

The Services note these comments. However, the determination as to the appropriateness of incidental take authorization under the ESA for the chosen alternative will be documented in a statement of findings under ESA Section 10 by each of the Services. Similarly, the determination as to the adequacy of the chosen alternative under ESA Section 7 will be documented in a biological opinion by each of the Services. Finally, if appropriate, ITPs will be documented and issued. When final, these documents will be available to the public.

One commenter wanted alternatives compared to recovery plans adopted by USFWS. At least one other urged that no ITP be issued until a recovery plan for all covered, listed species (and designation of critical habitat) was adopted. The Services note that the standards for issuance of an ITP are contained in Section 10 and, while consistent with recovery, do not require full recovery because so many other factors are involved in recovery than are included in "covered activities" in any particular HCP

Several commenters felt that landowners should not be "exempted" from the ESA. The Services point out that HCPs and ITPs are established by the ESA and that receiving an ITP is fully consistent with the statute. At least one commenter expressed the belief that the prohibition against "take" in the ESA encourages landowners to keep habitat degraded (so as not to attract listed species). The commenter favored issuance of an ITP, based on an HCP, as a better mechanism to conserve listed species. Comment noted.

Two commenters stated that DNR and WDFW cannot legally obtain Federal funding under ESA Section 6, Cooperative Agreements with States, because: (1) States can only receive Federal funding for "conservation" and such conservation shall not effect the applicability of ESA Section 9 "take prohibitions" and (2) the State government is approving and implementing programs for endangered species that do not provide for recovery. One of these commenters also suggested that the Services have created some sort of internal policy that provides Federal subsidies, via Section 6, to States and other non-Federal entities that agree to develop and implement ESA Section 10 and claims that

such "policies" are not consistent with the ESA and are unlawful. This same commenter also states that it appears that DNR has piggybacked on to the WDFW Cooperative Agreement in order to apply for Federal grants to develop and implement various HCP/ ITPs. Finally, this commenter states that Section 10 is the only Section of the ESA that is an exemption to Section 9 and objects to the Services providing Section 6 financial assistance grants for this HCP and ESA Section 4(d) program.

While these comments are outside the scope of the DEIS, it should be noted that the commenters are likely confusing Cooperative Agreements with States under ESA Section 6 with the lawful ability to receive Section 6 funds for developing an HCP under the Habitat Conservation Planning Assistance Grant of the Cooperative Endangered Species Conservation Fund, created 4 years ago. It is totally legal and, by regulation, is consistent with the ESA. The commenter is also informed that take can be authorized and/or exempted under ESA Sections 4(d) and 7.

3.1.2 Minimize and Mitigate

Many commenters addressed the question of mitigation. Some were focused on the requirements of NEPA to analyze mitigation and some were focused on the ESA Section 10(a)(2)(B) ITP issuance criteria. The Services received little comment on the NEPA mitigation requirement relative to those concerning the ESA "minimize and mitigate" criterion. It is important to note that these requirements are different, as is the analysis associated with them.

ESA Section 10(a)(2)(B) requires, among other things, that the Services determine that an applicant for an ITP will, "to the maximum extent practicable, minimize and mitigate the impacts of [the incidental] taking." Mitigation is linked solely to the *impact* of incidental take of covered species that would be authorized under Section 10, but it is linked to 100 percent of that impact, not just the increment of take that may be caused by the proposed action relative to the *status quo*. The Services' publish the analyses of whether this permit issuance criterion is met in the Services' respective ESA Section 10 findings documents. Related information is presented in the incidental take statements included with the Services' respective biological opinions prepared under ESA Section 7.

NEPA and the EIS, on the other hand, probe mitigating the broad range of effects from the proposed action on the human environment in comparison to reasonable alternatives. Unlike under ESA, NEPA examines effects relative to the *status quo*, *i.e.,* what would be the expected consequences to the environment if there was no Federal action. Alternative 1 in the DEIS presents this *status quo* condition and much of the analysis in Chapter 4 of the DEIS compares the effects of the other alternatives against Alternative 1 in order to expose areas where mitigation may be warranted, *i.e.*, where the action would cause an adverse effect compared to the *status quo*.

3.1.3 Mitigation under the Endangered Species Act

Most of the comments on this topic asserted opinions on whether or not the Section 10 criterion to "minimize and mitigate to the maximum extent practicable" is met by Alternative 2, the FPHCP. Favorable comments asserted that one or more of several "tests" (such as those stated in the Services' HCP Handbook or in recent judicial

opinions) for this criterion are met in the Draft FPHCP. Opposing comments asserted that the Draft FPHCP did not meet the ESA Section 10(a)(2)(B) requirement that the plan minimize and mitigate impacts to the maximum extent practicable. Most of these comments provided no information in support of their assertion. At least one commenter made this assertion about a variety of specific species, but with no information to support the conclusion. Another comment suggested that the Draft FPHCP did not analyze mitigation for activities that were "exempt" from the Washington Forest Practices Rules. The Services point out that such activities are not covered activities under the FPHCP.

Several commenters expressed their view that the "tests" presented in judicial opinions are not met. One commenter specifically argued that those cases held that mitigation measures that only met species minimum biological needs are not sufficient. At least one commented that the FPHCP should avoid all harm to listed species. Another stated that the adaptive management program could not be used as a mitigation measure. Others stated the belief that mitigation measures are insufficient because they are speculative or because they will not occur until after the associated incidental take has occurred. One commenter noted that mitigation measures may continue to be required if an ITP is revoked. One commenter was concerned about "residual" take, noting that there would be less residual take under the FPHCP than under the *status quo* (The Services believe this comment equated "residual" take to "incidental" take). One commenter cited the recommendations related to mitigation found in a national study of HCPs. Another felt the assessment of the impact of take must occur at the site scale.

The Services have noted these comments that favor and oppose a finding that the FPHCP minimizes and mitigates take to the maximum extent practicable. Much of the commentary asserting that an alternative fails to meet the "minimize and mitigate" criterion argues the applicant could "afford to pay more" in minimizing and mitigating the effects of take to the maximum extent practicable. The Services disagree that "ability to pay" is a primary consideration for this criterion. The Services further disagree that the NEPA public environmental review is the proper stage in the application process to explore whether the FPHCP meets this or any of the issuance criteria. The following summarizes the process that will be used to determine whether the FPHCP application meets this criterion when the Services prepare respective statements of findings under ESA Section 10(a)(2)(B).

To make the required determination, the Services assess the "impact" of incidental take that would be authorized through the respective ITPs. As noted by one commenter, the mitigation in an HCP is to be commensurate with the impacts the mitigation addresses; several commenters incorrectly interpreted the ESA requirement to mitigate the "impact" of incidental take to mean to require mitigation for the "amount" of take. Section 10(a)(2)(A) requires information about the "impact" to be included in the applicant's conservation plan. In the context of habitat-based conservation plans, the Services have advocated the use of assessment of the extent of effects expressed as a quantity of habitat affected. Several commenters supported this approach. Knowing the outcome of habitat-affecting actions enables the Services to assess the overall functional effect of the mitigation supplied in an HCP and whether it is commensurate with the effects of the

covered activities. The Draft FPHCP includes information in Chapter 4e on the extent of effects that are anticipated. The DEIS addresses effects in Chapter 4.

This method of assessment is entirely consistent with activities causing take in the form of "harm" as defined in the Services' respective ESA implementing regulations in the Code of Federal Regulations (CFR) (50 CFR 17.3 and 50 CFR 222.102). Harm in the definition of "take" in the ESA means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (USFWS definition), or breeding, spawning, rearing, migrating, feeding or sheltering (NMFS definition). So, the incidental take at the heart of this inquiry is that occurring through habitat modification. Thus, the Services examine the extent of take in terms of the extent of habitat modification that would occur under the proposed action.

Several commenters took issue with the assumptions in the Draft FPHCP under which the assessment of the extent of effects was made. The Services believe that sufficient information exists in the Draft FPHCP and the DEIS to make a reasonable assessment as to the impact of the incidental take that would be authorized under the FPHCP. The Services' assessments will be documented in statements of findings prepared under Section 10(a)(2)(B) and in the incidental take statements prepared for the Services' respective biological opinions under ESA Section 7 at the appropriate juncture in the process of reviewing the FPHCP application.

The determination by the Services that the plan as a whole not "appreciably reduce the likelihood of the survival and recovery of the species in the wild" (Section 10(a)(2)(B)(iv) complements but is independent of the assessment of the extent of take. This is the same determination for the "jeopardy" standard that is used in ESA Section 7 and it applies in both instances to the species as a whole (defined by NMFS as an Evolutionary Significant Unit [ESU] and the USFWS as a Distinct Population Segment [DPS]). Note that the assessment of the extent of take is done at the scale of the area affected by the action, but the jeopardy analysis is done at the scale of the ESU or DPS. According to this analysis, the "impact" of incidental take associated with the action area cannot be so significant so as to jeopardize the species at the ESU and DPS level. If the impact of take were significant enough to jeopardize the ESU or DPS, the Services would not issue ITPs. Where the ESU or DPS as a whole is not jeopardized by the action and an ITP can be issued, the "impact" of the take in the action area cannot be as significant. Thus the essential piece of information supporting a finding on whether an HCP minimizes and mitigates the effects of take to the maximum extent practicable is whether the ecological needs of the covered species are met by the HCP. It is within this context that the Services determine whether the impact of the incidental take has been minimized and mitigated to the maximum extent practicable.

Several commenters sought an explicit articulation of the mitigation measures. As stated in the Habitat Conservation Planning Handbook, mitigation programs under ITPs "are as varied as the projects they address," but "usually take one of the following forms: (1) avoiding the impact (to the extent practicable); (2) minimizing the impact; (3) rectifying

the impact; (4) reducing or eliminating the impact over time; or (5) compensating for the impact." More specifically, the Handbook includes among potential types of habitat mitigation a primary strategy of the FPHCP: the "prescriptive management of habitats to achieve specific biological characteristics" (Handbook Chapter 3(B)(3)(c)). As a practical matter, the Services view the FPHCP, like most other habitat-based conservation plans, as having integrated its minimization and mitigation measures with the other activities for which the applicant seeks incidental take authorization. In other words, the Services find it difficult to separate the environmental effects of covered activities from the effects of measures intended to minimize those effects. A site-scale example of such integration is the designation of protective buffers of unharvested trees around certain ecological features used by covered species. Incidental take does not result from the leaving of an unharvested buffer. Instead, leaving the buffer minimizes the effects of other harvest within the landscape in which the harvest occurs. However, it is important to remember that the assessment of whether this criterion for issuance of an ITP has been met is conducted for the plan as a whole, not for individual activities or measures.

Several commenters asserted that mitigation must occur prior to the commensurate incidental take under an HCP (See Habitat Conservation Planning Handbook Chapter 3(b)(2)(c)). The Services do not agree. On the contrary, the Services have approved HCPs that backload the mitigation, as well as HCPs whose mitigation occurs contemporaneous with the incidental take. The important factor is that, ultimately, the mitigation is commensurate with the incidental take that occurs. The Services note that the need for mitigation measures to "ripen" after habitat modifying activities has always been one of the main reasons for ITPs of longer duration for forestry HCPs. The Implementation Agreement for the FPHCP incorporates the Services' rules and regulations which make this clear. See also the Adaptive Management response, Term Duration, subsection 3.5.2.

The specific minimization and mitigation measures are found in Chapter 4 of the Draft FPHCP. This information is captured in Alternative 2 (Proposed Action) of the DEIS. Information on the effects of the Proposed Action and the various alternatives can be found in Chapter 4 of the DEIS. The Services believe sufficient information exists to make a determination as to whether the applicant has minimized and mitigated incidental take to the maximum extent practicable. This assessment will be documented in each of the Service's statement of findings document under ESA Section 10 and biological opinion under ESA Section 7.

3.1.4 Section 7

More than one commenter said the ESA Section 7 consultation should address all currently listed and proposed species that occur in Washington (plan area), including plants, avian, terrestrial and other non-aquatic species that are not "covered species" under the FPHCP. One of these commenters also suggests that the Services consider species that do not currently exist in the plan area but would need to utilize the area at some level to achieve recovery.

Under ESA Section 7, the Services are required to analyze the effects of the action, i.e., issuing ITPs for take that may occur as a result of implementing the Section 10 HCP measures, on all listed species and designated critical habitat that may occur in the action area, as well as all unlisted species requested by the permit applicant to be "covered species." The FPHCP plan area includes non-Federal, non-tribal forested lands subject to the Washington Forest Practices Rules. The action area includes the area determined to be affected by implementation of the covered activities described in the FPHCP. If the range of any listed species includes the action area, these species will be addressed by the Services in our respective biological opinions. If the range of any listed species does not include the action area, these species, as well as any unlisted species outside the plan area, will not be analyzed in the ESA Section 7 consultation. Analyzing effects of the action on unlisted species that are uncovered species is unnecessary and impractical. Although an ITP is not required for plants because there is no prohibition of take on non-Federal ownerships, an effects analysis for Federal actions is required and will be conducted for listed plant species within the action area.

One commenter stated that the analyses under Sections 7 and 10 need to assess baseline conditions and expected impacts at the same geographic scale. This same commenter reminds the Services that ESA Section 7(a)(2) and the ESA administrative rules require agencies to use the best available science and states that the Services must consider all relevant data and data expected from ongoing studies; where data gaps exist, the Services should either delay the biological opinion or develop the biological opinion with the available data but give the benefit of the doubt to the species. The commenter adds that the effects of likely future changes in environmental conditions, including those changes related to climate, must be accounted for.

The Services acknowledge that analyzing the expected impacts at the same geographic scale as that described in the baseline conditions is preferable. However, often the information available on the species being analyzed is at a different scale than the information that is known about the effects of the covered activities. For example, the Services may know the limits of the range of a particular species but the Services may not know if the species occupies a specific watershed or sub-basin. The Services may, however, know the effects of particular covered activities on habitat features at the sub-basin scale and can draw inferences from this information on how it may affect the species population at the range-wide scale. In order to conduct this type of analysis, the Services are required, as the commenter reminds us, to use the best available information and relevant data. Our analyses, though, will be conducted with information available at a moment in time, and cannot be expected to "wait" on the results of ongoing studies. There will often be studies that are ongoing that may or may not produce significant results. In the case of an HCP, rather than delay developing a biological opinion, the Services and the ITP applicant address biological uncertainties through an adaptive management program (see the Adaptive Management response, subsection 3.5). The Services are obligated to analyze the effects of the covered activities on covered species and cumulative effects to the extent that they are reasonably certain to occur. However, the specific effects of the magnitude and rate of changing environmental conditions such as global warming would be difficult to predict, and speculative, given the variability in

land use practices and vegetative conditions from watershed to watershed east and west of the Cascade crest.

At least one commenter suggested how the Services should make "effects determinations" on covered species and listed species not included in the FPHCP. The Services appreciate the commenter's opinion as to the "effects determinations" the Services should make on the covered species, and any uncovered listed species within the action area. However, very little scientific information was provided by the commenter to support these determinations. The Services are obligated to make effects determinations after conducting a thorough analysis of the effects of the action to the covered species in the action area using the best scientific and commercial information available. This will be done while conducting our internal ESA Section 7 analyses.

Another commenter cited language from applicable law and stated that in biological opinions conducted under ESA Section 7 and in the DEIS for the Draft FPHCP, the Services must analyze the impact of logging for the next 50 years under the FPHCP on the endangered population of the northern spotted owl. This commenter also reminded the Services that the Services must review all relevant information to determine whether the proposed action is likely to jeopardize a listed species or destroy or adversely modify its designated critical habitat, and that the Services' evaluation include the "effects of the action" together with "cumulative effects" on the listed species. This same commenter expressed concerns that restrictions on logging in riparian areas will increase the pressure to log upland areas affecting the northern spotted owl, and stated that the Services have a duty to analyze the nature and magnitude of that impact given that spotted owl populations are declining (Anthony et al. 2004).

The Services are cognizant of our obligations under ESA Section 7. Part of our obligations require that the Services analyze the effects of the action, i.e., issuing an ITP for covered species under our purview, on all listed species in the action area, whether or not they are covered species. As stated in other responses above, the Services will conduct this effects analysis using the best scientific information available.

3.1.5 Assessment of Take

The Services received a comment that suggested that fish species identified as covered species in the Draft FPHCP are likely to be subjected to greater amounts of unmitigated take than predicted by the generic assessment of the extent of effects in the Draft FPHCP. The Services' implementing regulations (50CFR17.22 and 50CFR222.307) for ESA Section 10 require an HCP applicant to specify the anticipated impact (i.e., amount, extent, and type of anticipated taking) that will likely result from their HCP. However, for any HCP, the Services actually conduct a detailed analysis of the take anticipated by issuing an ITP under an intra-Service consultation under ESA Section 7. The Services have the ultimate responsibility to determine the anticipated taking that would be expected under an HCP.

3.1.6 Section 4(d) Rule

One commenter stated that the ESA Section 4(d) Special Rules is convoluted and unlawful. Section 4(d) Special Rules are only to be used for management needs of the

species. Section 4(d) take provisions are only to be used for diseased individuals and where the species are overpopulated without adequate resources to maintain them. The commenter is opposed to the proposed use of Section 4(d) to "take" threatened species.

The Services disagree with this comment about the use of ESA Section 4(d) Special Rules and the circumstances under which take would be allowed. ESA Section 4(d) authorizes the Secretary (Commerce or Interior) to issue such regulations as deemed necessary and advisable to provide for the conservation of threatened species. Typically, Section 4(d) regulations (Special Rules) contain special measures tailored to the conservation of a particular threatened species, as well as prohibitions of specific activities necessary and appropriate to conserve the species. However, a Section 4(d) Special Rule may exempt certain activities from ESA Section 9 take prohibitions, or put a limit on the take definition, when the activities are conducted in accordance with the requirements identified in the Special Rule, for example, when such activities occur outside of important protected areas or, overall, the activities result in conservation of the species at the population level even though some individuals may be taken.

One comment letter stated that their comments submitted on the DEIS also apply to any potential USFWS ESA Section 4(d) rule applicable to aquatic species impacted by the Washington Forest Practices Rules, in the event the USFWS promulgates a Section 4(d) rule.

Comment noted. If and when the USFWS promulgates an ESA Section 4(d) rule, a public notice will be published in the Federal Register affording the public ample opportunity to comment on the Section 4(d) rule. The Services would expect members of the public and organized entities who wish to comment on such a rule to submit their comments at that time, i.e., during the open public comment period.

In addition, the same commenter submitted specific comments from March 2000, on NMFS's then proposed ESA Section 4(d) rule (U.S. Federal Register, Vol. 65, No.132, July 10, 2000, pages 42422-42481), as part of their comments on this DEIS. Some of the topics of include: best available science should be used to determine protection for listed species; protection of riparian function is insufficient; the basis for calculations -existing fish usage data - is inaccurate; the small landowner riparian exemption; standards used to determine necessary road fixes has no basis in science; the time frame for fixing roads is too long; mass wasting and sedimentation from roads is too high; forest management negatively effects stream peak flows; essential conservation elements are lacking in the plan; the Draft FPHCP lacks adequate funding for implementation; 50 years is too long for an HCP; and the Draft FPHCP adaptive management system is unlikely to bring about needed change.

The above comments were considered and responded to by NMFS under the ESA Section 4(d) rule-making process and responses were provided in the Final Rule Federal Register Notice in July 2000. The responses remain appropriate in the present context in which the comments were submitted.

Comments specific to the NMFS ESA Section 4(d) rule include a concern that the Washington Forest Practices Rules and the application for Section 4(d) assurances do not

meet the standards set forth in Limit 13 of the NMFS Section 4(d) rule. The commenter believes that NMFS should not limit the ESA take prohibition as requested because the State application does not comply with the requirements set forth in 50 CFR 223.203(b)(13). This is because there is little or no discussion of the impacts of significant rule changes in the Draft FPHCP and DEIS whereby the State exempted, from the riparian prescriptions, certain landowners with less than 20 acres of forested land, and exempted small forest landowners from the Rules requiring Road Maintenance and Abandonment Plans (RMAPs). The commenter continues that the State has failed to affirmatively show that its revised Rules are at least as protective as those in the Forests and Fish Report (FFR). The commenter goes on to state that NMFS must reject the State application under Limit 13 unless and until the State presents a package of forest practices rules that is consistent with the conservation of salmonid habitat, contributes to the attainment and maintenance of properly functioning conditions, is based on the best available science, and complies with all applicable regulatory criteria.

The Services respond that the Washington Forest Practices Rules are based on practices which, over time, will contribute to the attainment and maintenance of riparian and aquatic habitat conditions that support all salmonid life-stages, meeting the ecological needs of those species. This approach is consistent with ESA Section 4(d) and the July 2000 4(d) Special Rule. The Washington Forest Practices Rules, when combined with the administrative framework, including the annual Cooperative Monitoring, Evaluation and Research (CMER) Committee Work Plans and the overall adaptive management program, exceed the FFR. With respect to the commenter's reference to consistency with conservation of salmonid habitat, please see the Riparian response (subsection 3.6).

3.2 ENVIRONMENTAL IMPACT STATEMENT PROCESS

3.2.1 Environmental Impact Statement Process

One commenter insisted that the Services "prejudged NEPA" having participated in the Timber, Fish, and Wildlife (TFW) and FFR process, and by "approving" the FFR prior to conducting the present NEPA analysis. This misunderstanding can be clarified herein. The Services were requested to provide technical assistance during the latter TFW and full FFR processes that led to the development of the FFR. However, that was a State of Washington process and not a Federal one. The role of the Services was to provide technical assistance as the ESA allows. The conclusion of the State's FFR process was legislative and regulatory changes in the Washington Forest Practices Rule requirements, not Federal requirements. The Services did not provide any legally operative role such as "approval" of the FFR as the comment incorrectly insists.

After the State acted on the FFR, it packaged aspects of the FFR, again with the technical assistance of the Services, for the purpose of seeking the assurance that activities carried out under that package would be compliant with ESA under either the NMFS Section 4(d) rule (U.S. Federal Register, vol. 65, No. 132, July 10, 2000, pages 42422-42481) or 10(a)(1)(B) governing the so-called HCP process. When making decisions on such requests, the Services must conduct a NEPA process disclosing the effects of the proposed action on elements of the human environment, in comparison to those effects of other alternatives, including no-action (i.e., not issuing the requested ITPs or qualifying

the plan as meeting the requirements of the NMFS Section 4(d) rule). To trigger the NEPA process, there must first be a proposed action. Here that proposed action is to issue ITPs based on the proposed FPHCP. Therefore, NEPA has been triggered, the NEPA process is presently underway, and is the basis for this comment and written response document. The present question is whether or not to undertake the proposed action, to issue the requested ITPs, not whether or not to approve the FFR. Because the Services had no prior role in "approving the FFR," the Services could not have "prejudged NEPA."

The comment also insisted the Services must analyze alternatives to HCP approval. The Services agree; the No-Action Alternative assumes the Services will not issue ITPs. That analysis is included in the DEIS and to the extent required will be reflected in the Record of Decision that the Services prepare upon completing the NEPA process. The commenter asserts that analysis of the No-Action Alternative should also be reflected in the biological opinions and other decision documents. On this point the Services disagree with the comment. The biological opinion and the other decision document, the Services' ESA Section 10 statement of findings, fulfill different roles than does an EIS under NEPA. Neither of these documents contains an alternatives analysis as they are focused solely, as a matter of statute and regulation, on the proposed action before each agency: i.e., the issuance of ITPs.

Finally, a commenter asserted that it is not clear who drafted the DEIS and whether there was an objective third party (i.e., either a NMFS or USFWS office separate from the office that is negotiating the ITP, or a consultant that was not hired by the permittee, with an economic or political stake in the permit). Contractors for NEPA documents need to be selected by the Services. Moreover, the contractor should not have a financial or other interest in the outcome of the project.

The Services respond that Chapter 8 of the DEIS, List of Preparers, identifies the document contributors and their qualifications. The DEIS was primarily prepared by Tetra Tech/Foster Wheeler, Inc., an independent consulting firm, under the supervision of the Services. Portions of the DEIS were prepared by the Services, and HCP-related information was supplied to the Services from the applicant. The Services complied with the Council on Environmental Quality regulations for hiring a contactor to prepare this DEIS and approved the consultant selection (40 C.F.R. 1506.5(c)). Further, the consultant completed the required conflict of interest forms indicating no economic or other interest in the outcome of the ITP decision. Tetra Tech/Foster Wheeler, Inc. is included on the General Services Award-approved contractor list for both Services.

The Services also respond that there is no indication that the same Service office that is managing the ITP request cannot also prepare the accompanying EIS from either the Council on Environmental Quality or the NEPA implementing regulations for either the USFWS or NMFS. It is standard protocol for the Services to manage both portions of the permit action from one office or division with guidance from one or more appointed Regional NEPA Coordinators. We do not believe this practice in any way prevents the Services from conducting an objective review.

Several commenters felt that the DEIS and Draft FPHCP are too complex for the layman to easily interpret. Several others wanted an extended period within which to provide comments on the documents.

It was the Services' intent to prepare an EIS that was as easily understood by the general public as possible. Both Services have a policy to develop EISs that are clear, concise, and void of technical jargon to the extent possible without losing the meaning of an analysis. Various steps were taken to assist the lay reader including:

- A minimal list of acronyms
- Full spellings for units of measure and unfamiliar terms (e.g.,, professional jargon)
- The use of summary tables to present detailed information in a shortened format
- Considerable editing to ensure that terms were used consistently throughout the document
- A narrowed scope of review for each resource so only those topics that were critical to determine the level of significant impact were addressed
- Considerable editing to shorten lengthy statements and to provide a logical flow of information

Unfortunately, the subject matter of forest ecology does involve technical information that the lay person may not recognize. Because the Services are making a science-based decision, the use of technical details is necessary for an informed decision based on the best available science.

The Services recognized that the Draft FPHCP and DEIS were complex and large in scope, so we provided a 90-day comment period. Current USFWS policy is to provide a minimum of 90 days for public comments on large-scale or complex HCPs unless significant public involvement occurs during HCP development (U.S. Federal Register Vol. 65, No. 106, June 1, 2000, page 35256). The NMFS NEPA implementing regulations require 45 days for DEIS review, but we expanded the comment period for the Draft FPHCP because of its complexity.

Several parties, including Tribes, received copies of the DEIS and Draft FPHCP along with a "Dear Reviewer" letter. This letter specifically addressed the length of the comment period, comment period dates, and the Services' policy on comment periods and extensions. The letters requesting an extension were not received until the close of the comment period, May 12, 2005. This was not a timely request for the Services to consider the request and, if appropriate, to provide the necessary extension notice to the public. Further, the commenters did provide substantive comments on the documents. Together with numerous other comments, the Services have received sufficient information for preparation of the FEIS.

Adequate notice was provided to the public regarding the availability of the Draft FPHCP and DEIS for review at the start of the comment period. Notice of the DEIS was announced in the Federal Register on February 11, 2005, marking initiation of the 90-day

comment period. USFWS prepared a news release, which was distributed on February 11, 2005. The DNR news release was also distributed on February 9, 2005, which was the day the FPHCP application was submitted to the Services. The DNR news release provided advanced notice of the Federal Register announcement of a 90-day comment period. Finally, the Services and DNR announced the release of the DEIS for public review on each of their web sites.

One commenter indicated that the "Washington State Forest Practices Act (Revised Code of Washington (RCW) 76.09))" and "Report as Amended" state "The State legislature further stipulated that its actions were premised upon the expectation that any related incidental take of listed species otherwise prohibited by Section 9 and Federal regulations would be permitted or authorized by the Services by June 30, 2005." The commenter continues that States do have rights to make State legislation; however, the above referenced "expectation" of the State to receive Federal approvals and ITPs to "take" certain species, by a given date, due to State legislation is not realistic or legal. State laws do not make Federal laws superfluous. State laws, for endangered species conservation, must be equal or greater in conservation methods- especially if the State is applying for Federal funding through Congressional appropriations.

While the commenter is correct that States do not have the right to set expectations upon the Federal government with regard to issuance of ITPs, the commenter's interpretation of the legislation is not correct. To begin with, the statement quoted above actually does not occur within the Washington State Forest Practices Act (RCW 76.09), but rather came from the Services' Notice of Availability occurring within the Federal Register (U.S. Federal Register, Vol. 70, No. 28, February 11, 2005, pages 7245-7247). However, the Federal Register was in fact referring to language occurring within the State's RCW 77.85.190, which is titled Federal assurances in Forests and Fish Report -- Events constituting failure of assurances -- Governor's authority to negotiate. Further, the purpose of the legislation contained in RCW 77.85.190 was not to direct or otherwise obligate the Services to grant assurances to the State, but rather to direct the State to submit applications to the Services for incidental take coverage by a certain date. This direction was then followed up with a statement of what course of action the Legislature may take should the State fail to obtain incidental take coverage within the timeframe directed. This is strictly an obligation for the State of Washington and does not in any way make requirements on the Services to approve the State's FPHCP application.

3.2.2 Public Meetings

At least one commenter expressed disappointment about the process of the public meetings for the DEIS and Draft FPHCP. Public comments are an important part of the NEPA process. Per NEPA requirements described in Part 1500 of the Council of Environmental Quality regulations, the Services initially solicited comments during the scoping process beginning on March 17, 2003 (U.S. Federal Register, Vol. 68, No. 51, March 17, 2003, pages 12676-12678), during which time four public meetings were held across the State. Based on public scoping comments, the Services prepared a DEIS to analyze the effects of alternatives on the human environment. A Notice of Availability of a Draft Environmental Impact Statement and Conservation Plan was issued on February 11, 2005 (U.S. Federal Register, Vol. 70, No. 28, February 11, 2005, pages 7245-7247)

announcing the start of a 90-day public review period. The Services are required by law to provide at least 45 days for public review of a DEIS, however the Services usually allow a minimum of 60 days. In this instance, as with other large-scale conservation plans, the public was provided 90 days to review and comment on the DEIS. During the review period, the public was encouraged to submit written comments through e-mail, fax, mail or by hand delivering them to one of eight public meetings held across the State. During this time, 743 comment letters were received and have been responded to in this FEIS. A final public comment period will run for 30 days following the publication of the Notice of Availability of a FEIS in the Federal Register.

At least one commenter expressed disappointment that oral comments were not accepted as official public comments during the eight public meetings that were held on the DEIS and Draft FPHCP in late March and early April, 2005. The Services are not required to accept oral comments on a DEIS and are not even required to hold public meetings. The Services, along with the applicant, the State of Washington, decided that the proposed FPHCP warranted public outreach during the 90-day public comment period on the DEIS and Draft FPHCP. The Services decided not to accept oral comments at these meetings to avoid the potential of misinterpreting oral comments when transcribing them into written format for the administrative record. To precisely capture oral comments, a professional transcriptionist would have been needed to record in written format all oral comments received at the public meetings. This would have been cost-prohibitive when added to the cost of the holding the public meetings.

3.2.3 Purpose and Need

Many commenters supported the purpose and need statement in the DEIS, believing it accurately captures the Services' interest in securing long-term conservation commitments for covered species in exchange for Federal assurances to the State of Washinton. From the commenter's perspective, the purpose and need described in the DEIS also captures the need for assurances of ESA compliance to support an economically viable timber industry through a stable and ordered regulatory framework that is adaptable based on monitoring and a cooperative scientific approach.

One commenter questioned the range of alternatives because they believed the purpose and need was improperly stated, thereby narrowing the range of possible alternatives. They suggested that the need for the action should not be linked to the applicant's need to provide long-term management of forest resources, rather the need is only for the Services to determine if the State's application complies with Section 4(d) limits or Section 10 issuance criteria.

As correctly indicated by the commenter, Council on Environmental Quality regulations require the EIS to specify the underlying purpose and need to which the agency is responding (40 CFR 1502.13). In this case, the Services are responding to an application for ITPs within the context of a *voluntary* program. The Services are mindful that, in order to achieve the conservation benefits intended by the Section 10 program, it must respond, if at all, to alternatives that not only meet the requirements of the ESA, but also contain the applicant's need to provide long-term management of forest resources. Without incorporating this perspective, the Service's could not craft rational management

alternatives that meet the mandates of State legislated law. NEPA does not require a review of "straw," moot, or illegal alternatives; although in some case such attributes may be used to draw out or clarify environmental impacts. The Service's recognition of binding State legislation in its consideration of the range of alternatives is consistent with the *City of New York v. U.S. Department of Transportation* decision (715 F.2d 732, 743, 2nd Cir. 1983), which the commenter has documented.

The alternatives developed are based on the statutory goals of the ESA and NEPA, as the commenter recommended. As stated above, the Services believe the range of alternatives meets the NEPA requirement for a reasonable range, and that each alternative addresses ESA compliance. The commenter provides examples of suggested alternatives including guaranteed funding, reduced ITP term durations, and enforceable and required rule changes to preclude a jeopardy finding. Each of these attributes is examined in the DEIS and elsewhere in these responses (See the Adaptive Management response and the Compliance and Enforcement response, subsections 3.5 and 3.11, respectively).

One commenter asked whether the ITP applicant and/or future ITP holders performed a fiscal analysis that supports the need to receive an exemption from ESA Section 9, or if this ITP request is based on the desire of non-Federal landowners. The commenter further questioned which entity/s will go bankrupt or be unable to continue business if the Services deny issuance of ITPs.

ESA Section 9 pertains to ESA prohibited acts and covers, among other things, take of covered species. In order to understand the issues leading to the State's application for incidental take coverage and an ESA Section 4(d) rule limit, one must look back to the original FFR of 1999. The original goals of the FFR are listed in Chapter 1 of the DEIS, and are:

- To provide compliance with the ESA for aquatic and riparian-dependent species on non-Federal forestlands;
- To restore and maintain riparian habitat on non-Federal forestlands to support a harvestable supply of fish;
- To meet the requirements of the Clean Water Act for water quality on non-Federal forestlands; and
- To keep the timber industry economically viable in the State of Washington.

The State's applications for incidental take coverage and an ESA Section 4(d) rule limit is simply the latest step in realizing these initial goals of the FFR. Effective July 2001, the Forest Practices Board adopted the first set of permanent Washington Forest Practices Rules consistent with the FFR. During the permanent rule-making process, they developed an EIS under the State Environmental Policy Act (SEPA) as well as a Cost Benefit Analysis and a Small Business Economic Impact Statement. These documents provided additional information for the Forest Practices Board to base their decision to adopt the July 2001 Rules. Copies of these reports are available on-line through the DNR Small Forest Landowner Office website at: http://www.dnr.wa.gov/sflo/publications/.

3.3 ENVIRONMENTAL IMPACT STATEMENT ALTERNATIVES

3.3.1 Range of Alternatives

Several commenters were concerned about the range of alternatives analyzed in the DEIS. Several disputed the distinction among alternatives that was assumed to occur because of varying levels of stakeholder collaboration. Some commenters took issue with using the effectiveness of the adaptive management program to distinguish among alternatives.

Under NEPA, alternatives to the proposed action are used to make comparisons to define the issues and to provide a clear basis for choice for the decision-maker and the public. Attributes of the alternatives must be reasonable so that they do, in fact, provide meaningful information about the environmental consequences of meeting the purpose and need for the action. The Services note that, even without consideration of the differences in adaptive management, the alternatives in the DEIS provide three different initial mitigation strategies for comparison. The Services believe the Draft FPHCP and the DEIS provide information about the meaningful differences not only from the initial mitigation strategy, but also from varying levels of adaptive management effectiveness – the respective levels of effectiveness are a reasonably foreseeable outcome of each alternative.

The Services note that any application for an ITP must fulfill the ESA requirement to specify the impact which will likely result from the incidental take associated with the covered activities. The FPHCP identifies a level of habitat protection the applicant believes necessary to avoid take of covered species, described in Chapter 4e-2 as the "minimal effects strategy", as a basis of comparison for this purpose. The FPHCP contrasts this "minimal effects strategy" with the alternatives used for comparative analysis in the DEIS, also in Chapter 4e-2.

At least one commenter felt that the range of alternatives did not consider an alternative that was sufficiently restrictive. Another believed that all alternatives considered must avoid, reduce, minimize or mitigate all environmental impacts of the action. The purpose of NEPA (and the EIS) is not to determine what is "sufficiently restrictive" and to then propose an alternative to reflect that determination – the "sufficiency" of the proposal to receive incidental take authorization will be determined under the requirements of the ESA and documented in a statement of findings and a biological opinion for each of the Services. Alternatives in an EIS comprise a range of reasonable alternatives based on the purpose and need for the action. In this case, the purpose and need are to provide broad protection and conservation for listed species while incorporating the State's goal for long-term management of forest resources on State lands under the Washington Forest Practices Rules. The Services believe that the range of alternatives in the DEIS represent all reasonable alternatives that could meet this purpose and need. Once the alternatives are identified, the DEIS is developed to fully disclose the effects of an action on the broad human environment and to weigh those effects against the benefits. The EIS uses the alternatives to expose effects and to provide information (but not decisions) about whether those effects can reasonably be avoided or minimized.

One commenter wanted alternatives compared to recovery plans adopted by the USFWS. The Services note that the standards for issuance of an ITP are contained in ESA Section 10 and, while consistent with recovery do not require full recovery, because many other factors are involved in recovery than are included in "covered activities" in an HCP. In addition, while the USFWS has a draft recovery plan for bull trout, there are no adopted recovery plans for other listed species under the Service's jurisdiction. One commenter, the Muckleshoot Indian Tribe, provided a comprehensive proposal for an alternative to be analyzed in the DEIS. Many of the suggested elements of this proposal were included in Alternative 4 of the DEIS, but others were omitted because they were not within the Forest Practices Board's authority to implement, require statutory changes, or did not meet the purpose and need for the Federal action. Further, their alternative proposal was responded to under the State's SEPA Final EIS on Alternatives for Forest Practices Rules (Washington Forest Practices Board 2001a, Appendix K-20-21).

Commenters expressed the view that other alternatives, particularly a more-restrictive alternative, were not included because of the applicant's assertion of economic limitations and its desire for regulatory stability. The question of whether another alternative should be included depends on whether it would contribute to a comparative analysis of the environmental effects of the proposed action and whether such an additional alternative is reasonable or feasible to fulfill the purpose and need for the action. An applicant's economic limitations and desire for regulatory stability are legitimate objectives for framing the purpose and need for an action to occur. The purpose of this action is to provide broad protection and conservation for listed species while providing for long-term management of forest resources managed under the Washington Forest Practices Rules. The State has a legitimate economic interest in forest management practices as well as an interest in Federal ESA assurances. The alternatives were, therefore, framed with consideration of these objectives; however, Alternative 4 was included to present information about mitigation efforts that are beyond those included in the State's application. Some commenters questioned whether even Alternative 4 was a reasonable course of action. Regardless of whether it is viewed as reasonable from a commenter's perspective or from the perspective of economic viability, the Services believe Alternative 4 contributes to the important comparison of effects among the alternatives. Without regard to who may or may not support an alternative more restrictive than Alternative 4, the Services cannot identify significant additional information that would be provided by such an alternative that would contribute to the evaluation of the effects of the action.

At least one commenter wanted the DEIS to discuss who was involved in the negotiation of the FFR. Another believed that the Services had "pre-approved" the FPHCP because they had been involved in the negotiation of the FFR and that such participation limited the development of alternatives for analysis in the DEIS. Again, while the Services have noted in the DEIS the importance of collaboration to implementation, the Services have developed and evaluated the alternatives without regard to those involved in the development of them.

Several commented that the alternatives should have included an ITP for a term less than 50 years. The Services note that under Alternative 3 incidental take authorization is

provided without the 50-year term. Further discussion of the term can be found in the Adaptive Management response, Term Duration (subsection 3.5.2).

At least one commenter advocated an alternative that would combine Alternative 1-Scenario 1 with limited funding for adaptive management. The Services point out that Alternative 1 – Scenario 1 included an adaptive management program, but "functionally the program would be reduced." The Services believe the effects described are consistent with the suggestion of the commenter.

At least one commenter believed one alternative should have included "guaranteed" funding provisions. The Adaptive Management response, Adequate Funding (subsection 3.5.13), includes information about the feasibility of the applicant to "guarantee" future funding; within the State, one Legislature cannot bind the decisions of a future Legislature.

At least one commenter believed that the alternatives failed to consider the effects of regeneration of forests after harvest. The Services do not agree. Many mitigation measures rely on the regeneration of the forest over time and were described in Chapter 4 of the Draft FPHCP and Chapter 4 of the DEIS.

3.3.2 Alternative 1

During scoping of the DEIS, the Services received comments related to reasonable certainty that the Washington State Legislature would react to a failure to receive incidental take authorization under the No Action Alternative. At the same time, another group of interested persons believed it was reasonably certain that the Legislature would take no action whatsoever. The Services determined that these two positions warranted analysis under an assumption of "no action." They are described in Chapter 2 of the DEIS. Alternative 1 is the No Action Alternative. Scenario 1 of Alternative 1 assumes, literally, that no affirmative actions would be taken following a decision by the Services to not issue incidental take authorization. Scenario 2 of Alternative 1 assumes that the failure to receive incidental take authorization would result in a reaction by decision-makers to the failure to receive Federal assurances.

Several commenters opposed Alternative 1 because it would impede the adaptive management program and delay or halt progress toward resolution of various scientific uncertainties. Commenters were concerned about a halt to ongoing research dealing with water typing, landslide hazard zonation, and riparian function. At lease one was concerned about the potential reduction in educational and outreach efforts to protect cultural resources. A number of commenters opposed Alternative 1 because it was not consistent with the FFR. At least one felt that stakeholder support for the Alternative 1 – Scenario 1 should be described as "low" rather than "moderate." Several commenters noted that Alternative 1 would increase costs and reduce regulatory certainty, encouraging landowners to unilaterally seek a regulatory scheme that allowed the harvest of more trees or result in little support for funding road improvements, conservation easements, or other resource-oriented initiatives. The Services have noted each of these comments in opposition to Alternative 1.

At least one commenter felt Alternative 1 would fail to fulfill Indian treaty rights. The Services note this comment, but do not speculate about the likelihood that it would be found to be true or untrue.

At least one commenter opposed Alternative 1 (and Alternatives 3 and 4) because of the economic effect each would have on timber industry employees. The Services note this comment. Information about the economic effects of all alternatives is presented in subsection 4.14 (Social and Economic Environment) of the DEIS.

Alternative 1-Scenario 2 assumes that the Washington State Legislature would allow the Forest Practices Board to repeal the Washington Forest Practices Rules that resulted from the FFR, adopting in their place the Rules that were in effect on January 1, 1999. The DEIS explains why the regulations as of January 1, 1999 were chosen. One commenter stated that Alternative 1-Scenario 2 should include the expectation of third party litigation under ESA Section 9 enforcing the prohibition against "take" of listed species. Another went further to state the belief that the No Action Alternative should assume "full compliance" with all laws, including "no take" of listed species, regardless of the use of Section 9 litigation. Under NEPA, the No Action Alternative is to describe the expected consequences without the Federal action. The Services concur that the potential exists for third parties to seek enforcement of Section 9 under the circumstances presented by Alternative 1-Scenario 2. However, it is impossible to speculate what the scope of potential litigation may entail, and the outcome of any litigation on the Washington Forest Practices Rules. Further, the listing under the ESA of the species proposed to be covered in the FPHCP occurred years prior to January 1, 1999, and to the knowledge of the Services, no third-party enforcement efforts for take of aquatic species ever were initiated while those regulations were in place. The Services have not identified, nor have commenters, any circumstances that would suggest the decisions of third parties about enforcement under Section 9 would change under Alternative 1-Scenario 2 from the decisions made prior to January 1, 1999, when the same regulatory program was actually in place. Second, the Services note that, even if third-party enforcement actions were to be initiated, they would most likely effect the site-specific activities of particular forest practitioners. It would be difficult to measure or analyze on the scale of the FPHCP the effect of site-scale enforcement actions in the DEIS. Third, speculating that a regulatory response by the State of Washington to third party enforcement actions under Section 9 would occur, the Services point out that such regulatory response likely would be within the range of regulatory programs found in Alternative 1-Scenario 2 and Alternative 4.

For the same reasons stated above, the Services do not believe that "no take" (without ESA Section 9 enforcement) is a reasonably foreseeable outcome on the No Action Alternative because it is unlikely that statewide forest practices could occur without harm to a listed species over time, given the definition of take provided under ESA Section 9 (See DEIS subsection 1.5.1.1, Endangered Species Act).

One commenter was critical of Alternative 1-Scenario 2 in that it called for imposition of the Washington Forest Practices Rules that were in effect in 1988. The alternative calls for imposition of the Rules in effect on January 1, 1999, of which some of the rules were

the same as those in effect in 1988, including riparian management prescriptions. Another commenter supported Alternative 1 because of the incorrect belief that it was a "no take" alternative and the only alternative presented that was not "unlawful." Alternative 1 is a "no action" alternative, but likely not a "no take" alternative. Some reviewers may believe that Alternative 4, the most restrictive, approaches a "no take" alternative.

3.3.3 Alternative 2

Numerous commenters expressed support for Alternative 2 for various reasons including as examples: It represents a consensus-based plan based on science that will provide for habitat protection for riparian and aquatic species, will protect water quality, and will provide for the regulatory certainty landowners need to stay in forestry over the long term; It incorporates adaptive management to change prescriptions over time as new information becomes available; The adaptive management program ensures that regulatory changes occur when science, not politics or litigation, indicates that change is necessary; It is the only alternative that has the broad stakeholder support necessary to implement such an adaptive management program over time; It helps to reduce the risk of wildfires, which can severely damage both forest habitat and personal property; It would place Washington State with the highest level of protection for forests, streams, salmon, and other anadromous fish and amphibians in the nation; It would provide for the economic viability of an industry by removing regulatory uncertainty; It allows for thinning in these areas to reduce the risk of forest health problems by clearing out dead and dying trees, insect-damaged trees, and disease; It would increase basal area and riparian health over time along with reducing slope failures because it allows for management to produce healthy riparian management zones (RMZs) as quickly as possible.

The Services have noted each of these comments in support of Alternative 2.

Many commenters predicted that if any other alternative is chosen, support from landowners for all voluntary components of FFR will be minimized as is documented in several places in the Draft FPHCP. One commenter suggested that rejection of the State's ITP application would send very confusing and harmful messages to landowners. Landowners have already implemented the current Washington Forest Practices Rules. If the Services do not support FFR, why should landowners continue to do so? The Services have noted these comments in support of Alternative 2.

Some commenters discussed the certainties provided to forest landowners in Alternative 2. One commenter considered the legal benefits to forest landowners in Alternative 2. The commenter mentioned that the FPHCP insulates landowners from third party lawsuits under the ESA, that legal challenges proceed through the Federal courts and are defended by the Federal agencies, which reduces the legal uncertainties of operations under the FPHCP. The commenter concluded that the economic value of an HCP to private landowners would come from being relieved of the risks of incurring large expenses to defend themselves from citizen suits for alleged take. Many commenters noted the regulatory certainty provided by Alternative 2. The commenter stated that regulatory certainty allows landowners to better manage with long term plans appropriate

for timber, which is a long-term investment. The 50-year length of ITPs would also facilitate long-term forest management plans. The Services have noted these comments in support of Alternative 2.

Some commenters highlighted benefits that have already taken place with implementation of FFR or Alternative 2 including: enhanced protection of riparian areas, hundreds of fish passage barriers removed, tens of thousand miles of forest roads inventoried with many problem areas already repaired, and the completion of numerous adaptive management studies completed. The Services have noted this comment in support of Alternative 2.

A commenter stated that according to the Draft FPHCP, the lands covered by the FPHCP and ITPs are all non-Federal, non-tribal forests to which the Washington Forest Practices Rules are applicable, except for lands covered by other aquatic HCPs. However the commenter noted that various maps, charts, and data depicting the covered lands often include these other aquatic HCPs.

The lands covered by the FPHCP (Alternative 2) include all forestlands in the State of Washington subject to the Washington Forest Practices Rules. The EIS analysis team generally concluded that although detracting the acreage covered by relatively smaller aquatic HCPs would have likely added precision to estimates or would have better specified a relationship, the basic data and central relationships were sufficiently well established in the DEIS. The relatively small number of acres, relative to the number of forested acres statewide, that occurred within these aquatic HCPs would be very unlikely to change conclusions and therefore the removal of these acres was not considered necessary to provide adequate information for the decision-makers to make a reasoned choice among the alternatives. The only exception to this was the case of the DNR State Lands HCP where the acres of forestlands covered under the Westside conservation strategy, covering approximately 1.2 acres of forestland, were excluded from the Draft FPHCP calculations due to the relatively larger number of acres as compared to the total acres of forested lands statewide.

Another commenter stated that matrix areas that are Federal lands and/or have a Federal nexus should not be included in the FPHCP or used as mitigation for species take or habitat loss on non-Federal lands. ESA Section 10 is only to be used for non-Federal lands.

The FPHCP is intended to cover only forestlands in the State that are covered by the Forest Practices Act. In general, these lands do not include Federal or tribal lands because those lands are generally not covered by the Forest Practices Act.

One commenter stated that a section should be added to the Draft FPHCP to address forest practices under easements across Federal lands because in some situations non-Federal easement holders should qualify for ITP benefits.

The Services respond that whether an activity qualifies for ITP benefits depends on whether it is a forest practices activity covered by the FPHCP. Covered lands under the FPHCP are forestlands within the State of Washington subject to the Washington Forest Practices Act, Chapter 76.09 RCW. In some situations, non-Federal easement holders

may have sufficient property interests so that forest practices they conduct on Federal land would be subject to the Washington Forest Practices Act.

Several commenters opposed Alternative 2. Some stated that it did not provide adequate levels of protection for water temperature, mass wasting, sediment control, large woody debris (LWD), toxic chemicals, global warming, and general forest ecosystems. Others believe that Alternative 2 lacks an adequate scientific basis. One commenter suggested that the science behind the FFR lacks broad acceptance and has not withstood sufficient peer review.

The Draft FPHCP addresses protection measures for each of the concerns in the comment except for toxic chemicals (The use of chemicals is not a covered activity in the FPHCP). The description of the measures is found in Chapter 4 of the Draft FPHCP and the analysis of the effects is found in Chapter 4 of the DEIS. While use of chemicals is not a covered activity, use is addressed by the Washington Forest Practices Rules and effects are discussed in the DEIS (subsection 4.5.1, Surface Water Quality)). Regarding global climate change, please see the Adaptive Management response, "No Surprises" and Changed Circumstances (subsection 3.5.14) and the Cumulative Effects response, Future Actions (subsection 3.15.28). The DEIS has been modified to include new provisions under Changed Circumstances.

Several commenters suggested Alternative 2 would have increased scientific rigor if developed through a process by which science was challenged and debated. The Services note that the development of FFR and its mitigation measures followed the process where competing interests collaborated to produce the result. The negotiations took place with stakeholder groups supporting divergent viewpoints. Nevertheless, while the collaboration is undoubtedly important to implementation of Alternative 2, the Services believe the alternative must be evaluated on its merits, not on how it was developed. The Services note that the adaptive management process present in Alternative 2 provides an opportunity for stakeholders to challenge the scientific assumptions supporting the Washington Forest Practices Rules and effect change where needed.

Some commenters believed that the FPHCP or Alternative 2 should cover upland wildlife. The Services defer to HCP applicants in determining the scope of the conservation initiative. In this case, the State of Washington sought to develop ESA coverage for aquatic species. Nevertheless, the Services will complete an ESA Section 7 analysis for any action the Services take on the application of the State. The analysis is to determine that the action will not jeopardize the continued existence of any affected endangered species or threatened species (including species not covered in the FPHCP) or result in the destruction or adverse modification of habitat of those species. This analysis will include listed upland wildlife.

Another commenter stated that the Draft FPHCP does not strike the proper balance between resource protection and timber harvest. The requirement to "balance" these interests is found in Washington State's Forest Practices Act (See FPHCP Appendix E), not in the ESA. It is not a requirement of ESA Section 10 or any HCP. However, the Services presume that, in implementing the FPHCP, the Forest Practices Board and the

collaborators will continue to simultaneously seek and maintain the balance required by State law.

One commenter was concerned with the focus on providing regulatory certainty for the timber industry over the certainty of full ESA species protection.

The Services do not exchange regulatory certainty for species protection. Species protection is the goal of the ESA Section 10 process. Regulatory certainty is a result of the process. An ITP process allows for the incidental take of a listed, covered species while conducting an otherwise lawful activity, in this case forest practices. The plans must state how possible takings will be minimized and mitigated. HCPs reduce conflicts between listed species and economic use. The HCP process often results in consideration of the ecosystem as a whole which provides habitat beyond that which is required for the species of concern. In most cases, multiple species benefit from the habitat conservation approach. The FPHCP includes an adaptive management program to facilitate change in protection measures if the protection measures in the Plan are determined as not meeting resource objectives and performance standards.

One commenter said that there were mistakes in Alternative 2, including using 80-90-year stands instead of 140-year stands when calculating the desired future condition (DFC). The Services are not aware of this particular error in the initial calculations, but are aware of circumstances that could lead to the perception. At the time the targets were developed, the FFR stakeholders agreed that the DFC would be determined by basal area at age 140. Some negotiators thought that riparian areas would have lower basal areas than upland areas because natural disturbances in riparian areas would decrease stand density. A study and regression analysis in the late 1990's yielded a table of ratios of riparian basal areas to upland basal areas (McArdle et al.1961). From the table, a ratio of 0.813 was multiplied by the values at age 140 to arrive at the DFC targets that are part of the FFR and the Washington Forest Practices Rules. The DFC targets happen to be similar to the values for an 80 to 90 year old stand (McArdle et al. 1961).

However, a study on DFC was one of the first adaptive management studies to take place since the implementation of the current Washington Forest Practices Rules, the Rules in effect since January 1, 1999. The research was a validation of the western Washington riparian DFC performance targets and showed that basal area per acre of mature, unmanaged conifer-dominated riparian stands is significantly different from the values used in the Washington Forest Practices Rules. The study could not demonstrate that basal area per acre of mature, unmanaged conifer-dominated riparian stands is significantly different by site class, and the study suggests that site class identification maps are inaccurate. The study was peer reviewed by the University of Washington. The TFW/FFR Policy Group forwarded a recommendation to the Forest Practices Board recommending that they consider rule-making by investigating the scope of potential outcomes to resolve the issues identified by the DFC study. (See the Adaptive Management response, subsection 3.5).

Some commenters were concerned about implementation problems with regard to the FPHCP. One commenter wanted to make sure the FPHCP and Implementation Agreement require full funding for the implementation of the current Washington Forest

Practices Rules and the adaptive management program. (See the Adaptive Management response, subsection 3.5).

Another commenter felt the Draft FPHCP lacks a credible method for ensuring that the plan will be followed. See the Draft Implementation Agreement, Appendix A, in the Draft FPHCP. The Implementation Agreement clarifies procedures for implementing the FPHCP and describes remedies and recourse available should there be any problems during the implementation.

One commenter stated the costs associated with FFR make many forest practices prohibitive for small landowners. The DNR Small Forest Landowner Office was established to assist small forest landowners as a result of FFR. The office serves as a resource and focal point for small forest landowner concerns and policies with a mission to promote the economic and ecological viability of small forest landowners. Recognizing the significant contributions small landowners make to protecting Washington's public natural resources, the office strives to equip landowners with the necessary tools and information they need to keep their land in forestry use. In addition, cost sharing programs have been established to assist small forests landowners. The programs include the Family Forest Fish Passage Program, which assists with culvert replacement costs, and the Forestry Riparian Easement Program, which compensates eligible small forest landowners in exchange for a 50-year easement for the timber the landowner is required to leave unharvested as a result of new Washington Forest Practices Rules (See the Small Forest Landowners response, subsection 3.12).

One commenter felt the proposed FPHCP does not fit the definition of "incidental take" and is probably illegal based on the potential erosion-spurred siltation which negatively impacts stream health. The Services will analyze the FPHCP to determine whether it is legal and adheres to the requirements in ESA Sections 7 and 10. The Services will document their determinations as to the adequacy of the FPHCP to meet ESA standards in a statement of findings and biological opinion for each of the Services.

3.3.4 Alternative 3

Some commenters opposed Alternative 3. One commenter's concern was that no incidental take should be authorized for threatened species. Another concern was that the assurances offered under an ESA Section 4(d) limitation would be inadequate because they do not incorporate "No Surprises" conditions and they do not apply to endangered species or species administered by the USFWS.

The Services respond that an ESA Section 4(d) rule is fundamentally different than an HCP. A Section 4(d) rule is a set of regulations deemed necessary and advisable to provide for the conservation of threatened species. Currently NMFS has a Section 4(d) rule for threatened salmon and steelhead. USFWS does not have a Section 4(d) rule for threatened bull trout but under the assumptions of Alternative 3 would establish a Section 4(d) rule. An HCP is a voluntary conservation plan submitted by an applicant that specifies among other things, measures the applicant will take to minimize and mitigate the impacts of "take." A Section 4(d) rule is promulgated into rule by either the Secretary of the Interior or the Secretary of Commerce and establishes protective regulations considered "take prohibitions" for threatened species. The Federal agency

issuing the rule can specify certain activities or conservation plans that may qualify for a limit (exemption) from the rule's take prohibitions. Finally, a Section 4(d) rule applies only to threatened species while an HCP may apply to both threatened and endangered species and also unlisted species.

"No Surprises" is a component of an HCP but not of an ESA Section 4(d) rule. The "No Surprises" rule provides certainty to ITP holders by placing limits on the Federal agencies' ability to require additional mitigation after the ITP has been issued. In the event of unforeseen circumstances, the "No Surprises" rule allows the Services to require additional conservation and mitigation measures from a permittee, but only within conserved habitat areas within the HCP operating conservation program for the species covered in the plan, maintaining the original terms of the plan to the maximum extent possible.

One commenter was critical of Alternative 3 under the incorrect assumption that the Services should have, but failed to provide scientific literature to support a need for species "take" and reduction in numbers. The ESA Section 4(d) rule does not require the Services to provide support of a need for species "take" and reduction in numbers. Under ESA, the Services are required to determine if a species is threatened or endangered; and if so, designate, using the best scientific and commercial data available, habitat of such species to be critical habitat. During designation of critical habitat, factors such as economic impacts of potential critical habitat and other relevant impacts are taken into account.

The Services have noted each of these comments in opposition to Alternative 3.

3.3.5 Alternative 4

Many commenters believed that Alternative 4 would increase the conversion of forestlands to other uses which, some further suggested, would cause their own adverse environmental effects. The Services believe the analysis in the DEIS is consistent with these comments. At least one commenter suggested that the adverse effects of conversion would negate all beneficial effects from the conservation measures contained in Alternative 4. The Services do not have sufficient information to support this assertion.

Several commenters opposed Alternative 4 because of their view of its economic consequences relative to other alternatives, both to communities and individual landowners. The Services note this comment.

Many commenters were opposed to Alternative 4 because of the belief that it would increase the likelihood of fire. Many commenters also opposed Alternative 4 because of their belief that it would adversely affect the ability to deal with forest health issues, particularly in eastern Washington. At least one commenter believed the effects of fire, and a reduced ability to effectively fight fire under Alternative 4, would increase sediment above the assumptions stated in the DEIS. At lease one commenter held the opposite view, believing most adverse effects, including sediment, would be reduced under Alternative 4. (See the Forest Health response, subsection 3.17.4).

Many commenters supported Alternative 4 because of its more-restrictive conservation measures. At least one commenter challenged the Services' assumptions about effects if Alternative 4 was adopted, suggesting that it was equally as likely that the State would adopt forest practice rules consistent with Alternative 4 (if the Services suggested that there would be no Federal assurances without that alternative).

The purpose of the DEIS is not to determine whether any alternative is consistent with ESA Section 10, but rather to promote general analysis and disclosure of the broad range of environmental issues surrounding a proposed action. Alternative 4 is included in the DEIS to analyze the broad range of environmental effects (not limited to ESA related effects) of a full range of reasonable alternatives as required by NEPA. The alternative chosen will be documented in the Record of Decision. The determination about the appropriateness of Federal assurances for the chosen alternative will be documented in a statement of findings (by each of the Services) under ESA Section 10 and the decision published in the Federal Register. The determination as to the adequacy of the action under ESA Section 7 will be documented in a biological opinion by each of the Services. The purpose of the DEIS and FEIS is to compare environmental effects of various alternatives against the No Action Alternatives, not to determine whether any particular alternative complies with the ESA.

While the Services note that some commenters believe that Alternative 4 would meet the requirements of ESA Section 10, that view does not mean that other alternatives do not also meet the requirements of Section 10. Further, the Services are not being asked by the State of Washington to issue ITPs based upon Alternative 4, as Alternative 4 contains mitigation measures that are beyond those contained in the State's application.

The Services note that the application by the State of Washington is very specifically reflected under Alternative 2, as prescribed by the Washington State Legislature (See FPHCP Appendix C). In prescribing that the application be based on the FFR, the Legislature adopted findings that spoke to what it believed to be attributes of this option. On the one hand, it noted forest practice rules based upon the FFR would be ". . . consistent with maintaining commercial forest management as an economically viable use of lands suitable for that purpose; and (c) will provide a regulatory climate and structure more likely to keep landowners from converting forestlands to other uses that would be less desirable for salmon recovery" (See FPHCP Appendix C). On the other hand, the Legislature spoke to the collaborative nature by which the FFR was developed, saying that "the forest industry, small landowners, tribal governments, State and Federal agencies, and counties have worked diligently for nearly two years to reach agreement on scientifically based changes to the forest practices rules, set forth in the forests and fish report" (See FPHCP Appendix C). These statements reflect the Legislature's view that FFR is consistent with the basic balancing of interests found in the State's Forest Practices Act. That Act states that ". . .coincident with maintenance of a viable forest products industry, it is important to afford protection to forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation and scenic beauty" (See FPHCP Appendix E).

Without commenting on the accuracy of the statements, the Services note that in Engrossed Substitute House Bill (ESHB) 2091, the Legislature not only expressed the notion that the FFR met the joint goals of economic viability and resource protection, it further stated its expectation that the rules based on FFR would be sufficient to receive incidental take authorization from the Services under the ESA. The Legislature indicated that if the application based on the FFR failed to receive Federal assurances, it shall "take such action, including termination of funding or the modification of other statutes, as it deemed appropriate" (See FPHCP Appendix C).

Alternative 4 does not possess at least three attributes identified by the Legislature in its stated support of the FFR (Alternative 2). First, it was not collaboratively developed. Second, it would exceed the conservation measures which, as stated in ESHB 2091, the applicant believes are necessary to receive Federal assurances. Third, because of the more restrictive nature of the alternative, it would be less successful in meeting the applicant's stated goal of a viable forest products industry than Alternative 2. As a result, the Services believe that the anticipated response of the applicant and stakeholders, and the other effects resulting from that response, to Alternative 4 as stated in the DEIS are reasonable.

One commenter believed that the DEIS should explicitly state that the effectiveness of the adaptive management program under Alternative 4 should be stated to be "low," rather than merely stating that the need for adaptive management would be low. The Services believe this view is, in fact, reflected in the DEIS (See DEIS subsection 2.3.4, Alternative 4). Another commenter believed that a Forest Practices Board-directed adaptive management program could be used along with more restrictive conservation measures. The Services believe this comment is reflected in Alternative 4.

One commenter asserted that the Beaver Habitat Zones protected by Alternative 4 in the DEIS do not provide additional riparian buffer protection beyond that provided by the No Action Alternative 1-Scenario 1. The Services agree that a majority of potential beaver habitat protected by Alternative 4 receives protection under the Channel Migration Zone protective measures provided in No Action Alternative 1-Scenario 1. However, according to Retzer et al. (1956) and Pollock and Pess (1998) (as cited in Pollock and Kennard 1998), beavers often dam streams with gradients between 4-8 percent, and sometimes as high as 16 percent. Channel Migration and Beaver Habitat Zones may not overlap in these high gradient streams. In these circumstances, Alternative 4's Beaver Habitat Zone protective measures would provide additional protection.

Several commenters suggested that there was not evidence that the more-restrictive measures under Alternative 4 would result in greater conservation benefits. The Services note these comments, but also point out that the commenters provided no information upon which to base any modifications to the assumptions in the DEIS.

At least one commenter was concerned that adoption of Alternative 4 would result in "property takings" lawsuits filed against the State and Federal agencies. The Services have noted this comment without speculating as to its accuracy.

3.4 IMPLEMENTATION AGREEMENT

3.4.1 Judicial Review

One commenter felt that the right of government and/or conservation and environmental groups to take violators of natural resources law/regulations to court should never be given up. The Services point out that nothing in the proposed action would reduce the right under law for any person to enforce the law through the judiciary.

3.4.2 Endangered Species Act Criteria

One commenter stated that the reporting required by the FPHCP and Implementation Agreement seems focused on FFR implementation and compliance, but implementation and compliance should not be a substitute for meeting ESA goals, avoiding jeopardy, and minimizing take.

The Services respond that nothing in the FPHCP or Implementation Agreement excuses the State from meeting the ESA Section 10 issuance criteria, which include avoidance of jeopardy and minimizing take. The Services must find that the FPHCP meets those criteria before issuing ITPs. Moreover, Section 8.1 of the Implementation Agreement provides that the Services retain the authority to revoke or suspend the ITPs upon a finding that they are likely to jeopardize a listed species.

One commenter stated that the parties should not be able to extend the terms of the Implementation Agreement and FPHCP. If they can, they need to spell out more definitely the rights and responsibilities of the parties and the public.

The Services respond that the Implementation Agreement gives the State no right to ITPs on any specific terms beyond the initial 50-year term of the ITPs. Section 6.5 of the Implementation Agreement merely states what would be true in any event: the State may apply to extend the ITPs. The Implementation Agreement does not entitle the State to an automatic extension on the same terms as the initial ITPs. Rather, the Implementation Agreement states that an extension would require the Services' agreement and compliance with all applicable laws then in effect, and provides that any extension would be "subject to any modifications that the Services may require." Assuming that the laws then in effect are similar to those in force now, a decision regarding extension of the ITPs would be a Federal action requiring an updated environmental analysis, biological opinions, and opportunity for public comment. Any extension would be subject to the jeopardy standard, and to any other standards that apply then.

One commenter was concerned that the DEIS did not analyze the effects of a provision in the Draft Implementation Agreement and that it would allow ITPs, resulting from the FPHCP, "to be extended for indefinite periods of time."

The Draft Implementation Agreement does have a clause (Section 6.5) for extension of the ITPs. This clause allows for an extension of the ITPs if they are in compliance with all applicable laws and all parties are in agreement on the extension. If an extension is requested in the future, the Services would consider the current situation and determine what additional information or analysis would be necessary, if any, in order to determine if a continuation is in the best interest of the listed species.

Another commenter believed that the Implementation Agreement needs a citizen enforcement mechanism, third party beneficiary rights, or some other clear mechanism for public to enforce the FPHCP and Implementation Agreement terms. In response, nothing in the ESA requires the Services to grant third-party beneficiary or enforcement rights in connection with ITPs.

One commenter thought that the Draft Implementation Agreement did not include any meaningful enforcement, remedies, or relief provisions and that neither the Draft FPHCP nor the Implementation Agreement provided any mechanism to hold other forest landowners accountable to terms of the Implementation Agreement or the FPHCP. Further comments stated the Implementation Agreement and FPHCP should expressly state that these statutes, rules, policies, Forest Practices Board Manuals, budgets, adaptive management documents, etc. are enforceable components of the FPHCP. It is unclear whether the WACs, Forest Practices Board Manuals, technical studies such as stream typing, and many other documents and materials referred to in the Draft FPHCP have any binding effect.

In response, the State's application for ITPs are intended to cover the Forest Practices Regulatory Program in general, which includes all of the components mentioned above, including non-regulatory items which direct the general operations of the Forest Practices Regulatory Program. Within the Forest Practices Regulatory Program, the statutes and WACs that contain the Washington Forest Practices Rules are the regulatory aspects of the Program, enforceable by the State. Other documents, such as technical studies, adaptive management documents, the Forest Practices Board Manual, etc. may support changes to the Rules over time, or in the case of the Forest Practices Board Manual may provide clarification on how to interpret the Rules. However, they are not considered regulatory aspects of the Forest Practices Regulatory Program. The Services recognize that as a regulatory program, circumstances will occur over time that will require changes to the governing regulatory Rules themselves. Section 10 of the Implementation Agreement, titled Adaptive Management and Changed Circumstances, describes the process for the State to notify the Services regarding changes made to the Rules specific to adaptive management. Section 11 of the Implementation Agreement, Modifications and Changes, takes this into account by providing the State with flexibility to incorporate changes over time in order to take advantage of new science or legislative- or court-mandated direction.

The Implementation Agreement incorporates the entire Forest Practices Regulatory Program. The Forest Practices Regulatory Program includes daily on-going compliance and enforcement of all forest practices applications by DNR, WDFW, and Ecology. In addition, the compliance monitoring program, a part of the Forest Practices Regulatory Program, has begun monitoring riparian rules and will begin monitoring the road construction and maintenance and abandonment rules in 2006. Should ITPs be issued, the Services would consider it Washington State's responsibility to make sure landowners comply with the Forest Practices Regulatory Program. It would be the Federal government's responsibility to ensure Washington State fulfills its obligations under the FPHCP, Implementation Agreement, and issued ITPs. The Federal government can revoke issued ITPs when deemed necessary.

One commenter noted that the Implementation Agreement has a dispute resolution process, but no mechanism to require the timber industry to agree with an adaptive management technical recommendation.

Section 10.4 of the Implementation Agreement provides that, should the State fail to implement an adaptive management change that the Services believe the data warrants, the Services may suspend or revoke the ITPs, after notice and an attempt to resolve the dispute. The Services retain this authority regardless of whether the State's failure is a result of timber industry opposition to the change. Hence, there is no need for the Implementation Agreement to include a mechanism to require the timber industry to agree with an adaptive management recommendation. While the process set forth in Section 4a-4.1 of the FPHCP calls for various outside parties, including the timber industry, to participate in developing adaptive management recommendations, the ultimate responsibility for amending Washington Forest Practice Rules lies with the State, and the Services will hold the State accountable for doing so.

One commenter felt it was unlawful for the proposed Implementation Agreement to issue ITPs before full implementation of mitigation measures occurred.

In response, the ESA does not require that mitigation measures be implemented prior to issuance of Section 10 ITPs. Rather, ESA Section 10 requires that the applicant "will, to the maximum extent practicable, minimize and mitigate the impacts" of take. The statute's use of the word "will" rather than "has" indicates that Congress contemplated that mitigation and minimization will occur at some time in the future.

One Tribe expressed concern that language in the Implementation Agreement could be viewed as seeking to avoid or exculpate parties from liability to the Tribe.

In response, the Implementation Agreement does not "exculpate" any party from any existing or future liability for damages that they might have to Tribes or other parties as a result of breach of any other legal duty. It simply makes clear that the agreement cannot form the basis of any cause of action for damages. The Services know of no basis in law for awarding damages to third parties as a result of issuance of an ITP, so this provision does not deprive any third parties of any rights that they may have.

3.4.3 Landowner Coverage

One commenter suggested that if forest practitioners are gaining the benefit of the Implementation Agreement and the FPHCP, then they need to be signatories and be bound by the contract terms.

The statutory and regulatory provisions governing ITPs allow for both the benefits and liabilities of permit coverage to extend to entities that are not named parties to the ITPs. Federal regulations provide that, where the permittee is a State, persons acting under the State's jurisdiction may carry out the authorized activities to the extent authorized by the ITP (50 C.F.R. § 13.25(d)). Section 12.4 of the Implementation Agreement provides that nothing in the agreement limits the Federal government's authority to seek civil or criminal penalties or otherwise fulfill its enforcement responsibilities under the ESA.

Thus, the Services believe that persons operating under the ITPs will comply with all applicable provisions of the FPHCP.

3.4.4 Incidental Take Permit Revocation

Several commenters stressed that the Services must be allowed to revoke and suspend ITPs at any time for any reason. Some wanted the Draft Implementation Agreement to provide further details, timelines, and procedures on when ITPs shall be revoked or suspended. Similarly, several commenters wanted a description of clear instances when the FPHCP is no longer working and the ITPs must be revoked, some adding that the Services must revoke ITPs should the sustainability of treaty trust resources be negatively impacted. Others wanted to ensure that the Services not intrude upon the day-to-day administration of the State program in order to ensure its implementation.

Section 6.2 of the Implementation Agreement provides that the Services may revoke the ITPs for cause in accordance with their regulations. The Services' regulations allow revocation where the permittee has violated the terms of the ITPs, or where continuation of the ITPs would jeopardize a listed species. 50 C.F.R. §§ 13.28(a), 17.22(b)(8), and 222.306(e) describe the revocation procedures. Should there be a violation of the ITP requirements, the Services' determination as to whether to revoke or suspend will depend on the usual factors informing the exercise of prosecutorial discretion, such as the severity of the violation, the willingness of the State or the operator to remedy the violation, and whether the violation is an isolated incident or one of a series of chronic violations. The Services do not believe it is possible or advisable to define in advance all possible circumstances that might warrant suspension or revocation of the ITPs. The FPHCP is a complex, long-term plan that calls for a significant adaptive management program. Should there be disputes in the future about what response that research calls for, the Services intend to work in good faith with the State to try to resolve those differences before pursuing any enforcement or permit termination proceedings. The Services agree that successful implementation of the FPHCP, assuming it meets the issuance criteria of the ESA, would be consistent with trust obligations.

Section 11.4 in the Draft Implementation Agreement states that: "Changes in State laws or forest practice rules will not be considered changes in the HCP, the Permits, or this IA. However, if the Services determine that such changes materially impair the conservation plan contained in the HCP, they will so notify the State…" (FPHCP Appendix A). One commenter wanted to know what the process will be for determining the level of "materially impair."

The Services will review the best scientific information available at the time to determine whether future changes in the Washington Forest Practices Rules would materially impair the FPHCP. The process for making such a determination will depend on the nature of the change at issue.

One commenter believed that the Implementation Agreement should specifically state that one central purpose of the Implementation Agreement is to ensure proper and complete implementation of the FPHCP by contractually binding the permittees.

The permittees are bound to meet their obligations under the Implementation Agreement by ESA Section 11, which makes it a violation of the ESA to violate any term of an ITP issued under ESA Section 10. Thus, should an enforcement action be required to address any violations, the Services would bring an action under Section 11.

In the case of an ITP and an HCP, the Services will approve an ITP if it meets issuance criteria, and the permittee has a legal duty to implement an HCP in accordance with its requirements.

One commenter thought that Section 5.0 of the Draft Implementation Agreement should be amended to reflect that the ITPs are included by reference into the Implementation Agreement. Furthermore, that in the event of a conflict between the Implementation Agreement and the FPHCP or ITPs, the commenter wanted terms that provide more protection to the public or natural resources to apply.

The Services see no benefit in including the ITPs by reference in the Implementation Agreement. The State and all persons acting under the State's jurisdiction are required to comply with all conditions of both documents. In addition, the Services are aware of no conflicts between the language of the ITPs and that of the Implementation Agreement.

One commenter suggested that the FEIS or Final FPHCP include copies of the ITPs, because the reader should have the opportunity to understand the take that would be allowed pursuant to the permit.

Although it might be helpful to the reader to have a copies of the ITPs included in either an FEIS or an HCP, the general purpose of an FEIS and an HCP is for these documents to be prepared prior to issuance of an ITP because they include information that will help the Services in their determination process. Following an FEIS and a Final HCP, which are released together, each of the Services then prepares a biological opinion based on the information available. The final step in a successful application process would be the issuance of an ITP. However, this is the last item issued after all of the other documents are prepared. A copy of the Implementation Agreement, which is the legal document that both parties agree to adhere to should an ITP be issued, is included in the Final FPHCP as Appendix A.

One commenter wanted the Services to ensure that Section 9.2 of the Implementation Agreement in no way limited their ability to acquire information necessary to determining whether the State is complying with the FPHCP and ITPs.

In response, Section 9.2 does not unduly constrain the Services' power to obtain necessary information; it simply requires that requests for information be reasonable, and that the parties will seek to resolve differences over requests that may be unnecessarily burdensome. Moreover, Section 9.4 makes it clear that the Services retain the ability to conduct inspections and monitoring in accordance with their regulations.

A commenter observed that the Draft Implementation Agreement does not clearly describe how the FPHCP and Implementation Agreement are affected by changes in Federal HCP regulations.

In response, Section 13.5 of the Draft Implementation Agreement makes clear what the effect of changes in the Federal HCP regulations would be. The State and those acting under its authority will be required to comply with regulations in effect at the time an action is taken, except that the State may elect to rely on those Federal regulations in effect at the time the agreement was signed if necessary to protect "No Surprises" assurances.

3.4.5 Maintaining Protection Level

A commenter stated that the State should have to bind itself, for the duration of the ITPs or longer, to maintaining a regulatory program at least as protective as the current Washington Forest Practices Rules. The Implementation Agreement in Section 11.4 allows the State to change the Rules without necessarily losing the benefits of the ITPs. Moreover, the Services will only take action on rule changes if they determine the changes "materially impair" the FPHCP.

In response, the Implementation Agreement does bind the State to a regulatory program that is at least as protective as the current Washington Forest Practice Rules. Section 4.1.1 of the Implementation Agreement sets forth the State's obligation to fulfill all obligations in the FPHCP, the ITPs and the Implementation Agreement. Section 11.4 of the Implementation Agreement clearly permits the Services to suspend or revoke the ITPs in the event that the State amends State law or Washington Forest Practices Rules in a manner that materially impairs the FPHCP conservation measures. Some Washington Forest Practice Rules have no bearing on the FPHCP, and the State is free to change those as it sees fit. If, however, the State modifies a forest practices rule in a way that reduces protection or mitigation for a covered species, it would do so at the risk of losing the ITPs and exposing itself and timber operators to liability for take.

3.4.6 Maintenance of Mitigation

At least one commenter believed that the relinquishment, suspension, and termination provisions (Sections 6.3 and 6.4 of the Implementation Agreement) should be revised to ensure that the State implements and maintains mitigation measures beyond the life of the ITP. The Services point out that the regulations cited in Section 6.2 of the Implementation Agreement ensure that, under the circumstances cited, the mitigation measures achieved shall be commensurate with the amount of incidental take that is authorized.

3.4.7 Unlisted Species Coverage

At least one commenter believed that the Draft Implementation Agreement improperly allows unlisted species to be automatically added to the ITPs when they are listed, without evaluations of whether the FPHCP is still sufficient to fully mitigate impacts to the species and provide for their recovery or survival.

The Services' analysis of covered species essentially treats them as if they were listed. As a result, statement of findings documents assess at the time of ITP issuance whether or not the FPHCP provides adequate protection for all covered species, listed and unlisted. Nothing in the ESA requires the Services to repeat that analysis should an unlisted species become listed in the future. The Services always retain the authority to suspend

or revoke the ITPs, in whole or in part, if covered activities would jeopardize any listed species.

Several commenters stated that any unlisted species "covered" by the conservation plan and any regulatory assurances must be addressed and conserved as thoroughly and specifically as if they were listed, as is required by the "No Surprises" rule, to individually address each covered species and their unique conservation needs; that “No Surprises” and other regulatory assurances are not warranted for many of the unlisted species covered in the FPHCP, including the amphibians, due to the failure of the FPHCP and DEIS to address the species as if they were listed, to fully minimize and mitigate the impacts of “take” to these species, to demonstrate that issuing an ITP for these species will avoid harming their chances of recovery or even survival, and to require adequate use of adaptive management to address gaps in knowledge about these species’ conservation needs; and that the Implementation Agreement should not include unlisted species, as there is currently not enough scientific information to determine whether their inclusion for long-term "takings" would not preclude recovery, and without adequate biological data and so many data gaps, the Services are unable to make an accurate EIS and determination.

In response, the issue of covered unlisted species is more appropriately addressed in the FPHCP and in the Services’ final decision documents. The Implementation Agreement contains a definition of unlisted species and a provision to add covered unlisted species when they are listed but it is not the document that is supposed to address species’ conservation needs or where the determination is made as to whether or not the species are adequately addressed. The EIS, likewise, is not the appropriate document for “addressing the species as if listed.” The role of the EIS is to evaluate the effects to all elements of the affected human environment of each of the alternatives when compared to the No Action Alternative(s) to determine the significance of the effects.

The conservation measures in the FPHCP were developed with technical assistance from the Services based on current knowledge of the species habitat needs in areas where they are known to occur. These measures, written into the Washington Forest Practices Rules, are based on the functional elements of riparian and aquatic habitat that are expected to provide the necessary life requisites for salmon and bull trout to survive and recover. Similarly, these same key elements of properly functioning riparian and aquatic habitat are also necessary for conserving and protecting the seven amphibian species and the unlisted fish species. The habitat requirements of fish and amphibians (e.g., riparian forests, instream structures, cool water temperatures, proper year-round flows, seeps, springs, and headwater streams) are described in Chapter 3 of the FPHCP, while Chapter 4 describes how the habitat features important to these species are provided under theprescriptions of the Washington Forest Practices Rules. Addressing a species “as if listed” does not mean in all cases that each species must have conservation measures developed specifically for them. Habitat-based HCPs are a common approach to addressing the conservation needs of covered species, especially in forested landscapes (Plum Creek Timber 1996, Washington DNR 1997d, West Fork Timber 1995). As such, providing all the functional elements of riparian and aquatic habitat of a quality and quantity deemed sufficient to conserve the covered species is all that is required. Making

the determination that the FPHCP is sufficient and meets the ITP issuance criteria is a decision the Services make after the Final FPHCP has been completed. The Services in their analyses must also address each species as if listed. However, that does not preclude the ability to guild species that have very similar habitat requirements, i.e., a special section of the analysis documents does not have to be devoted to each individual species.

With respect to adaptive management, where gaps exist in the scientific knowledge of certain species, the adaptive management program is designed to address such gaps. The adaptive management program described in the FPHCP is a fully functioning program, with resource objectives defined, that already is addressing areas of biological uncertainty associated with the protections for amphibian habitat, and aquatic habitat occupied by listed and unlisted fish species (See FPHCP Appendix H and the Adaptive Management response (subsection 3.5)).

Finally, with respect to minimizing and mitigating the take of unlisted species, the commenters are reminded that these species are currently unlisted because they are not considered to be at risk of extinction; there are viable populations distributed throughout their range, which includes the FPHCP covered lands. As such, the impacts of any incidental "take" of these species is relatively low, e.g., when compared to the listed fish. Also, it is important for the commenters to know that it is not a requirement that an HCP recover any species in and of itself but, rather, it should contribute to the species' recovery. The analyses in the Service's decision documents are where we will determine, given the available scientific information, whether or not the FPHCP conservation measures are sufficient to issue ITPs.

One commenter stated that the ESA only authorizes ITPs for listed species. At least two commenters stated their belief that it is highly improper for unlisted species to be included in ITPs, or the Implementation Agreement to suggest that unlisted species will be automatically added to ITPs without proper ESA review at that time. Further, one commenter cited the need for ESA Section 7 and Section 10 review prior to adding a species to the permit like the process described in some previously approved HCPs.

In response, the Final "No Surprises" Rule (U.S. Federal Register Vol. 63, No. 35, page 8859 , February 23, 1998) stated that the Services will only provide assurances for species listed on an ITP that are adequately covered in the conservation plan and specifically identified on the ITP. Thus, if the Services make the determination to issue an ITP to the State, all covered species, listed and unlisted, are required to be listed on the ITP. An HCP must address unlisted species as if they were listed and adequately cover the species with conservation measures that will satisfy ITP issuance criteria under ESA Section 10(a)(2)(B). The Services are also required to address each species in our biological opinion as if it were listed. This means conducting an effects analysis and making a determination as to whether or not the conservation plan's covered activities would result in jeopardizing the continued existence of that species in the wild. As a result of this approach, when a covered unlisted species becomes listed, they are "automatically" included on the ITP. For this to happen, however, the Service must conduct a review of the ITP issuance criteria and make a determination that their original

Section 10 statements of findings documents are still valid. If so, no further analysis or review is required.

3.4.8 "No Surprises"

One commenter thought that the DEIS should be modifed to reflect the fact that the USFWS has re-issued an ITP revocation rule, as required by the court, and there is no reason to doubt the Services' full authority to provide "No Surprises" assurances in connection with the approval of the FPHCP or any HCP. "No Surprises" assurances are essential to the success of the Services' ESA Section 10 HCP program and they should be provided for approved HCPs without legal limitations of qualifications that are unrelated to the negotiated terms of a particular HCP and its Implementation Agreement.

The Services believe there is no need to modify the DEIS to reflect USFWS's re-issuance of the ITP revocation rule, because the new rule does not change the environmental effects of the proposed action. Section 8.1 of the Implementation Agreement, however, has been modified to reflect the fact that USFWS has re-issued the permit revocation rule and is therefore no longer subject to the order issued in Spirit of the Sage Council v. Norton, which temporarily barred USFWS from issuing ITPs that included "No Surprises" assurances.

3.4.9 Implementation

DNR developed a list of Forests and Fish Commitments dated January 19, 2005, relating to the adaptive management program, the development or updating of Forest Practices Board Manual sections, and implementation reporting requirements under the Washington Forest Practices Rules. The Services received at least one comment that mentioned the DNR commitment list and the need for reconciling and prioritizing with another list, developed by the Northwest Indian Fisheries Commission and represented Tribes that includes some additional commitments. The Services acknowledge the importance of the commitments made by the TFW/FFR Policy Group and the representative stakeholders at the time the FFR was completed and the Washington Forest Practices Rules were changed in 1999. Additional commitments identified by the TFW/FFR Policy Group and representative stakeholders need to be reconciled and prioritized with the DNR January 19, 2005, list. The Services are fully committed to continuing participation in the TFW/FFR Policy Group where these discussions would take place. If ITPs are issued for the FPHCP, some of these commitments, particularly implementation reporting requirements, would likely be included as permit conditions of the ITPs.

3.4.10 Covered Activities

One commenter stated that Section 2.1 should be revised to more accurately and narrowly state the take and impacts authorized by the ITPs. By stating that the ITPs authorize any take "in connection with forest practices", the second sentence of paragraph 2.1 is too broad and will conflict with the actual scope of permit coverage in the ITPs. If properly drafted, the ITPs should only permit take incidental to certain limited activities conducted in compliance with the Washington Forest Practices Rules, 50 C.F.R. 13.42 &222.301(e).

In response, Section 13.7 of the Implementation Agreement provides that all activities undertaken under the FPHCP and the ITPs must be in compliance with all applicable State and Federal laws and regulations. This provision makes it clear that the ITPs will not cover any activity that violates the Washington Forest Practices Rules.

3.4.11 Class IV-General

One commenter stated that DNR has transferred Class IV-General regulatory authority to local jurisdictions. However, there is no guarantee that DNR will be able to ensure that local critical areas and other regulatory ordinances comply with ESA.

In response, this issue is covered in the FPHCP in Chapter 4a-3.1.1 Classes of Forest Practices. Once conditions have been met under the Revised Code of Washington's 76.09.240, then the city or county is responsible for regulating Class IV-General forest practices. Assuming the State is successful in gaining incidental take coverage through the FPHCP, local jurisdictions will need to contact the Federal Services individually to determine the appropriate process for extending incidental take coverage to these Class IV-General forest practices. Presently, four counties (Thurston, King, Spokane, and Clark) and one city (Port Townsend) have assumed Class IV-General regulatory authority; at the time of this writing, the City of Bothell has completed SEPA requirements toward achieving transfer of jurisdiction.

Through Chapter 36.70A of the Revised Code of Washington, once local governments have assumed authority for Class IV-General forest practices, the counties and cities are required to follow standards set forth in the Growth Management Act in maintaining their critical areas ordinances, which include regular updates to ensure the protection of targeted resources.

3.4.12 Impact on Local Government

One commenter stated that in two specific instances, the standards and practices reflected in the Draft FPHCP will have a tangible effect on King County government actions. The first instance is the management of the 90,000 acres in the Hancock Timber forest holdings in the Snoqualmie watershed. King County recently acquired the development rights to this property under the belief that keeping it in managed timberland in perpetuity is a sound way to ensure it supports a healthy watershed. As timber production proceeds in this forest it will be governed by the standards in the FPHCP. The second instance is the management of small forest lots regulated by King County for timber production. King County's Critical Areas Ordinance explicitly recognizes that the Washington Forest Practices Rules that are the basis for the FPHCP will be the governing regulatory standard. These examples illustrate that from large- to small-scale forestry lands, this FPHCP will affect resource management in King County.

3.5 ADAPTIVE MANAGEMENT

3.5.1 The Role of Adaptive Management

Each alternative evaluated in the DEIS contains provisions for adaptive management. The effectiveness of each of the alternatives is evaluated by the Services with the use of best available science. Even with the use of best available science, an expected outcome resulting from an action usually is expressed as a degree of likelihood (high, moderate or

low, *etc.*). Rarely is a particular ecological outcome a certainty. The adaptive management program can be an effective means to reduce uncertainty associated with expected outcomes, particularly as uncertainties are identified over time.

Several commenters believe that the adaptive management program should "correct" inadequacies in the initial conservation strategy proposed by the State. Others expressed the view that the FPHCP should not receive incidental take authorization until after adaptive management had "verified" the conservation strategy or answered key questions, or quantified the costs of uncertainty. Others suggested that the DEIS implied that the adaptive management program was to be relied upon to "improve" the initial conservation strategy in the Draft FPHCP. Still others captured their concerns in the notion that there was an "over reliance" on the adaptive management program in the context of an overly complex mitigation strategy in the FPHCP.

In response, it is against the Services' policies to accept known, significant errors in the initial mitigation strategy, and then use the adaptive management program to "correct" or improve them. Nor do the Services view the adaptive management process as "mitigation" for adverse effects. Rather – and even with an effective adaptive management program -- the base mitigation strategy or initial minimization and mitigation measures which are implemented in any HCP should be sufficiently vigorous so that the Services may reasonably believe that they will be successful. However, the adaptive management program should be used to address uncertainties associated with that determination and to improve knowledge *over time*. The construct is consistent with what some commenters called the "precautionary approach," although several questioned whether the FPHCP followed the model.

The adaptive management process included in the FPHCP can complement the initial mitigation strategy in two ways. The adaptive management program can help in the near term to reduce uncertainty associated with the Services' initial determination about the adequacy of the initial mitigation strategy. While not directed at the Services' determination, Schedule L1 (Final FPHCP Appendix N) and the CMER Work Plan (FPHCP Appendix H) addresses various uncertainties initially agreed-to by the collaborators participating in the development of the FFR. In the longer term, the adaptive management program can ensure over time that the mitigation strategy will continue to meet the criteria of ESA Sections 10 and 7 as knowledge of the ways covered activities affect ecological functions and processes grows and evolves. A comprehensive monitoring program is included within the adaptive management process to, among other things, complement this longer term objective (See FPHCP Appendix H and below).

3.5.2 Term Duration

Many commenters were concerned about the proposed 50-year term of the FPHCP, most because of a concern and belief that the FPHCP's initial mitigation strategy provided inadequate resource protection and that the adaptive management program was inadequate. At least one wanted a "check in" during the fifth year. Another wanted 10-year ITPs. Another stressed that the FPHCP should utilize a "precautionary approach" before issuing ITPs for 50 years. In response, the Services reiterate their view that the base mitigation strategy or initial minimization and mitigation measures which are

implemented in any HCP should be sufficiently vigorous so that the Services may reasonably believe that they will be successful. The term of the agreement is a factor in this evaluation because of the length of time it may take for mitigation measures to become effective and to become commensurate with the amount of incidental take that is authorized under the ITP as required by ESA Section 10 (See the Endangered Species Act response, Minimize and Mitigate, subsection 3.1.2). In a degraded forest environment, these measures may take time to become effective as the forest matures and begins to restore its ecological functions. Such mitigation measures are cited in the Services' Habitat Conservation Planning Handbook as "prescriptive management of habitats to achieve specific biological objectives." Another factor in determining the term of an ITP is the desire of the applicant. In this instance, the applicant seeks a 50-year term. A third factor is the rigor of the adaptive management program and its ability to reduce uncertainties as they may arise over time. Monitoring the performance of the FPHCP is an important component of this aspect of the adaptive management program.

Many commenters supported the 50-year term because it provided the industry with regulatory certainty. This comment was conveyed many times in support of Alternative 2 and in connection with the regulatory certainty provided by its adaptive management program. The Services have noted these comments.

3.5.3 The Adaptive Management Process

Many reviewers stated that it was unclear that adaptive management-related guidance and/or policy documents would be enforceable parts of the FPHCP (e.g., WACs, Rules, the Forest Practices Board Manual, CMER Work Plan, and Schedules L-1 and L-2) since many of these documents are included as appendices in the plan and appeared to some to be just "background material." The FPHCP states that the Forest Practices Regulatory Program, including the Forest Practices Act, Washington Forest Practices Rules, Forest Practices Board Manual, and rule implementation guidance issued by the DNR Forest Practices Division comprise the overall approach to species conservation. Therefore, the Services consider all these documents to be enforceable parts of the FPHCP. The FPHCP states that due to the scope and scale of the Forest Practices Regulatory Program, the published plan includes a summary, rather than a complete and detailed listing, of some program components which are then included as appendices to the plan. However, the Services believe appropriate reference to these materials is contained in the body of the FPHCP.

Many commenters wanted to ensure that the adaptive management program be science-based. At least one commenter wanted a "firewall" between science and policy considerations. The Services note that the adaptive management process outlines significant procedures for the development, analysis and review of science-based monitoring and research. The program was first described in the FFR. Subsequently, the Washington State Legislature endorsed the process in ESHB 2091 by directing the Forest Practices Board to "incorporate the scientific-based adaptive management process described in FFR which will be used to determine the effectiveness of the new forest practices rules in aiding the State's salmon recovery effort. The purpose of an adaptive management process is to make adjustments as quickly as possible to forest practices that are not achieving the resource objectives. The adaptive management process shall

incorporate the best available science and information, include protocols and standards, regular monitoring, a scientific and peer review process, and provide recommendation to the board on proposed changes to forest practices rules to meet timber industry viability and salmon recovery" (ESHB 2091, §204(7)). Further, the Legislature ensured that the Washington Forest Practices Rules would remain science-based by requiring that any changes to the Rules "may be adopted by the board but only if the changes or new rules are consistent with recommendations resulting from the scientifically based adaptive management process adopted by a rule of the board"(ESHB 2091, 204(6)). ESHB 2091 is included in the FPHCP as Appendix C.

Several commenters were concerned about enforceability or accountability for the adaptive management program. While the Services believe this system is described in the FPHCP and its appendices, they also note that many of the provisions of the FPHCP, including its adaptive management program, are now required by and have the force of Washington State law. At least one commenter was concerned that the Legislature could change the adaptive management program by changing the statute that prescribes it. The Services note this comment, but believe that such an action by the Legislature would be equivalent to relinquishment of the ITPs (See below) because the existing statute, ESHB 2091, is incorporated into the FPHCP (FPHCP Appendix C). In response to this legislative mandate within ESHB 2091, the Forest Practices Board adopted WAC 222-12-045 providing more detail to the adaptive management process and the means by which the Forest Practices Board would ensure that it remain "science-based." WAC 222-12-045 is included in the Final FPHCP (Final FPHCP Appendix E).

Further explanation of the legislative mandate and the administrative rule was in development when the DEIS was published. The Draft FPHCP discussed the development of the adaptive management process guidelines to be included as Section 22 of the Forest Practices Board Manual in Chapter 4a-4.1. The Forest Practices Board adopted Section 22 on September 15, 2005 (FPHCP Appendix F). The DEIS has been modified to reflect this updated information. These Guidelines provide explicit timeframes to fulfill the legislative requirement that the "adaptive management process is to make adjustments as quickly as possible to forest practices that are not achieving the resource objectives" (ESHB 2091, Sec. 204(7)) and, in turn, to comply with WAC 222-12-045.

At least one commenter cited the Services ESA Section 10 Handbook's recommendation that the "range and magnitude" of change anticipated under the adaptive management program be negotiated, defining caps on economic impacts. The Services note that the adaptive management program of the FPHCP is limited only by the requirement to achieve resource objectives and stay consistent with State law and regulation and does not contain specific caps on economic impacts (See also the Adaptive Management response, "No Surprises" and Changed Circumstances, subsection 3.5.14).

At least one commenter felt that the adaptive management program inappropriately empowered the TFW/FFR Policy Group to make decisions related to adaptive management rather than the Forest Practices Board. In particular, one commenter was concerned that the TFW/FFR Policy Group could essentially "veto" an adaptive

management decision by not including it in the CMER Work Plan (see below). The Services believe that the FFR, ESHB 2091, WAC 222-12-045, and the Forest Practices Board Manual's Guidelines for Adaptive Management Program make it clear that the Forest Practices Board remains the decision-making entity for the adaptive management program, and maintains within it the ability of any member of the public to petition for rule changes. Further, the Forest Practices Board's public process allows information to be brought before it on any matter, including the decision-making of the TFW/FFR Policy Group as it formulates its recommendations.

Several commenters desired explicit "decision criteria" within the adaptive management program. Some advocated "triggers" within the adaptive management program that would provide stronger guidance to decision-makers on their response to research. Several commenters were concerned that the adaptive management program opened the door for an economic cost versus resource benefit analysis. At least one cited early drafts of the adaptive management process guidelines for the Forest Practices Board Manual to reinforce their concern.

The Services acknowledge that some research projects are of a nature that the range of policy responses to the range of scientific outcomes can be predicted and reflected in "triggers" or "decision criteria." However, the Services' believe that there are many circumstances where the optimum policy response to a scientific investigation may require further synthesis, deliberation, and consideration. This is particularly true where, as with the FPHCP, the decision-making process includes the desire for consensus among interests who may have differing initial views of the management actions necessary to achieve the desired scientific outcome. It is the responsibility of the TFW/FFR Policy Group and the varying interests it represents to evaluate scientific information forwarded from the science-based CMER Committee in light of existing program goals, resource objectives, and performance targets. Program goals include biological components (e.g., "…restore and maintain riparian habitat…"), cultural components (e.g., "…support a harvestable supply of fish"), economic components (e.g., "…keep the timber industry economically viable…"), and legal components (e.g., "provide compliance with the Endangered Species Act…"). The TFW/FFR Policy Group and the Forest Practices Board must evaluate the implications of CMER findings not only on the more biologically-oriented resource objectives and performance targets, but also on the cultural, economic, and legal aspects of the broader program goals. Therefore, position advocacy at the TFW/FFR Policy Group and Forest Practices Board levels is not only expected, but necessary given the complex and sometimes competing values embedded within these goals.

The Services note that the final version of the adaptive management section of the Forest Practices Board Manual, adopted by the Forest Practices Board since the DEIS was published, addressed directly one concern expressed by commenters about decision criteria that would require consideration of economic costs versus resource benefit. The adopted version of the manual is in FPHCP Appendix F. The Services acknowledge, however, that individual decision-makers will consider whatever information they view relevant to his or her decision. The Services are focused on the commitment that the

outcome of the adaptive management process, which is comprised of multiple, successive decisions, will be consistent with the purposes stated in the FPHCP.

At least one commenter believed that adaptive management programs are too centralized, not allowing for "remote" resource protection. The Services do not necessarily see an impediment in any of the alternatives to applying the adaptive management program to local circumstances, should the Forest Practices Board so choose. For Alternative 1 – Scenario 1, and Alternatives 2 and 3, this would occur when the Forest Practices Board adopts the annual CMER Work Plan (See FPHCP Chapter 4a-4 and FPHCP Appendix H). However, the Services recognize that the costs associated with research and monitoring at the site-scale would certainly be a factor in the Forest Practices Board's consideration. At least one commenter cited provisions of adaptive management programs found in other HCPs approved by the Services and urged that the Services require similar provisions in the FPHCP. The Services determine whether an application for an ITP meets the issuance criteria on the application's own merits, not on whether it duplicates provisions of other applications.

3.5.4 Cooperative Monitoring, Evaluation, and Research Committee Work Plan

Several commenters sought clarification of how adaptive management projects are developed, prioritized, and approved. Others questioned the accountability for implementation of the program. The Services believe WAC 222-12-045 makes clear that the Forest Practices Board is the decision-making authority for the adaptive management program, but that recommendations are developed through the TFW/FFR Policy Group.

WAC 222-12-045 implemented ESHB 2091 and the FFR by requiring "a process for policy approval of research, monitoring, and assessment projects and use of external information, including the questions to be answered and the timelines." Research and monitoring activities within the adaptive management program are guided by a work plan for the CMER Committee. The Work Plan is drafted by the Committee, recommended by the TFW/FFR Policy Group, and approved by the Forest Practices Board. The DEIS included the Work Plan for fiscal year 2005 as Appendix H of the FPHCP. Since the DEIS was published, the Forest Practices Board has adopted the Work Plan for fiscal year 2006. The FEIS has included this latest version (2006) of the Work Plan as Appendix H of the FPHCP. Accountability for implementation of the Work Plan is maintained by the program administrator, an employee of DNR (WAC 222-12-045(2)(b)(iii)).

One commenter states that *"Harvest rates, rotation ages, and in channel response need to be monitored closely, to ascertain whether low flows and peak flows are being influenced by upland harvest patterns."*

In response, research and monitoring priorities under the proposed FPHCP are established through the adaptive management process. Within this process, the CMER Committee recommends research and monitoring projects to the TFW/FFR Policy Group. After considering CMER recommendations and making any changes, the TFW/FFR Policy Group then forwards its priority recommendations to the Forest Practices Board.

The Forest Practices Board has the option of modifying the TFW/FFR Policy Group's priorities prior to approving the final list.

In establishing the initial priority list, CMER considers the scientific uncertainty and resource risk associated with each project. That is, CMER considers the following questions: "*How much do we know about the cause-and-effect relationship between forest practices and the geomorphic, habitat, or biological parameter at hand?*" and "*How much risk to covered resources is there if our assessment of the cause-and-effect relationship is wrong?*" (See Forest Practices Board Manual Section 22; "Guidelines for Adaptive Management Program", FPHCP Appendix F). Based on responses to these questions, CMER establishes it proposed research and monitoring priorities on an annual basis.

In the first five years of the program, adaptive management projects have focused on the development of rule implementation tools and effectiveness monitoring. Proposals for extensive (i.e., status and trends) monitoring projects and intensive (i.e., cumulative effects) monitoring are currently in the development stage.

So far, hydrologic issues such as peak flows and low flows have not been high priorities for research and monitoring within the adaptive management program. This is primarily because CMER's current priorities are thought to have greater degrees of scientific uncertainty and resource risk, including riparian- (e.g., large woody debris recruitment and shade/water temperature) and road- (e.g., mass wasting and surface erosion) related issues. However, the road-related projects include a hydrologic component that will address the effectiveness of road maintenance practices in disconnecting roads from the stream network. Depending on the degree to which roads affect the timing and magnitude of peak flows (and possibly low flows), these projects may indirectly address the issue raised by the commenter. Although the intensive monitoring component of adaptive management is still being developed, it may include an instream element that could shed some light on hydrologic issues. However, it is likely that in the near-term, peak flows, low flows, and associated instream response will remain low priorities relative to other research and monitoring issues.

3.5.5 Compliance Monitoring

Some commenters were concerned about adequate compliance monitoring (referred to by some commenters as "implementation monitoring") in support of the adaptive management program. Several commenters associated "adequate" with sufficient funding. Others were concerned that an adequate monitoring plan had yet to be developed.

While compliance with regulations is a necessary prerequisite for many adaptive management studies, monitoring for compliance is primarily an enforcement responsibility. Nevertheless, the Services note that the FPHCP outlines the compliance assumptions and associated compliance monitoring while describing the essential link to the adaptive management program (See FPHCP Chapter 4a-3.1.3). Since the DEIS was published, the Forest Practices Board has adopted the "Guidelines for Adaptive Management Program" as Chapter 22 of the Forest Practices Board Manual. The Guidelines reinforce the connection between compliance monitoring and adaptive

management by stating that "[t]he Department will design a compliance monitoring program, and will conduct compliance monitoring to determine how well the forest practice rules are being implemented on the ground. Compliance monitoring results will be reported to the Forest Practices Board, to CMER through the Administrator, and to others as directed by the board" (Forest Practices Board Manual, Section 22, Chapter 6.2; FPHCP Appendix F). For further Compliance and Enforcement responses, see subsection 3.11.

The Services consider the requirements for adequate funding of the compliance monitoring program to be essential, as is funding for the entirety of the FPHCP (See the Adaptive Management response, Adequate Funding, subsection 3.5.13).

3.5.6 Effectiveness/Validation Monitoring

One commenter suggested that successful effectiveness and validation monitoring hinge on the feedback loop from the compliance monitoring program results.

In response, an information feedback loop is a critical component of all the monitoring efforts. The adaptive management program is structured as a "loop" so that scientific findings can be integrated into the Washington Forest Practices Rules, monitoring can evaluate the effectiveness of those Rules, and the Rules can be refined as necessary to meet program objectives and goals. The compliance monitoring program would share its processes and reporting its results to the monitoring programs within the adaptive management program.

Another commenter believed the Services should include provisions for periodic review of the effectiveness of the various measures that allow changes and major improvements to those measures that are not performing effectively or as anticipated. A suggested period for major review should be between every 10 to 15 years to ensure that there is adequate information on actual performance to gauge the effectiveness of the protections under review.

The Services note that effectiveness monitoring will be conducted throughout the 50-year duration of the FPHCP, with the highest priority monitoring issues being evaluated early in the life of the plan. The TFW/FFR Policy Group and the Forest Practices Board will consider monitoring results in light of existing performance targets and resource objectives. Where performance targets and/or resource objectives are not being met, the Forest Practices Board may decide to modify protection measures to improve their effectiveness. Already, two monitoring projects (evaluation of DFC RMZ targets and evaluation of perennial initiation point default basin sizes) have been completed and the Forest Practices Board is considering modifying the Washington Forest Practices Rules based on the results.

One commenter stated the HCP should include adequate biological goals and objectives. The FPHCP's performance measures do not adequately correspond to the recovery, or even the survival, of each of the covered species.

The Services believe that adequate information regarding biological goals and objectives exists within the FPHCP on which to base a determination. The State's purpose in

preparing a programmatic HCP is to gain ITPs providing take authorization for the Washington Forest Practices Rules based on the FFR of 1999. The FFR was developed in response to listings of several species of Pacific salmon under the ESA as well as the continued listing of surface waters on the Federal Clean Water Act 303(d) list. To address these issues, the FFR recommended modifying existing forest practices statutes and Rules related to:

- The protection of riparian areas, unstable slopes and wetlands;
- The construction, maintenance and abandonment of forest roads;
- The application of forest chemicals; and
- The implementation of Watershed Analysis.

Therefore, the FPHCP includes two parts, an administrative framework and protection measures made up of two parts; a riparian conservation strategy (FPHCP Section 4b) and an upland conservation strategy (FPHCP Section 4c). The conservation objective of the riparian strategy is to restore function to high levels on lands covered by the FPHCP and to maintain those levels once they are attained (WAC 222-30-010(2)). Riparian functions include large woody debris recruitment, sediment filtration, streambank stability, shade, litterfall and nutrients, in addition to other processes important to riparian and aquatic systems.

The approach to restoring riparian function differs for different parts of the State. In western Washington, protection measures place riparian forests on growth trajectories toward a DFC, which is defined as the condition of a riparian forest stand at 140 years of age. In eastern Washington, protection measures are intended to provide for stand conditions that vary over time. Varying stand conditions are designed to mimic natural disturbance regimes within a range that meets resource objectives and maintains general forest health. Further, the riparian strategy from the FPHCP consists of three separate but related sets of protection measures:

- Riparian and wetland management zones that provide woody debris recruitment, shade and other ecological functions through tree retention.
- Limitations on equipment use in and around waters and wetlands to minimize erosion and sedimentation and maintain hydrologic flowpaths.
- Streamside land and timber acquisitions for the long-term conservation of aquatic resources.

The goal of the upland strategy is to prevent, avoid, minimize, or mitigate forest practices-related changes in erosion and hydrologic processes and the associated effects on public resources. The upland strategy in the FPCHP consists of protection measures that are implemented in upslope areas outside RMZs and wetlands. These measures are intended to limit forest practices-related changes in physical watershed processes, such as erosion and hydrology that may adversely affect the quality and quantity of riparian and aquatic habitat lower in the watershed. The upland strategy includes Washington Forest

Practices Rules, guidance from the Forest Practices Board Manual, and guidance issued through the DNR Forest Practices Division related to unstable slopes and landforms; the location, design, construction, maintenance, and abandonment of forest roads; and harvest-induced changes in rain-on-snow peak flows. Specific objectives of some of the protection measures of the upland conservation strategy are found in the FFR (FPHCP Appendix B) and the Washington Forest Practices Rules, are listed in Section 4c of the FPHCP, and cover unstable slopes/mass wasting, forest roads, and hydrology.

Further, the effectiveness and validation monitoring component of the FPHCP (as described in Section 4a-4.2) is designed to evaluate the degree to which the Washington Forest Practices Rules and guidance meet performance targets and resource objectives. Validation monitoring will determine if the performance targets are appropriate for meeting the stated resource objectives. The CMER Committee has identified 15 effectiveness and validation monitoring programs (FPHCP Appendix H). Each program has several associated projects, some of which are currently underway, while others have not yet reached the scoping phase.

3.5.7 Ambient Monitoring

Commenters had concerns about how CMER monitoring plans fit into ongoing tribal monitoring plans that have monitored long-term ambient conditions for years. Participants in the adaptive management program recognize the value of external monitoring data in addressing critical research and monitoring issues identified in the FFR. A good example of this type of integration is the recent work by individual Tribes to collect data related to the default basin sizes for defining perennial initiation points (PIP). PIP data was collected and compiled by Tribes in accordance with CMER-established protocols and was subsequently incorporated into the adaptive management process where it is currently being evaluated at the policy level.

The Services recognize that prudent use of future funding increases the need for cooperative research and monitoring efforts so CMER can make more efficient use of limited resources. Tribal ambient monitoring can supplement CMER-sponsored extensive (i.e., status and trends) monitoring, increasing the effectiveness of the adaptive management process in determining if protection measures are achieving established goals and objectives. To the extent that tribal ambient monitoring addresses FFR critical questions and is conducted in accordance with CMER-established standards and protocols, these efforts will complement ongoing CMER projects by increasing the pool of available data.

It is unclear what a commenter means when stating that "*Recent ambient monitoring proposals…have been declined recently claiming that CMER will be doing all this monitoring for the individual Tribes."* If the issue is one of access to private forestlands, neither the Services nor DNR has the authority to guarantee tribal access to private lands for monitoring purposes.

The Services believe that CMER recognizes the need for "ambient" monitoring as reflected in the creation of its extensive monitoring program to evaluate the status and trends of key watershed parameters. However, as the commenter correctly points out, the spatial scale of CMER extensive monitoring may be broader than what many individual

Tribes find useful. In addition, extensive monitoring may not evaluate all parameters of interest to particular Tribes. This reinforces the need for local tribal ambient monitoring at the usual and accustomed watershed scale. The Services agree that ambient monitoring by individual Tribes can make important contributions to the adaptive management program.

3.5.8 Intensive Monitoring

One commenter recommended that one of the goals of intensive monitoring be to determine statistically significant trends and changes in water quality and aquatic habitat. Also, will the Washington Forest Practices Rules' effects on stream temperature, sediment yield, and hydrology result in the Washington Water Quality Standards being met? Will these objectives be met through the Intensive Monitoring Program?

In response, the FPHCP's adaptive management program has four components: (1) rule implementation tool development, (2) validation and effectiveness monitoring, (3) extensive monitoring, and (4) intensive monitoring. Each component has a specific purpose or goal. The goal of the rule implementation tool component is to develop scientifically based tools and guidance to facilitate forest practices rule implementation in the field. An example of a rule implementation tool is the Geographic Information System (GIS)-based water typing model currently under development.

The goal of the validation and effectiveness monitoring component is to determine if established performance targets for different geomorphic inputs (e.g., large wood, temperature, sediment, or hydrology) are appropriate and to determine if protection measures are effective in achieving those targets. For example, validation monitoring might address the question "*Is limiting road sediment inputs to 50 percent over background adequate to protect in-stream uses*" while effectiveness monitoring would address the question "*Are road maintenance and abandonment practices limiting road sediment inputs to 50 percent over background?*".

The goal of extensive monitoring is to evaluate the status and trends of key environmental parameters at a statewide scale. For example, the implementation of better management practices on covered lands should lead to reduced sediment inputs and greater retention of riparian cover. Together, these factors should result in the recovery of thermal regimes within forested watersheds throughout the State due to improved channel conditions (i.e., narrowing and deepening) and higher shade levels. Extensive monitoring is designed to test this hypothesis by monitoring stream temperatures at multiple locations throughout the State. The number and location of monitoring sites is intended to be representative of conditions across covered lands so results can be extrapolated to watersheds with similar vegetative and geomorphic conditions.

The goal of intensive monitoring is to determine if implementation of the full range of FPHCP protection measures is preventing cumulative watershed effects. While other monitoring components evaluate individual protection measures and performance targets, intensive monitoring will evaluate the integration of multiple protection measures to assess their effects on instream conditions at the watershed scale. While the intensive monitoring component of adaptive management is still under development, it is likely

that multiple watersheds throughout the State will be monitored so that variations in watershed conditions can be addressed.

The commenter questions if intensive monitoring is the mechanism for evaluating forest practices compliance with water quality standards for temperature, sediment, and hydrology. Based on the overviews of each monitoring component above, the short answer is "no." However, both effectiveness and extensive monitoring will address the question, but at different spatial scales. Effectiveness monitoring will determine the degree to which individual protection measures are meeting the performance targets at the site-scale. In some cases, such as for temperature, the FFR performance targets are the State water quality standards. In other cases, such as for sediment and hydrology, performance targets are not the same as the State water quality standards, but are designed to meet the standards. Therefore, effectiveness monitoring results will help EPA and Ecology assess the degree to which certain protection measures are meeting water quality standards at the road- or stream-reach scale.

Extensive monitoring will serve the same purpose, but at a much larger scale. Rather than evaluate the degree to which a given protection measure meets the water quality standard at the local level, extensive monitoring will provide a statewide "report card" for different environmental parameters. As described above, temperature will be monitored at representative locations throughout FPHCP covered lands to assess the status and trends in this particular parameter. Sediment will also be monitored, but through a road-based extensive monitoring program designed to assess sediment inputs at the sub-basin (or small watershed) scale. While no extensive monitoring is proposed for hydrology, as mentioned under the CMER Work Plan subheading above, effectiveness monitoring results will help address hydrology-related impacts. In addition, it is possible that intensive monitoring may incorporate a hydrologic component to evaluate hydrologic changes due to forest practices.

3.5.9 Status and Trends: In-Channel Characteristics

One commenter was concerned that current monitoring efforts do not have a program to assess in-channel characteristics and responses as well as harvest patterns.

Currently, the focus of the extensive (i.e., status and trends) monitoring program is on watershed geomorphic inputs. Geomorphic inputs such as large woody debris, solar energy, sediment, and hydrology affect the quality and quantity of instream habitat. Extensive monitoring components have been (or are being) developed to assess the status and trends of these inputs (i.e., riparian, roads, and mass wasting). There is currently no proposal to assess the status and trends of in-channel characteristics within the extensive monitoring program.

The structure and format of the adaptive management program assumes that it is currently more important to monitor variables that are directly affected by forestry activities (i.e., geomorphic inputs) than variables that are indirectly affected by forest practices (i.e., in-channel characteristics) through changes in geomorphic inputs. As time goes on and the cause-and-effect relationships between forest practices and geomorphic inputs are better understood, adaptive management may become more in-channel focused.

Although in-channel characteristics are not currently part of extensive monitoring, riparian and instream habitat will be considered within the adaptive management program. In fact, intensive monitoring will evaluate the interaction of multiple forest practices to assess the effects on instream conditions at the watershed scale. The goal of intensive monitoring is to determine if implementation of the full range of FPHCP protection measures is preventing cumulative watershed effects.

While the roads component of extensive monitoring will evaluate the degree to which road practices affect hydrology, monitoring of instream flows is not planned. So far, instream flow monitoring has not been a high priority for research and monitoring within the adaptive management program. This is primarily because CMER's current priorities are thought to have greater degrees of scientific uncertainty and resource risk, including riparian- (e.g., large woody debris recruitment and shade/water temperature) and road- (e.g., mass wasting and surface erosion) related issues. However, the road-related projects include a hydrologic component that will address the effectiveness of road maintenance practices in disconnecting roads from the stream network. Depending on the degree to which roads affect instream flows, these projects may indirectly address the issue raised by the commenter. Although the intensive monitoring component of adaptive management is still being developed, it may include an instream element that could shed some light on hydrologic issues. However, it is likely that in the near-term, instream flow monitoring will remain a low priority relative to other research and monitoring issues.

Several commenters were generally concerned about adequate biological monitoring intended to measure the effectiveness of the measures within the FPHCP. The Services note that each adaptive management project is subject to an independent, scientific peer review process carried out by a group known as the Scientific Review Committee. The Scientific Review Committee operates outside the CMER Committee and reviews project study designs and results to ensure they are valid and credible. Scientific Review Committee review further ensures the proposed approach to monitoring outcomes in the project will provide results by which one can determine whether actions achieve their stated objectives. This was a concern expressed by one commenter who suggested that CMER must "*have a clearly defined idea of the scientific study at hand and design a monitoring program which will provide the required information.*"

Another commenter suggested the "status and trends" component of the adaptive management program (i.e., extensive monitoring) should include "*a program to assess in-channel characteristics and responses to ensure proper monitoring and determine the effectiveness of the HCP.*" The Services note that in-channel characteristics are largely shaped by three geomorphic inputs: sediment, large woody debris, and water (i.e., hydrology). The adaptive management program has performance targets for each of these three inputs. Performance targets serve as the basis for assessing the effectiveness of the Washington Forest Practices Rules and are, themselves, subject to validation monitoring in the adaptive management program. The FPHCP assumes that if the Washington Forest Practices Rules are effective in achieving validated performance targets for sediment, large woody debris, and hydrology, the development and/or maintenance of desirable in-channel characteristics and associated habitat features will

follow to the degree in any given stream-reach that forest practices affects those characteristics.

3.5.10 Timber, Fish, and Wildlife/Forests and Fish Report Policy Group

Some commenters believed that the TFW/FFR Policy Group was biased, unduly influenced or dominated by the regulated community of forest landowners. The Services point out that the TFW/FFR Policy Group formulates recommendations by consensus (even if formulated through dispute resolution), but that regulatory decisions ultimately are made by the Forest Practices Board. In cases where recommendations by the TFW/FFR Policy Group are made by consensus, the Services assume that commenters would agree that potential bias is not an issue. However, commenters could be concerned that "bias" would be the cause of the TFW/FFR Policy Group *not* reaching consensus on a recommendation.

Commenters were concerned that the lack of a decision could lead to inaction. At least one commenter wanted a "hard and fast" feedback loop. The Services note that the Washington State Legislature emphasized in ESHB 2091 that the adaptive management program was to "make adjustments *as quickly as possible*….so that management and related policy *can be changed promptly* and appropriately" (emphasis added) (ESHB 2091, Sec. 204(7) and Sec. 301(1); See FPHCP Appendix C).

The FPHCP reiterated this commitment by stating that the adaptive management program was, among other things, to "*ensure* programmatic changes will occur as needed" (FPHCP Chapter 4a-4) (emphasis added) and incorporated rules adopted by the Forest Practices Board to govern the process (WAC 222-112-145). The Services do not interpret these statements of the Legislature or the applicant as aspirations, but as commitments. The FPHCP and its appendices further explain how these commitments will be met.

Some commenters were concerned that the adaptive management process, even if science-based, might be frustrated by a lack of consensus at either the technical or policy level. Others suggested that under some circumstances particular stakeholders or interests might deliberately frustrate the adaptive management process by failing to agree. In order to force decision-making even in the face of a lack of consensus, the Forest Practices Board adopted Rules governing the adaptive management program which included procedures to deal with the lack of consensus by the TFW/FFR Policy Group. The Washington Forest Practices Rules addressing adaptive management anticipate the potential for circumstances where consensus is difficult or impossible to reach and specifically address it (WAC 222-112-045(2)(h)(ii)(C)), by calling for dispute resolution within time-certain and, ultimately, action by the Forest Practices Board even when consensus is not reached. Since the draft FPHCP was submitted, work has continued on the detailed adaptive management process guide discussed in FPHCP Chapter 4a-4.1. The TFW/FFR Policy Group approved a draft process guide on August 4, 2005, and submitted it to the Forest Practices Board on August l0, 2005. The Forest Practices Board approved the "Guidelines on Adaptive Management Program" as Section 22 of the Forest Practices Board Manual on September 15 (See FPHCP Appendix F). The Guidelines include the timeframes for TFW/FFR Policy Group decision-making first

adopted by the TFW/FFR Policy Group in May of 2004. If those timeframes are not met, all relevant information, including associated CMER science reports, is forwarded directly to the Forest Practices Board for consideration and decision-making. The Services believe that sufficient information exists to determine whether this system is consistent with the FPHCP's commitment to ensure changes will occur as needed and that sufficient information exists to determine whether bias or influence of any stakeholder is likely to frustrate successful implementation of the adaptive management process.

Several commenters were concerned that the adaptive management process could be circumvented entirely by anyone who chose to directly petition the Forest Practices Board for rule-making, particularly for non-science based issues. Other commenters were concerned about the opposite occurrence; i.e., that the adaptive management process might preclude people from directly petitioning the Forest Practices Board. Other commenters were concerned that participating stakeholders did not necessarily include fishers, water users, or other potentially-interested individuals. Finally, at least one commenter was concerned that the adaptive management program constituted an illegal delegation of authority to make public policy decisions.

First, the Services point out that the rule-making process of the Forest Practices Board is not "delegated" under the FPHCP or ESHB 2091, the law which provides the framework for implementation of the FPHCP. The adaptive management program does not delegate the ultimate decision-making to non-governmental bodies, but creates a scientific-based process to determine the effectiveness of the Washington Forest Practices Rules and guidance that facilitates stakeholder involvement. This process does not exclude the public from participation in actions of the Forest Practices Board. All Forest Practices Board meetings are advertised and open to the public. All rule-makings have public notice and comment requirements. More specifically, any member of the public, whether or not they participate in the adaptive management program, may petition the Forest Practices Board with an adaptive management proposal (WAC 222-12-045(2)(d)(i)). If consensus cannot be reached on an adaptive management proposal, the issues are addressed in the dispute resolution process; these issues can include research priorities, program direction, and recommendations to the Forest Practices Board on proposals for change (WAC 222-12-045(2)(h)). The Forest Practices Board makes the final determination regarding a dispute, which means that even if the dispute resolution process does not result in a recommendation for change, the Forest Practices Board may adopt a rule or guidance change if necessary to carry out its duties under the Forest Practices Act (WAC 222-12-045(2)(ii)(C)).

ESHB 2091 provides the Forest Practices Board the standards under which it was delegated rule-making responsibility to implement the FFR. The Forest Practices Board has adopted rules implementing this statutory directive at WAC 222-12-045. The creation and implementation of the adaptive management program does not violate the delegation doctrine nor does it impermissibly involve non-governmental parties. The Legislature provided standards about what should be included in the program, and procedural safeguards exist in both the Forest Practices Act, RCW 76.09, and the Administrative Procedure Act, RCW 34.05, that governs adoption of rules, hearings on

decisions implementing the Forest Practices Regulatory Program, and judicial review. It is a public process under the State's Administrative Procedures Act that allows any member of the public to be heard and to participate in the rule-making process.

Second, consistent with State law and regulation, both CMER and the TFW/FFR Policy Group meetings dealing with the adaptive management program are open to any member of the public.

Third, the Services point out that in setting the policy for rule-making by the Forest Practices Board, the Washington State Legislature precluded the Forest Practices Board from adopting rules affecting covered species if such rules were not the result of the science-based adaptive management program. Should the Forest Practices Board receive information that warrants further consideration, procedures call for it to refer the matter to the science-based adaptive management program. That is not to say that the Forest Practices Board cannot adopt *any* other rules -- rules not affecting aquatic species or rules not based in science (such as some administrative requirements) are not precluded by the legislative language.

Some commenters were concerned that the State Legislature could change the Washington Forest Practices Rules. One commenter used as an example changes made for small landowners to the Rule pertaining to RMAPs. The Services acknowledge that the Legislature, as ultimate policy-maker for the State, could change rules or, for that matter, elect to terminate the FPHCP. However, it was the Legislature that passed ESHB 2091 which called for the State to apply for the FPHCP on the basis of a science-based adaptive management program. The Services also note that legislative interest in RMAPs led to a request by the Forest Practices Board that the TFW/FFR Policy Group take up the issue. The TFW/FFR Policy Group determined that the issue was not one of biological uncertainty, but rather economic. As such, it was not an issue appropriate for the science-based adaptive management process.

The Services acknowledge the possibility that the Washington State Legislature could constrain the Forest Practices Board and DNR from properly implementing the FPHCP. The Legislature could do so either through substantive lawmaking affecting conservation measures, procedural alternations affecting adaptive management, or through its funding decisions. The Services are confident that any such instance will become well known and understood by the participating collaborators (including the Services), particularly if it is viewed as contrary to the commitments in the FPHCP or, if issued, the ITPs. The Implementation Agreement (FPHCP Appendix A) contains procedures whereby the Services would respond to circumstances where the ITP is not being properly implemented, including revocation of the permit (Section 6.2).

3.5.11 Timely Recommendations

Several commenters believed that the adaptive management program was ineffective because it had failed to date to result in changes to the Washington Forest Practices Rules, or because it generally proceeded too slowly. The Services acknowledge that timeliness of decision-making is important. Discussed above is the legislative and regulatory language that requires an adaptive management process that ensures timely decisions. But the Services also recognize that the requirement that the adaptive

management program be science-based requires a validation process and rigor that may conflict with the desire for rapid decisions.

The FPHCP states that, in addition to a science-based process, another objective of the adaptive management program is "(t)o ensure quality controls are applied to scientific study design, project execution and interpreted results" (See FPHCP Chapter 4a-4). The Services do not quarrel with this objective. In order to carry out this objective, the program calls for peer review of the research and science developed in the program prior to consideration by the TFW/FFR Policy Group. In order for the peer review to be effective, full documentation of research is required. These procedures, included by the Forest Practices Board in WAC 222-12-45 and further detailed in Section 22 of the Forest Practices Board Manual (FPHCP Appendix F), include timeframes for consideration by the TFW/FFR Policy Group once the information has been formally transmitted to it, but do not constrain the amount of time within which the scientific work is done, documented, and reviewed.

The Services are aware that, prior to publication of the DEIS, no research had advanced through the scientific review procedures. However, since the DEIS was published, the first two research projects (basal area of reference stand conditions and the land area defining a perennial and seasonal stream initiation point) have progressed through the process to the point at which they have been reviewed by the Scientific Review Committee and forwarded to the TFW/FFR Policy Group (See FPHCP 4a-4.1; WAC 222-12-45; FPHCP Appendix F). For the two studies mentioned above, the TFW/FFR Policy Group has complied with the adopted schedule to develop recommendations for the Forest Practices Board.

The Services note the concern of commenters that decisions be made on a timely basis, but existing experience with the adaptive management program suggests that the majority of time devoted to an issue has been used by the scientific researchers and peer reviewers, not the TFW/FFR Policy Group or other decision-makers. These policy decision-makers have, thus far, complied with the existing schedule for decision-making.

The Services believe sufficient information exists to determine whether the schedule for decision-making is appropriate under ESA Sections 10 and 7, and sufficient information exists to establish a reasonable expectation about whether the TFW/FFR Policy Group will formulate its recommendations to the Forest Practices Board in accordance with the schedule.

3.5.12 Forest Practices Board Decision-Making

Commenters expressed the concern that landowners would not have the incentive to modify their practices in accordance with the outcome of adaptive management procedures. The Services believe this concern can be interpreted two ways. The first is to suggest that there will be reduced incentive for landowners to comply with new Washington Forest Practices Rules after adoption by the Forest Practices Board. All Rules are enforced through Washington State law by DNR. Violators are subject to a variety of responses for failure to comply, including State civil or criminal penalties. The program of compliance has existed since before adoption of the current Rules, and continues. The FPHCP includes information based on the history of compliance and

enforcement with which to assess the overall level of compliance with forest practice regulation (See FPHCP Chapter 4a-3.1.3, Compliance and Enforcement). The Services believe the FPHCP includes information on the enforcement program of DNR sufficient to establish a reasonable expectation about the level of compliance with the regulations if they also become subject of ITPs.

The second interpretation reflected in a number of comments is that the Forest Practices Board will have reduced incentive to make rule changes that conform to information produced through the adaptive management program. Other commenters held the related concern that potential lack of action by the Forest Practices Board will be the result of undue influence by landowners or a general lack of independence by the Forest Practices Board. Many commenters used the term "political" to describe the Forest Practices Board, suggesting that the Forest Practices Board could make "political decisions" rather than rely on science. Some commenter interpreted the statutory requirement that the Forest Practices Board "balance" the interests of landowners against the protection of public resources to constrain adequate resource protection. Some commenters believe that there should be stricter criteria for decision-making by the Forest Practices Board. Another concern, closely aligned, was expressed by some commenters who believe that the Services should retain approval authority over individual decisions of the Forest Practices Board, or that there should be the ability to appeal individual decisions of the Forest Practices Board if it was believed that they did not meet the standards for issuing incidental take authorization under the ESA.

In response, decision-making by the Forest Practices Board primarily is governed by RCW 76.09.010 which states, among other things, "that coincident with maintenance of a viable forest products industry, it is important to afford protection to forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation, and scenic beauty" (FPHCP Appendix E). The Services believe that there is sufficient information available to determine whether this broad statute provides the Forest Practices Board the authority to adopt Washington Forest Practices Rules consistent with the FPHCP.

However, it not only is important that the Forest Practices Board have the *authority* to adopt such rules, the Services must arrive at the reasonable belief that the Forest Practices Board *does, in fact, adopt rules* consistent with the FPHCP and the outcome of its adaptive management program. Some commenters believe that the requirement to maintain a viable forest products industry precludes the ability to afford protection to other resources. Other commenters believe that the Services should ensure that *each* relevant decision of the Forest Practices Board meet the standards of the ESA. Others commenters cautioned that such structure would, in their view, essentially transform State forest practices rule-making into a Federal process, an outcome they suggest is inconsistent with the intent of ESA Section 10.

The Services point out that almost all HCPs require many implementation decisions to be made by ITP holders. The Services have not believed it appropriate to review each of these decisions individually for compliance with the ESA, and they do not do so. Rather, the Services review implementation by ITP holders to ensure substantial compliance with

the provisions of the permit and to ensure that implementation does not raise issues related to achieving over the term of the permit the standards of ESA Sections 10 and 7.

The Services do not believe that the FPHCP presents a particularly unique case simply because the decision-maker is a twelve member quasi-legislative board. Should ITPs be issued, *all* responsible parties, including the Forest Practices Board, will be expected to make decisions consistent with the requirements of the ITPs. The Services must reach a determination that any expectation of consistent decision-making, if established, is reasonable. Included in this consideration are circumstances where the Forest Practices Board may *not* make a decision, deciding in favor of the *status quo*, a concern raised by several commenters. It also includes decisions of the Forest Practices Board which, while not rule-making, are important to implementation of the FPHCP. Budget priorities to address scientific uncertainties under the adaptive management program are examples of such important decisions.

In the case of affirmative rule-making, the Forest Practices Board is prescribed by legislation from adopting rules that are inconsistent "with recommendations resulting from the scientifically based adaptive management process . . ." (ESHB 2091). That process, fully described in the DEIS and discussed below, requires specific timeframes for the development of recommendations to the Forest Practices Board. At least one commenter suggested that the Legislature, the Forest Practices Board or DNR could establish a different science-based adaptive management program that would result in stronger conservation measures than assumed in the DEIS. The Services note this comment, but find it highly speculative and presented without any supporting information to suggest it to be a reasonable anticipation. Further, since the provisions of ESHB 2091 are incorporated into the application, a fundamental change in the law would be equivalent to relinquishment of the ITPs, should they be issued.

In order to determine what expectation should be established for other types of decisions or non-decisions, the Services will look to a variety of factors, some of which were the subject of comments by reviewers. One such factor is that that the Forest Practices Board deliberates and makes decisions in a public setting within which all interests can monitor the Forest Practices Board's activities and bring to light any concerns. Unlike most HCPs, the FPHCP provides for the public and interested parties to monitor the process by which implementation decisions are made.

Another factor is the relatively large size and membership of the Forest Practices Board. Several commenters felt this membership could be unduly influenced by forest landowners who are regulated by the Forest Practices Board's decisions. The Services note that State legislation requires the regulated community to hold at least two of the twelve positions on the Forest Practices Board. By convention, landowners have held at least one additional seat. By statute, the Forest Practices Board is chaired by the publicly elected Commissioner of Public Lands (or designee), the person primarily responsible for administration of the FPHCP. Three seats are held by the gubernatorial-appointed directors (or designees) of the State Departments of Agriculture, Ecology, and Trade and Economic Development. Notably, the same legislation that endorsed the adaptive management program expanded the membership of the Forest Practices Board to include

the director of WDFW. That person does not report to the governor, but is appointed by the Fish and Wildlife Commission whose members serve rotating six-year terms and are appointed by the governor in office at the time that a vacancy occurs. One member is a county commissioner, appointed by the governor. Finally, there are four remaining "at large" members appointed by the governor who serve four-year terms. In recent years, one of those members has been a representative of environmental interests, and one has represented Indian tribal interests.

The Services note that the Governor is directly or indirectly responsible for the appointment of each member of the Forest Practices Board except the independently-elected Commissioner of Public Lands. It is conceivable that this appointment relationship could give rise to a concern about "independence" of the Forest Practices Board. However, the legislation establishing the membership places requirements upon the Governor which have the intent of ensuring varying interests are represented, particularly by the directors of State agencies with varying responsibility for natural resource stewardship. Further, in recent years, convention has been established that has resulted in the representation of environmental and tribal interests on the Forest Practices Board. Further, the Services point out that the Implementation Agreement includes provisions that allow the Services to revoke the ITPs for cause, including circumstances where necessary modifications to the mitigation strategy are not made by the Forest Practices Board or if compliance levels are unacceptable (See Implementation Agreement Section 6.2 and 50 C.F.R. §§ 13/27-13.29 222.306). The Services anticipate that, should such a circumstance become a possibility, a decision by the Forest Practices Board that would put the ITPs at risk would be a conscious one and perhaps equivalent to a decision by the State to relinquish the ITPs. Relinquishment is addressed in the Implementation Agreement (See HCP Appendix A, Section 6.3). While it is impossible to predict the outcome of any particular decision of the Forest Practices Board, the Services believe that sufficient information exists to allow them to anticipate the degree to which the Forest Practices Board's future decisions will be unduly influenced by any interest or be biased or lack appropriate independence, if at all.

3.5.13 Adequate Funding

Many commenters were concerned about "full," "adequate," or "assured" funding of the adaptive management program. Others were concerned about funding for the monitoring program. At least one was concerned about funding for enforcement. Some commenters referred to the projected budget for adaptive management research related to Schedules L1 and the CMER Work Plan and pointed out what they perceived to be a shortfall between anticipated funds and desired expenditures between 2006 and 2010. Others were concerned about delays in implementation of the adaptive management program.

The Services believe that funding the implementation of the entire FPHCP is important. In fact, under ESA Section 10, the Services must find that "the applicant will ensure that adequate funding for the plan will be provided" (ESA Section 10(a)(1)(b)(iii)). The determination as to adequate funding will be documented in the statement of findings documents issued by the Services should ITPs under Section 10 be issued. The Services address all comments related to adequate funding here. They do so in the context of adaptive management, although the response to adequacy of funding would be applicable

to each and all elements of the FPHCP, including those related to administration of the Forest Practices Regulatory Program.

The Services interpret the language in ESA Section 10 to require that they have a high degree of confidence that funding adequate to implement the plan will be made available when and as it is necessary. While this finding requires familiarity with the costs of implementation, the Services do not believe it requires a specific budget for the term of the plan, particularly for a long-term plan. It is reasonable to anticipate the costs of administration of the Forest Practices Regulatory Program in the near-term, and the FPHCP has been modified to include information about recent expenditures related to the Forest Practices Regulatory Program of the State of Washington. Over the long term, however, costs become more speculative. Similarly, estimates of near-term costs of the adaptive management program to address known research priorities may be reasonably foreseeable, but longer-term costs associated with unknown research needs are not. The Services do not believe the provision in Section 10 requires that specific funds for implementation be identified at the outset, only a determination that "adequate funding for the plan will be provided."

The concept of "full funding" of the adaptive management program, or the FPHCP in its entirety, is unquantifiable in the sense that there may always be some who seek more adaptive management, more enforcement, more monitoring or more research, *etc.* However, the degree to which the program is funded can be a factor in determining the degree to which—or the speed with which—the program can be effective. For adaptive management, it can contribute to the speed with which the program achieves the two objectives of reducing uncertainty associated with initial determinations and addressing scientific uncertainties that may arise over time. The Services must determine under the ESA that adequate funding for the plan will be provided.

The Services point out that the adaptive management program can be an effective means to reduce uncertainty associated with expected outcomes, particularly over time, but it should not be viewed as a tool to "correct" known, significant inadequacies in the initial conservation strategy. The base mitigation strategy or initial minimization and mitigation measures which are implemented in any HCP should be sufficiently vigorous so that the Services may reasonably believe that they will be successful. Throughout the term of the agreement, it should be anticipated that uncertainties will arise. They should be identified and prioritized, and funds should be appropriately allocated to reduce those uncertainties. The Services do not believe that all uncertainties that may arise during the term of the agreement have been identified at the outset nor that all uncertainties are or will be of equal importance. In fact, while the Services acknowledge that Schedules L1 and L2 (now the CMER Work Plan) were developed by the collaboration prior to agreement on FFR, and have been submitted as part of the application, they have not determined that each uncertainty or each priority identified in these schedules is critical to meeting the criteria of ESA Sections 10 or 7. At a minimum, however, they are important to the collaboration that developed them and which now implements the Washington Forest Practices Rules. The Services do not believe, therefore, that budget requirements to implement the adaptive management program for the duration of the agreement can be identified at this time by looking solely to Schedules L1 and L2 as an

indication of research needs over time. The Services do believe, however, that sufficient information exists to determine whether the applicant will fulfill its commitment to provide sufficient funds for the duration of the agreement to implement the plan.

If the Services determine that adequate funding for implementation of the FPHCP will be forthcoming, the Services anticipate that the initial mitigation strategy periodically will be modified if and when changes are found to be appropriate through the adaptive management program.

However, some commenters expressed the concern that stakeholders in the FPHCP would not have an incentive to obtain funding for implementation of the FPHCP, including the adaptive management program, once ITPs had been issued. At least one wanted the Implementation Agreement to describe the course of action should funding not be available. The Services point out that the stakeholders who developed FFR and who participate in its implementation under the Washington Forest Practices Rules include traditionally competing interests who are now mutually dependent upon one another for its success. If one competing interest was to fail to support funding for the adaptive management program or otherwise frustrate the program by lack of participation, it is reasonable to assume another would ensure that the consequences of that failure are well known and thoroughly considered by policy-makers at all levels, including by members of the Forest Practices Board. Included among potential consequences is non-compliance with the provisions of the FPHCP, whether caused by a lack of adequate funding or otherwise. Non-compliance can give rise to the suspension or revocation of the ITPs (See FPHCP Appendix A Implementation Agreement, Section 6.2). Further, it should be noted that the Forest Practices Board is not constrained from decision-making because of any action or inaction of particular stakeholders or the TFW/FFR Policy Group as a whole. The Services believe that the mutual dependence of stakeholders with divergent interests is significant in determining whether they all will continue to support appropriate funding for implementation of the FPHCP over time.

Several commenters requested a description of the source of current funding. One comment stated if States (programs and plans) can only receive Federal funding for "conservation" they should not be used to fund other activities associated with the FPHCP, such as road construction activities. The Services interpret this latter comment to refer to funds received by the State from USFWS under ESA Section 6. These funds can and have been used to help develop the FPHCP, but are not being used by the State for implementation of the Forest Practices Regulatory Program described in the FPHCP. A new section has been added to the Final FPHCP describing funding history and future commitments for implementation of the FPHCP.

Some commenters stated that they could support Alternative 2 or Alternative 3 if provisions were made for participation in the adaptive management program.

Adequate resources are essential to the adaptive management program. The primary method to provide adequate resources is to obtain adequate funding. The State has committed three million dollars over the last five years to the adaptive management program (since the implementation of the current Washington Forest Practices Rules in effect since January 1, 1999). The Federal government has also provided approximately

four million dollars per year for six years to the adaptive management program. The Federal funds are primarily used for CMER research. Some of the funds enable Ecology and WDFW to fully participate in the adaptive management program. While appropriations of State funding are solely within the discretion of the Washington State Legislature, the Services note that the Legislature passed the Forests and Fish Law (Special Session 1999 ESHB 2091, RCW 76.09.370) directing the Forest Practices Board to adopt permanent Rules representing the recommendations of the FFR, including adaptive management and requiring that an HCP be pursued. Further, the FPHCP has been modified to include additional information about recent funding of the administration of the Forest Practices Regulatory Program, including adaptive management (See FPHCP Section 1-2). The Services believe sufficient information exists to determine budget priorities for the adaptive management program that will lead to adequate funding for the program throughout the term of the FPHCP.

At least one commenter challenged the assumptions in the DEIS, believing that significant funding for adaptive management would be available without the support of the collaboration and that adaptive management could be directed in that instance by the Forest Practices Board. This commenter believed that a more conservation-based alternative could be pursued without degrading the effectiveness of the adaptive management program. The Services note this comment and do not add to the extensive explanation found in the DEIS of the adaptive management program's effectiveness under varying levels of collaboration.

One commenter suggested funding the acquisition of preserves through checking a box on Federal tax returns to create a $1 or $3 dollar donation to such a system. The Services note the comment. Another advocated acquisition of important habitat using funds from various Federal appropriations. The Services also note this comment but believe it is beyond the scope of the DEIS.

One commenter asserted that the timber industry should pay for implementation of the FPHCP. Another commented that the landowners should not be allowed to "transfer" costs to State or Federal taxpayers. The Services note that if a private funding mechanism were to be pursued, it would need to be adopted by law by the State and included in its application. Since many of the lands to which the FPHCP applies are State lands, not private lands, the Services understand why this funding mechanism was not included in the application.

3.5.14 "No Surprises" and Changed Circumstances

Some commenters were concerned that appropriate changes to the Washington Forest Practices Rules that may be indicated by the adaptive management program may be precluded by application of the Services' "No Surprises" rule. Others were concerned that the FPHCP adequately identify foreseeable changes in circumstances to which management practices must adapt without being precluded by the "No Surprises" rule. Still others wanted to ensure that the "No Surprises" rule was still applicable to the FPHCP notwithstanding the resolution of recent litigation.

In response, Section 4a-4 of the FPHCP sets forth an adaptive management program that provides for modifying forest practice regulations where monitoring and research indicate

that changes are necessary in order to achieve the FPHCP goals. Section 10.1 of the Implementation Agreement makes it clear that the "No Surprises" assurances will not exempt landowners from providing additional mitigation that may be found necessary through adaptive management. It states: "Changes that result from the Adaptive Management Program are provided for in the FPHCP, and do not constitute unforeseen circumstances or require amendments of the FPHCP or the Permits except as provided in this section."

There is no need to modify the DEIS to reflect the outcome of litigation related to the "No Surprises" rule because that outcome does not change the environmental effect of the proposed action. Section 8.1 of the Implementation Agreement, however, has been modified to reflect the fact that USFWS has re-issued the ITP revocation rule and is therefore no longer subject to the order issued in *Spirit of the Sage Council v. Norton,* which temporarily barred USFWS from issuing ITPs that included "No Surprises" assurances.

The FPHCP has been modified to clarify those changes in circumstances that trigger a potential response developed through the adaptive management program.

Many commenters wrote favorably about the adaptive management process described in Alternative 2 or about specific components of it. Several landowners affirmed their commitment to participate in the process. At least one commenter noted that the study of the basal area of reference stands (See above) is being addressed under the schedule adopted by the TFW/FFR Policy Group and incorporated into Alternative 2. The Services have noted these comments.

Several commenters were concerned about the coordination between the FPHCP (and particularly the adaptive management program) and species recovery planning under the ESA. The Services participate in all recovery planning efforts in Washington State and note that the FPHCP is implemented through the Washington Forest Practices Rules and its ecological effects are factored into recovery efforts. The Services believe that the coordination with CMER monitoring will naturally improve over time as recovery planning becomes more robust. While this is a benefit of both the FPHCP and recovery planning efforts, it is not a requirement of either ESA Sections 10 or 7. Nevertheless, the Services believe that any HCP is consistent with recovery planning.

Another commenter believed that the DEIS was inadequate because the Services are unable to realistically determine that the proposed "take" of species and habitat impacts will not preclude recovery of the listed species unless there were adopted recovery plans for those species.

The purpose of the DEIS is to disclose a broad range of environmental effects of a proposed Federal action, not to determine the adequacy of the action under the ESA or, in particular, to determine whether the action would "preclude recovery" of a listed species under the ESA. The determination as to the adequacy of the action under ESA Sections 10 and 7 will be documented by the Services in statement of findings documents and in their biological opinions. Those ESA Sections describe standards and criteria the action must meet.

One commenter stated DNR should focus on preparing a multi-species recovery plan, instead of a programmatic HCP that has its premise in "taking" species and causing further loss and degradation of waters and habitat acres.

In response, species recovery plans are certainly an important part of recovery for threatened and endangered species. As stated in the DEIS (see Table S-1), implementation of the FPHCP is expected to result in improved aquatic and riparian habitat as well as improved water quality as compared to either No-Action Alternative. These improvements to habitat and water quality are expected to complement threatened and endangered species conservation and Federal recovery planning.

3.6 RIPARIAN

3.6.1 Riparian Function

Several commenters suggested that the riparian prescriptions in the FPHCP are insufficient for protecting riparian and aquatic functions, including LWD recruitment, sediment and temperature control, and shade. Other commenters were concerned that the riparian prescriptions are overly protective. At least one commenter asserted that the FPHCP is risky because it allows some harvest in the RMZ, while another commenter advised that the LWD standards are insufficient.

The Services believe that the FPHCP's riparian management prescriptions are designed to provide adequate protection of riparian and aquatic functions. The widths and management prescriptions (e.g., basal area targets) for the core and inner RMZs were designed primarily to provide adequate shade and recruitable LWD to adjacent streams. The Services will analyze these prescriptions to determine their effectiveness for shade and LWD, as well as their contribution to the provision of other riparian functions, including the prevention of sediment delivery, and the maintenance of amphibian population viability, nutrient inputs, and cool water temperatures. The Services will also look to the Washington Forest Practices Rules designed to minimize negative road impacts. These analyses will be documented in the Services ESA Section 7 biological opinions.

However, the Services recognize that the determination of effectiveness of the riparian management prescriptions and road rules will always be associated with some uncertainty associated with scientific understanding of streams, their aquatic resources, and their responses to different riparian management strategies. The CMER's Type N and Type F effectiveness monitoring programs are designed to determine if riparian processes and functions provided by the FPHCP's buffers are maintained at levels to meet FFR resource objectives and performance targets. If the buffers are insufficient, experimental buffer treatment studies will identify which riparian protection measures will meet these objectives and performance targets. Similarly, CMER's roads prescription effectiveness monitoring programs are designed to determine if road prescriptions are meeting sub-basin and site-scale performance targets for sediment and water. At the same time, if riparian and aquatic functions are over-protected by the riparian and roads strategies, the FPHCP allows for a reduction in protection measures.

Another commenter stated that recently proposed or enacted State and Federal plans, and other HCPs, have higher riparian protection amounts. The Services do not compare proposed conservation plans to the Northwest Forest Plan, nor to other habitat plans or previously developed conservation measures. The Northwest Forest Plan, in particular, was developed to meet different standards and for different species than this – or any – HCP. The Services review each habitat conservation plan on its own merits to determine if it meets the ESA Section 10(a)(2)(B) issuance criteria that must be satisfied before an ITP can be issued.

At least one commenter stated that, in spite of the FPHCP's measures designed to protect Channel Migration Zones, Channel Migration Zones receive little or no protection from harvest activities. Another commenter suggested that Channel Migration Zones should not be used to justify harvesting in the outer zone. The Services note that the intent of the Channel Migration Zone Rule is to maintain riparian forest functions (e.g., woody debris recruitment, bank enforcement, shade, and litter) along migrating channels. No timber harvest, salvage, or road construction (except for road crossings) is allowed within Channel Migration Zones without an alternate plan that specifies the conditions which will provide equal and overall effectiveness of public resources as described in the Washington Forest Practices Rules and the Forest Practices Act.

However, the Services recognize that there are uncertainties concerning Channel Migration Zone delineation and effectiveness. The CMER Committee has developed questions and programs to address these uncertainties. The overall strategy for the Channel Migration Zone rule group is to assess the delineation methods for Channel Migration Zones while developing and implementing a long-term Channel Migration Zone effectiveness monitoring program. As these uncertainties are addressed, the Services expect an increase in correct delineations of the Channel Migration Zone and a reduction of the vulnerability of the RMZs to channel disturbance. Furthermore, compliance with the FPHCP will be a condition of the ITPs, should they be issued. If the Services issue ITPs for the FPHCP, the State must ensure that the FPHCP, including its compliance monitoring provisions, will be carried out as specified. The authority of the ITPs and the Implementation Agreement are primary instruments for ensuring that the FPHCP will be properly implemented. Failure to abide by the terms of the FPHCP and Implementation Agreement is likely to result in suspension or revocation of the ITPs.

Some commenters suggested that the DFC concept does not articulate a distribution of forest types and stand ages across the landscape, and that it is inappropriate to assume that late seral conifer conditions provide optimum habitat for salmon. In fact, the Services had a key role in promoting the concept that properly functioning riparian areas are a mix of conditions (Parton 1998, as cited in "Westside RMZs and the DFC Model: Documentation of Their Conceptual and Methodological Development" by S. E. Fairweather, Sept 12, 2001, TFW-RSAG-1-01-001). The foundation of the DFC management approach is the assumption that stands managed to emulate mature, unmanaged riparian forests will provide similar ecological functions that support aquatic resources, particularly the recruitment of LWD. The Services recognize that because of differences in stocking, basal area, disturbance events, and community composition, mature riparian forests are spatially diverse and understocked compared with upland

stands managed for high yield. The protocol used to develop DFC targets, and the tracking of hardwood conversion activities by DNR, reflects the concept that that a mix of conditions, ranging from early seral hardwood to late seral conifer, is required to maintain productive habitat for salmon and trout.

Several commenters offered specific suggestions related to LWD. One commenter suggested that the terms "LWD" and "downed wood" should be defined. In fact, LWD, which is also called coarse woody debris or down woody debris, is defined in the DEIS' glossary. Another commenter thought that leave requirements for downed wood should be established. Please see WAC 222-30-045, where down wood guidelines for salvage in RMZ inner zones have been established. At least one commenter suggested that the adaptive management program should address uncertainties regarding downed wood. Another commenter suggested that a wood placement program would mitigate for reductions in recruitable LWD caused by implementation of the FPHCP. The Services believe that downed wood is addressed in the CMER program under the Type N Buffer Characteristics, Integrity and Function Program and the Type F Statewide Effectiveness Monitoring Program. Both of these programs address uncertainty regarding the effectiveness of riparian rules in meeting performance targets (e.g., LWD) and achieving resource objectives (FPHCP Appendix H).

Several commenters suggested that all or most functional LWD is produced within a limited distance from the channel. One commenter stated that most LWD comes from the core and inner RMZ zones; another commenter suggested that trees located more than one-half a site potential tree height would not produce functional LWD. The Service note that, according to McDade et al. (1990), approximately 90 percent of instream logs originated within 26 meters of the channel in mature conifer and 36 meters of the channel in the old-growth stands. These distances are generally captured in the FPHCP Type F RMZ prescriptions.

Several commenters addressed LWD delivery sources and suggested that the FPHCP's riparian prescriptions would be insufficient for supplying recruitable wood to downstream reaches. In response, there are many pathways for LWD delivery into type F streams. Pathways include mass wasting, windthrow, bank erosion, suppression kill, fire, and disease. Most of these pathways are site specific and dependent on the inherent geology of the source area. McDade et al. (1990) concluded that most LWD originates in the stream's adjacent channel migration and riparian zones.

Perhaps one-third to one-half of LWD comes from upstream sources. Most of the upstream wood recruitment comes from landforms typically associated with or susceptible to debris avalanches, debris flows, and debris torrents. While most of the FPHCP protection measures are prescriptive in nature, those related to unstable slopes rely on an outcome-based, decision-making process. The Services expect this process to result in unstable slopes buffers that serve as additional sources of LWD. Unstable Slopes protection is described in Section 4c-1 of the FPHCP.

Other comments stated the FPHCP relies on passive restoration of riparian conditions as the means of providing habitat improvements to balance future adverse effects from

logging, while acknowledging that recovery to desired conditions may in many areas take longer than the time interval covered by the plan (50 years).

The FPHCP does not rely solely on passive restoration of riparian conditions, although it does restrict harvesting or road construction within the core zones except for yarding corridors and road construction for stream crossings. This is because trees closest to the stream edge are assumed to provide the greater amounts of protection for riparian and aquatic habitats than do trees farther from the stream edge. Core zones are the portion of the RMZ occurring closest to the stream edge extending outward to 50 feet in western Washington (WAC 222-30-021) and 30 feet in eastern Washington (WAC 222-30-022). Some management options are permitted within the inner and outer RMZs in both eastern and western Washington. Although the DNR Forest Practices Regulatory Program cannot require landowners to actively manage forestlands adjacent to riparian areas—to reach DFC sooner than would be accomplished with no management. For purposes of the FPHCP, DFC is defined as the condition of a mature riparian forest stand at 140 years of age and is based on basal area. Growth modeling is used to determine if a particular stand meets the DFC basal area target. Only "surplus" basal area (i.e., basal area beyond that needed to meet the DFC basal area target) may be harvested. If the DFC basal area target is not met, then no harvest is allowed within the inner zone except in cases where the landowner chooses the hardwood conversion management option. By using DFC basal area targets and modeling, landowners may change the overall trajectory for their lands and thus allow riparian areas to reach DFC sooner than would occur through passive management.

Another commenter was concerned that the FPHCP ignored literature on the impacts to physical processes affecting LWD recruitment and temperature on type Np channels. The Services disagree. Section 4d-1.1 of the Draft HCP provides the rationale for riparian prescriptions adjacent to Type Np waters. Citations included in this section that address the physical processes controlling channel form and function, and articulate the role of LWD as a sediment retention mechanism include Gregory and Bisson (1997), Bisson et al. (1987), Harmon et al. (1986), McDade et al. (1990), McKinley (1997), Forest Ecosystems Management Assessment Team (FEMAT) (1993), Murphy and Koski (1989), Van Sickle and Gregory (1990), Benda et al. (in press), McArdle et al. (1961), Robison and Beschta (1990), and Bragg et al. (2000).

One commenter suggested that hardwood stands offer unique riparian functions that conifer stands do not. Although the Services agree that hardwoods provide nutrients and light penetration in the early spring, and that they tend to lean into and fall into streams, the Services believe that the benefits of hardwoods are limited and short in duration, compared to those provided by conifers. Conifers grow taller, thus providing a greater volume of LWD and more shade for greater distances from the stream. Also, instream LWD from conifers is more persistent than the LWD from hardwoods.

It is important to note that the hardwood conversion provision in the FPHCP is not expected to result in the loss of all hardwoods across the landscape. To be eligible for the hardwood conversion option, a site must meet certain minimum requirements (WAC 222-30-021(1)(b)(i)(A)(I)), including one that requires evidence that the site can be

successfully converted to conifers. The Washington Forest Practices Rules also require DNR to track hardwood conversion activities and identify areas with susceptible to high rates of conversion.

Several commenters were concerned about the direct, indirect, and cumulative effects of hardwood conversions on stream productivity. The Services believe that hardwood-dominated riparian stands probably will not achieve DFC without active intervention. The Services also recognize that there are uncertainties about the effectiveness of hardwood conversions in re-establishing conifers and the effects of conversions on shade, stream temperature, and LWD recruitment. To reduce these uncertainties, the FPHCP's adaptive management program has a Hardwood Conversion project, which is currently underway.

One commenter asserted that alternate plans, under the rubric of hardwood conversions, have caused significant losses of riparian vegetation on many streams. The commenter did not provide supporting data, nor are the Services aware of information that supports this assertion. According to DNR, there have been approximately 200 approved alternative plan forest practices applications, out of more than 25,000 approved forest practices applications since January 1, 1999, when the current Washington Forest Practices Rules were implemented. Only a small portion of the 200 alternative plans have been related to hardwood conversions. The resource protection standard is the same for alternative plan forest practices applications as it is for regular forest practices applications. The difference is that hardwood conversions may result in short term riparian degradation, in exchange for long term improved functions as a result of converting a hardwood-dominated area to a conifer dominated area. Furthermore, all alternative plans are reviewed through an open, collaborative interdisciplinary team process. DNR gives considerable weight to the team recommendations when approving or disapproving alternative plans.

Several commenters are concerned that DNR has not defined "habitat." In fact, fish habitat is defined in the FPHCP as habitat which is used by fish at any life stage at any time of the year including potential habitat likely to be used by fish, which could be recovered by restoration or management, and off-channel habitat (WAC 222-16-045). Wetlands and other waterbodies may be defined as fish-bearing habitat if they meet the criteria provided in the Rule. To map the initiation point of fish-bearing habitat, CMER's Instream Scientific Advisory Group is developing and validating a GIS-based model to predict the upstream extent of fish habitat.

A related comment mentioned violations of Washington Forest Practices Rules in regard to harvesting in forested wetlands. In response, violations of the Rules, including inappropriate levels of harvest in fish-bearing habitat, would be subject to enforcement actions.

A number of commenters raised the concern that current DFC targets are inadequate. Suggestions were made to supplement the basal area per acre targets with other parameters, such as Quadratic Mean Diameter, Volume, Trees Per Acre, and/or Relative Density. A recent CMER study on the validation of DFC targets (CMER 2005) evaluated alternative target metrics on the basis of their ability to characterize stand

structure, variability, biological/ecological significance and cost/feasibility. The report concluded that none of the alternative parameters appeared to be clearly superior to live conifer basal area per acre as a DFC target. However, total live volume appeared to provide the most information about the stand because it incorporates tree density, diameter, and height. The report also suggested that the use of a metric based on the relationship between trees per acre and quadratic mean diameter might merit further investigation. This information has been shared with the TFW/FFR Policy Group for possible recommendations to the Forest Practice Board regarding Rule changes.

Other commenters asserted that the Washington Forest Practices Rules should be changed because the DFC validation study concluded that (a) current DFC performance targets are significantly lower than mapped and field-observed site class data; and (b) there is no significant relationship between site classes and basal area per acre. The Services are familiar with the study and the fact that the TFW/FFR Policy Group has recommended to the Forest Practices Board that it consider rule-making related to the results of the study.

At least one commenter asked what the Services would do if CMER studies were to reveal a lack of effectiveness of the riparian stand requirements. The Services would expect the results of CMER studies to be reported *via* the adaptive management program to the TFW/FFR Policy Group and the Forest Practices Board and dealt with as described according to the Washington Forest Practices Rules.

One commenter was concerned that the DFC targets are based on metrics from 80 to 90 year old stands, instead of 140 year old stands, as described in Section 4b-3.1.1 of the FPHCP. The Services understand that this could be a point of confusion. At the time the targets were developed, the FFR stakeholders agreed that the DFC would be represented by basal area at age 140. Some negotiators thought that riparian areas would have lower basal areas than upland areas because natural disturbances in riparian areas would decrease stand density. A study and regression analysis in the late 1990's yielded a table of ratios of riparian basal areas to upland basal areas (McArdle et al.1961). From the table, a ratio of 0.813 was multiplied by the values at age 140 to arrive at the DFC targets that are now part of the FFR and the Washington Forest Practices Rules. The DFC targets happen to be similar to the values for an 80 to 90 year old stand (McArdle et al.1961).

At least one commenter suggested that baseline riparian and instream conditions constitute ongoing "harm" to fish, amphibians, and their habitats. In an opposite, but similar vein, another commenter asserted that there was no credible basis for concluding in the DEIS that there may be potential adverse temperature effects on fish. The Services' biological opinions for the FPHCP will be the appropriate documents for addressing the extent and consequences of harm and other adverse impacts. The biological opinions will present the Services' opinions regarding whether the aggregate effects of the factors analyzed under "environmental baseline," "effects of the action," and "cumulative effects" in the action area – when viewed against the status of the species or critical habitat as listed or designated – are likely to jeopardize the continued existence of the species or result in destruction or adverse modification of critical habitat.

One commenter suggested that the DEIS shade analysis should utilize information from more studies on shade than just the conclusions from FEMAT 1993. The Services believe the DEIS considered substantial information apart from FEMAT to analyze shade effects (DEIS subsection 4.7.1.2 Evaluation of Effects of Alternatives on Riparian Processes--Stream Shade).

One commenter noted that downstream effects from the removal of shade from forest practices on Type N streams are temporary and mitigated by stream cooling in shaded lower reaches. Another commenter asserted that the removal of shade from Type Ns streams is unlikely to affect fish-bearing streams because Type Ns streams are dry during the summer, when the potential for exceeding temperature criteria is greatest, and that other factors affect stream temperature, including canopy, sediment delivery, microclimate, and hydrologic conditions. A different commenter suggested that all stream types, including non-fish-bearing streams, should be given full buffer protection to protect shade and instream temperatures.

The Services agree that other factors, in addition to shade, affect stream temperatures. For example, the FPHCP (Section 4d-1.1.) states that groundwater mixing and exchange contributes to decreases in water temperature. The CMER Work Plan is addressing the effectiveness of Type N and Type F riparian prescriptions at meeting performance targets for shade and stream temperature (FPHCP Appendix H). The Services believe sufficient information exists to determine whether riparian prescriptions for all stream types are appropriate under ESA Sections 10 and 7, and sufficient information exists to establish a reasonable expectation about whether the TFW/FFR Policy Group will formulate its recommendations regarding CMER projects to the Forest Practices Board in accordance with the adaptive management framework schedule.

One commenter believes that recent data on the implementation of the Washington Forest Practices Rules by small landowners suggest that cumulative effects from harvesting in riparian areas on small landowner parcels may be negligible. The commenter suggests that this data be made available. In fact, data from 2002/2003 of the small landowner harvest data is provided in the Draft FPHCP. The Final FPHCP has updated information. Also, the Services have noted that small landowners are not necessarily applying more restrictive prescriptions than required, but rather are implementing existing shade rule requirements, which result in leaving the RMZ as a no-harvest zone, and more leave trees than the minimum RMZ requirements.

At least one commenter intimated that the FPHCP offers less riparian protection than other HCPs. The Services are familiar with the differences between HCPs in Washington and other forestry-based HCPs elsewhere. Most of the differences in protection measures reflect differences in covered activities, species, and covered lands. In particular, the FPHCP focuses on aquatic species, while other HCPs have different prescriptions to cover upland species, as well. All HCPs are stand alone plans, with unique analyses. Their prescriptions are not comparable.

Several commenters suggested that riparian prescriptions in the FPHCP do not account for windthrow. This is incorrect. Basal area retained at the time of harvest was set at 14 percent over the minimum needed to meet the basal area standard at age 140. Heide

(1999, as cited in "Westside RMZs and the DFC Model: Documentation of Their Conceptual and Methodological Development" by S. E. Fairweather, Sept 12, 2001, TFW-RSAG-1-01-001), described the results of a study by J. Welty that showed that unless the core zone was understocked, leaving 50 trees per acre at age 50 in the inner zone would result in at least 84 percent of the potential recruitment of LWD. Given a windthrow rate of approximately 14 percent (Welty et al. 2002; Grizzel and Wolff 1998), the number of residual trees per acre was increased to 56.5.

One commenter asserted that buffers composed of early seral stage conifers may not create fully functioning aquatic systems. The Services agree that a forest containing only early seral stage conifers would not currently represent a natural late seral stand with properly functioning conditions. The Services recognize that the spatial arrangement of structures in stands – the vertical distribution of branches and foliage and horizontal distribution of trees and other structures – is as important as the diversity of individual structures. Young- and old-growth forests offer extreme contrasts in foliage distribution. The shift in foliage distribution with stand development is a complex, long-term process that contributes significantly to the vertebrate diversity of old-growth forests (Franklin et al. 2002). Disturbances that kill trees are natural events and operate throughout succession to generate and maintain spatial heterogeneity within a forest stand. The Services understand, however, that under-aged riparian stands must mature largely on their own; the goal of the FPHCP is to place these riparian areas on a trajectory to function as a late seral stand as quickly as feasible. For further descriptions of the composition, function, and structure of forest stand developmental stages, the Services refer the commenter to the paper by Franklin et al. (2002).

One commenter suggested that the DEIS is flawed because it considers the impacts of overland sheet flow delivery of sediments. The commenter asserted that the overland delivery of fine sediments is negligible and that the vast majority of fine sediments are delivered to drainage systems by landslides, erosion of road surfaces, and bank cutting. The Services disagree that the discussion of overland flow is unreasonable. As noted in Appendix B of the DEIS, the Equivalent Buffer Area Index for sediment was devised as a "crude assessment" of risk to streams in relation to management activities. However, we agree that the delivery of sediments by overland flow is a not a major contributor of sediments to streams.

A commenter requested additional wording for statements in the DEIS regarding the authority of DNR to prevent damage to Type N stream channels. The DEIS has been modified to reflect this comment. The Washington Forest Practices Rules for Equipment Limitation Zones (WAC 222-30-021 and 022) are intended to prevent actual or potential material damage to public resources, including delivery of significant sediment to a typed water as a result of harvest activity near streams.

One commenter suggested that the DEIS should be modified to reflect our lack of knowledge of the effects of forest practices on lakes, reservoirs, and nearshore marine areas, and the speculative analysis in the DEIS on the effects to these areas from the different alternatives. In response, recent reviews of factors affecting marine and estuarine shoreline areas do not mention the effects of forest practices on nearshore areas

(Williams and Thom 2001, Shared Strategy 2005), and little information is available for lakes. However, the Services believe that assumptions provided in the DEIS regarding the effects to lakes, reservoirs, and nearshore marine areas from changing recruitment levels of LWD have some merit. The DEIS has been modified to reflect this distinction.

One commenter suggested that supplemental Perennial Initiation Point (PIP) data, collected in a tribal 2002 study, should have been included in a 2001 CMER report to reflect best available science. According to the commenter, there was a long discussion within CMER regarding how to include the supplemental tribal "PIP" data collected in 2002 (original CMER study data collected in 2001). As the data was collected using the same CMER report methods and the same tribal staff, it was the tribal intent that it be folded into the 2001 report or considered a separate CMER product as the process to finalize the 2001 report lagged until February of 2005. The Services understand that CMER was reluctant to do so for the primary reason that the data collection had not been managed through one of CMER's Scientific Advisory Groups. CMER and the TFW/FFR Policy Group eventually decided that the process used by the Tribes was "outside" the regular CMER Work Plan and should not be considered a CMER product. The TFW/FFR Policy Group did request that the tribal PIP study be peer reviewed as a separate study to better inform them of its scientific value. Based on successful peer review, it was decided to incorporate the report as "external information" per WAC 222-12-045(2)(b)(i)(E) through the TFW/FFR Policy Group's newly developed "Framework for Successful CMER/Policy Interaction."

One commenter suggested that the DFC discussion in subsection 4.1.5.2 (Adaptive Management Evaluation of Alternatives) of the DEIS is inconsistent with regard to mentioning LWD. The commenter argues that LWD is not mentioned in the analyses of the first two alternatives, but is mentioned in the second two. This may be true, but the Services point out that subsection 4.1.5.2 is a subsection of the adaptive management section. Subsection 4.1.5.2 distinguishes the different approaches between alternatives to validating DFC targets. The subsection does not evaluate the effectiveness of riparian prescriptions in providing LWD to streams. That information is provided in subsection 4.8.3.4 (Evaluation of Alternatives Large Woody Debris).

Some commenters asserted that the outer zone of the RMZ should not be considered part of the continuous RMZ for the purpose of calculating critical areas (FPHCP Appendix K) covered by the FPHCP. The Services recognize that the outer zone may be heavily harvested, with few leave trees after harvest. However, the Services will evaluate the contribution to ecological function of the entire RMZ width, whatever that may be.

Another commenter states that the FPHCP RMZ widths do not account for channel size. In response, channel size does not determine the total width of RMZs under the FPHCP, however, it does affect the width of the inner zone (and thus the outer zone). Inner zone widths adjacent to smaller channels are narrower than inner zone widths adjacent to larger channels. By linking inner zone width to channel size, the FPHCP recognizes differences in wood loading that exist between channels of different size.

The same commenter claims that the FPHCP uses outdated science with regard to LWD abundance. In response, LWD abundance, expressed either in terms of number of pieces

or volume, is not used as a regulatory requirement, adaptive management performance target, or resource objective. Thus, while the FFR that the FPHCP is based on cites Bilby and Ward (1991), their work is included only as background information and not as the basis for a particular rule or protection measure.

Another comment cited the review of FFR published by CH2M-Hill (2000) that states "*the probable amounts of LWD that would be delivered under the Forests and Fish plan would be less than the amount for maximum pool formation*." The Services note that maximum pool formation is only attainable under riparian conditions that facilitate maximum wood recruitment. Since the FFR wood recruitment goal is to provide 85 percent of wood recruitment potential from a mature riparian forest (for western Washington), it follows that maximum (or 100 percent) wood recruitment, and therefore, maximum pool formation would not necessarily be attained under the FPHCP. The FFR participants felt the 85 percent recruitment objective was adequate to achieve the performance goals (i.e., support harvestable levels of salmonids, support the long-term viability of other covered species, and meet or exceed water quality standards) and agreed to validate the adequacy of this issue through adaptive management research and monitoring (which is currently in progress).

One commenter states "…*the effects of bank erosion in triggering landsliding is not considered* [in the FPHCP] *and therefore a significant upslope supply of LWD will be eliminated*…" In response, bank erosion is a common landslide-triggering mechanism, particularly along high-gradient, confined channels bordered by inner gorge landforms. Other landforms that are subject to bank erosion and associated landsliding include terrace edges and coastal bluffs. Logging activities proposed on any of these landforms are subject to forest practices regulatory requirements for unstable slopes that include SEPA review and qualified geotechnical expert review. These regulatory requirements almost always result in little, if any, harvest on unstable slopes. Limited harvest in these areas means that woody debris recruitment potential from these areas will be protected, rather than eliminated as the commenter claims.

Several comments focused on the effects of bank erosion on woody debris recruitment. One commenter in particular states that the FFR (and therefore FPHCP) does not adequately consider the effects of bank erosion on wood recruitment, suggesting that bank erosion can eliminate wood inputs by "…*consuming the forest areas within the CMZ* [Channel Migration Zone] *and RMZ.*" The FPHCP acknowledges the importance of bank erosion as a wood recruitment mechanism by restricting forest practices within Channel Migration Zones and RMZ core zones. By treating Channel Migration Zones and RMZ core zones as no-harvest zones, wood recruitment potential in these areas is fully protected. Under the FPHCP, Channel Migration Zones represent the area beyond which channel movement is unlikely to occur during the life of the plan. Thus, Channel Migration Zone protection ensures that RMZ function will be conserved in areas where Channel Migration Zones exist. In areas where Channel Migration Zones are not present, RMZ core zone protections ensure riparian functions are conserved, even in situations where limited bank erosion occurs. While past forest practices have likely accelerated bank erosion rates (due to higher sediment inputs and decreased streambank rooting

strength), the protection measures proposed under the FPHCP are expected to reverse this trend and allow stream channels and associated habitat to recover.

Another commenter expressed concern over a perceived lack of protection for non-fish-bearing waters. The comments are directed towards protection of large woody debris recruitment and unstable slopes. The Services note that logging activities on all high-hazard unstable slopes are regulated under the FPHCP. As noted above, the regulatory requirements often result in little, if any, harvest on unstable slopes, effectively preserving wood recruitment potential in these areas. Thus, nearly all trees on unstable slopes that serve as a potential source of mass-wasting derived woody debris for non-fish-bearing and fish-bearing streams will be retained during harvest operations. Stream-adjacent areas that do not qualify as unstable slopes are subject to harvest; therefore, wood recruitment potential in these areas will be reduced as a result of tree removal.

3.6.2 Bull Trout Overlay

At least one comment was received asking for clarification on how the bull trout habitat overlay, a mapped area in eastern Washington requiring additional shade protection from forest practices, was determined. In response, the participants that developed the FFR also developed the bull trout habitat overlay for eastern Washington. Technical experts on bull trout habitat, from USFWS and WDFW, developed the actual overlay map coverage.

The bull trout habitat overlay was intended to identify all potentially suitable bull trout habitat for all of their life history stages. Potentially suitable habitat was the benchmark for the overlay to protect undegraded habitat and habitat that could reasonably be recovered. The overlay was not designed to include historical populations that have been extirpated and areas of bull trout absence. The overlay was mapped using the State Water Resource Inventory Areas (WRIA) for eastern Washington that are currently known to be occupied by bull trout (as determined by WDFW bull trout distribution databases and maps) and those WRIAs that could reasonable be recovered to provide bull trout habitat.

WRIAs were chosen because bull trout utilize various areas in a watershed for different life history stages (i.e., spawning, juvenile rearing, adult foraging, and migration). The WRIA/watershed approach also addressed the varied and complex life history strategies of bull trout (i.e., anadromous, adfluvial, fluvial, and resident). There are many unknowns about bull trout distribution, life history strategies, limiting factors, and habitat relationships. Therefore, the use of WRIAs was a comprehensive approach to recognize all potential bull trout suitable habitat.

At least one commenter suggested that the Draft FPHCP and DEIS fail to demonstrate that the FPHCP's minimization measures will be sufficient to restore and maintain temperatures needed by bull trout. The Services note that predicting aquatic habitat conditions is difficult, particularly if predictions are long-term and could include significant changes in the Washington Forest Practice Rules resulting from adaptive management. When predictions cannot be precisely made, as is the situation when applying any of the alternatives to the planning area, monitoring is often required to determine if a trend toward a favorable or target condition is occurring and the strength of

that trend. CMER's Bull Trout Temperature Overlay Program addresses the effectiveness of eastside Rules in meeting shade and temperature requirements for bull trout habitat (FPHCP Appendix H).

Comments specific to bull trout suggested that: (1) the FPHCP failed to explicitly include stream temperatures sufficient for bull trout among the plan's biological goals and objectives; (2) water quality standards would not be sufficient to meet the cold water temperature needs of bull trout; and (3) other bull trout habitat needs would not be adequately protected. The Services disagree that the FPHCP does not include provisions to maintain stream temperature sufficient for covered aquatic species, including bull trout. See the Water Quality response on temperature and water quality standards. In addition, specific provisions in the FPHCP that protect habitat important for bull trout include: (1) the restriction that no harvest is allowed within Channel Migration Zones or the bankfull width of streams; (2) the requirement for no-harvest buffers on all fish-bearing streams, at least half non-fish-bearing perennial streams, and sensitive sites; and (3) the bull trout habitat overlay in eastern Washington that requires that all available shade within 75 feet of a Channel Migration Zone or bankfull width of a stream must be retained during harvest.

Another comment suggested that conservation measures for bull trout may also need to meet or exceed the measures being employed on Federal public forestlands because the final listing rule for all bull trout populations affirmed that existing Federal land management policies are insufficient for bull trout conservation. The standards in which the Services must use to evaluate if conservation measures in an HCP are adequate are the issuance criteria established in the Services' ESA implementing regulations (50 CFR 17.22(b)(2) and 50 CFR 222.307(c)). If the Services find that an HCP meets the issuance criteria, the Services shall issue an ITP. Regarding the final rule listing bull trout as a threatened species (U.S. Federal Register, Vol. 64, No. 210, November 1, 1999, pages 58909-58933), it does not indicate (as the commenter implies) that Federal forestland management policies (i.e., the Northwest Forest Plan and the PACFISH/INFISH strategies) are inadequate for bull trout conservation.

3.6.3 Riparian Buffers

Several comments question the effectiveness of the FPHCP in protecting both fish-bearing and non-fish-bearing streams. In response, stream protection under the FPHCP is provided through a variety of measures. Channel Migration Zones, RMZs, Equipment Limitation Zones, unstable slope buffers and RMAP implementation are some of the more important stream protection measures included in the plan. These measures provide stream protection by conserving ecological processes important in the creation and maintenance of riparian and aquatic habitats. For example, Channel Migration Zones and RMZs supply large woody debris, shade, and litterfall while maintaining streambank stability. Equipment Limitation Zones and RMAP implementation protect streams from excessive fine sediment delivery associated with surface erosion. Unstable slopes buffers are designed to prevent management-related landslides, thereby maintaining sediment and woody debris inputs at background levels.

FPHCP protection measures are designed to meet quantitative performance targets and qualitative resource objectives. Performance targets and resource objectives are, in turn, designed to meet the habitat needs of covered species. Adaptive management research and monitoring will evaluate the appropriateness of the targets and objectives (validation monitoring) and the degree to which protection measures meet the targets and objectives (effectiveness and extensive monitoring). Research topics with a higher level of scientific uncertainty and resource risk have been identified as high priorities within the adaptive management program. Therefore, while there is uncertainty associated with the effectiveness of some protection measures, monitoring results will help policy-makers assess the need for modifying forest practices requirements to meet the habitat needs of covered species.

Another comment points out that effectiveness monitoring results may show that some protection measures exceed established performance targets and resource objectives. In other words, some measures may actually "overprotect" covered resources. The comment suggests the DEIS should explain that adaptive management can be used to increase protection in cases where measures fall short of their targets, or decrease protection in cases where measures exceed targets. The Services believe the DEIS is clear on how adaptive management works in the context of the Washington Forest Practices Rules. The Services note that the outcome of adaptive management research and monitoring can result in changes to the Rules that are more or less restrictive.

Two comments question the use of the full RMZ width in calculating the FPHCP critical area extent, claiming that this artificially inflates protected area estimates. The commenter suggests that the outer zone should not be included as part of the RMZ width due to reduced leave tree requirements that apply to that zone. In response, the intent of the critical area calculations was to estimate the spatial extent of "protected" areas under the FPHCP, which includes RMZs. For purposes of calculating critical area extent, "protected" areas were not assumed to mean "no management" areas but rather parts of the landscape where forest practices activities are restricted in order to maintain certain ecological functions. In the discussion of effects, the FPHCP acknowledges this when it states *"Parts of critical areas that are more sensitive to forest practices effects (e.g, CMZs* [Channel Migration Zones]*, RMZ core zones) receive higher levels of protection under the FPHCP as compared to areas that are less sensitive (e.g., RMZ outer zones, some Type Np waters)"* (See FPHCP Section 4e-3 Results). Thus, the Washington Forest Practices Rules and FPHCP assume that allowing some management while at the same time providing ecological function are not mutually exclusive objectives. Although RMZ outer zones are seldom treated as no-harvest areas, the leave tree requirements together with the other protection measures for these areas are designed to provide ecological functions important to the creation and maintenance of habitat for covered species. Therefore, it is appropriate to include the full RMZ width, including both managed and unmanaged zones, as part of the critical area-based calculation of take.

3.6.4 Type N Stream Demarcation

One commenter suggested that adaptive management monitoring results have invalidated several assumptions used in the FPHCP calculation of Type N stream (and associated initiation points) critical area extent. The assumptions were related to the use of the

interim water typing system, the use of map-based site class to determine RMZ widths, and the use of default basin sizes when estimating the Type Np network length. The adaptive management research noted by the commenter was conducted by CMER. The TFW/FFR Policy Group made recommendations to the Forest Practices Board and the Board may change specific rules in response. Until the Board acts, the interim water typing system, map-based site classes, and Type Np default basin sizes are required.

Another comment included above relates to the Perennial Initiation Point (PIP) survey work performed within the adaptive management program. The commenter notes that "*the differences in channel length between the upstream end point of perennial flow and the channel head are similar between the Eastside and Westside regions and relatively short within all regions surveyed.*" In response, this statement accurately reflects the results of the PIP surveys, which generally found that the basins represented by the upstream extent of perennial flow were substantially smaller than the default basin sizes included in the Washington Forest Practices Rules. The Forest Practices Board is currently considering these findings, as well as those that resulted from the tribal PIP data collection effort.

Another commenter stated the Type N Stream Demarcation studies (Palmquist 2003; Pleus and Goodman 2003), generated by the adaptive management program and the Northwest Indian Fisheries Commission, directly affect the Critical Area Calculations in the FPHCP. Both of these studies clearly invalidate the FFR default basin areas for Type Np waters in both eastern and western Washington, used in the DEIS Water Type Modeling approach (Appendix B), to calculate Critical Areas for estimating effects in the Minimal Effects Strategy in the FPHCP (FPHCP Appendix K; FPHCP Chapter 4e; DEIS Appendix B). The commenter concluded that this significant underestimate in Type Np channel length was not accounted for in the Critical Areas Estimates for the Minimal Effects Strategy in the FPHCP for estimating effects.

The Services note that DNR did not use the Type N study data because it has not been fully considered within the adaptive management process. The Palmquist (2003) and Pleus and Goodman (2003) studies have been reviewed by the Scientific Review Committee and have been approved by CMER; and the TFW/FFR Policy Group has made a recommendation to the Forest Practices Board. The Board has not yet acted on the recommendation. Until then, the current default basin sizes will remain in the Washington Forest Practices Rules. However, landowners do not always use the default basin sizes to define the Type Np/Ns break. The degree to which landowners use the default basin sizes versus field indicators to define the Type Np/Ns break is unknown. Therefore, rather than speculate about how the Type Np/Ns break is being defined across the landscape and the associated effects on Type Np stream length, DNR decided to use the current default basin sizes as a consistent means of estimating the extent of the Type Np network in the FPHCP Critical Areas Calculations.

3.6.5 Type N Stream Buffers

Commenters were concerned about the amount of protection afforded Type N streams by the FPHCP. The commenters noted that Type N channels are significant sources of sediment, they are sensitive to disturbance, and the time required for recovery is

significant. The commenters suggested that full riparian buffers on Type N channels are necessary to provide sediment filtering and LWD input. The Services disagree. The Services believe sufficient information exists to determine whether Type N channel riparian prescriptions are appropriate under ESA Sections 10 and 7. Also, areas susceptible to mass wasting and erosion, such as steep side slopes, are protected by unstable slopes rules. However, the Services note and support the high priority of Type N research and monitoring under the CMER Work Plan.

One commenter argues "*intermittent stream channels…and perennial non-fish-bearing streams need full protection/restoration*" due to their influence on downstream biological productivity. It is not clear what the commenter means by "full protection/restoration." In response, under the proposed FPHCP, non-fish-bearing streams receive considerable protection. Some of the more important FPHCP protection measures related to non-fish-bearing streams include: no-harvest RMZs 50 feet in width along 50 to 100 percent of the Type Np network length (including all sensitive sites), Equipment Limitation Zones 30 feet in width along 100 percent of all Type Np and Type Ns streams, variable-width buffers on high-hazard unstable slopes and landforms adjacent to and upslope from all Type Np and Type Ns streams, and mandatory RMAP implementation by the year 2016 for most covered lands. Additional protection measures related to timber harvesting and road construction near non-fish-bearing streams also apply.

One commenter asserted that the FPHCP ignored a wealth of scientific literature that specifically addresses the impacts of forest practices on the physical processes affecting LWD recruitment in Type Np channels. The commenter then questioned the FPHCP's ability to provide adequate conservation measures given that it only provides a portion of full LWD recruitment into Type Np channels. The Services note the comment. The Services did not ignore scientific information. Instead, we cited references in the DEIS that we believe reflect the current body of knowledge regarding the impacts of forest practices on physical processes affecting LWD recruitment. All pathways of LWD recruitment to Type Np streams are intended to be addressed by the FPCHP's conservation measures.

Two commenters questioned the level of protection for non-fish-bearing waters under the proposed FPHCP, claiming current measures do not go far enough and fail to recognize the influence of headwater streams on downstream conditions. In response, there is little doubt that small headwater streams (i.e., Type Np and Ns waters) influence the creation and maintenance of riparian and instream habitat in downstream fish-bearing waters, including the quantity and quality of that habitat. While this connection has been demonstrated and documented through the scientific literature, there is little information to quantify the linkages between hillslope and riparian processes operating in headwater areas and habitat development in downstream reaches. In the absence of such information, it is difficult to devise management strategies that are guaranteed to achieve resource protection objectives. As a result, some FFR-based protection measures have uncertainty with respect to their effectiveness (e.g., large wood recruitment and temperature protection along Type Np waters). Evaluating the effectiveness of these protection measures through adaptive management is a high priority within the CMER Work Plan (FPHCP Appendix H). Results will allow the Forest Practices Board to assess

the protection measures and make adjustments where necessary to meet the FPHCP objectives.

3.6.6 Critical Area Calculations

Several commenters suggested the critical areas riparian acreage estimates were artificially inflated in the FPHCP Strategy, and significantly under estimated in the Minimal Effects Strategy. The commenter also suggested the riparian modeling methods are inconsistent with Forest Practices Board Manual language regulating timber harvesting in RMZs on Type F waters in eastern and western Washington as outlined in WAC 222-030-021. The commenter also suggested the total length of Type Np waters (Type 4) as a proportion of the entire channel network is underestimated on the DNR HYDRO maps, and this underestimate results in a flawed comparison in riparian protections between the Minimal Effects Strategy and the FPHCP Strategy. Finally, the commenter was also concerned that the methods did not address the Type N demarcation studies (Palmquist 2003; Pleus and Goodman 2003), which indicate that Type Np channels constitute the majority of the channel network in watersheds across FFR lands.

In response, the critical area calculations in the FPHCP Critical Areas assessment are not based on overestimates of RMZ width by site class. Tables 4.2 through 4.7 in the FPHCP list RMZ widths by site class, as required by the Washington Forest Practices Rules. The critical area calculations are based on these widths. The commenter may be equating the term "RMZ" with "no-harvest buffer." Nowhere in the FPHCP are Type S and F RMZs described as no-harvest zones. Sections 4b-3.1.1 and 4b-3.2.1 of the FPHCP describe RMZ requirements for Type S and F waters in detail. These descriptions clearly indicate that harvesting is allowed in at least one (outer) and sometimes two (outer and inner) of the three zones that comprise the RMZ.

The Critical Areas assessment used the same water type lengths reported in the DEIS. Rather than using the DNR HYDRO layer, the DEIS used GIS technology to model a new hydro layer based on the current interim water typing rules. For the non-fish-bearing portion of the channel network (i.e., Type Np and Type Ns waters), the modeling used the default basin sizes cited in the Washington Forest Practices Rules as a means of identifying the upstream extent of perennial flow (i.e., the Type Np/Ns break). While the default basin sizes are only used to type waters when the Type Np/Ns break cannot be reliably identified using field indicators, they represented the only quantitative means of estimating Type Np and Type Ns stream lengths using GIS that is consistent with current Washington Forest Practices Rule requirements.

Another commenter stated it's crucial that the estimated critical areas calculations under the FPHCP are an accurate reflection of the riparian prescriptions required for timber harvest under the Washington Forest Practices Rules (WAC 222-30-021). The commenter stated this is clearly not the case with the FPHCP as it claims to protect a percentage of critical areas greater than the actual Washington Forest Practices Rules and regulations require under WAC 222-30-021. Under the FPHCP (FPHCP Table 4.13) the calculation used to determine the proportion of critical areas (acreage) protected in RMZs for Type F waters are based on gross overestimates of RMZ width by Site Class (WAC 222-030-021). The Critical Areas estimates provided under the FPHCP (FPHCP Table

4.13) inflate riparian protections by taking credit for full RMZ widths including the "outer zone" on fish-bearing channels which in reality, and for all practicable purposes, simply do not exist (FPHCP Appendix K; DEIS Appendix B; Forest Practices Board Manual; WAC222-030-021). The commenter concluded by stating the Critical Area Riparian Zone Widths in Table 3 of Appendix K in the FPHCP significantly overestimate the total Type F RMZ acres for both eastern and western Washington. The commenter further states that the FPHCP overestimated the extent of Type Np buffers (i.e., RMZs) as part of the FPHCP Critical Areas assessment. The commenter cited WAC 222-30-021 which includes a table describing the minimum percent of length of Type Np waters to be buffered beyond 500 feet upstream of the confluence of a Type S or Type F water.

In response, it is not possible to make an equal comparison between WAC 222-30-021 and the calculations used in Appendix K of the FPHCP because this particular WAC was designed for a different purpose and does not take into account the other factors that are necessarily included in the calculations of critical areas in the FPHCP. The assessment in Appendix K assumes that in western Washington, 50 percent of the Type Np stream length is buffered. This assumption includes the 500 feet protection upstream from the confluence of a Type S or Type F water, as well as protections of unstable slopes and other sensitive sites occurring within and adjacent to RMZs along Type Np waters. The WAC 222-30-021 does not.

Specifically, the Washington Forest Practices Rules require a 50-foot no-harvest buffer along 50 percent of the length of each Type Np network in western Washington. In eastern Washington, the harvest strategy implemented within 50 feet of the bankfull width of Type Np streams determines the proportion of each Type Np network protected. In cases where the landowner implements a partial cut strategy within 50 feet of the Type Np bankfull width, 100 percent of the length of Type Np length within the harvest unit must be protected with a 50-foot buffer. Harvest is allowed within this buffer in accordance with basal area requirements described in the Washington Forest Practices Rules. In cases where the landowner implements a clearcut strategy within 50 feet of the Type Np bankfull width, at least 70 percent of the Type Np length within the harvest unit must be protected with a 50-foot no-harvest buffer.

While these represent the minimum requirements for Type Np riparian protection, anecdotal evidence suggests other forest practices requirements increase the level of Type Np protection beyond these minimums. For example, the high frequency of unstable landforms in some parts of western Washington results in the retention of variable width unstable slope buffers along many Type Np channels. Because Type Np channels in many areas of western Washington are associated with inner gorges, bedrock hollows, and convergent headwalls, Washington Forest Practices Rules related to the protection of these unstable landforms often produce levels of protection that exceed the standard riparian requirements described above. This occurs for two reasons. First, the most common form of unstable slopes protection is avoidance. This results in the retention of no-harvest buffers that conform to the spatial characteristics of the unstable landform(s). Second, because unstable landforms vary widely in their shape and extent, unstable slope buffers sometimes extend beyond both the 50-foot zone protected by the standard riparian buffer and the required riparian buffer length.

In addition to unstable slopes protection, Type Np protection may exceed standard riparian protections for other reasons. Minimum riparian protections may not be met in areas where there is a high frequency of sensitive sites such as seeps, springs, Type Np intersections and/or alluvial fans. These areas must be protected with no-harvest buffers even if the resulting buffering exceeds standard riparian protection minimums. Additionally, operational issues such as harvest unit configuration or yarding distance may limit the degree to which some areas can be economically harvested.

DNR field forest practices foresters have said the aforementioned conditions frequently occur along many Type Np streams, particularly in western Washington. The combination of unstable slopes, sensitive sites, and operational issues often result in levels of Type Np protection that exceed the 50 feet/50 percent riparian standard for western Washington. Therefore, for purposes of estimating critical area extent under the FPHCP strategy, it is reasonable to assume that on average, 50-foot buffers were retained along 70 percent of the Type Np network length in western Washington.

Another commenter is also critical of Type Np RMZ, saying they do not "*…account for the crucial roles of headwater streamside forests along Type Np streams as filters to reduce the delivery of sediment from upslope sources, such as… management-related increases in landsliding, …sediment delivery from roads, stream crossings, and felling, yarding, and other logging-related ground disturbance.*" Another commenter expresses similar concerns, stating "*Control of sediment delivery to the stream system is seriously weakened by an inadequate level of protection of all Type N streams…*" and "*there is no scientific or logical basis for ignoring the significant contribution of sediment from Type N streams to the downstream fish-bearing stream system.*" It appears these commenters fail to recognize that RMZs represent only one Type Np-related protection measure included in the FPHCP. In fact, RMZs represent the minimum level of protection afforded to Type Np streams under the plan and primarily serve as sources of woody debris and shade; preventing sediment delivery is a secondary benefit associated with Type Np RMZs that results from the lack of soil disturbance within the buffered area. The FPHCP includes additional Type Np and Type Ns protection measures to prevent and minimize sediment delivery to headwater streams. These include unstable slopes buffers, Equipment Limitation Zones, and implementation of RMAPs (see FPHCP Upland Strategy Section 4c). Unstable slopes buffers often lead to levels of tree retention that exceed minimum RMZ requirements. Combined with the RMZ requirements, these protection measures provide multiple benefits to headwater streams by maintaining a range of ecological processes important to the creation of instream habitat including woody debris recruitment, shade, litterfall, and sediment control.

At least one commenter was concerned that most of the alternatives allow some ground disturbance activity along and in Type N streams. Up to 10 percent of the area within 30 feet of these streams can be disturbed. More area can be disturbed if erosion control practices are accomplished. Ground disturbing activities next to streams can significantly elevate sediment delivery and cause downstream impacts.

The commenter is correct in saying that soil disturbance adjacent to streams increases the risk of surface erosion, associated sediment delivery, and adverse water quality impacts.

If undisturbed, forest soils throughout most of the Pacific Northwest have high infiltration rates mainly due to their high organic matter content. This makes overland flow and surface erosion extremely rare. Where the protective organic layer is removed and underlying mineral soils exposed and/or compacted, overland flow may occur. Overland flow often results in sheet, rill, or gully erosion and associated sediment delivery. Therefore, forest practices activities that avoid soil disturbance in near-stream areas are not likely to increase the risk of erosion and sedimentation.

The establishment of a 30-foot Equipment Limitation Zone adjacent to all non-fish-bearing waters attempts to minimize management-related sediment delivery on FPHCP lands. The objective behind Equipment Limitation Zones is to minimize equipment use in these zones thereby limiting soil disturbance and sediment delivery. Equipment Limitation Zones were recommended in the FFR as a result of a study by Rashin et al. (1999) where the effectiveness, of the rules in place on January 1, 1999, in reducing sediment delivery was evaluated. Other studies have also shown implementation of similar best management practices (BMPs) to be an effective means of reducing sediment delivery to streams (Martin et al. 2000; Kreutzweiser and Capell 2001).

The critical area calculations show that riparian areas and unstable slopes protected under the proposed FPHCP comprise 80 percent of critical areas defined under a "minimal effects" management strategy. Based on this analysis, one commenter suggests the level of "take" under the FPHCP would therefore be reduced by 80 percent compared to having no protection at all. This was neither the conclusion nor the intent of the assessment included in the FPHCP. As part of HCP development, the applicant must estimate the extent of effects that will result from implementation. Effects and take can be estimated in terms of the number of animals or the habitat area affected. In the FPHCP, the assessment focused on habitat area affected. The assessment compared management under the FPHCP with the minimal effects strategy and concluded that the "affected area" (i.e., the difference in protected area between the two strategies) comprised 20 percent of the minimal effects strategy. The baseline for comparing FPHCP management was the minimal effects strategy and not a "zero-protection" strategy as the commenter suggests. Thus, the comment suggesting the assessment concluded that the FPHCP reduces take by 80 percent compared to no protection is inaccurate.

3.6.7 Type N Streams Shade

One commenter is critical of the DEIS and Draft FPHCP's use of a temperature study by Caldwell et al. (1991). The commenter is correct in saying that the study was done on a limited number of streams and its limitations were described in the report. Nonetheless, Caldwell et al. (1991) is one of only a few studies that have evaluated timber harvest effects on temperatures in small headwater streams. The study included 11 sites in western Washington where the RMZs adjacent to non-fish-bearing streams (i.e., Type 4 waters under the previous water typing system) had been clearcut. The authors found that eight of the 11 recently harvested Type 4 waters met State water temperature standards. The main conclusions of the study included:

Type 4 waters that were tributary to Type 3 waters had minimal influence on downstream water temperature. This was primarily because of differences in flow volumes between the two water types. Type 3 waters farther than 4.5 miles from the watershed divide showed virtually no effect from the temperatures of incoming Type 4 tributaries, because the flow of the Type 3 water was too large relative to the size of the Type 4 water to have an influence.

For single streams where the water type changes from a Type 4 to a Type 3, water temperatures responded quickly to increased shade levels as flow progressed downstream into a shaded Type 3 reach. Water temperatures quickly reached equilibrium with downstream conditions, with the influence of the upstream Type 4 water temperature extending 500 feet or less beyond the water type change.

In addition to the Caldwell et al. (1991) study, three studies in Oregon evaluated the effects of riparian clearcutting on small streams (Andrus 1993; Dent and Walsh 1997; Robison et al. 1999). Robison et al. (1999) concluded that clearcutting adjacent to small, non-fish-bearing coastal streams generally did not produce water temperatures that exceeded State standards. Two of the studies (Andrus 1993; Robison et al. 1999) found significant cooling of water temperatures below most clearcut units as streams entered forested reaches. Andrus (1993) found that at sites where cooling occurred, the cooling rate was greatest in the first 600 feet downstream from the clearcut boundary. The third study (Dent and Walsh 1997) also documented cooling within 500 to 1,000 feet downstream of clearcut units at 10 of 15 study sites. However, the degree of cooling was not statistically significant.

The results of these studies suggest the protection afforded to Type Np waters under the FPHCP should be effective in minimizing and mitigating temperature effects. The results also indicate that increases in water temperatures in downstream Type S and F waters should be minimal. However, each of the studies cited above included a small number of study sites, and in some cases the geographic distribution of sites was limited. None of the studies included management or environmental conditions representative of eastern Washington. Therefore, the degree of uncertainty surrounding the expected effects of Type Np protection measures on water temperature is higher relative to other FPHCP requirements, particularly for eastern Washington.

The uncertainty surrounding the effectiveness of Type Np protection measures in meeting water temperature standards has made this issue a priority research and monitoring topic under adaptive management. The CMER Committee is currently developing a comprehensive study to assess the effectiveness of non-fish-bearing riparian protection measures in achieving established performance targets and resource objectives (see Type N Buffer Characteristics, Integrity, and Function program in the CMER Work Plan, FPHCP Appendix H). Water temperature is a primary focus of the study. In addition, CMER is also developing an extensive monitoring program that will establish the status of water temperatures at a statewide scale and document trends over time. The results of these efforts will help refine Type Np protection measures, where necessary, through the adaptive management process.

Another commenter questioned the scientific or logical basis for not protecting Type Ns (seasonal non-fish-bearing) streams. Shade is not retained along Type Ns streams because by definition, these streams flow for only a portion of the year. Almost always, flow cessation occurs in mid- to late-summer, the same period when increases in stream temperature would occur if water were present. Water temperature control is one reason the water typing system under the proposed FPHCP is hydrologically based rather than geomorphically based.

3.7 ROADS

3.7.1 Road Maintenance and Abandonment Plans

Commenters noted concerns with not knowing whether the RMAP process advocated in the Draft FPHCP and DEIS will adequately prevent impacts from roads to aquatic resources and the stream system. This is because RMAPs have few quantifiable or measurable requirements, the prioritization and timeline of road work can allow for impacts to occur in the short term, and because RMAP work is developed and implemented by the landowner and the efficacy of the work is uncertain and it is unknown how well the actions will protect water quality, fish and other aquatic resources. Some noted that repair of roads were inadequately addressed in FFR and there continues to be major road failures on an annual basis. Commenters also stated that the DEIS overstates the assumptions that the RMAPs program will work correctly to reduce sediment delivery to streams. The Washington Forest Practices Rules are still subjective as they relate to sediment production, problem identification, enforcement and compliance, and resource damage. No scientifically defensible targets have been made by CMER science to represent real conditions to streams based on real empirical data.

In response, the stakeholder group who wrote the FFR developed the following objectives, which are listed in the Washington Forest Practices Rules, for the management of roads: to maintain or provide passage for fish in all life stages, to provide for the passage of some woody debris, to meet water quality standards, to control sediment delivery, to protect streambank stability, and to divert most road run-off to the forest floor. To this end the RMAPs process and stronger culvert standards were developed. The expectation in the FPHCP is that the RMAP process and stricter standards will greatly reduce the adverse impacts of roads to stream habitat. Consequently, the FPHCP includes monitoring RMAPs and roads for compliance and protection effectiveness. If monitoring shows that protection is not sufficient, adaptive management will provide the vehicle for making rule changes to obtain the necessary resource protection (See CMER Work Plan – Roads Rule Group, FPHCP Appendix H). Some short-term impacts may occur in the effort to obtain better long-term resource protection. The FPHCP objective is to minimize short-term impacts and ensure long-term protection.

The Services view compliance monitoring and enforcement to be an integral part of all Washington Forest Practices Rules including roads rules. The Services are aware that DNR is currently developing compliance monitoring procedures for roads which is projected to start in July 2007. In addition, DNR has 47 forest practices foresters statewide who enforce Washington Forest Practices Rules.

The Services understand that under State law it is the forest landowner's responsibility to prevent damage to public resources during both road maintenance and construction. "To protect water quality and riparian habitat, roads must be constructed and maintained in a manner that will prevent potential or actual damage to public resources. This will be accomplished by constructing and maintaining roads so as not to result in the delivery of sediment and surface water to any typed water in amounts, at times or by means, that preclude achieving desired fish habitat and water quality" (WAC 222-24-010(2)).

Culvert replacement is part of road maintenance and construction (see WAC 222-16-050). Culvert replacements require the landowner to obtain a forest practices application from DNR and sometimes a Hydraulic Project Approval from WDFW. Forest practices applications require protection of water quality and the Hydraulic Project Approval requires protection of fish life during culvert replacement. The requirements of Hydraulic Project Approvals are enforced by WDFW and the forest practices applications are enforced by DNR.

One commenter had a concern with forest road decommissioning, stating that new roads should not be built; roads are a waste of taxpayer money and cause a reduction in habitat quality. One commenter was concerned that there is a failure in the FPHCP to force the repair of abandoned roads. The Services note that the Washington Forest Practices Rules clearly state that landowners are to minimize the construction of new roads in order to protect water quality (WAC 222-24-010). Existing roads are to be maintained in a manner that will prevent potential or actual damage to public resources. Forest roads on private land are built by private forest landowners and therefore are not funded by taxpayer's money.

Landowners have an incentive to abandon roads and are required to plan for road abandonment in their RMAPs. Once a forest road is abandoned it no longer requires maintenance. The purpose of abandoning a road is to place it in a condition that would prevent it from negatively affecting public resources. In order for a road to be considered officially abandoned, it must first meet specific criteria and then be approved by DNR as officially abandoned (WAC 222-24-052(3)). Between July 2001 and December 2004, landowners reported a total of 1,587 miles of forest road abandoned under RMAPs.

One commenter was concerned that the FPHCP did not adopt a provision to force repair of orphan roads. The commenter stated that adopting an HCP that does not include provisions ensuring the repair and restoration of orphan roads in effect immunizes landowners from future liability.

The FFR contained an agreement to determine the abundance and location of orphan roads subject to the Forest Practices Act. To that end a Washington Forest Practices Rule was written requiring an inventory and assessment of orphan roads during the RMAP process (WAC 222-24-052(4)(a)). Once the inventory is completed by July 2006, the true picture of orphan roads will be better known. At that time, stakeholders can more realistically discuss orphan roads, whether or not they are a problem and if so, how to resolve the issue. The Services do not hold the view that, because mandatory repair of orphan roads is not part of the FPHCP, potential problems due to orphan roads will not be resolved.

One commenter was concerned with RMAP reporting and how each DNR region needs to have annual reports for the RMAPs program showing miles of road constructed, abandoned, fish barriers removed, and status of likelihood to meeting 2016 target dates.

In response, the data collected from RMAPs includes miles of forest road in the plan, miles of forest road abandoned, miles of orphaned roads, estimated miles of fish passage opened, and number of structures removed or replaced on fish-bearing streams. Each region sends these data to the Forest Practices Division for statewide compilation once a year.

One commenter was concerned that RMAPs would not meet road density requirements. Another added that the standards lack rigor due to lack of Watershed Analysis.

The Services note that the FPHCP does not propose to regulate the density of forest roads, however, the Washington Forest Practices Rules clearly state that landowners are to minimize the construction of new roads in order to protect water quality (WAC 222-24-010). Existing roads are to be maintained in a manner that will prevent potential or actual damage to public resources. The Forest Practices Regulatory Program has 47 forest practices foresters to enforce road rules. The compliance monitoring program is developing a monitoring procedure for forest roads. The compliance monitoring is scheduled to begin in July 2007. Effectiveness monitoring for forest road protective measures is in development.

As mentioned above, landowners do have an incentive to officially abandon forest roads because they no longer have to maintain them. Maintenance is no longer necessary because they are in a condition where they cannot harm public resources. Part of the RMAPs process is planning for road abandonment.

3.7.2 Small Forest Landowners and Road Maintenance and Abandonment Plans

Some commenters expressed concerns with the cost of culvert replacement, and suggested that landowners should only receive public funding if they own a total of 500 acres or less. Others had concerns with the road culvert removal or replacement activities, and how enforcement of sediment delivery downstream of culverts is often overlooked and rarely assessed visually or quantitatively by DNR, Ecology, or WDFW.

In response, the Family Forest Fish Passage Program was established by the 2003 State Legislature with Second Substitute House Bill 1095 and can be found in RCW 76.13.150. The Family Forest Fish Passage Program is a cost-share program that helps small forest landowners correct fish passage barriers on their forestlands. The program provides technical assistance and 75-100 percent of the cost of correcting a barrier. The definition of small forest landowner used for RMAPs rules including the Family Forest Fish Passage Program is found in RCW 76.09.450. This definition was changed from a landowner owning less than 500 acres to an annual timber harvest level of two million board feet or less, in order to better reflect small forest landowners. The definition of small forest landowner for RMAPs purposes shifted from focusing on ownership size to how the land is managed. The new definition became effective on May 14, 2003.

One commenter suggested identifying additional funding to assist small forest landowners repair or replace fish passage barriers in an effective and efficient manner. Another commenter stated that RMAPs being required sooner under Alternative 4 than under Alternative 2 would remove fish blockages sooner, thus causing fewer impacts on fish populations.

The Services note that currently the Family Forest Fish Passage Program has $4 million allocated for correcting fish passage barriers on small forest landowners' lands for the current biennium. Last biennium, the Family Forest Fish Passage Program funded 62 barrier corrections for small forest landowners ($2 million). Other sources such as the Landowner Incentive Program and the National Resource Conservation Service have also contributed funding to small forest landowner barrier corrections.

Assuming there would be no change to private forestland management practices in the State of Washington as a result of adopting Alternative 4, fish blockages could be repaired sooner than under Alternative 2. However, other factors that need to be considered include: a) the extent to which a more restrictive set of regulations would encourage conversion of some forestland to more intensive land uses, b) the extent to which some landowners would seek regulatory relief through the Legislature or the courts, c) the extent to which an accelerated schedule for culvert repair would result in less effective prioritization and coordination of repairs at the watershed scale, and d) the extent to which an accelerated schedule requirement for repairs may result in less collaboration amongst Forests and Fish stakeholders, and the subsequent effect less collaboration may have on the availability of funding for culvert repair programs.

Several commenters were concerned about small forest landowner RMAP "exemptions" and stated the analysis of the impacts of the small forest landowner exemption is inadequate or inaccurate in the Draft FPHCP and the DEIS. One commenter said the effect of the small landowner exclusion on habitat conditions and fish populations needs to be evaluated and disclosed. Further, the DEIS addresses neither the long-term (50 years) impacts from the small forest landowner RMAP exemption nor the amount of area likely to be impacted. One commenter was concerned that the small forest landowner RMAP exemption would preempt the ability of forest practices to meet the Clean Water Act standards. One commenter said landowners are creating Limited Liability Corporations to fall under the small forest landowner definition enabling them to circumvent the requirement to do RMAPs. Several commenters felt that the small forest landowner RMAP Checklist gives little confidence that roads will be sufficiently improved because ultimately roads for small landowners would continue to impact the stream system until forest practices are conducted, and very possibly after the harvest activities are completed. One commenter mentioned that there are no requirements for small forest landowners to comply with annual RMAP reporting requirements or to bring all forest roads up to Rule standards by the year 2016. One commenter stated that some of the most damaging roads occur on lands covered by the 20-acre exemption for small landowners. Failure to adopt any provisions to force repair of abandoned or orphan roads could offset or severely limit any possible benefit derived from RMAPs.

In response, an RMAP is a forest road inventory and schedule for any repair work that is needed to bring roads up to forest road standards. An RMAP is prepared by the landowner and approved by DNR. It is true that small forest landowners have different administrative requirements than large forest landowners, related to RMAPs. However, small forest landowners are not exempted from the RMAP process (except for small forest landowners who are 20-acre exempt landowners). Large forest landowners are required to have RMAPs completed for their entire forestland ownership by 2006. Small forest landowners must submit with each forest practices application/notification a Checklist RMAP for the forest roads used in the forest practices application/notification. Landowners with 20-acre exempt parcels do not have to submit an RMAP or an RMAP checklist. Both small forest landowners, including 20-acre exempt landowners, and large forest landowners have to maintain their forest roads to the extent necessary to prevent potential or actual damage to public resources (WAC 222-24-052). This WAC was not changed in the RMAPs emergency rules. Monitoring to ensure public resources are not damaged is required by DNR.

One commenter expressed the concern that the effort to minimize the burden to small forest landowners will eventually lead to overlooking even the bare minimum requirements. The FPHCP should more fully explain a strategy to deal with the potential problem of complacency overtaking this part of the program.

The Services note that, while small forest landowners and large forest landowners have different RMAP planning requirements, both landowner groups are responsible for meeting resource protection standards, for putting a stop to resource damage, and for preventing potential resource damage due to forest roads on their lands. If damage or potential damage to public resources is occurring, the landowner, regardless of size, is obligated to correct the situation so that damage will either be prevented or stop occurring. If the resource damage is occurring due to a forest road that is not part of a forest practices application, the landowner is still responsible for correcting the situation.

One commenter said that to ensure that all fish passage barriers are identified, provisions must be implemented so small forest landowners' fish passage barriers are identified and placed on a centralized database that Tribes can access and that agencies and conservation groups can access to prioritize and restore fish barriers in an efficient and effective manner. Another commenter said that although a voluntary program for public funding to repair fish passage is available to small forest landowners, those enrolling are relieved of any regulatory [requirement] and most, if not all, of the monetary obligation to fix fish passage barriers until they have priority and public funding is available. A work group of the TFW/FFR Policy Group estimated the funding need for the successful completion of this program is $150 million. At the current rate of funding this project will take over 100 years to complete and will violate the 15-year commitment to repair all fish passage problems on forestlands.

The Services point out that, to assist small landowners to replace culverts economically, the 2003 Washington Legislature established the Family Forest Fish Passage Program

(RMAPs emergency rule WAC 222-24-050). The emergency rule included the following provisions:

- The State created a cost-share program that provides 75-100 percent of the cost of correcting small forest landowners' fish barriers.
- Small forest landowners enrolling in the program are required to fix their barriers only if financial assistance is available from the State.
- Barriers are prioritized and repaired on a worst first basis.

Once a year, projects submitted to the Family Forest Fish Passage Program are prioritized, and the fish barriers that cause the greatest harm to public resources are funded first. Lower priority projects remain in the Program to be funded later once they become high priority and money is available. By signing up for the Program, a landowner is relieved of any Washington Forest Practices Rules obligation to fix a fish passage barrier until the State determines the barrier is a high priority.

The Services are aware of the Washington State Legislature's prior funding for the Family Forest Fish Passage Program. The Legislature allocated $2 million for the 2003-05 biennium and $4 million for the 2006-07 biennium. In addition, the Services are aware of the fact that the DNR Small Forest Landowner Office is actively pursuing grant funding for small forest landowner programs. To date, the Small Forest Landowner Office has brought in $550,000 in Federal matching grants for the Family Forest Fish Passage Program. The Final FPHCP includes up-to-date funding information on the Family Forest Fish Passage Program.

3.7.3 Culverts

One commenter suggested culvert replacement costs should only receive public funding if the landowner owns a total of 500 acres or less.

The Services understand that the State's application has been endorsed and authorized by the Washington State Legislature. In so authorizing, the Legislature provided certain parameters for the application. In Section 11 of Second Substitute House Bill 1095, for instance, a small forest landowner is defined as: "*an owner of forest land who, at the time of submission of required documentation to the department, has harvested from his or her own lands in this state no more than an average timber volume of two million board feet per year during the three years prior to submitting documentation to the department and who certifies that he or she does not expect to harvest from his or her own lands in the state more than an average timber volume of two million board feet per year during the ten years following the submission of documentation to the department.*" The Services defer to the State's application on this point.

Another commenter suggested enforcement of sediment delivery downstream of culverts is often overlooked and rarely assessed visually or quantitatively by DNR, Ecology, or WDFW. Many site-specific examples were given regarding the effects of protection or lack of protection provided by culverts on local resources.

The Services understand that WDFW, Ecology, and tribal biologists have a practice of visually checking culverts and recommending actions to prevent sediment delivery to streams. The Services also understand that agency and tribal biologists do not usually make quantitative assessments of sediment delivery on site visits. WDFW's Hydraulic Project Approvals typically require that the culvert work area be isolated from flowing water prior to road culvert removal and replacement activities. Wastewater from the construction area must be diverted and treated before reentering the stream. Only clean fill may be used and all disturbed areas must be protected from erosion and revegetated within one year (see WAC 220-110-070(3) "Permanent Water Crossing Structures").

The Services also point out that, as part of the adaptive management program, sediment delivery will be assessed through effectiveness Monitoring. Also, DNR is cooperatively working with the other Forests and Fish stakeholders to design and implement a compliance monitoring program, which will evaluate road construction, maintenance and abandonment practices for compliance with the Washington Forest Practices Rules.

3.7.4 Adaptive Management

One commenter was concerned that the DEIS discussion of the CMER Roads Effectiveness project does not indicate that the prescriptions in current Washington Forest Practices Rules may be overprotective. It is possible that this study will show that different, less costly prescriptions could protect resources from sediment delivery and mass wasting from forest roads.

The main objective of effectiveness monitoring is to determine if and to what extent individual protection measures achieve performance targets. Performance targets have been established for most geomorphic inputs (e.g., large woody debris, solar energy/water temperature, sediment, hydrology). In cases where monitoring shows that protection measures are meeting or exceeding performance targets, the protection measures are considered "effective." As the commenter correctly points out, there may be opportunities to modify protection measures that have been deemed "effective" in order to make them more economically efficient without compromising their resource protection benefits. The commenter specifically cites the CMER Roads Effectiveness monitoring project as one example of where this might occur. In addition to this project, the same could be said about nearly all other effectiveness projects. That is, where protection measures are shown to meet or exceed performance targets, monitoring results may be used to define or develop more cost-effective measures that still provide the same level of resource protection. The Services note that the fact that this opportunity exists is widely recognized within the adaptive management program and is reflected in the FFR goals (e.g., "keep the timber industry economically viable in Washington"). Since the primary objective behind the DEIS is to evaluate the environmental effects of the various alternatives, and not the economic effects, it is not necessary to modify the document as suggested by the commenter.

3.7.5 Surface Erosion

The DEIS notes that Alternative 2 would have low to moderate adverse impacts from delivery of coarse sediments into streams resulting from road construction and maintenance. A commenter was concerned that, despite these impacts, roads do not have

to be upgraded for 10-15 years by large landowners, and not at all by small landowners unless they file a forest practices application. Another felt that the FPHCP authors relied on the assertion that the majority of forestry-related sediment impacts come from roads, and that RMAP requirements will result in substantial reductions in sediment loading. In fact, the commenter believes, available scientific evidence indicates that the proposed measures will result in ongoing sediment loading from roads unless there are significant reductions in watershed road density.

In response, under the Washington Forest Practices Rules roads owned by large forest landowners must meet forest practices standards by July 1, 2016. Small forest landowners, while not required to adhere to the same RMAP requirements, must still maintain their roads in a condition that does not cause material damage to public resources. DNR has regulatory authority to require any landowner (large or small) to submit and implement an RMAP where public resource damage is occurring. In most cases, however, it is expected that small landowner road maintenance work will occur in conjunction with a timber harvest operation.

The degree to which road maintenance and abandonment work reduces sediment inputs to streams is an issue that will be addressed through adaptive management. The adaptive management program is currently developing an approach to evaluate the effectiveness of RMAP implementation with respect to sediment and hydrology. The results of this work are expected within a few years. The TFW/FFR Policy Group and the Forest Practices Board will consider the results and may make changes to the Washington Forest Practices Rules if resource objectives and/or performance targets for these parameters are not met.

While limits on road density may help reduce sediment inputs to streams, the use of road density as a regulatory tool would be potentially ineffective due to the large number of environmental and management-related factors that influence sediment delivery to streams. It is much more effective to implement site-specific sediment reduction measures at the road reach scale than to limit road density at the watershed scale. Road age, road use, and road drainage-stream network integration generally influence sediment inputs and delivery more so than just road density.

Another commenter says that the DEIS identifies RMAPs as the primary mechanism for addressing road-related sediment and hydrologic impacts. The Services acknowledge that this is correct. The commenter goes on to claim "…*the* [DEIS] *analysis of effect* [on the] *road management practices rests of assumption that implementation of forest practices under RMAP standards will eliminate all effects of roads.*" The Services acknowledge that this is incorrect. The DEIS concludes that implementation of Alternative 2, which includes RMAP requirements, will "…*reduce road-related sediment from delivering to streams relative to No Action Alternative 1-Scenario 2*…" The DEIS fully describes its conclusions regarding RMAP implementation in subsection 4.4.1.2 (Evaluation of Alternatives—Road Surface Erosion). Nowhere does the DEIS state that RMAP implementation will eliminate all road-related sediment and/or hydrologic impacts.

3.8 WATER QUALITY

3.8.1 Temperature and Antidegradation

A commenter expressed concern that water temperature criteria are not provided in the Washington Forest Practices Rules; the commenter noted that the Rules need to be consistent with State water quality standards, but was concerned that temperature increases to naturally cold streams are permitted. A statement was made that forest practices conducted pursuant to the Washington Forest Practices Rules are not consistent with the Clean Water Act or Washington State water pollution and water quality laws and rules. A commenter wondered whether one temperature target was suitable for all species of concern in a stream. One commenter noted that pages 5-15 and 5-16 (subsection 5.2.2.2) of the DEIS do not describe whether State water quality standards are sufficient in protecting aquatic resources or that the standards are currently under revision.

The Services agree that the Washington Forest Practices Rules must be consistent with State water quality standards. These standards are developed by Ecology under the Washington State Water Pollution Control Act. The standards, which include provisions to protect existing water quality (Ch. 173-201A WAC Part III Antidegradation), are reviewed periodically to ensure protection of beneficial uses based on best available science. The DEIS has been modified to reflect this comment. Temperature requirements for multiple species, including stream-associated amphibians and macro-invertebrates were considered during development of the 2003 State Water Quality Standards; sensitive "key species" were selected to aid in identifying aquatic communities requiring unique temperature criteria to ensure all the resident species are fully protected.

Multiple comments focused on potential inadequacies of the Washington Forest Practices Rules and guidance, especially the shade rule and associated Forest Practices Board Manual, and harvest rules for Type N streams to provide effective shade to protect stream temperature. Commenters pointed out that in addition to shade, changes to channel morphology, air temperature, interception of groundwater into surface ditches, and other parameters affect stream temperature. There was concern that riparian buffer widths are based on inadequate assumptions, and that cumulative effects of multiple forest practices, especially in watersheds degraded from past practices, will put salmon at risk. There was further concern that no extra precautions would be taken if a stream is already exceeding State water quality standards. A commenter expressed concern that near-term degradation is allowed based on anticipated long-term improvement. One commenter believed that the Forest Practices Regulatory Program protected landowners from any new temperature criteria for the next 50 years.

Another commenter recommended that the FEIS include a summary of the antidegradation process and how the process will be adhered to. The DEIS has been modified to reflect this comment.

In response to comments concerning temperature criteria and antidegradation, Table 3-14 of the DEIS has been updated to show existing (2003) State water quality standards, including antidegradation. In addition, the words "including antidegradation" have been

added to the end of subsection 1.5.2.5 of the DEIS. The 2003 standards have not been approved by EPA, but they are currently in effect as Washington State law.

Washington Forest Practices Rules that affect water quality must be approved by Ecology. The DEIS has been modified to reflect that Ecology has a continuing obligation to seek adjustments to Washington Forest Practices Rules and Guidance through adaptive management when necessary to ensure that they meet or exceed water quality standards. For instance, Section 1 of the Forest Practices Board Manual, Method for Determination of Adequate Shade Requirements on Streams, will need to be adjusted to protect existing water quality consistent with the new antidegradation rules. Other Washington Forest Practices Rules and Guidance may need to be adjusted based on best available science to protect near-term water quality.

Adaptive management studies are in progress to investigate the effectiveness of current Rules at protecting water quality and other functions of riparian areas. These studies include temperature effects of Type N harvest prescriptions, which CMER ranked as a top priority. Ecology will analyze results of these studies using temperature criteria in effect at the time the studies are completed, including antidegradation requirements. If current prescriptions are degrading water quality, Ecology will request changes to the Forest Practices Regulatory Program to prevent future degradation.

Subsection 3.5.1.2 of the DEIS acknowledges that many factors, including channel width and depth (morphology) and groundwater flow influence stream temperature, and lists convective mixing with air as one of the ways heat energy is transferred to streams. There is still uncertainty regarding the magnitude of stream temperature effects from upslope harvesting and other factors. Intensive monitoring and adaptive management studies will provide information on whether or not current forest practices are cumulatively increasing stream temperature.

Regarding roads that intercept groundwater, WAC 222-24-010 requires construction and maintenance of roads to avoid capture and redirection of surface roads, and requires subsurface flow captured by roads and road ditches to be routed back to the forest floor (see also FPHCP 4c-2.1). This will be subject to compliance monitoring and CMER extensive status and trends monitoring.

There was concern from one commenter that the FFR did not consider protection for fish from too cold of water temperatures in the winter.

At this time, the State does not have minimum temperature standards, but criteria designed to address harmful cooling of water temperature may be considered sometime in the future. The Services currently believe that vegetated buffers that protect species covered by the FPHCP from elevated temperatures will also protect them from lower temperatures.

Please also refer to the responses to comments on Adaptive Management, Riparian (Buffers, Type N Streams, Large Woody Debris), Monitoring, Clean Water Act, 20-Acre Exemption, and Cumulative Effects.

At least one commenter thought that the statement that "the shade rule is meant to achieve state water quality standards" should be clarified. In response, the shade rule is designed to meet State water quality standards for temperature. The nomographs used to establish minimum required shade rely on elevation and the temperature standard (i.e., 16 or 18 degrees Celsius). These relationships were developed through a CMER study conducted in the late 1980s (Sullivan et al. 1990). Since that time, there has been little work to evaluate the performance of the shade rule in meeting water quality standards. As a result, this is a high priority monitoring issue within the adaptive management program. CMER is currently conducting three projects related to this issue. Two of the projects will evaluate the effectiveness of riparian protection measures (including the shade rule) in meeting temperature standards; one will focus on Type F waters while the other will evaluate Type Np waters. The third project is evaluating the performance of the densiometer in measuring shade.

The Services received at least one comment stating that the influence of groundwater warming on instream temperatures is missing from the protection measures included in the FPHCP. In response, RMZ requirements in the FPHCP are intended to restore or maintain the range of riparian and aquatic habitat and functions. The Services believe that RMZ prescriptions under the FPHCP have the capacity to moderate potential groundwater warming from upland timber harvest activities. However, there is a lack of research to fully support this belief. Therefore, the FFR (and subsequently the adaptive management program in the FPHCP) identified the effects of forest practices on groundwater influences on stream temperatures (e.g., hyporheic zones) and their relationship to temperature targets as an effectiveness monitoring and research priority under Schedule L-1 of the FFR. A preliminary report on groundwater research has been produced under the adaptive management program and includes a literature review and some conceptual modeling. This report generated additional questions that will necessitate further exploration to determine what additional research or monitoring may be necessary to determine the effects on groundwater from forest practices.

3.8.2 303(d) List and Total Maximum Daily Loads

Commenters noted that there are more water body segments listed as impaired due to high temperature on the State's 2004 303(d) list than on the 1998 list. There was concern that this increase indicates that current forest practices are not sufficiently protecting water quality. One reviewer questioned a statement in the DEIS, "Ecology's 303(d) list also does not differentiate between land uses. . ."

In response, Ecology submitted the 2004 Washington Water Quality Assessment in June, 2005, including a 303(d) list of impaired waters (Category 5) (http://www.ecy.wa.gov/programs/wq/303d/2002/overview.html). The chapter on Prioritization of Category 5 (for developing Total Maximum Daily Loads) includes the following statement:

> *Of the main pollutant parameters causing 303(d) listings, the most significant increase in listings occurs with temperature. This increase appears to be due to increased temperature monitoring efforts in the last several years, likely spurred by increased salmon habitat protection*

> *efforts and increased watershed planning efforts that have occurred since 1998. The collection of continuous monitoring data through the use of temperature probes has also proven to be a cheap and reliable method for gathering temperature data. So, the combination of increased salmon habitat studies and having a low cost reliable method for gathering temperature data has resulted in increased temperature listings.*

The DEIS has been modified to reflect this comment. The 2004 Water Quality Assessment is included in the FEIS. The Services do not have data to support the comment that increased listings indicate current forest practices do not sufficiently protect water quality.

The Prioritization of Category 5 for the 2004 Washington Water Quality Assessment also includes this statement:

> *Therefore, in those watersheds affected only by forest practices, listings for waters impaired by sediment, turbidity, or temperature caused by forest practices on state and private forest lands will generally be lower priority and will be addressed after July 1, 2009. Exceptions may be made if requested by the landowners. Listings caused by forest practices in mixed use watersheds will be addressed according to the schedule above. TMDLs prepared in mixed use watersheds will specify that the implementation mechanism for achieving load allocations for forest practices will be compliance with the forest practices rules.*

Ecology is conducting TMDLs in certain mixed used watersheds, but has not identified watersheds that only contain listings for lands covered by the FPHCP.

A commenter requested clearer wording for statements in the DEIS on page 2-35, lines 36-39, and on page 2-42, lines 28-32 regarding the need for TMDLs in forestlands covered by the FPHCP. The DEIS has been modified to reflect this comment.

A commenter stated that the Forests and Fish Report is not equivalent to a TMDL because it does not identify the baseline state of water and the specific focus on a particular watershed.

The Services, as well as EPA and Ecology, agree that the Forest Practices Regulatory Program is not equivalent to a TMDL. At this time, however, the Program is equivalent to an implementation plan for a forest practices TMDL.

Some comments focused on Clean Water Act Assurances and the 2009 date for determining whether or not to continue the assurances that were offered in Schedule M-2 of the FFR. One commenter recommended delaying a decision on ESA assurances until water quality and compliance monitoring data are evaluated in 2009. There was also a comment that the DEIS and Draft FPHCP do not analyze the potential impacts associated with the deferral (lower priority) for TMDLs until 2009. One commenter stated that EPA's assessment is not based on compliance with water quality standards, and that if a stream segment is already violating temperature standards, that FFR requirements cannot bring that stream into compliance.

In response, Ecology and EPA will evaluate data from adaptive management and compliance monitoring studies in 2009 to determine if implementation of the Washington Forest Practices Rules and Guidance will allow streams to meet water quality standards. If there is insufficient data to make this determination, EPA and Ecology may need to elevate the priority of forestry TMDLs and re-evaluate the best way to attain water quality standards. Clean Water Act assurances and, if ITPs are issued, ESA assurances will be conditioned on results of future monitoring. Ecology and EPA consider implementation of the Forest Practices Regulatory Program to be the quickest and most efficient means for achieving State water quality standards, which is why they agreed to lower the priority for developing TMDLs in waters covered by the FPHCP until 2009.

Some comments focused on Total Maximum Daily Loads prepared by Ecology to recover impaired waters, such as the Teanaway Temperature TMDL. The commenter was concerned about water quality standards used in the TMDL and elsewhere, protection of Type N streams, and the need for stream restoration. A commenter stated that pages 5-15 and 5-16 (subsection 5.2.2.2) of the DEIS do not say how effective TMDLs are at protecting resources.

In response, TMDL implementation includes follow-up monitoring and adaptive management; if streams with TMDLs are not on a trajectory to meet water quality standards, the TMDLs or implementation plans will need to be adjusted. Results of effectiveness monitoring will be compared to temperature standards in effect at the time of the evaluation, rather than to those in effect at the time the TMDL was prepared. If current forest practices are degrading water quality or preventing recovery, the Washington Forest Practices Rules may need to be adjusted through adaptive management.

3.8.3 Turbidity and Sediment

A reviewer recommended including sediment loading to streams as an evaluation criterion, due to its influence on stream temperature. A commenter expressed concern that one reason there are so few waters listed as impaired for sediment on the State's 303(d) list is due to the relative difficulty of monitoring for sediment and deriving numeric targets for sediment. The commenter recommended discussing the extent of fine sediment monitoring and data regarding impacts to streams in the DEIS. One commenter recommended that the FEIS include a discussion on how much siltation and turbidity above background will impact fish.

Subsection 3.8.4 of the DEIS, The Freshwater Aquatic Ecosystem mentions that a large sediment supply may widen a stream channel, and subsection 3.8.4.7, Water Temperature, mentions that stream widening can affect water temperature. The DEIS has been modified to reflect this comment.

The Services acknowledge commenter concerns regarding the limited availability of sediment data and specific data on amounts of siltation that will impact fish. The primary purpose of an EIS is to compare alternatives to "no action." The Services recognize that excessive turbidity and sediment is detrimental to species covered by the FPHCP and must consider the alternatives' relative effectiveness at reducing sedimentation.

A reviewer commented that the recommendations of the FFR will allow more sediment input and higher turbidity in streams than allowed by State water quality standards. There was concern that forest practices may proceed without an evaluation of current instream temperature and sediment, the miles of road already present, riparian tree cover or sediment delivery at a watershed scale.

The Services note that the success of the Forest Practices Regulatory Program in helping streams meet State water quality standards will be evaluated through compliance monitoring and through the adaptive management program. The monitoring programs will examine water quality status and trends statewide, and cumulative effects within representative watersheds, rather than for each individual forest practices application.

3.8.4 Forest Chemicals

Comments included a recommendation to add information in subsection 4.5.1.2 of the DEIS on chemicals used in forest practices, including their persistence and toxicity, especially for chemicals applied to dry stream beds. A reviewer recommended mentioning that pesticide label requirements are part of the minimum requirements of pesticide application. The reviewer also recommended mentioning that some herbicides are subject to court-ordered restrictions (see http://www.epa.gov/oppfead1/endanger/wtc/index.html).

In response, the DEIS mentions in the Forest Pesticides paragraph of subsection 2.3.1.2 that one of the main goals of the current Washington Forest Practices Rules is to ensure that use of pesticides is managed to meet water quality standards and label requirements and to avoid harm to riparian vegetation.

One comment focused on uncertainty regarding the effectiveness of BMPs in preventing forest chemicals from entering streams.

In response, forest chemical applications may be subject to future effectiveness monitoring, although to date, adaptive management participants have ranked such studies as low priority, based on risk. Application of forest chemicals may be subject to future compliance monitoring.

A reviewer recommended that clearer language be used in a statement regarding pesticide applications on page 4-72, lines 12-15 of the DEIS. The DEIS has been modified to reflect this comment.

In general, because of the slow surface and subsurface runoff from forested lands and the relatively infrequent pesticide applications, most pesticide applications in the RMZ are not expected to result in meaningful impacts on water quality.

3.8.5 Compliance and Enforcement

A reviewer commented that Ecology is legally mandated to monitor and enforce non-point source pollution within the State, including private forestland. Commenters were concerned that Ecology is not taking the lead on enforcement of water quality laws involving forest practices and has minimal presence on private forestlands. One comment said that Ecology has used its waiver of enforcement powers for forest practices to justify a failure to actively monitor water quality in our streams. There was also a

comment that both Ecology and DNR are required to enforce laws and encourage BMPs to help eliminate sediment delivery to waters of the State.

Two commenters expressed concern that DNR evaluates sediment pollution by visually comparing the amount of color in different water bodies, which results in too much flexibility in enforcement, is problematic during the rainy season, and has not been audited by DNR or CMER.

The Services agree that Ecology has jurisdiction to control and prevent water pollution, and that DNR is the lead agency for forest practices and has primary authority to enforce water quality provisions of the Washington Forest Practices Rules. Compliance with the Rules, including use of BMPs to prevent sediment delivery to State waters, will be evaluated through compliance monitoring. In addition to DNR foresters, field staff from both Ecology and WDFW will assist with this monitoring, which will assess compliance in different parts of the State. The effectiveness of BMPs in preventing sediment delivery, and effects of sediment delivery on public resources will be evaluated through CMER studies. Ecology and other adaptive management participants will rely on statistically valid sampling, involving random selection of sites to assess effectiveness of the Washington Forest Practices Rules. (See also the Compliance and Enforcement response (subsection 3.11) and the Adaptive Management response, Compliance Monitoring (subsection 3.5.5)).

3.8.6 Environmental Protection Agency Rating

EPA assigned a rating of EC-2 (Environmental Concerns - Insufficient Information) to the proposed alternative in the DEIS. EPA was concerned that the document lacked adequate information important to the analysis of environmental effects of the proposed alternatives. Specific areas of concern were pesticide application procedures, small forest landowner exemptions, and monitoring.

The Services believe that the FEIS includes adequate analysis of environmental issues in a full range of reasonable alternatives associated with the proposed Federal decision. Please refer to the Forest Chemicals (subsection 3.10), Small Forest Landowners (subsection 3.12), and Compliance and Enforcement (3.11) responses as well as to the ESA Overview (subsection 3.1.1).

3.9 WILDLIFE

3.9.1 Upland Wildlife

Some comments were received expressing concern that the current Washington Forest Practices Rules do not contain sufficient provisions for the protection of upland wildlife and their habitats, specifically the northern spotted owl. Further, the comments stated that the Rules pertaining to upland wildlife must provide protection and restoration of wildlife habitat on non-Federal forestlands and an ecosystem approach based on the conservation of biodiversity. Also of concern was that the Services be sure to analyze the impact of logging for the next 50 years under the FPHCP on the endangered population of the northern spotted owl in their biological opinions conducted under ESA Section 7 and in its DEIS for the FPHCP.

In response, the purpose of an EIS is to compare environmental effects of various alternatives against the No Action Alternative, not to determine whether any particular alternative complies with the ESA. Determination of compliance with the ESA occurs through Section 7, under which both NMFS and USFWS will prepare separate biological opinions outlining the potential impacts within the proposed project area, including those that are expected to occur to other listed species. These biological opinions will include analysis of the impacts to the northern spotted owl and other listed species in Washington State.

A number of comments were received that expressed concern regarding the decline of the northern spotted owl and an associated lack of protection of habitat for the spotted owl and other upland wildlife species. In response, the Services note that the DEIS compared a range of alternatives to "no action." The DEIS contains an analysis of the effects of action alternatives compared to "no action" in terms of spotted owl habitat (subsection 4.10.2.2 Species-Specific Discussion). However, due to the number of comments received on the subject of spotted owl, the background, policies, mechanics of protection, and future direction of the current Washington Forest Practices Rules addressing upland wildlife and specifically the northern spotted owl are addressed below.

3.9.1.1 Background

The northern spotted owl was federally listed as threatened under the ESA in June of 1990. On April 2, 1993, President Clinton held a Forest Conference in Portland, Oregon to address controversies over forest management and protection of species associated with old-growth forests in the Pacific Northwest and Northern California. Following the Forest Conference, President Clinton established a FEMAT to develop options for the management of Federal forest ecosystems to provide habitat that would support stable populations of species associated with late-successional forests. This ultimately led to the adoption of the Northwest Forest Plan in 1994.

In light of the adoption of the Northwest Forest Plan, the Services assessed the conservation needs of the northern spotted owl on non-Federal lands in Washington and California. The agency concluded that since the Forest Plan's commitment to a comprehensive habitat-based strategy would accomplish or exceed the standards expected for the Federal contribution to recovery of the owl and assurance of adequate habitat for its reproduction and dispersal, it was no longer necessary or advisable to continue to prohibit incidental take of the owl on all non-Federal lands within the range of the owl. This determination was consistent with the underlying premise for the President's selection of the Forest Plan that Federal lands should have the primary role for the conservation of the spotted owl, thereby enabling an easing of restrictions on non-Federal lands. Consistent with this, the USFWS then proposed critical habitat designations that included Federal lands only. President Clinton thus directed the USFWS to issue regulations, pursuant to ESA Section 4(d), with the goal of easing, where appropriate, prohibitions against the incidental take of spotted owls on non-Federal lands.

Although never finalized, the USFWS proposed a draft Section 4(d) rule in 1995 to manage northern spotted owls in Washington and California. Per a written request from

the Oregon Congressional Delegation, Oregon was not included in the proposed draft Section 4(d) rule in order to allow the State to further its negotiations with private landowners to develop a stakeholder based "Oregon Alternative." In proposing a Section 4(d) rule, the USFWS recognized a need to revise regulations to reduce take prohibitions on non-Federal lands while taking into account: 1) the level of protection provided to the owl on Federal lands under the Forest Plan; 2) the likely possibility for the development of additional large-scale, multi- species Habitat Conservation Plans; and 3) State and tribal regulatory programs for forest practices and owl protection in Washington and California. By reducing incidental take prohibitions in specified areas, and allowing some incidental take to occur as a result of timber harvest activities on non-Federal lands, the proposed Section 4(d) rule would have provided the following important landowner benefits: 1) more regulatory certainty regarding the use of their land; 2) reduction of social and economic impacts from owl conservation; 3) positive incentives for voluntary owl conservation and enhancement of late-successional forest conditions; and 4) special relief for small-acreage landowners. The USFWS proposed Section 4(d) rule was never finalized. However, the Forest Practices Board continued their rule-making efforts in order to offer protection for the northern spotted owl and marbled murrelet.

The marbled murrelet was federally listed as threatened in Washington, Oregon, and California on October 1, 1992. The USFWS proposed critical habitat designations on January 27, 1994, and a supplemental designation on August 10, 1995. Unlike Oregon and California, the Washington Forest Practices Rules include a provision whereby within 30 days of Federal designation of critical habitat being published in the Federal Register, DNR, in consultation with WDFW, shall submit to the Forest Practices Board a proposed list of any forest practices and/or areas proposed for inclusion in Class IV-Special forest practices. Unless the proposed management activity is covered under a federally approved habitat conservation plan or other similar management agreement, the Washington Forest Practices Rules would then require the application to go through the SEPA to determine if an EIS should be prepared. In Washington, the USFWS designated critical habitat for murrelets on 1,202,000 acres of Federal land, 426,800 acres of State lands and 2,500 acres of private lands.

WDFW is responsible for setting requirements for forest components that comprise suitable habitat. Specifically, the habitat requirements are based on modeling that utilized field data collected during habitat suitability studies which measured forest components, such as tree age and species, presence of moss and platforms, elevation, etc. that exist in forest stands known to be occupied by marbled murrelets. These specific habitat criteria were later included in the Washington Forest Practices Rules (WAC 222-16-080 (1)(j).

The current Washington Forest Practices Rules covering critical habitats, including the northern spotted owl and marbled murrelet, first became effective in July 1996 (WAC 222-16-080). Specifically, the Rules governing the spotted owl were originally negotiated by many of the same stakeholder groups that had developed the TFW Agreement (1987) and later authored the FFR (1999). These stakeholder groups included the WDFW, DNR, the timber industry (including both large and small forest landowners), environmental groups, and some Native American Tribes. One of the

central concepts of the 1996 Rules was that spotted owl conservation was strategically concentrated in specific important landscapes (Spotted Owl Special Emphasis Areas, or SOSEAs) and located primarily adjacent to Federal lands (Buchanan and Swedeen 2005) in order to offer support to efforts underway on the Northwest Forest Plan. This approach to landscape planning is consistent with prior spotted owl recovery planning efforts (USDI 1992; Hanson et al. 1993), which delineated circles around owl site centers located at nesting sites or other sites where owls were detected during surveys.

As stated in the DEIS in subsection 1.3.1.1, early in the 1990s, the stakeholder groups participating in the TFW process made a recommendation to the Forest Practices Board addressing conservation of the northern spotted owl. This recommendation, which was later incorporated into the 1996 Rules, was developed in concert with the owl strategy in the Northwest Forest Plan. Soon after this, beginning in late 1996, the TFW participants agreed to address riparian issues that arose with the listing of several salmon species in Washington. These efforts resulted in the FFR in 1999 and new Washington Forest Practices Rules effective in July 2001.

3.9.1.2 Policy

The Washington State Legislature and the Forest Practices Board have included many provisions both in RCW and WAC demonstrating a commitment to the protection of wildlife in conjunction with forest practices activities in Washington State. In the Forest Practices Act (Chapter 76.09 RCW), the Legislature declared, "forestland resources are among the most valuable of all resources in the state" and directed that State agencies work cooperatively to manage public resources including wildlife. Specifically, RCW 76.09.010 states that among other key forest resources, coincident with maintenance of a viable forest products industry, it is important to afford protection to forest soils, fisheries, wildlife, and water quantity and quality. In support of this, the Forest Practices Act includes provisions requiring the Forest Practices Board to include WDFW in key decision-making processes. This includes a representative from WDFW serving as a member on the Forest Practices Board along with representatives from other State agencies and the general public (RCW 76.09.030).

A major policy of the Forest Practices Act and the Forest Practices Board is to work toward a comprehensive, statewide system of laws and rules for forest practices which avoids unnecessary duplication and provides for interagency input and cooperation to the extent that can be accomplished without interfering with the authority of the affected Federal, State, regional and local agencies (WAC 222-50-010). Consistent with this goal, the Forest Practices Board has included additions to the SEPA that specifically provide for additional environmental review of proposed forest practices activities on forestlands governed by the Forest Practices Act (chapter 222-10-WAC). For State threatened or endangered species, as listed in WAC 222-16-080, DNR must consult with the WDFW, other agencies with expertise, including the affected Federal agency, affected Tribes, and affected landowners and require specific mitigation measures designed to reduce any probable significant impacts to the listed species (WAC 222-10-040). This includes forest practices as listed in WAC 222-16-080 that impact critical habitats (state) of threatened and endangered species which are then classified by the Forest Practices Board as Class IV-Special actions and are therefore subject to additional review and the

application of specific mitigation measures or conditions designed to reduce any probable significant adverse impacts. Forest practices that involve northern spotted owl or marbled murrelet habitat and may cause adverse impacts to the species require additional specific mitigation to maintain habitat for that species. In general, through application of the Washington Forest Practices Rules, the Forest Practices Board encourages timber harvest practices that would protect wildlife habitats, provided that such action shall not unreasonably restrict landowners' action without compensation (WAC 222-30-020(10)).

3.9.1.3 Mechanics

The Washington Forest Practices Rules governing critical habitats (WAC 222-16-080) include definitions for three general categories spotted owl habitat based on the functions it provides: old forest habitat, sub-mature habitat, and young forest marginal. Old forest habitat is the highest quality habitat and means habitat that provides for all the characteristics needed by northern spotted owls for nesting, roosting, foraging and dispersal and is followed by sub-mature habitat, which provides all the characteristics needed for roosting, foraging, and dispersal. Young forest marginal habitat is the poorest quality habitat and provides only some of the characteristics needed by northern spotted owls for roosting, foraging, and dispersal, but provides none of the characteristics typically needed for nesting. The forest components that comprise sub-mature and young forest marginal habitat differ between eastern and western Washington and include characteristics such as forest community types, canopy closure, tree density and height, vertical density, the number of snags and cavity trees per acre, etc. as listed in WAC 222-16-085 (1)(b)(i) and (ii).

Further, the current Washington Forest Practices Rules for northern spotted owls are primarily based on 10 geographically significant units across the State, which are strategically located to compliment protection efforts underway on Federal lands. These units, called SOSEAs (WAC 222-16-010 and WAC 222-16-086), which were developed in consultation with the USFWS, are further defined by the type of habitat needed for spotted owl management on a statewide, landscape level basis, to provide demographic support, dispersal support, and combination of dispersal support and demographic support. Within each SOSEA, forestlands are identified for one of these three habitat support categories, with demographic support areas being identified as those areas critical for reproductive success and dispersal support areas being necessary for the movement, or dispersal, of owls across the landscape to and from nesting, roosting and foraging areas. Without dispersal support habitats, owls would be vulnerable to predation as they move between demographic support areas.

The Washington Forest Practices Rules for northern spotted owls include management by circles but they also included provisions for landscape planning through voluntary programs including Landowner Option Plans, Cooperative Habitat Enhancement Agreements, and HCPs. Landowner Option Plans (WAC 222-16-100 titled Planning Options for the Northern Spotted Owl) are completed on a voluntary basis and are intended to provide landowners with a mechanism to contribute to the protection of northern spotted owls by considering the needs of overall population maintenance or dispersal habitat across a defined geographical area. Generally, if a landowner voluntarily enters into a Landowner Option Plan then their forest practices applications

consistent with that plan will not be classified as Class-IV Special by the Forest Practices Board on the basis of critical habitat for the northern spotted owl. Similarly, a Cooperative Habitat Enhancement Agreement (WAC 222-16-105) is also entered into voluntarily by the landowner and is intended to also add to the overall needs of wildlife by providing habitat on a landscape basis. The premise of a Cooperative Habitat Enhancement Agreement is to remove disincentives for landowners who create, enhance, or maintain habitat for northern spotted owls or marbled murrelets by providing landowners with protection against future spotted owl or murrelet restrictions caused by their enhancement activities.

Unfortunately, there have been no Cooperative Habitat Enhancement Agreements implemented to date. Two Landowner Option Plans have been completed; one totaling 540 acres, and one that is close to 300 acres. Additionally, a third Landowner Option Plan is nearing completion on approximately 50,000 acres in the I-90 East SOSEA. The 1996 Rules covering critical habitats also include provisions for landowners who voluntarily enter into a Habitat Conservation Plan or other similar agreement with the Federal government (WAC 222-16-080 (6)(a)). To date, seven HCPs for northern spotted owls have been implemented on forestlands in Washington State, while 6 have been implemented for the marbled murrelet.

WAC 222-16-080 (1)(h)(iv) allows small forest landowners an exemption from the northern spotted owl rules. This Rule states that forest practices proposed on the lands owned or controlled by a landowner whose forestland ownership within the SOSEA is less than or equal to 500 acres and where the forest practices is not within 0.7 mile of a northern spotted owl site center shall not be considered to be on lands designated as critical habitat (state) for northern spotted owls.

In addition to the Washington Forest Practices Rules covering protection of northern spotted owl habitat, provisions also exist that offer significant protection for habitats of other upland species, including marbled murrelets. WAC 222-16-080 covers critical habitats (state) of threatened and endangered species including: bald eagle, gray wolf, grizzly bear, mountain caribou, Oregon silverspot butterfly, peregrine falcon, sandhill crane, western pond turtle, and the marbled murrelet. In the case of the marbled murrelet, the Washington Forest Practices Rules include specific management directions, including a marbled murrelet special landscape area (WAC 222-16-087), restrictions from harvesting near occupied or suitable habitat (WAC 222-16-050, 060, and 070), and additional SEPA review (WAC 222-10-042). Protections for other species include primarily avoidance of known breeding sites and timing restrictions that limit management activities during the breeding season (WAC 222-16-050, 060, and 070).

The Rules governing critical habitat designate specific forest practices as Class IV-Special applications subject to review under SEPA for forest practices (Chapter 222-10 WAC). Additionally, WAC 222-30-020 (11) provides for leaving wildlife reserve trees to protect habitat for cavity nesting wildlife in accordance with geographic area, size, and tree spacing. Protection of other habitat features are also provided for in the Washington Forest Practices Rules such as identification and protection of wildlife habitat (WAC 222-30-020 (10)), protection of wetlands (WAC 222-30-020 (6), (7), and (8)), and

protection of sensitive sites such as headwater springs, alluvial fans, and side-slope seeps (WACs 222-16-010, and 222-30-021).

Likewise, as stated in Sections 4c and 4d-2 of the FPHCP, the upland conservation strategy consists of protection measures that are implemented in upslope areas outside RMZs and wetlands. The specific objectives for some of the upland strategy protection measures include: prevention or avoidance of forest practices-related landslides, prevention of mass wasting, avoidance of sediment and surface runoff from forest roads, and maintenance of surface and groundwater hydrologic regimes (for a complete list, see Appendix B of the FFR). Protection of unstable slopes and landforms are governed by WACs 222-10-030 and 222-16-050(1) while Section 16 of the Forest Practices Board Manual provides Guidelines for Evaluating Potentially Unstable Slopes and Landforms. Protection of these sites relies heavily on screening tools such as models, mapping, interdisciplinary teams, and review by a qualified expert combined with strategies for avoidance and ultimately protection through the SEPA. Protection of upland unstable slopes does two things: provides for protection of sediment delivery to streams and riparian corridors, and provides habitat protection for upland wildlife species.

Disturbance avoidance rules also apply for road and timber harvesting operations (chapter 222-24 WAC; chapter 222-30 WAC) and include timing restrictions for operations that would generally disturb nesting owls and murrelets. In the case of northern spotted owls, restrictions would limit activities within 0.25 mile of an active owl nest. For marbled murrelets, activities are limited within 0.25 mile of an active nest during the daily peak activity periods during the critical nesting season. The only exceptions to these Rules are if there is another plan or agreement in place that provides for the protection of nesting owls or murrelets.

Finally, the Revised Code of Washington includes provisions allowing for the preparation of long-term multispecies landscape management plans (RCW 76.09.350) as part of an overall landscape planning system to help achieve the following goals: 1) providing the greatest diversity of habitats, particularly riparian, wetland, and old growth habitats; 2) assuring the greatest diversity of species within those habitats for the survival and reproduction of enough individuals to maintain the native wildlife of Washington forestlands; 3) long term habitat productivity for natural and wild fish and for the protection of water quality and quantity to meet the needs of people, fish and wildlife; maintaining and enhancing fish and wildlife habitats capable of sustaining the commercial and noncommercial uses of fish and wildlife; and 4) the continued growth and development of the State's forest products industry which has a vital stake in the long-term productivity of both the public and private forestland base.

The Forest Practices Board has further implemented this direction into the Washington Forest Practices Rules allowing for a number of options for landowners to manage species on a landscape basis (WAC 222-16-080(6)). These include: i) a habitat conservation plan and ITP, or an incidental take statement; ii) an unlisted species agreement approved by the USFWS or NMFS; iii) other conservation agreement entered into with a Federal agency; iv) a rule adopted by the USFWS or NMFS for the conservation of an affected species pursuant to 16 U.S.C. Section 1533(d); v) a landscape

management plan or another cooperative or conservation agreement entered into with a State resource agency; vi) a special wildlife management plan developed by DNR in consultation with WDFW; vii) a bald eagle management plan; or viii) a take avoidance plan issued by USFWS or NMFS.

3.9.1.4 Future Direction

In late 2002, the Forest Practices Board began discussions about developing and adopting a statewide comprehensive wildlife strategy to include a comprehensive regulatory system for wildlife as stated in WAC 222-16-080(5)(b), the spotted owl rule assessment under WAC 222-16-080(8), the development of voluntary cooperative management planning process and plans as listed with WAC 222-08-035(3), and the annual general rule evaluations as directed under WAC 222-08-035(1). In November 2002, the Forest Practices Board directed WDFW to develop a wildlife work plan and also requested regular updates and status reports on the work plan. The Forest Practices Board directed that the wildlife work plan include the following elements:

- Effectiveness of the current Washington Forest Practices Rules at meeting the Forest Practices Board's intent or expectations,
- Contribution of Forests and Fish to non-riparian dependent species,
- Wildlife resource protection needs not addressed in Rules, planning process, or other means,
- Operational improvements:
- Alternate plans for family forest owners
- Improved incentives and effectiveness of wildlife planning options
- Better integration between State and Federal rules and planning processes
- Adaptive management for wildlife resources

The Forest Practices Board later adopted the wildlife work plan at their March 19, 2003, meeting and it was estimated that with the WDFW and DNR working together in consultation, it would take 2-3 years to accomplish.

In February 2004, per request by the Forest Practices Board, WDFW provided the Forest Practices Board with a "Draft Briefing Report to the Washington State Forest Practices Board Regarding Spotted Owl Status and Forest Practices Rules" (Buchanan and Swedeen 2004). The purpose of this report was to provide the Forest Practices Board with: 1) a detailed background on the spotted owl forest practices rules; 2) an update on population status of the owl in Washington; and 3) a preliminary discussion of areas of concern regarding spotted owl rule implementation.

Recognizing the continued decline of the spotted owl, and new scientific information, the Forest Practices Board made a decision at their August 2005 meeting to review the existing Rules governing spotted owl habitat. At that time, the Forest Practices Board directed DNR to notify the public of their intent to initiate review of the current spotted

owl rules. The Forest Practices Board also directed DNR to convene a group of SEPA experts from various State agencies to assess the SEPA process in order to remove obstacles that are disincentives for landowners to undertake landscape planning. DNR was further directed by the Forest Practices Board to work with USFWS and WDFW to create "regulatory harmony" between the Forest Practices Board's spotted owl rules and the ESA. The Forest Practices Board further declared that it will monitor the USFWS recovery plan and further encouraged USFWS, WDFW, and "all organizations with authority and influence" to take quick and decisive actions to address the threats to spotted owl populations posed by barred owls.

In early November 2005, the Forest Practices Board voted to enact two emergency rules and approved three resolutions to provide additional protection for northern spotted owls, citing several major factors as the cause of population declines, including barred owls, current and past timber harvest, severe weather, decline in forest health, and fire. The emergency rules established a temporary moratorium on the practice of "decertifying" spotted owl sites until June 30, 2007, coincidental with the release of a federally led recovery plan for the owl. The emergency rules also eliminated the potential for landowners without an HCP or similar agreement with the Federal government from benefiting from the actions on adjacent lands covered by such agreements. The Forest Practices Board also passed a resolution requesting DNR to conduct an operational review of procedures used when evaluating forest practices applications and notifications. Additionally, the Forest Practices Board also committed to engaging stakeholder involvement in reviewing the remainder of the Washington Forest Practices Rules for northern spotted owls and indicated a desire to actively participate in the federally led recovery planning process. The DEIS and Draft FPHCP have been modified to update information on spotted owls and Forest Practices Board actions.

One commenter said subsection 3.10 (Birds, Mammals, Other Wildlife and Their Habitats) of the DEIS suffers from a lack of a consistent outline in the species accounts. Some of the accounts have excessive detail on State regulatory context, while others have none. Since there are so many references to existing regulations, a description of the analysis and ongoing adaptive management of these regulations seems appropriate.

The Services note that although the listing status and basic habitat requirements is consistently provided for each of the species in subsection 3.10, they are treated slightly differently with respect to State regulations. Some federally-listed species have special conservation measures incorporated into the Washington Forest Practices Rules to protect them. These species, and others, are also protected through the Forest Practices Board's regulatory authority to designate critical wildlife habitat for State-listed species that may be affected by forest practices (WAC 222-16-010). This accounts for the differences between species with regard to the level of detail in a regulatory context. It is debatable whether or not this is considered excessive. See the Adaptive Management Response (subsection 3.5) for information on analysis and adaptive management related to the regulations.

One commenter said subsection 3.10 of the DEIS suffers from a lack of adherence to the purpose of the subsection. The introductory paragraph states that the subsection will

focus on species "… with a strong association with riparian habitats … (because they)… have the greatest potential to be affected by the alternatives," but the choice of species described does not appear to match this purpose. Some important species are left out and others of marginal relevance are included. This problem continues in subsection 4.10 where the same list of species is addressed in the context of each alternative.

In response, we direct the commenter to read on in subection 3.10 of the DEIS. After the language cited above, the DEIS states that "Effects on threatened and endangered species are also addressed." And later, referring to the species list, "…it is a list of sensitive species or species that have regulatory status under State or Federal statutes, and that face the potential for significant impacts under the proposed alternatives." Under NEPA, we are obligated to conduct an analysis of effects of the action to all elements of the affected human environment. Fish and wildlife, and other natural resources, are an element of the human environment that should be described and analyzed. Choosing only those species for which ESA coverage is being requested in the FPHCP would be too limiting in scope and would not fulfill the purpose of NEPA. Because the commenter did not provide the names of "some important species" that were left out or the other species "of marginal relevance," we cannot respond to the rest of the comment.

Several comments were received which describe areas within general wildlife issues of the DEIS that need more clarity or where more information is needed. Specifically, DEIS Table 3-24 should clearly state what the table is meant to represent since it includes species that are not dependent on riparian areas, does not include species that are dependent on riparian areas, and includes species that do not occur in Washington State. In addition, the listing status is confusing making it unclear if a species' status is under the ESA or not. It would be more reasonable to assess only those species listed under the ESA. Another commenter, referring to DEIS Table 3.24, said the FEIS should either delete the discussion of these species or explain their relevance to the proposed action, approval of the FPHCP, and issuance of the ITPs. Another commenter said it is unclear how species were chosen to appear in Table 3-24. Many of the species in the table do not have a State or Federal status, and there are some species with regulatory status that are missing. In general, this table is poorly justified and an unclear way to list "other species."

Further, one commenter said both DEIS subections 3.10 and 4.10 specifically address other listed species, e.g., marbled murrelet, northern spotted owl, bald eagle, Oregon silverspot butterfly, Canada lynx, gray wolf, Columbia white-tailed deer, woodland caribou, and grizzly bear. There is no information about why these species are specifically identified in the State critical habitats section of the Washington Forest Practices Rules. Lynx and Columbian white-tailed deer are not included in the Rules, and peregrine falcon, sandhill crane, and western pond turtle are included in the Rules but are not addressed in these sections. The significance of riparian dependence on some of these species is questionable, especially in the context of rule protections (e.g., wolf and grizzly). Table 3-24 of the DEIS includes species that are on regulatory lists and species that are not. This list does not appear to follow any of the already established species lists that exist elsewhere. An explanation for this species selection should be included in the DEIS. This list also includes species of questionable association with riparian

habitats and omits others. Both Sections 3.10 and 4.10 imply that birds and mammals are of more importance than reptiles and those amphibians not included in covered species list by the choice of words and organization of habitats.

In response, the proposed Federal action of issuing take authorization under ESA Section 4(d) or Section 10 have the potential to affect the human environment and, therefore, are actions subject to review under NEPA. Under NEPA, we are obligated to conduct an analysis of effects of the action to all elements of the affected human environment. Fish and wildlife, and other natural resources, are an element of the human environment that should be described and analyzed. Choosing only those species for which ESA coverage is being requested in the FPHCP would be too limiting in scope and wouldn't fulfill the purpose of NEPA, as other species may be affected by the proposed action besides those for which ESA coverage is being sought.

On the page prior to the table, the DEIS states that the table is a list of sensitive species or species that have regulatory status under State or Federal statutes, and that face the potential for significant impacts under the proposed alternatives. The listing status is footnoted to denote that State-listed or special status species have an S preceding the designation, while Federally-listed or special status species have an F preceding the designation. This is fairly straightforward. We disagree with the commenters about the species' occurrence in Washington, as all the species listed are known to occur in the State. We do agree, however, that the table clearly was not meant to identify species that are, or are not, riparian-dependent, and it is understandable how this table could be confusing, especially as to its purpose. The FEIS will contain a better explanation of the purpose of Table 3.24 within the scope of NEPA. The DEIS has been modified to reflect this comment.

One commenter said the DEIS description of the regulatory measures for the northern spotted owl in DEIS subection 3.10 are not accurate. The DEIS should definitively say that the Washington Forest Practices Rules are more conservative than the proposed ESA Section 4(d) rule was. The DEIS does a very poor job of documenting previous analyses that went into the 1996 northern spotted owl rules, and the analysis recently completed by the USFWS and cited in the Sustainable Ecosystem Institute (SEI) Report. We strongly recommend that this section be completely re-written or substantially shortened to describe only the types of habitat the northern spotted owl actually uses. The FPHCP will provide a net benefit for the northern spotted owl as it provides more habitat for the species over time. The discussion in both sections is western Washington-centric in the treatment of species and the descriptions of habitat conditions.

In response, it is not appropriate to make qualitative statements in either of the draft documents comparing spotted owl conservation/protection strategies when no comparative analysis has been conducted. This applies to any comparison of the Washington Forest Practices Rules for owls and a draft Federal proposed rule that was never finalized. This also applies to making any statements about the benefit of the FPHCP to spotted owls since that is not the focus of the conservation plan and spotted owls are not being requested to be a covered species. With respect to the focus of species and habitat discussions being mostly from a western Washington perspective, a review of

the descriptions does not support this statement. Perhaps that perception is borne by the fact that most of the covered amphibian species, as well as several of the non-fish listed species, occur primarily west of the Cascade crest. We agree with the suggestion that previous and recent analyses addressing spotted owls should be documented. The DEIS has been modified to reflect this comment.

At least two commenters said the use of literature citations lacks thoroughness in DEIS subsection 3.10 of the DEIS. Use of citations tends to include WDFW information synthesis documents, often not independently peer-reviewed; use only one or two citations repeatedly for all statements within a given section; use other gray literature (including Natureserve) instead of citing the original primary literature; and use older citations. Many sources of natural history, population trends, and management information from the late 1990s and beyond are not included, although their use would be more appropriate for the statements being made. Further, the DEIS would benefit greatly from increased attention to the benefits these other species are likely to receive from approval of the FPHCP. A great deal of peer-reviewed scientific literature on some of these species was recently completed including previous SEPA EISs that analyze how Washington Forest Practices Rules impact or protect these species.

In response, the DEIS has been updated to include information from more current citations, such as the USFWS Five-Year Status Reviews for northern spotted owls and marbled murrelets.

One commenter requested that DEIS subsection 4.10 include voluntary conservation planning efforts to address threatened and endangered species on numerous ownerships and through various conservation programs that provide a variety of protections to wildlife species.

In response, subsection 4.10 is the DEIS Environmental Effects section in the NEPA environmental review document where the effects of the alternatives are compared to the No Action Alternative. As such, this comment is not pertinent to an effects analysis of the alternatives, including the proposed Alternative 2. However, perhaps the commenter was suggesting that voluntary measures be included in the FPHCP to protect wildlife species. To that, the Services respond that the submission of an HCP is part of an applicant's application package for an ITP. It is a voluntary process whereby an applicant often develops their HCP with technical assistance from the Services. The conservation measures developed for the HCP are focused on the species for which the applicant desires incidental take coverage. While the Services encourage the applicant to also include any voluntary measures that we believe will benefit many fish and wildlife species, our decision documents focus the analyses on the activities that a permit applicant actually commits to implement to minimize and mitigate their effects to the species for which coverage is desired.

Analysis

One commenter said it is imperative that the Services consider the extent to which any HCP, (including the FPHCP which will govern logging on private land over the next 50 years) could impact the threatened population of northern spotted owls. The commenter

adds that the DEIS contains no such analysis; it merely asserts that the owl's suitable or critical habitat will not be affected by the FPHCP.

In response, the Services will consider the effects of the FPHCP on all listed species in the FPHCP action area. These effects will be documented in the ESA Section 7 biological opinions for each of the Services. The commenter is correct that the DEIS contains little analysis of the impacts of the alternatives on spotted owls. What the DEIS does do is state what relative change in habitat would occur in the No Action Alternative(s) and then compares the other alternatives to the No Action Alternative. This is what the DEIS is supposed to do. The DEIS does not assert that the owl's suitable or critical habitat will not be affected by the FPHCP. When referring to owl habitat, the DEIS says, "Increased buffer widths would likely provide additional habitat for spotted owls especially near individual owl territories or clusters of territories", and, further, "Thus, none of these alternatives would likely provide suitable nesting habitat for northern spotted owls for many years."

One **c**ommenter stated that the DEIS uses a very simplistic analysis of wildlife habitat and concludes that No Action Alternative 1-Scenario 2 would be the least protective followed by more protection under all the other alternatives. The DEIS concludes that impacts to wildlife of increased riparian buffers are basically unknown, thus, a comparison among the alternatives is impossible. This should be clearly stated for the reader.

In response, we disagree with the commenter that the impacts to wildlife of increased riparian buffers are basically unknown making a comparison among the alternatives impossible. Bear in mind that in the environmental review analysis, the Federal agencies are required to conduct an analysis that compares each action alternative to the No Action Alternative, not compare the action alternatives to each other. Although specific wildlife responses (impacts) to implementing wider riparian buffers across the landscape are not discussed, a qualitative evaluation of the effects on wildlife species that may be associated with riparian habitats for some of their life requisites is provided by comparing the degree of protection afforded to various habitat components. By definition, wider riparian buffers in all the action alternatives than the No Action Alternative 1, Scenario 2, will provide more habitat for species associated with riparian habitats and will result in better habitat conditions. The adaptive management program and/or the greater conservation measures of the action alternatives also are a marked improvement when compared to the No Action Alternative 1, Scenario 1. These comparisons are clearly shown in Table S-1 of the Summary chapter of the DEIS, and discussed in Chapter 4.

Listed Species

At least one commenter stated that timber harvest activities are noted as "factors affecting" many of the species not covered by this Plan. The FPHCP should acknowledge that the Washington Forest Practices Rules address several of these species, including northern spotted owls and marbled murrelets, but this FPHCP and the proposed ITPs cover only aquatic species and therefore the forest practices rules (and other State programs) are not addressed in the FPHCP. For each species not addressed in the FPHCP, the Services should move on to the next step in ESA consultations: are the

proposed Federal actions likely to adversely affect the species? We believe that the Services can and should make a "not likely to adversely affect" determinations for each species for which a positive "may affect" determination is made. This is because approval of the FPHCP and related Federal implementing actions are not likely to have significant adverse effects on non-aquatic listed species.

In response, the FPHCP makes it fairly clear that other listed species in the plan area are not covered species (see responses above and FPHCP Section 1-7 (Federally listed and candidate species not covered by the plan)). With respect to the comment that the Services should make a particular "effects" call for listed species that are not covered species; that is a requirement the Services must fulfill and will do so in conducting their respective ESA Section 7 biological opinions. See the Endangered Species Act response, subsection 3.1.

The Northwest Forest Plan

One commenter said the discussion of Federal lands management in the Draft FPHCP and DEIS needs to provide a more accurate assessment of the likelihood that actual management practices will recover each of the covered species in different locations on Federal lands. The FPHCP and DEIS need to be further revised to account for changes to the Northwest Forest Plan which are reducing protections for the species covered by the FPHCP, and to account for other such changes which could be easily made in the future. Further, the FPHCP and DEIS fail to account for Federal forest managers' failure to implement many of the important habitat restoration activities that were expected under the Northwest Forest Plan.

The Services note that in developing their HCP, the applicant is not required to assess the efficacy of other species conservation actions in recovering covered species being conducted in or near the HCP area, although this information may be provided to the extent that the HCP builds off these plans. The FPHCP, like other HCPs, is expected to contribute to the recovery of the covered species but they are not expected to be recovery plans in and of themselves.

In 2004, the Northwest Forest Plan was amended to clarify the language in the Record of Decision regarding implementation of the Aquatic Conservation Strategy. By clarifying that Aquatic Conservation Strategy objectives are to be attained at the fifth-field watershed scale and larger, projects that have short-term impacts, such as watershed restoration projects and timber sales, will move forward as long as they comply with all of the protective measures specified in the standards and guidelines.

The Aquatic Conservation Strategy was developed to restore and maintain ecological health of watersheds on federally-managed lands within the Northwest Forest Plan area. The four components of the Aquatic Conservation Strategy (Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration) provide the basis for protection of watershed health. The 2004 amendment did not change the Aquatic Conservation Strategy. The agencies continue to follow all aspects of the Aquatic Conservation Strategy. The standards and guidelines, which include riparian buffers and other protective measures, remain intact and continue to be implemented. In 2004, the Services produced biological opinions on the Aquatic Conservation Strategy amendment

and concluded that implementation of the Aquatic Conservation Strategy should result in maintaining or restoring properly functioning aquatic ecosystem conditions within the Northwest Forest Plan area.

In 2005, the U.S. Forest Service and the Bureau of Land Management released a monitoring report on the first 10 years of Northwest Forest Plan implementation. According to the report, nearly 60 percent of the watersheds across the plan area have improved in condition since 1994 due to net decreases in road miles, vegetation growth, and stream restoration projects, however these changes are small. Of the remaining watersheds, 39 percent did not change in condition, and three percent decreased in condition. Watersheds that decreased in condition experienced significant vegetation loss due to wildfire. Overall, the factors that positively influence watershed condition, such as road decommissioning and tree growth outpaced factors that negatively influence condition, such as road construction and vegetation losses. For example, the total length of roads built on U.S. Forest Service and Bureau of Land Management-managed lands from 1995 to 2002 was 353.5 miles; the total length of roads decommissioned or closed was 3,324 miles. The Northwest Forest Plan monitoring report is available on the internet at http://www.reo.gov/monitoring/10yr-report/.

Since forest stands take decades to recover from past forest management activities, it would be speculative to include in the DEIS an assessment of likelihood that the Northwest Forest Plan will recover covered species. Nevertheless, the fact that a majority of Washington forestlands under the Northwest Forest Plan are protected in reserves and are not available for forest management activities, and the information above indicating the relative success of the Aquatic Conservation Strategy, the belief is that the Northwest Forest Plan has a high likelihood of contributing to the recovery of aquatic species.

One commenter said that Figure 2.1 of the FPHCP may also be significantly overestimating the extent to which different Federal forests are in protected status. The map should be revised to clearly show the exact designation and status of different forestland categories. This commenter goes on to state that, given potential and likely future reductions in protections for late successional reserves and administratively protected areas, these areas should not be shown as being in protected status on this map, except where a case by case analysis of these areas warrants such conclusion. More generally, the FPHCP and DEIS should only consider Federal lands to be in protected status where there are assurances that such status will be maintained over the long term.

In response, the figure to which the commenter refers is provided to give the reader a coarse-scale view of how forested lands are managed across the State. The text following the figure provides the detail the commenter requests. As far as "potential and likely future reductions in protections" of Northwest Forest Plan lands, the premise and expectation of the Northwest Forest Plan land designations is that they will be in place for the long-term. To assess whether or not these lands are assured of long term protection would be highly speculative, given the purpose and objectives stated for the Northwest Forest Plan.

Species-specific Comments

One commenter said the FPCHP should not include any commitments or lead readers to believe that commitments have been made with respect to northern spotted owls or other non-aquatic species.

In response, the commenter does not indicate where in the FPHCP document the reader is led to believe that commitments to other species besides the covered species, i.e., Washington native fish, anadromous fish, and seven species of stream-associated amphibians, is intimated. The covered species are clearly identified in the FPHCP in the Executive Summary, the Introduction, and Chapter 3. The conservation plan, which includes Washington Forest Practices Rules that address riparian and aquatic species and their habitats, as well as the adaptive management program, are clearly directed at these covered species. Further evidence that the commitments of the FPHCP are directed at the covered species is provided in Chapter 4, Rationale for the Plan. The NEPA environmental review document, on the other hand, must analyze the effects of the action on all fish and wildlife resources in the plan area that may be significantly affected, whether or not they are covered species. An effects analysis in the NEPA is not meant to imply that the FPHCP contains commitments for non-covered species.

Several commenters said more information, including recently completed status reviews, should be included in the sections describing some of the listed species, e.g., northern spotted owls, marbled murrelets, and bald eagles, that address population declines and the factors behind low populations, including continuing loss of habitat, climatic conditions, and other factors. Another commenter provided comments regarding editorial type changes for specific species accounts and requested that inaccurate or misleading statements be removed from the DEIS.

The Services respond that although the commenter did not identify where in the DEIS the inaccurate or misleading statements were, both the DEIS and the Draft FPHCP will be revised by the Services and the State, respectively, to incorporate edits, provide additional information and/or analyses as appropriate, and to correct any known inaccuracies. The FEIS includes information from more current citations, such as the USFWS Five-Year Status Reviews for northern spotted owls and marbled murrelets. The literature update also includes more recent reports on owls (Anthony et al. 2004; Courtney et al. 2004) and murrelets (McShane et al. 2004).

3.9.2 Amphibians

One commenter stated that the DEIS and proposed FPHCP do not provide an adequate basis to find that the proposed FPHCP will prevent significant impairment of the survival of the seven covered amphibians. Key problems related to amphibians include: significant portions of smaller streams are vulnerable to clearcut timber harvest, there are no clear metrics established to define the allowable limits of logging-associated impacts, preventing meaningful quantification of take, monitoring, and adaptive management.

The Services disagree that the DEIS and proposed FPHCP do not provide an adequate basis to find that the FPHCP will prevent impairment to the survival of the seven covered amphibian species. The Services believe that the no-harvest buffers on approximately 50

percent of non-fish-bearing Type Np streams and the additional protections on sensitive sites (WAC 222-30-021(2)(b)) protect the majority of habitat used by the amphibians included in the FPHCP. CMER's Type N Sensitive Site Program includes several specific projects to confirm that the FPHCP is in fact protecting the best and also the majority of habitat used by the seven amphibians (FPHCP Appendix H). Resource Objectives identified in Schedule L-1 (FPHCP Appendix B) are required elements of the FPHCP. The Draft FPHCP has been modified to reflect this requirement. Performance targets, also identified in Schedule L-1, provide the metrics or measurable criteria to meet the Resource Objectives. Performance targets are not expected to change dramatically over the life of the FPHCP, however, they may change somewhat as science evolves and new information changes what was known at the time Schedule L-1 was written. The Services would be involved in any proposed changes to performance targets and have the authority to suspend or revoke ITPs should the performance targets change in a manner that the Services determine do not meet the required Resource Objectives.

Another comment stated concern about the high level of risk associated with the current riparian strategy for non-fish-bearing perennial streams, non-perennial streams, and unstable areas, including but not limited to those with high delivery potential to downstream waters. The findings of the Type N Stream Demarcation Study clearly indicate that the default basin size criteria being used to make the Np/Ns call under-identify perennial streams. This CMER-generated information already is in hand, and it supports a significant change in the application of Np buffers replacing the current, inaccurate default criteria for perennial initiation points with a more accurate set of criteria that would bring more stream miles into Np protective buffers. This improvement would greatly benefit the covered amphibians, and such a change at the Plan proposal phase would greatly increase the credibility of the applicant's adaptive management program.

In response, the CMER report, Type N Stream Demarcation Study – Phase 1: Pilot Study, was forwarded to the TFW/FFR Policy Group and they subsequently recommended a course of action on August 16, 2005, for the Forest Practices Board to consider (Palmquist 2003). Briefly, the results of the study indicated that the default basin sizes for determining stream perennial initiation points in the current Washington Forest Practices Rules are incorrect. The TFW/FFR Policy Group recommended that the default basin sizes be eliminated from the Rules and the language in WACs 222-16-030(3) and 222-16-031(4) be replaced with language that refers landowners to Forest Practices Board Manual Section 23 to locate perennial initiation points in the field. The Services anticipate that the Forest Practices Board will approve this recommendation, as this recommendation was a consensus decision among the TFW/FFR Policy Group stakeholders.

At least one commenter stated that at present, the adaptive management program's link to policy changes is not developed in enough detail to support approval of an HCP. For example, it must be explicit that measurable criteria (i.e., performance targets) are adequate to assess the sufficiency of the FPHCP to meet biological objectives, and exactly how these targets will be measured. For example, specific provisions of the Forest Practices Board Manual on adaptive management will need to become part of the

conservation commitments made in the FPHCP itself, as will certain core monitoring and rule tool programs of the CMER Work Plan.

The Services believe that the adaptive management program's link to changes in the current Washington Forest Practices Rules is illustrated in the two recent recommendations for rule changes by the TFW/FFR Policy Group: the Type N Stream Demarcation Study – Phase 1: Pilot Study (Palmquist 2003) and the Validation of the Western Washington Riparian Desired Future Condition (DFC) Performance Targets in the Washington State Forest Practices Rules with Data from Mature, Unmanaged, Conifer-Dominated Riparian Stands (Shuett et al. 2005). Both of these studies showed that numerical targets in the current Washington Forest Practices Rules were incorrect. The TFW/FFR Policy Group submitted consensus recommendations, based on the results of each of these studies, to the Forests Practices Board. The Services anticipate that Forest Practices Board will approve these two TFW/FFR Policy Group recommendations for rule changes.

The recently approved Adaptive Management Board Manual Section 22, Guidelines for Adaptive Management Program, contains the necessary elements to implement the research, monitoring, and technical rule tool development that is required under WAC 222-12-045 (Adaptive Management). The Services acknowledge that current research and monitoring projects and their priorities are described in the latest version of the CMER Work Plan (FPHCP Appendix H) and that over time the resulting science may change future projects and priorities. However, the FPHCP identifies Resource Objectives in Schedule L-1 of the FFR (FPHCP Appendix N) that are required elements of the FPHCP. The FPHCP has been modified to reflect this requirement. These Resource Objectives guide research and monitoring projects and priorities. If these Resource Objectives change in the future, the Services' consent is required. Further, Section 10.2 of the Implementation Agreement gives the Services the authority to initiate adaptive management research proposals.

A commenter stated that the FPHCP's protected area design does not capture all potential habitat for the covered amphibian species, which is likely to leave significant stretches of important streams and site-specific habitat open to logging, including large clearcuts, and associated activities, leading to local extirpations and increased habitat fragmentation. The FPHCP does not adequately recognize the extent to which the covered amphibians have limited dispersal ability, and thus require habitat connectivity and protection of a large percentage of potential habitat. Large clearcuts in upland areas still are allowed under the FPHCP, which are likely to severely limit populations of tailed frogs. The USFWS has recognized that riparian and aquatic strategies consisting of buffers averaging less than 100 feet may not be adequate on small streams, and the extreme sensitivity of some wetlands, seeps, springs, and source areas may necessitate even larger buffers (USFWS 1998). The currently applied riparian protections on small streams do not provide reasonable assurance that significant take of amphibians will occur.

In response, no HCP would ever be held to a standard to protect "all potential habitat" for any particular covered species. The standards that are required for the Services to issue ITPs for an HCP are the issuance criteria described in the Services' implementing

regulations (50 CFR 17.22(b)(2) and 50 CFR 222.307(c)). In particular, the Services must find that an HCP applicant minimizes and mitigates, to the maximum extent practicable, the impacts of their taking (of covered species) and that the taking (of covered species) will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

The extent to which upland harvest may limit tailed frogs has not been well studied. The few studies that have looked at riparian and upslope differences show that juvenile and adult tailed frogs are more often found in riparian areas compared to upslope areas (Gomez and Anthony 1996; McComb et al. 1993). Individual tailed frogs that forage outside of the FPHCP's RMZs or that migrate between watersheds could be adversely affected by upland harvest under the FPHCP. However, the Services believe the majority of tailed frog habitat will be protected under the FPHCP's riparian strategies.

The statements made in USFWS (1998) about buffers averaging less than 100 feet not being adequate to protect the needs of stream-associated species do not account for the buffers that are included in the FPHCP on sensitive sites (i.e., seeps and springs). However, the FPHCP limits protection of sensitive side-slope seeps to those within 100 feet of a non-fish-bearing, perennial (Type Np) stream. There is uncertainty about the need to buffer other sensitive sites to protect covered amphibian species. So, under CMER's Type N Sensitive Site Program there are two projects nearing completion that address whether sensitive sites important to amphibians are correctly identified by the Washington Forest Practices Rules. These two projects are the Stream-Associated Amphibian Sensitive Site Identification Methods Project and the Stream-Associated Amphibian Sensitive Site Characterization Project (FPHCP Appendix H). Further, the Type N Buffer Characteristics, Integrity and Function Program and the Type N Amphibian Response Program are top priorities in the CMER Work Plan to determine if the FPHCP is protecting the habitat used by the seven covered amphibian species.

One comment stated that in all RMZs, up to 20 percent of the buffer length may be cleared for yarding corridors to facilitate logging operations, and road crossings are permitted.

In response, all trees felled in a yarding corridor within the core zone of an RMZ must remain within the core zone (WAC 222-30-021(1)(a)) and are not allowed to be hauled off site for commercial purposes. Within the inner zone, a landowner must still meet the DFC basal area requirements (WAC 222-30-021(1)(b)). Because of these requirements, there is not much reason for a landowner to create yarding corridors for the sake of harvesting the trees within the corridor itself. Anecdotally, stream-crossing, yarding corridors are not extensively used. Landowners generally yard trees with ground-based equipment or cable yarding that avoids the need for a corridor across an RMZ (S. Butts, USFWS, Personal Communication, October 26, 2005).

Trees felled for a road crossing may be removed off site, except as needed to meet DFC requirements. However, the cost associated with a road crossing structure (i.e., culvert, bridge) and installation should offset the desire by a landowner to put in a road crossing unless it was the only reasonable means of accessing timber. Even so, there may be effects on covered species from such activities and these effects were acknowledged in

the DEIS. This would also be addressed in the Services' ESA Section 7 intra-Service biological opinions on the issuance of ITPs.

At least one commenter stated that adaptive management studies relative to the accuracy of initial basal area values to approximate mature forest conditions indicate a need to increase the basal area retention in the managed portion of buffers (DFC study). These changes would decrease management impacts on covered amphibians and should be incorporated into the proposed plan rather than being deferred to a subsequent process.

In response, CMER completed the following study: Validation of the Western Washington Riparian Desired Future Condition (DFC) Performance Targets in the Washington State Forest Practices Rules with Data from Mature, Unmanaged, Conifer-Dominated Riparian Stands (Shuett et al. 2005). This study showed that the basal area targets in the FPHCP are significantly different from the values determined from the study. The TFW/FFR Policy Group formally recommended to the Forest Practices Board that they commence rule-making to determine a full range of alternative approaches to the issues presented in the DFC study. The Services fully expect the Board to take action on this to reconcile DFC basal area targets in a timely manner.

One commenter stated that small non-fish-bearing, non-perennial streams are estimated to comprise a majority of stream miles throughout timberlands in Washington. Requirements on these streams and perennial non-fish-bearing streams are not adequate to protect amphibians from adverse sediment impacts and reduction of key organic habitat components such as large wood.

In response, some portions of non-fish-bearing, perennial streams (Type Np) and most seasonal, non-fish-bearing streams (Type Ns) would not be required to receive buffers under the FPHCP. The Services believe that the majority of habitat needed by covered amphibians is addressed by the prescriptions in the FPHCP. However, adverse effects on covered species may result from these unbuffered portions of Type Np and Ns streams. This potential effect was acknowledged in the DEIS. Also, this would be addressed in the Services' ESA Section 7 intra-Service biological opinions on the issuance of ITPs. Further, research on Type N streams is a top priority under the CMER Work Plan (FPHCP Appendix H).

One commenter stated that the removal of existing trees within the range of deliverability of any size may deplete future potential sources of large wood. Such actions can effectively impede the rate of recovery of mature riparian stands, an impediment which goes into effect immediately, not some time in the future as is implied in the plan rationale and DEIS. Actions that impede recovery of large wood sources have real ecological impacts that should be recognized and prevented where amphibian species recovery also is impeded. This impact would appear to be inconsistent with the legal requirements for issuance of an HCP, necessitating a finding that the survival and recovery of species in the wild must not be significantly impaired, or jeopardized.

In response, the Services must determine if the FPHCP meets the issuance criteria in 50 CFR 17.22(b)(2) and 50 CFR 222.307(c). If the FPHCP meets the issuance criteria, the Services are required to issue ITPs. However, the issuance criteria are much broader and

more complex than one specific habitat element (e.g., large wood) on a portion of an HCP's project area (e.g., Type Np streams). An HCP may have adverse effects and result in take of listed or covered species included in the HCP. This is the reason that ITPs are issued for approved HCPs. So, adverse effects or take are not inconsistent with the legal requirements for issuance of an HCP so long as the HCP (and applicant) meet the issuance criteria. See also the Endangered Species Act response, subsection 3.1.

A commenter stated that due to the primarily procedural nature of the protections provided for landslide-prone landforms and the focus on identification of only the very highest risk sites, there is a substantial likelihood that forest practices which increase the rate and change the overall impacts of landsliding will nonetheless be permitted to go forward. The site-by-site application of forest practices mitigations through the SEPA process does not ensure uniform application of adequate management practices to high risk landforms. Although microhabitat features such as seeps, talus piles, and down wood aggregations are likely to overlap significantly with unstable area landforms that trigger Class IV SEPA analysis, it is not clear the extent to which this is true or that consistent management prescriptions are applied to such areas that would prevent amphibian population declines from management in these areas. These issues can and should be addressed in the decision documents.

In response, the Services disagree that only the "very highest risk sites" are subject to identification and evaluation for potential resource impacts from proposed forest practices. CMER's Unstable Landform Identification Program includes two projects (among others), the Landslide Hazard Zonation Project and the Regional Unstable Landform Identification Project, that are partially complete (FPHCP Appendix H). The goal of the Landslide Hazard Zonation Project is to create a screening tool to describe and map all potentially unstable slope areas in watersheds that include lands regulated by the Washington Forest Practices Rules. The goal of the Regional Unstable Landform Identification Project is to identify unstable landforms that do not meet the present statewide landform descriptions. The project also serves as an interim screen for deep-seated landslides by identifying lithologies that promote deep-seated landslides; however, it is not intended to map them. The results of this program are being incorporated into the Landslide Hazard Zonation Project.

In addition to the above projects, the FPHCP and the Washington Forest Practices Rules include opportunities for cooperating agencies and organizations, and the general public, to review and comment on proposed forest practices through an internet-based system known as the Forest Practices Application Review System. Also, representatives of cooperating agencies and organizations frequently participate in interdisciplinary team reviews of forest practices applications by providing DNR staff with technical input on potential hazards (including unstable landforms) and risks to public resources and providing recommendations to avoid and/or reduce those risks. The Forest Practices Board recognized the success of these cooperative opportunities by creating a Rule to utilize this approach when resolving conflicting issues (WAC 222-12-044).

The comment suggests that the SEPA process does not ensure a uniform application of management practices to address unstable landforms. Unstable landforms are not

uniform and therefore a uniform application of management practices would not address the varied nature of these landforms. The Services believe the evaluation of unstable landforms by a qualified geotechnical expert allows for tailored prescriptions to adequately address these landforms through SEPA (WAC 222-10-030).

At least one commenter stated that the DEIS concedes that current conditions on the covered forestlands are much degraded from historical conditions. It therefore seems likely that the current number and distribution of the covered amphibians are greatly reduced from historical patterns. The highly degraded status of most riparian areas on the plan area increases the likelihood that intensive upland logging activities will adversely affect stream and near-stream environments in the near-term.

In response, Table 3-18 of the DEIS estimates that approximately one percent of the westside covered land streams and five percent of the eastside covered land streams are within late seral forests. The DEIS defines late seral as forests with greater than 70 percent conifer crown cover, more than 10 percent of the crown cover must be in trees greater than or equal to 21 inches diameter at breast height (dbh). Table 3-18 estimates that approximately 21 percent of the westside covered land streams and 34 percent of the eastside covered land streams are within mid-seral forests. The DEIS defines mid-seral as forests with greater than 70 percent conifer crown cover, less than 10 percent crown cover in trees greater than or equal to 21 inches dbh. The DEIS acknowledges that past timber management activities have substantially increased the amount of early seral forests on covered lands, including riparian areas. The Services acknowledge that the current number and distribution of covered amphibians that depend on late seral forests are, therefore, likely reduced from historical patterns. However, the DEIS states that the current Washington Forest Practices Rules, in effect since January 1, 1999, form the basis for the FPHCP and would result in a greater amounts of late seral forests in riparian areas over the long-term. The Services believe this outcome will provide improved habitat conditions for the covered amphibian species.

One commenter stated that the FPHCP downplays the importance of management impacts occurring outside riparian areas and unstable slopes as defined by the Rules. Effects on microclimate and sediment regimes are potentially severe. The effects analysis in the FPHCP takes into consideration only the effects of management on 404,420 acres of the 9.3 million acres covered by the FPHCP – or 4.4 percent of the land base – by finding that all other areas are protected and therefore need not be analyzed. This analysis seriously under-represents impacts from harvest and associated activities in upland areas, active riparian management outside no-harvest zones, management of unstable slopes, and impacts from management adjacent to the unbuffered portions of Type Np streams.

Amphibian and riparian habitat does not exist in isolation from the surrounding terrestrial landscape, so an HCP that ignores upland forest management practices fails to realistically assess the threat to, and response of, the aquatic and riparian systems. The effectiveness of riparian buffers at controlling microclimate and sediment are strongly influenced by upslope land use. Treating riparian management as independent from upslope practices ignores the connection between riparian processes and upland forests.

The Services believe that the FPHCP riparian strategies protect the majority of habitat used by the covered amphibian species and also provide properly functioning riparian and aquatic conditions. However, priority research programs under CMER are the Type N Buffer Characteristics, Integrity and Function Program, the Type N Amphibian Response Program, and the Type F Statewide Prescription Monitoring Program (FPHCP Appendix H). The objective of each of these programs, in part, is to determine the effectiveness of the riparian strategies in the FPHCP to meet the Resource Objectives in Schedule L-1 (FPHCP Appendix N).

A commenter suggested that many of the performance targets for amphibians are disclosed in the FPHCP; however, their biological basis is not. The FPHCP recognizes the substantial uncertainty for amphibians inherent in its partial-buffer strategy by calling out as priorities for adaptive management studies the effectiveness of Type N buffers and the response of amphibians to these buffers. However, despite the broad and impressive research program that has been instituted by CMER, the FPHCP itself fails to build in any hard and fast adaptive management feedback loops that provide any degree of certainty that the information generated by this research actually will result in management changes. Unless the response mechanisms to new data are "hard wired" into the FPHCP, there is simply no basis to rely upon adaptive management as being part of the FPHCP.

The commenter is directed to the Adaptive Management response (subsection 3.5). The Services believe the FPHCP does have a strong feedback loop for management changes based on new science, including CMER generated science.

At least one comment suggested that increased sedimentation may have the greatest impact on amphibians in Type Np and Ns streams. Changes in sediment load should be part of the adaptive response for these streams.

The Services agree that increased sedimentation from activities included in the FPHCP may have an affect on amphibians in Type N streams. CMER's Type N Buffer Characteristics, Integrity and Function Program includes at least one specific project (Type N Experimental Buffer Treatments Project) in which sediment is one of the input measured variables. This project is currently underway with site selection nearly completed (FPHCP Appendix H).

Another comment stated that the FPHCP's overall performance goal for amphibians is to support their long-term viability (Schedule L-1, FPHCP Appendix N). But it is never quite clear what specific conservation commitment is being made in that the meaning of support is not translated into specific habitat or population targets. How viability of amphibians will be assessed is unclear, although the implication is that current levels are adequate to achieve this goal. Given that the entire FPHCP area and its immediate surroundings have been intensively logged, existing conditions do not state an appropriate baseline. Further, we caution that mere occurrence should not be the metric used to assess amphibian populations. Given the considerable uncertainty over how amphibian population units should be configured for purposes of determining their conservation status, the current proposal would benefit from further explanation of how a "no jeopardy" finding will be arrived at for the covered amphibian species. Given that

these species are not wide-ranging, it is likely that treating them as single species across the entire FPHCP area is biologically and legally inappropriate. For example, tailed frog populations show major genetic differences among watersheds and most torrent salamanders are highly distinct between watersheds.

In response, Schedule L-1 (FPHCP Appendix N) specifies Resource Objectives that are required elements of the FPHCP. The Draft FPHCP has been modified to reflect this requirement. The Resource Objectives are designed to meet the Performance Goals, one of which is the long-term viability of covered amphibian species. The measurable criteria for determining if the Resource Objectives are being met are the Performance Targets. While these targets may change as new science shapes our understanding of forestry effects on resources and habitat for covered species, Section 10 of the Implementation Agreement (FPHCP Appendix A) specifies that if the Services determine that the State has not conducted such adaptive management monitoring, evaluation, and research as the Services determine is necessary to meet the Resource Objectives, within a timeframe that the Services determine is reasonable, or has not modified the Washington Forest Practices Rules in a manner that the Services determine is appropriate in response to adaptive management information or changed circumstances, the Services will notify the State of the actions that are necessary to avoid suspension or revocation of ITPs. The Draft Implementation Agreement has been modified to reflect this change. USFWS's ESA Section 7 intra-Service biological opinion will include a jeopardy analysis of covered amphibian species.

One commenter stated that the sheer size of the FPHCP area warrants a full analysis of all affected amphibian species. Declines in abundant species should not be contributed to, especially given the important trophic role these species are likely to play.

The Services note that in subsection 3.10.4 (Wildlife in Upland Forested Habitats) of the DEIS there is a discussion of early, mid-, and late seral forests and the wildlife habitat that is provided by these forest stages. There are general statements about terrestrial amphibian use in early seral forests. The discussion on late seral forests is not specific as to the habitat provided for terrestrial amphibians. The DEIS has been modified to reflect this omission. Subsection 4.10.2.1 (General Effects) also has been modified to be inclusive of terrestrial amphibians.

One commenter suggested that the FPHCP fails to provide the impact minimization measures recommended for amphibians by other important scientific and wildlife management sources, as well as providing measures specific to the needs of each covered amphibian species.

The Services believe the FPHCP's riparian strategies protect the majority of habitat for the covered amphibian species. However, the adaptive management program and the research and monitoring included in the CMER Work Plan (FPHCP Appendix H) will help to confirm that the majority of, and the highest quality, habitat for covered amphibian species is protected with the riparian strategies.

Another commenter stated that the amphibians covered by the FPHCP rely heavily on non-Federal forests, meaning the adequacy of the FPHCP's conservation measures is likely to play a large role in their survival and recovery.

The Services agree with the comment and believe the FPHCP will contribute to covered amphibian species' survival and, in the future, their recovery should they become listed.

At least one commenter stated that virtually all of the amphibian-specific targets are still in development, making the bottom line for the FPHCP highly reliant on the monitoring and enforcement of State water quality standards, which were not developed specifically to protect amphibian species. In order to meet antidegradation requirements, an activity must not partially or completely eliminate any existing use, which includes all aquatic life. This means that water quality impacts cannot cause mortality or significant growth or reproductive impairment of resident species. This standard has strong implications for the degree of protection that must be afforded amphibians in their aquatic life stages.

The Services agree that the Washington Forest Practices Rules must be consistent with State water quality standards. These standards are developed by Ecology under the Washington State Water Pollution Control Act. The standards, which include provisions to protect existing water quality (Ch. 173-201A WAC Part III Antidegradation), are reviewed periodically to ensure protection of beneficial uses based on best available science. Temperature requirements for multiple species, including stream-associated amphibians and macro-invertebrates were considered during development of the 2003 State Water Quality Standards; sensitive "key species" were selected to aid in identifying aquatic communities requiring unique temperature criteria to ensure all the resident species are fully protected.

Another commenter stated that temperature regimes should be monitored, but monitoring should recognize that biological threshold temperatures are upper limits for survival, and that thermal stress can result from prolonged exposure to sub-threshold levels. A 7-day moving average temperature as the monitoring threshold should not be used because it can mask peak temperatures. It would be most appropriate to use a 7-day moving maximum temperature as an adaptive management trigger. Tailed frogs are intolerant of temperatures greater than 18.5 degrees C and temperatures above 26 degrees C are lethal to torrent salamanders.

The Services agree that a 7-day moving maximum temperature is most appropriate, and that is what is used in the 2003 Washington State Water Quality Standards. Temperature requirements for multiple species, including stream-associated amphibians and macro-invertebrates were considered during development of the 2003 State Water Quality Standards; sensitive "key species" were selected to aid in identifying aquatic communities requiring unique temperature criteria to ensure all the resident species are fully protected. The 7-day average daily maximum temperature standard in headwater streams ranges from 12°C to 17.5°C, depending on the watershed, with 16°C being the most prevalent standard. State water quality standards include antidegradation.

3.10 FOREST CHEMICALS

One commenter suggested that the effects of regulated forest chemical use should be analyzed in the cumulative impact section of the FEIS. Commenters are reminded that the purpose of the DEIS is to promote disclosure, analysis and consideration of the broad range of environmental issues surrounding a proposed Federal action by looking closely at a full range of reasonable alternatives and comparing them to "no action." Compared to No Action Alternative 1-Scenario 2, the other alternatives contain additional requirements targeting the protection of water resources from pesticide applications (see DEIS, subsection 4.5.1.1).

Although forest chemical activities are not included as a proposed covered activity in the State's application for incidental take authorization under Alternative 2, Alternative 3, and Alternative 4, some of these alternatives allow for pesticide application over dry segments of some watercourses. The environmental effects of other forest practices are addressed in Chapter 4 of the DEIS. Chapter 4, therefore, is the appropriate chapter for the analysis of the effects of regulated forest chemical use.

Several commenters suggested that the Services should consider covering the application of forest chemicals under the ITPs because "it is tough to prove that forest chemicals cause take." Other commenters stated that no problems have been found from forest chemical applications, even though pesticide runoff from other land uses has exceeded guideline concentrations and drinking water advisories. At least one commenter was concerned about allowing forest chemicals over dry portions of some ephemeral streams. The Services have not consulted on the direct or indirect effects of the EPA's Office of Water's water quality criteria or State water quality standards on covered species. Therefore there is no assurance that the criteria and/or standards are over protective or under protective. Furthermore, current water quality criteria address fewer than 10 pesticides, half of which are banned or not used anymore (e.g., DDT and DDE).

The Services are familiar with substantial literature on the toxicity of various herbicides on salmonids, although most of the information comes from laboratory studies focusing on acute lethal doses and not on chronic toxicity (Spence et al. 1996). It is inherently difficult to find and document affected or dead fish resulting from field exposures to forest chemicals; this does not imply that there is no harm and no take. Therefore, a weight of evidence approach is appropriate to characterize use, exposure, and effects to ultimately determine harm and take probabilities.

The Services recognize that if contamination of surface waters occurs and results in sufficiently high concentrations of a chemical, impacts to salmonids and designated critical habitat will occur including acute and chronic toxicity, leading to injury or death, behavior modifications, reduced growth, decreased reproductive success, and increased vulnerability to diseases and pathogens (reviewed in Beschta et al. 1995; Fairchild et al. 1999; Peterson et al. 2001a; Peterson et al. 2001b; Woods et al. 2002; Sandahl and Jenkins 2002; Amweg et al. 2005; Anderson and Lydy 2002; Preston 2002; Lydy et al. 2004; Lydy and Austin 2005).

The Services are currently engaged in consultation with the EPA on the authorization of most agricultural uses of a number of active pesticide ingredients (including commonly used forest chemicals) within 20 yards (and aerial application within 100 yards) of salmon streams in California, Oregon, Idaho, and Washington. Given the ongoing programmatic consultation on pesticides, the Services have adopted a policy to refrain from issuing take coverage for the application of forest chemicals until the EPA has completed its consultation obligation. Therefore, the application of forest chemicals will not be covered under the ITPs, should they be issued for the FPHCP.

3.11 COMPLIANCE AND ENFORCEMENT

3.11.1 Compliance Monitoring

Many commenters expressed concerns about the importance of funding and implementing the compliance monitoring program. In addition, tribal commenters, in particular, asked to be involved in the design, development and evaluation of the compliance monitoring program. Others felt that in order for the compliance monitoring program to be credible and defensible, it should be held to the same standards of scientific rigor as other CMER directed adaptive management monitoring projects. Commenters also suggested that the design of the compliance monitoring program include more frequent compliance checks for forest practices involving wetlands, riparian crossings, and/or road construction - and those forest practices with lower risks to public resources receive less frequent checks. It was also suggested that DNR randomly select applications for pre and post application review since it was felt that forest practices foresters have a lot of flexibility in determining which forest practices to field check and which receive approval based only on an office review. A commenter thought that Class II forest practices should also be included in the review, since it was felt that those applications receive minimal review by DNR and can be reclassed if classed incorrectly.

Others expressed the view that the Forest Practices Board has failed to conduct compliance monitoring and without the compliance monitoring program, it will be impossible to have an effective adaptive management program. They noted the importance of the linkage between the compliance monitoring program results and the adaptive management program, which includes both effectiveness and validation monitoring.

There were also concerns that DNR has struggled to make progress, or has made little progress with the compliance monitoring program along with the suggestion that it iss premature for the Services to approve the FPHCP until compliance monitoring can show that the Washington Forest Practices Rules as described in the FPHCP are working as intended. In that same light, several noted that the formal compliance monitoring program should be finalized and outcomes fully assessed before issuing the 50-year ITPs.

Several commenters noted that there is extensive observational and empirical tribal data that displays, in their view, both the inadequacy of the existing Washington Forest Practices Rules and the severe lack of compliance monitoring or enforcement of these Rules. They noted that DNR has focused their efforts on the up-front forest practice application review and compliance, leaving little time for enforcement efforts. They also noted that forest practice foresters currently see only a percentage (roughly 50 percent) of

applications before they are approved and see an even smaller percentage (roughly 10 percent) during or following harvest activities for enforcement or compliance. And that often the only chance forest practice foresters get to see or review implementation and the associated impacts is when driving by projects in progress or completed. They commented that since most forest harvest units are not along mainlines and are located in remote parts of tree farms; infractions such as sedimentation may largely go unnoticed by most regulators or stakeholders. Others noted that to fully implement existing laws and to tackle existing workloads of pre- and post-harvest enforcement and compliance, two to three forest practice foresters would be needed for every one that exists currently.

Several commenters expressed concerns about the effectiveness of the DNR compliance monitoring and enforcement programs in light of the increasing complexity of the Washington Forest Practices Rules with the implementation of FFR. Other commenters expressed the view that the FPHCP's data on the rate of compliance with the Washington Forest Practices Rules is flawed in that it does not indicate which violations pertained to the Rules that were implemented to be consistent with FFR. They noted that there is no indication of the severity and impact of the violations and that a relatively low number of high impact violations may be just as significant as a high number of low impact violations. A commenter was also concerned that the DEIS and Draft FPHCP ignored the results of a 1995 TFW Field Implementation Committee's Forest Practices Compliance Survey that the commenter thought showed that the DNR enforcement programs to be insufficient to consistently produce high levels of compliance.

The Services believe it is important to have a reasonably accurate expectation of the level of compliance in order to correctly anticipate the conservation benefits provided by each alternative. The Services believe that expectation can be established by a review of the existing DNR compliance program and the compliance monitoring program proposed in the FPHCP.

DNR began work on the formal compliance monitoring program in 2004. Funding for the next biennium (2005-2007) includes approximately $1.9 million supporting the compliance monitoring program, with approximately $170,000 passed through to WDFW and $269,000 to Ecology. According to DNR, the objective of the compliance monitoring program is to determine if forest practices are being conducted in compliance with the Washington Forest Practices Rules in effect since July 2001 (effective date of the Rules consistent with FFR). WAC 222-08-160 directs DNR too "provide statistically sound, biennial compliance audits and monitoring reports to the board for consideration and support of rule and guidance analysis." The program is designed to be responsive to evolving needs, and works initially to address Rules having the greatest influence on the protection of aquatic resources. The program uses a random sampling method in order to estimate the proportion of completed forest practices activities that are in compliance with the Rules being reviewed. An internal working group led by DNR and including representatives from the DNR Forest Practices Regulatory Program, Ecology, WDFW, and USFWS has developed an initial framework for the compliance monitoring program, which includes the following components:

- determining which Rules to review first,

- identifying the type of data to be collected,
- determining sampling methods, sample size, and measurement techniques,
- deciding how data will be analyzed, processed, and reported,
- designing a preliminary assessment to test the process, and
- resolving funding, staffing, equipment, and training needs.

An external review committee assists the internal work group by reviewing the program, offering suggestions for design improvement and assisting in prioritizing the Rule selection process. Its members represent the above mentioned organizations in addition to the following groups: large industrial forest landowners, small non-industrial forest landowners, EPA, Tribes, the conservation caucus and NMFS. The compliance monitoring program will be sharing its processes and reporting its results to the CMER directed monitoring programs within the adaptive management program.

The Services are aware of a preliminary assessment, conducted in late 2004 by DNR that reviewed compliance with the RMZ rules adjacent to fish-bearing (Type S and Type F) streams - WAC 222-30-021, 222-30-022, and 222-30-040. Applications were reviewed following the effective application period (2 years) to determine whether the RMZs were designed and laid out correctly with the proper number and species of trees left post-harvest. Future compliance monitoring efforts may occur during the life of the application, depending on the Washington Forest Practices Rule(s) being reviewed. In addition to collecting compliance data, the preliminary assessment served as a "dry run" to gain a clearer picture of staffing, budget and equipment needs; a refinement of statistical methodology and data needs; an ironing out of logistical challenges; and a final determination of the field data collection procedures and forms.

The compliance monitoring workgroup for the road construction, maintenance and abandonment rules is scheduled to begin in July 2007. Subsequent phases of the compliance monitoring program include surveys of the Rules covering:

- Type Np & Type Ns streams,
- perennial initiation points,
- sensitive sites,
- unstable slopes,
- exempt 20 acre parcels,
- alternate plans, and
- wetland management zones.

The preliminary assessment process and results, as well as an update to the compliance monitoring program, has been added to the Final FPHCP.

Class II forest practices are currently not included in the monitoring program since the emphasis is on those forest practice activities with greatest potential to damage public resources. However, if an error is found on a forest practices application (i.e., misclassification) or damage or potential damage to public resources is discovered on a forest practices operation, the forest practices forester will address the issue to ensure that the application is accurate and/or public resource damage is either prevented or stopped.

The compliance monitoring program is part of the DNR Forest Practices Regulatory Program. The Services view it to be Washington State's responsibility to make sure landowners comply with the Forest Practices Regulatory Program.

One commenter suggested that compliance monitoring needs to be an independent, peer-reviewed process, fully funded from the timber excise tax. Others are concerned that monitoring road conditions and sediment delivery is not part of the existing compliance monitoring efforts, but that all the monitoring efforts have focused on RMZs.

In response, the compliance monitoring program involves all the Forests and Fish stakeholders – other State and Federal agencies, Tribes, conservation caucus members, small forest landowners, and industrial forest landowners. While DNR is taking the lead in coordinating the compliance monitoring program, some stakeholders serve on the workgroup that is designing the program, while others serve in a review capacity, offering suggestions to improve the program.

While initial monitoring efforts have focused on the RMZ rules, the strategy for monitoring the road construction, maintenance and abandonment rules is scheduled to begin in July 2007. For more information on the compliance monitoring program, refer to Section 4a-3.1.3 of the FPHCP.

A commenter noted that DNR has not been adequately funded to administer the compliance program. There were also concerns about whether the development of the DNR compliance monitoring program is being adequately coordinated with CMER, to ensure the mutual compatibility of interdependent compliance monitoring and other Forests and Fish related monitoring and adaptive management studies.

The FFR states that compliance monitoring "is the responsibility of the DNR and is outside the scope of the [FFR] adaptive management program" (FFR Schedule L-1). However, according to WAC 222-08-160(4), DNR "shall provide statistically sound, biennial compliance audits and monitoring reports to the board for consideration and support of rule and guidance analysis." It is the responsibility of DNR to develop a study design that ensures the results will be "statistically sound." However, the Services and FFR collaborators recognize that compliance with regulations is a necessary prerequisite for many adaptive management studies. The Services note that the FPHCP outlines the compliance assumptions and associated compliance monitoring while describing the essential link to the adaptive management program (See FPHCP Chapter 4a-3.1.3). Since the DEIS was published, the Forest Practices Board has adopted the "Guidelines for Adaptive Management Program" as Chapter 22 of the Forest Practices Board Manual. The Guidelines reinforce the connection between compliance monitoring and adaptive management by stating that "[t]he Department will design a compliance monitoring

program, and will conduct compliance monitoring to determine how well the Washington Forest Practices Rules are being implemented on the ground. Compliance monitoring results will be reported to the Forest Practices Board, to CMER through the Administrator, and to others as directed by the board" (Forest Practices Board Manual, Section 22, Chapter 6.2; FPHCP Appendix F).

The Services believe it is important to note the difference in the enforcement actions that was mentioned by several commenters. As used by DNR, a *notice to comply* is an official, formal enforcement document. It is served to the landowner, timber owner or operator, and it informs him/her of the need to comply with the direction detailed in the notice – to correct a failure to comply with the Washington Forest Practices Rules or to take action to prevent resource damage when there has been no violation, unauthorized deviation or negligence. Oftentimes, notices to comply are used as an administrative tool to make minor changes to an approved forest practices application. A *stop work order* is an official, formal notice served to an operator to temporarily or permanently shut down all or part of an operation in progress. DNR has the authority to issue a stop work order if there is any violation of the Forest Practices Act or Rules, there is a deviation from an approved application or immediate action is necessary to prevent continuation of or to avoid material damage to a public resource. Notices to comply and stop work orders are used for both non-violation and violation situations. Non-violation situations include authorized changes to the forest practices application or notification; modification of an approved forest practices application in order to avoid resource damage, often as a result of new information becoming available; and/or unauthorized deviations from the approved forest practices application where there is no direct violation of the Washington Forest Practices Rules and no significant public resource damage. Violation situations include unauthorized deviations from the approved forest practices application where there is a direct violation of the Rules and damage to or potential damage to a public resource.

There were comments expressed that once Hydraulic Project Approvals for Type 4 and Type 5 (Type Np and Type Ns) streams is transferred to DNR and integrated within the Forest Practices Regulatory Program, forest practices foresters workloads will likely double. They noted that Type 4 and Type 5 streams are the most numerous on the landscape and if laws and BMPs are not enforced at these streams, they have an enormous potential to deliver large quantities of sediment to downstream fish-bearing streams.

The Services understand that DNR anticipates that the compliance workload for Class IV-General forest practices will continue to decrease as counties and other local governments take responsibility for those forest practices applications that are generally conversions from forestry to another land use. RCW 76.09.240 mandates that administration and enforcement of all Class IV-General forest practices be transferred from DNR jurisdiction to local government jurisdiction by December 31, 2005.

The Services are aware that the responsibility for administration of the Hydraulics Project Approvals within Washington lies with WDFW. However, it is the Services' understanding that WDFW believes that the FPHCP is consistent with the goals of the

Hydraulic Code for the protection of fish life. The Services understand that WDFW does not anticipate any loss of WDFW field expertise regarding forest practices under the FPHCP, only the reduction in the amount of time they spend writing Hydraulic Project Approvals for forest practices in non-fish-bearing streams. A Memorandum of Agreement between WDFW and DNR was signed in November 2005 for transfer of compliance responsibility in non-fish-bearing streams, defining a training program for DNR staff, describing a monitoring program that will take place after implementation, and requiring consultations with WDFW biologists for high priority activities in locations where there is a potentially significant risk to fish and fish habitat.

One commenter felt that beyond the State of Washington, the Federal government presence on this private forestry ownership is virtually non-existent and that the DEIS clearly shows how out of touch these Federal agencies (NMFS, USFWS, and the National Park Service) are with current conditions on the ground on private land. The Services have noted this comment, but suggest that primary responsibility for implementation of the FPHCP would be with the State of Washington.

Commenters expressed concerns that errors are made in determining critical issues on forest practices applications – examples given included stream typing, maximum percent of slopes, presence or absence of endangered species, and appropriate harvest technique selection. In response, landowners, operators and/or timber owners complete forest practices applications. A detailed instruction form is an important part of the forest practices application. It guides the applicant on how to fill out the application and where to find critical information needed to accurately complete the application.

As part of the application information, applicants use DNR activity maps (available at the region offices or downloaded from the Forest Practices Application Review System website, or their own map (one that meets DNR mapping standards as outlined in the application instructions), to show their proposed forest practices operation. The DNR activity maps show, among other attributes, typed waters (Type S, Type F and Type N). However, waters on an applicants' property may not be shown accurately on the activity maps, and must be verified by the applicant.

When DNR receives a forest practices application or notification, it evaluates the proposal for unstable slopes, hydric soils, forested wetlands, threatened and endangered species, rain-on-snow zones, cultural/archaeological sites, and city or county permit requirements. Forest practices staff determines the class of application (Class I, Class II, Class III, Class IV-Special or Class IV-General) based on the outcome of the screening, and enters it into the Forest Practices Application Review System for review and comment by DNR field staff and cooperating agencies, Tribes, landowners, organizations, and the general public.

The Services understand that the State's approach to encouraging compliance with forest practices regulations involves a comprehensive program. For example, cooperating agencies (including Ecology and WDFW), organizations, Tribes, and the general public have the opportunity to review and comment on proposed forest practices. In addition, representatives of cooperating agencies, Tribes and organizations frequently participate in interdisciplinary team reviews of forest practices applications by providing DNR staff

with technical input on potential hazards and risks to public resources and providing recommendations to avoid and/or reduce those risks. See Section 4a-1 of the FPHCP for more information.

3.11.2 Roads Enforcement and Monitoring

A commenter expressed concern that as the RMAP process moves from planning to implementation, there needs to be a mechanism for monitoring and enforcement.

The Services consider compliance monitoring and enforcement are an integral part of all Washington Forest Practices Rules including the RMAP rules (WACs 222-24-050, 222-24-051, and 222-0511). DNR has started work to establish a formal compliance monitoring program. The objective of the DNR compliance monitoring program is to determine if forest practices are being conducted in compliance with the Washington Forest Practices Rules in effect since July 2001 (effective date of the forest practices rules consistent with FFR). The program is designed to be responsive to evolving needs, and will work initially to address Rules having the greatest influence on the protection of aquatic resources. The compliance monitoring workgroup for the road rules is projected to begin July 2007. The program uses a random sampling method in order to estimate the proportion of completed forest practices activities that are in compliance with the WAC(s) being reviewed. For more information, see Section 4a-3.1.3 of the FPHCP.

One commenter stated that enforcement of sediment pollution by DNR is highly subjective, resulting in variable rule interpretation and implementation between individual foresters and DNR regions. The commenter felt that these differences in interpretation influence project outcomes and ultimate resource protection. The commenter also stated that enforcement actions are effected by group pressure and are often susceptible to "groupthink."

The Services understand that consistency in rule interpretation amongst DNR regions and forest practices foresters is one of the primary goals of the DNR Forest Practices Division. Every time new rules are adopted by the Forest Practices Board, the Forest Practices Division develops training for the implementation of those rules. Forest practices foresters in every region attend the training. Continuing training is required under WAC 222-08-020(2). The Forest Practices Division determines the interpretation of Washington Forest Practices Rules for the program in order to enhance consistency and communicates this interpretation to region forest practices staff through statewide monthly coordination meetings, guidance memos, division management field tours, and daily phone and email conversations. The division has three forest practices specialists and their manager whose purpose is to assist region staff and the public with rule interpretation. Forest practices applications are available for review on the web. Further, DNR is required to consult with specific agencies and Tribes for their expertise, during various steps in the forest practices process.

3.12 SMALL FOREST LANDOWNERS

3.12.1 Definitions

Several comments addressed the definition of small forest landowners. One commenter noted that there are two different definitions of small forest landowners that are

applicable to RMAPs; one based on harvesting no more than 2 million board feet of timber per year, and one based on landowners who own less than 80 acres of forestland in Washington. The DEIS should be consistent in what definitions are used. One commenter suggested correcting the DEIS where it says that large landowners represent "the majority of covered lands" because small landowners own approximately half of the non-State lands covered by Alternative 2. Another opposes the inclusion of small forest landowners because the definition may include landowners with as much as 3000 acres of ownership. Another commenter had concerns with defining small forest landowner in terms of a harvest volume threshold as opposed to an acreage threshold increasing the amount of land not covered under a RMAP.

In response, the definition for small forest landowners for the purposes of RMAPs including the Family Forest Fish Passage Program was provided by the Legislature and can be found in RCW 76.09.450. The landowner has to have harvested from his/her lands no more than an average timber volume of two million board feet per year during the three years prior to submitting the forest practices application and certifies that he or she does not expect to harvest from his or her own forestlands more than an average timber volume of two million board feet per year during the ten years following the submission of a forest practices application. This definition was changed from a landowner owning less than 500 acres to an annual timber harvest level of two million board feet or less, in order to better reflect small forest landowners. The definition of small forest landowner for RMAP purposes shifted from focusing on ownership size to how the land is managed. The new definition became effective on May 14, 2003.

3.12.2 Alternate Plans

Some commenters support the idea of alternate plans claiming that the collaborative nature of the FPHCP allows for continued improvements to management prescriptions on small ownerships, and that through the alternate planning process templates can be developed that will help small landowners with site specific approaches that are more appropriate for their size of ownership. Some commenters said that alternate plans should be allowed where the small landowner could show that they are protecting the resources and not have to follow the same Rules as industrial owners do. The Services have noted these comments in support of alternate plans.

Some commenters were concerned about alternate plans, template prescriptions and their protection of public resources. Commenters felt templates for alternate plans needed to provide equivalent or greater protections to public resources. One commenter was concerned that template prescriptions, particularly in eastern Washington tend to decrease protection for short-term financial gain over a large area. One commenter was concerned that templates for alternate plans should be based on credible information and not personal points of view and that adaptive management should be utilized when insufficient scientific information is available for a proposed template prescription. Some commenters noted that alternate plans deviated from FFR prescriptions and presumed DNR would ensure that these plans would comply with ESA. Others noted that regulations for longer-term alternate plans had not yet been developed. Commenters expressed concerns with alternate plans being utilized by DNR and the timber industry to attempt to set precedence for future alternate plans.

In response, alternate plans are for site-specific forest practices activities that vary from the forest practices regulations. Template prescriptions are designed to meet resource objectives to address common situations that are repeatedly addressed in alternate plans. The alternate planning process, including for templates, must result in a plan that provides protection to public resources at least equal in overall effectiveness as provided by the Forest Practices Act. Templates are based on credible information and not on personal points of view. They are developed through a collaborative, consensus-based process, which by its very nature, accounts for many stakeholder perspectives. The Department is directed in WAC*222-12-0403 to cooperatively develop, with representatives of the Small Forest Landowner Office and advisory committee, Ecology and WDFW, USFWS, NMFS, and affected Indian Tribes guidelines for alternate plans (including template prescriptions) to be approved by the Forest Practices Board as Section 21 in the Forest Practices Board Manual for alternate plans (WAC 222-12-090(21)). In addition, NMFS and USFWS staff are involved in alternate plan reviews. The Forest Practices Board Manual (Section 21) is a resource for landowners considering an alternate plan and contains recommendations for alternate plans that meet riparian functions, the effectiveness of strategies for meeting resource objectives and protecting public resources, and criteria to assist the Department in determining whether a small forest landowner alternate plan qualifies as a low impact alternate plan. Templates are not developed as a substitute for adaptive management. Adaptive management is a separate process used to address areas of scientific uncertainty and can be an effective means to reduce uncertainty associated with expected outcomes.

There have been 201 alternate plans since the Washington Forest Practices Rules on alternate plan rules went into effect in July 2001. Of those 201 alternate plans, 95 were small forest landowner plans. The small forest landowner plans included six template alternate plans. Forty-nine of the 201 alternate plans were multiyear forest practices applications. During this time period, DNR received a total of 24,593 forest practices applications for all types of forest practices.

The Small Forest Landowner Working Group developed an alternate plan template for small landowners called the Small Forest Landowner Western Washington Thinning Strategies for Overstocked Conifer-Dominated Riparian Management Zones template, which was approved by the Forest Practices Board in November 2004. For information on the template see the Forests Practices Board Manual, Section 21, Guidelines for Alternate Plans (FPHCP Appendix F). The committee is currently working on two additional small forest landowner templates, the Eastside Mortality template and the Hardwood Conversion template.

When an alternate plan is submitted with a forest practices application, the forest practices application with an alternate plan has to be approved or disapproved within 30 days of receipt of the application. This 30-day timeline is the same for both forest practices applications with an alternate plan and forest practices applications without an alternate plan.

Upon receipt of an alternate plan, DNR appoints an interdisciplinary team comprised of members who have qualifications necessary to evaluate the alternative plan. The

interdisciplinary team includes members with necessary expertise, a representative of any affected Tribe, Ecology, and WDFW. The interdisciplinary team conducts a site visit and submits a recommendation to DNR, which informs the approval/disapproval decision by DNR on the forest practices application with an alternate plan. The recommendation of the interdisciplinary team has to indicate whether the alternate plan meets the approval standard of providing protection to public resources equal in overall effectiveness as provided by the Washington Forest Practices Rules and law.

3.12.3 Impact of the Rules

One commenter stated that small forest landowners should be exempt from the FPHCP and not covered for "Federal Assurances." Another comment stated that small forest landowners should have to adhere to the same regulations and standards as large forest landowners to ensure intended objectives to achieve compliance with the ESA for aquatic and riparian dependent species.

The Services are responding to the State of Washington's application as it was submitted. The State was directed to apply for assurances, including special provisions for small forest landowners, by the Washington State Legislature. These provisions for small forest landowners come in two general categories, 20-acre exemptions and partial relief from RMAP requirements. The FPHCP describes 20-acre exemptions in Section 4d and the DEIS description occurs in subsection 4.1.1.2.

Some commenters say the price has been high for protecting the environment by small forest landowners – nearly 40 percent of small forest landowner ownership is with RMZs. In addition, non-tree farm neighbors do not have to protect the riparian areas on their land to the extent that forest landowners do. Small forest landowners love their forests and want to be able to provide habitat for fish and wildlife. Unlike any other farmer, small forest landowners must go through huge permitting processes to harvest their crops. The regulatory costs are becoming too large. It is time to realize that tree farming is the answer - not the problem. Small landowner exemptions were designed to reduce the economic impact of the FFR and give a measure of stability.

In response, the Legislature mandated the establishment of a Small Forest Landowner Office (RCW 76.13.110) because of its concern about the impact of Washington Forest Practices Rules on small forest landowners. The office serves as a resource and focal point for small forest landowner concerns and policies with a mission to promote the economic and ecological viability of small forest landowners. Recognizing the significant contributions small landowners make to protecting Washington's public natural resources, the office strives to equip landowners with all the necessary tools and information they need to keep their land in forestry use. In addition, programs have been established to assist small forests landowners. The programs include the Family Forest Fish Passage Program, which cost-shares in culvert replacement costs. The Forestry Riparian Easement Program compensates eligible small forest landowners for leaving timber in riparian areas in exchange for a 50-year easement.

Another commenter stated voluntary programs like the Forest Riparian Easement Program and the Riparian Open Space Program should not be a basis for granting/denying the FPHCP application.

The Services note that voluntary programs such as the Forest Riparian Easement Program and the Riparian Open Space Program mentioned above are not the primary basis for granting/denying the FPHCP application. The FPHCP covers the Forest Practices Regulatory Program as a whole of which the Forest Riparian Easement Program and the Riparian Open Space Program are simply a part. The intent of these programs are to further enhance the prescriptive nature of the Forest Practices Regulatory Program and in the case of the Forest Riparian Easement Program, to offer some financial compensation to small forest landowners who are burdened with a high density of streams requiring riparian buffers on their lands.

One commenter stated that termination of the Forest Riparian Easement Program in particular would trigger a call for reconsideration of the Small Business Economic Impact Statement developed for current Washington Forest Practices Rules. It would also make the State more vulnerable to a "taking of private property" lawsuit. In order to avoid a potential adverse judgment against the State, these two outcomes may lead to reconsideration of Washington Forest Practices Rules directing a substantial reduction of restriction on forest practices. Another likely outcome of reduced compensation to private forest landowners would be further acceleration of land use conversion to non-forestry activities.

While appropriations of State funding for the Forestry Riparian Easement Program is solely within the discretion of the State Legislature, the Services note that the Legislature passed the Forest and Fish Law (ESHB 2091) requiring that the Small Forest Landowner Office and the Forestry Riparian Easement Program, and has provided significant implementation appropriations for Forestry Riparian Easement Program. The Legislature allocated $4 million for the 2002-03 biennium, $4 million for the 2004-05 biennium, and $ 8million for the 2006-07 biennium.

The DEIS should note that without substantial funding assistance, which is unlikely under Alternative 4, small landowners will not be able to implement RMAPs and large landowners will also have difficulties. Furthermore, if there is a "no net increase" in roads rule, landowners will focus efforts on moving roads to haul their timber, not fixing existing roads.

The Services have noted this comment in opposition of Alternative 4.

3.13 20-ACRE EXEMPTION

3.13.1 20-Acre Exemption

One commenter said the FPHCP should clarify whether or not 20-acre parcels qualifying for the exemption are considered “covered lands.” If so, the FPHCP should include analysis showing a de-minimus effect and the assumptions or conditions supporting the decision to include these parcels as covered lands.

In response, 20-acre parcels qualifying for the exemption are included as covered lands in the State’s application because the State was directed to do so by the State Legislature in the 1999 Salmon Recovery Act. Section 1-5 of the FPHCP, Lands Covered by the Plan, explains which forestlands are considered covered lands and those that are not. Generally, the only forestlands subject to the Forest Practices Act not included as covered

lands are those covered by an existing, approved HCP, and forestlands which fall under the jurisdiction of a local municipality that has assumed authority for regulating Class IV-General forest practices (see Section 4a-3.1.1 of the FPHCP). All other forestlands subject to the Forest Practices Act are considered covered lands. In addition, the 20-acre parcel exemption rule is described in Chapter 4, Section 4b-3.1.3 for western Washington and Section 4b-3.2.3 for eastern Washington. Appendix J of the FPHCP contains information from a landscape scale characterization and site scale functional assessment of the 20-acre parcel exemption.

Another commenter stated small landowner exemptions were designed to reduce the economic impact of the FFR and give a measure of stability. The data used to discuss the potential impacts of small forest landowner was not complete for eastern Washington and underestimates the acres and stream miles.

In response, the Rural Technology Initiative at the University of Washington conducted an analysis of exempt 20-acre parcels in 2002. The purpose of the assessment was to estimate the number of stream miles located on exempt 20-acre parcels in the State so as to quantify the potential landscape-scale effects of exempting certain parcels from the Washington Forest Practices Rules. The assessment is described in the DEIS and is included in the FPHCP Appendix J.

The Rural Technology Initiative used existing GIS-based data in their analysis. They used county parcel tax codes to identify forested parcels and ownership information to identify qualifying parcels. The Rural Technology Initiative selected parcel tax codes that would most likely be representative of forestland in each county. The Rural Technology Initiative reliance on tax codes as a means of identifying forested parcels likely means that some parcels that are actually forestland (but not taxed as forestland) were not included in their analysis. Thus, the commenter is correct in saying that the analysis likely underestimates the number of exempt 20-acre parcels and the associated stream miles. Also, since not all counties had GIS-based data, some counties were excluded from the analysis. Here again, the commenter is correct in saying that the analysis was incomplete for eastern Washington since digital data was unavailable for several counties (notably Stevens, Ferry, and Pend Oreille). However, digital data was obtained from 21 of the State's 39 counties.

Several commenters commented on the Rural Technology Initiative analysis of the 20-acre parcel exemption believing it to be flawed and/or inadequate. In addition, the importance of the full package of exemptions is downplayed based on a sampling of 37 parcels for which it was concluded that RMZ harvest had not occurred.

Another commenter said the numbers provided by the Rural Technology Initiative and used in the FPHCP appear to contradict what other DNR documents state.

Another commenter said twenty-one small forest landowner riparian exemption applications in WRIAs 3 and 4 were submitted to DNR during 2003 and 2004. These were compared with the Rural Technology Initiative WRIA 3 and 4 small forest landowner database. The major difference between the database and reality was the screen used to separate out the small forest landowners - a tax classification that was

forest related. The Rural Technology Initiative failure to identify over 85 percent of the parcels that actually applied for the small forest landowner riparian exemption in WRIAs 3 and 4 clearly indicated that additional analyses were warranted.

Another commenter said the exemption rule would result in more stream miles with few riparian protections measures and thus adversely affect recovery and productivity of fish and other aquatic resources.

Several commenters referred to a recent study by the Northwest Indian Fisheries Commission (Waldo and Wyman 2005) that contradicts the Rural Technology Initiative study.

Another commenter, also citing the Northwest Indian Fisheries Commission report figures, said the small forest landowner exemption, added to the FPHCP after completion of the FFR, significantly undermines the adequacy of the FPHCP "protections" and whether the FPHCP meets the standards of the ESA.

One commenter said there is concern that the 20-acre rule will be abused by family owners dividing their property among family members in order to qualify for the exemptions.

Another commenter said ownerships change, parcels get sub-divided and financial goals get modified. All of these circumstances can lead to a reduction of riparian and aquatic functions.

Another commenter said they are concerned about the potential cumulative effects on watersheds that have a high proportion of exempt 20-acre parcels.

Another commenter said to address the impacts caused by insufficient analysis regarding the 20-acre exempt parcels, the Services should shorten the duration of the ITPs' term.

In response, the Forests and Fish Law included a provision that allows a certain class of small forestland owners to implement less restrictive riparian protection measures (relative to standard requirements) on non-contiguous parcels of 20 acres or less if their total landownership in the State is less than 80 acres. This provision is commonly referred to as the "exempt 20-acre parcel" rule. Given the lack of information related to this subset of small forest landowner parcels, the Services encouraged the State of Washington to collect information for use in assessing the potential environmental impacts associated with implementing less restrictive measures.

The State of Washington (through DNR) sponsored two separate analyses of exempt 20-acre parcels. In the first study, a technical working group of Forests and Fish stakeholders reviewed the riparian requirements for exempt 20-acre parcels in light of the available scientific literature. The objective was to estimate the level of ecological benefit the requirements provided relative to unmanaged, mature forest conditions. The primary conclusions of the study were:

- the ecological benefit provided by the exempt 20-acre parcel rule varies widely and is a function of RMZ width;

- stream size (width) determines RMZ width, with larger streams receiving wider buffers and smaller streams receiving narrower buffers;
- shade levels from exempt parcel RMZs will range from 25 to 85 percent of that expected from unmanaged, mature forest stands:
- large woody debris recruitment and shade levels from exempt parcel RMZs will range from 45 percent (for small streams) to 100 percent (for large streams) of that expected from unmanaged, mature forest stands;
- harvest within RMZs is rare; the lack of harvesting can be attributed to restrictions associated with the shade rule, whose requirements must also be met.

The Rural Technology Initiative conducted the second study. They were asked to quantify the landscape-scale effects of the exempt parcel rule by estimating the length of streams flowing through exempt parcels. Exempt parcel stream length was then expressed as a proportion of total WRIA stream length in an attempt to quantify the potential impact. The primary conclusions were:

- in 87 percent of WRIAs studied (46/53), exempt 20-acre parcels encompassed less than two percent of the total WRIA stream length;
- exempt 20-acre parcels encompassed more than eight percent of the total WRIA stream length in two of 53 WRIAs included in the study;
- when viewed at a landscape scale, the length of streams on qualifying parcels is small relative to total stream length, therefore, any negative effects associated with implementation of less restrictive riparian rules are expected to be minimal.

Several commenters are critical of the Rural Technology Initiative analysis, stating that it drastically underestimates the number of exempt parcels and associated stream length. The Rural Technology Initiative analysis used parcel tax class codes as a means of identifying forested parcels. Tax class codes were used because they provided a way of assessing a large portion of lands regulated by the Washington Forest Practices Rules in a fairly short period of time. This approach, while efficient, likely underestimates the number of exempt 20-acre parcels and associated stream miles. This is because some forested parcels were not identified by the Rural Technology Initiative as being forested because they were not taxed as "forestland." For example, small, forested parcels are often taxed as "rural-residential" land due to their proximity to urban areas. The Rural Technology Initiative did not capture these parcels in their analysis. However, these parcels will probably be converted to a non-forestry land use during the proposed 50-year life of the FPHCP. Once converted, these parcels are no longer subject to the Washington Forest Practices Rules and would no longer be covered under the FPHCP.

According to the Rural Technology Initiative, as much as 5.8 percent of the stream miles in one FPHCP planning region may fall under the 20-acre exemption. However, this does not mean those streams are not protected during forest practices activities as one commenter suggests. As the DEIS and FPHCP point out, RMZs adjacent to streams flowing through exempt 20-acre parcels range from 29 to 115 feet in width (depending on

stream width) and in nearly all cases, there is no harvest within those areas. The lack of harvesting is associated with the shade rule, which typically requires the retention of high levels of canopy closure over low-elevation streams (and as several commenters have pointed out, most exempt 20-acre parcels are located at lower elevations). While the analysis on which this finding is based was initially conducted on a sample of 37 forest practices applications filed during 2003, further analysis of forest practices applications submitted to DNR during 2004/2005 discovered the same trend. That is, little if any harvest has been occurring within RMZs on exempt 20-acre parcels. Again, this appears to be associated with the more restrictive requirements of the shade rule.

One commenter questioned the age of the RMZs included in the aforementioned analysis. RMZ age was not documented in these analyses. However, it is reasonable to assume that RMZ composition was similar to that of the adjacent stand; therefore, RMZs were probably all (or nearly all) second- or third-growth stands that likely ranged in age from 40 to 50 years in western Washington and 60 to 80 years in eastern Washington.

One commenter suggests the requirements of the 1999 shade rule differ from those of the 2000 shade rule; they do not. Shade rule requirements have remained unchanged since the rule was adopted in 1988.

Several commenters state that parcel subdivision could potentially increase the number of forested parcels that qualify for the 20-acre exemption in the future. This may be true. However, the degree to which this will occur over the proposed 50-year life of the FPHCP is unknown and any estimate would be speculative since multiple factors affect an individual landowners' interest in subdividing or selling forested parcels.

While the region-based estimates of exempt 20-acre parcel stream miles ranges from 0.5 to 5.8 percent of total stream miles, one commenter is correct in saying that at smaller spatial scales, these estimates are more variable. Therefore, at the watershed scale, the number of stream miles on exempt 20-acre parcels may be higher or lower than the corresponding region-based estimate. The Rural Technology Initiative report demonstrates this variability by showing exempt parcel stream miles expressed as a function of total stream miles in each WRIA. When expressed as a percentage of total WRIA stream miles (rather than FPHCP planning region stream miles), exempt 20-acre parcel stream miles range from 0.02 to 9.12 percent (Table 28 in the Rural Technology Initiative report; FPHCP Appendix J).

The difference between protection afforded by exempt parcel RMZs and RMZs established in accordance with the standard Washington Forest Practices Rules is likely to be fairly small. This is because the RMZ's degree of influence on the aquatic system decreases with increasing distance from the stream. According to the FEMAT-based curves presented in the FPHCP, most ecological functions are satisfied within 0.5 to 0.75 site potential tree height from the stream. While exempt parcel RMZs adjacent to smaller streams are somewhat below this range, exempt parcel RMZs along larger streams and rivers are well within this range. The FPHCP notes that large woody debris recruitment levels from exempt 20-acre parcel RMZs are expected to range from 45 to 100 percent of that from unmanaged, mature forests; shade levels between 25 to 85 percent. In addition, harvest within the RMZ appears to be rare on exempt 20-acre parcels due to restrictions

associated with the shade rule. Therefore, it is unlikely that exempt parcel RMZs will alter riparian functions such that sediment, temperature, and peak flows become significant mortality agents for salmonids.

One commenter expressed concern over the lack of protection for Type N waters on exempt 20-acre parcels. Along Type N waters, DNR may require tree retention on exempt 20-acre parcels where necessary to protect public resources (including water quality). The Rules authorize DNR to require the retention of 29 trees, at least 6 inches dbh, on each side of every 1,000 feet of stream length within 29 feet of the stream. Type N streams must still meet State water quality standards, including temperature standards. In addition, temperature standards must also be met in downstream Type F waters.

As one commenter points out, differences in the number of small forest landowners (and the forestlands they own) reported by the Rural Technology Initiative and the DNR Family Forest Fish Passage Program are attributable to differences in how a "small forest landowner" is defined. In their analysis, the Rural Technology Initiative specifically focused on a subset of small forest landowners – and more specifically, forested parcels – that qualified for the 20-acre exemption. Given the restrictive nature of the exempt 20-acre parcel rule (parcels must be 20 acres or less, be non-contiguous, and the landowner must not own more than 80 acres statewide), the large discrepancy in ownership estimates between the Rural Technology Initiative and DNR is not surprising. However, the higher estimates of small forest landowner numbers reported by DNR do not provide evidence that the Rural Technology Initiative estimates of exempt 20-acre parcels are drastically underestimated.

Multiple comments cited a report by Waldo and Wyman (2005) that shows the number of exempt 20-acre parcel stream miles in the North Puget Sound Region to be much greater than reported by the Rural Technology Initiative. In the North Puget Sound Region (which includes WRIAs 1, 3, 4, 5, and 7), the Rural Technology Initiative reported a total of 95 exempt stream miles while Waldo and Wyman (2005) reported a total of 343 exempt stream miles (3.6 times more). According to Waldo and Wyman, exempt parcels in the North Puget Sound Region comprise 33.7 percent of anadromous fish-bearing stream miles on lands regulated in accordance with the Washington Forest Practices Rules. This compares to the Rural Technology Initiative report, which shows exempt parcels encompass only 0.9 percent of total forested stream miles in the region. There are several reasons the Rural Technology Initiative and Waldo and Wyman analyses and findings differ. These differences are explained below.

(1) Exempt Versus "Potentially Exempt" Parcels

Both the Rural Technology Initiative and Waldo and Wyman analyses identify parcels that currently qualify for the exemption based on parcel size (less than 20 acres) and contiguity (must be non-contiguous). However, the Waldo and Wyman analysis also includes a class of parcels identified as "potentially exempt." Parcels identified as "potentially exempt" include those that do not currently qualify for the exemption, but may qualify for the exemption at some point in the future based on the landowner's ability to transfer ownership or subdivide the parcel in order to meet the eligibility criteria. Waldo and Wyman classify these parcels as "exempt."

While some landowners might use ownership transfers and/or parcel subdivision as a means of qualifying for the exemption, estimating the degree to which this might occur during the proposed 50-year life of the Forest Practices HCP is speculative. Therefore, rather than attempting to predict future changes in land ownership patterns and associated forest practices rule implementation, the Rural Technology Initiative analysis was limited to those parcels that currently qualify for the exemption.

(2) Stream Miles on Exempt Parcels

Quantifying the larger, landscape-scale effect of the exempt parcel rules is heavily influenced by the baseline used to express the effect. The Rural Technology Initiative quantified the landscape-scale effects of the exempt 20-acre parcel rules by estimating the length of streams flowing through exempt parcels, which was then expressed as a proportion of total stream length within a certain geographic area.

The Rural Technology Initiative analysis used total analyzed (i.e., forested) stream miles in the North Puget Sound Region as one way of quantifying the proportion of the landscape affected by the exempt parcel rules (FPHCP Appendix J, page VI). The Rural Technology Initiative analysis shows that there are 10,814 total forested stream miles and 95 exempt stream miles in the North Puget Sound Region. Thus, exempt stream miles represent 0.9 percent of forested stream miles in the North Puget Sound Region (95 miles/10,814 miles).

In contrast, Waldo and Wyman limited their assessment to streams utilized by anadromous salmonids on forestlands regulated under the current Washington Forest Practices Rules to quantify the proportion of the landscape affected by the exempt parcel rules. This results in a baseline of 1,018 stream miles. Waldo and Wyman reported a total of 343 exempt stream miles, or 3.6 times more than the Rural Technology Initiative (see (3) below). The 343 exempt stream miles identified by Waldo and Wyman represents 34 percent of the anadromous Washington Forest Practices Rules-regulated stream miles in the North Puget Sound Region (343 miles/1,018 miles). If the Rural Technology Initiative had used this same baseline, the 95 exempt stream miles would comprise about nine percent of the forested stream network in the North Puget Sound Region (Table 3-1). Therefore, depending on what baseline is used for comparison, the 248-mile difference between the Rural Technology Initiative and Waldo and Wyman analyses (i.e., 343 miles – 95 miles = 248 miles) produces large differences in the proportion of streams affected by the exempt parcel rules.

Table 3-1 below expresses the exempt stream miles identified in the Rural Technology Initiative and Waldo and Wyman analyses as a percentage of each baseline used in the analyses. The Rural Technology Initiative estimate of exempt stream miles (i.e., 95 miles) represents 3.3 percent of the forested anadromous stream length and 9.3 percent of the forested anadromous stream length used by Waldo and Wyman in their analysis (Table 3-1). The Waldo and Wyman estimate of exempt stream miles (i.e., 343 miles) represents 3.2 percent of the total forested region stream length and 3.9 percent of the forested fish-bearing stream length used by the Rural Technology Initiative in its analysis (Table 3-1). Here again, these values illustrate how the use of different baselines affects data interpretation.

Table 3-1. Rural Technology Initiative (RTI) estimated exempt stream length (95 miles) and Waldo and Wyman (W&W) estimated exempt stream length (343 miles) expressed as a percentage of differing "baseline" stream lengths in the North Puget Sound Region. F&F (Forests and Fish) stream miles indicates stream miles regulated under the Washington Forest Practices Rules.

	RTI Forested Stream Miles[1] (10,814)	RTI Forested Fish-bearing F&F Stream Miles[2] (8,834)	W&W Forested Anadromous Stream Miles[3] (2,885)	W&W Forested Anadromous F&F Stream Miles[4] (1,018)
RTI Exempt %	0.9	1.1	3.3	9.3
Waldo and Wyman Exempt %	3.2	3.9	11.9	33.7

1 Total stream miles on all forestland in the North Puget Sound Region as reported by RTI
2 Total fish-bearing stream miles on forestland regulated under the current Washington Forest Practices Rules in the North Puget Sound Region as reported by RTI
3 Total anadromous (i.e., pink, chum, sockeye, Chinook, coho, and steelhead) stream length on all forestland in the North Puget Sound Region as reported by Waldo and Wyman
4 Total anadromous (i.e., pink, chum, sockeye, Chinook, coho, and steelhead) stream length on forestland regulated under the current Washington Forest Practices Rules in the North Puget Sound Region as reported by Waldo and Wyman

The stream lengths used as baselines in each analysis likely vary in their degree of accuracy. The Rural Technology Initiative analysis relies on the hydrograph layer maintained by DNR. While this layer is routinely updated based on field data, it is widely recognized that many streams that actually exist on the ground are missing from the data, particularly on Federal lands. Furthermore, the data likely under-represents the extent of the fish-bearing portion of the stream network. These two factors mean that the baselines used by the Rural Technology Initiative and reported in Table 3-1 (i.e., forested stream miles and forested fish-bearing Forests and Fish stream miles) underestimate the true length of all streams and fish-bearing streams. However, because at least some of these streams are probably located on exempt parcels, the Rural Technology Initiative analysis also underestimates the true length of exempt stream miles. Since the number of under-represented exempt stream miles is likely small relative to the total number of "missing" stream miles, the net effect would probably be a decrease in the percentages reported in Table 3-1 (i.e., 0.9 percent and 1.1 percent). Yet, without additional analysis it is impossible to quantify the effect.

Because the data Waldo and Wyman used to estimate the extent of the anadromous stream length largely originated from WRIA-specific Limiting Factors Reports, the information may be a more accurate representation of the baselines these authors used for reporting (i.e., forested anadromous stream miles and forested anadromous Forests and Fish stream miles) than the Rural Technology Initiative baselines described above. Even though this data may be more accurate, it undoubtedly shares some of the same problems inherent to the DNR hydrograph layer – namely, unmapped or "missing" streams and under-representation of fish distribution. Similar to the Rural Technology Initiative analysis, the net effect would be a decrease in the percentages reported in Table 3-1 (11.9 percent and 33.7 percent); however, the effect would likely be smaller than expected for the Rural Technology Initiative values.

(3) Differences in Exempt Stream Mile Estimates

There are several reasons for the 248-mile difference in exempt stream miles between the Rural Technology Initiative and Waldo and Wyman analyses.

(a) First, the analysts used different approaches in identifying "forested" parcels. The Rural Technology Initiative analysis relies on county tax class codes while Waldo and Wyman rely on remotely sensed satellite imagery (i.e., National Land Cover Dataset from the U.S. Geological Survey). The Rural Technology Initiative approach underestimates the number of eligible exempt parcels and associated stream miles because of its reliance on "forestry-related" tax classes (FPHCP Appendix J, page 7). This approach excludes parcels taxed as residential, agricultural, or undeveloped land even though they may contain forestland and qualify for the exemption. Therefore, a certain number of exempt parcels were not identified as part of the Rural Technology Initiative analysis even though long-term forestry may be the predominant land use on all or a portion of the parcel. However, it is likely that owners of many of these parcels, particularly those taxed as residential land, would convert the parcel to a non-forestry land use during the proposed 50-year life of the HCP. In cases where conversion from forestland to non-forestland occurs, local county critical area ordinances, not Washington Forest Practices Rules, would dictate the level of resource protection. Lands converted to non-forestry uses would no longer be covered under the FPHCP.

In contrast to the Rural Technology Initiative analysis, the Waldo and Wyman analysis relies on National Land Cover Data to identify forested parcels. This approach likely overestimates the number of exempt stream miles for several reasons. First, the resolution of the National Land Cover Data is insufficient to reliably distinguish forestland from parcels that are forested, but are in non-forestry land uses. For example, a single-family residence in a small clearing that is otherwise surrounded by trees could easily be categorized as "forestland" because the 30-meter pixel size of the National Land Cover Data may not allow the residence and associated clearing to be classified separate from the surrounding trees. Therefore, it is likely that Waldo and Wyman identified some "residential" parcels as exempt forested parcels as a result of using the National Land Cover Data to identify forestland. While the use of current taxation classification would allow such parcels to be identified as non-forest and non-exempt, the use of the National Land Cover Data does not.

(b) A second factor affecting the Waldo and Wyman estimate of exempt stream miles relates to the age of the National Land Cover Data. The National Land Cover Data is based on satellite imagery from 1992. Population growth and associated conversion of forestland to residential land uses in the North Puget Sound Region has been common in many areas, particularly along the Interstate-5 corridor. It is possible that some parcels legitimately identified as exempt forested parcels based on the 1992 data have been converted to non-forestry land uses during the past 12-plus years. Here again, while the use of current taxation classification would allow such parcels to be identified as non-forest and non-exempt, the use of the National Land Cover Data does not.

(c) Another factor that likely contributes to the difference in exempt stream miles is the degree to which each analysis addressed the issue of statewide landownership. In order

to qualify for the exemption, the owner of a parcel must not own more than 80 acres of forestland statewide. The Rural Technology Initiative analysis used landowner names and mailing addresses derived from county parcel data as a means of screening for statewide ownership. Since the Rural Technology Initiative did not have data from every county in the State (digital data was only available for 19 of the State's 39 counties), some parcels identified by the Rural Technology Initiative as exempt may be ineligible for the exemption. For example, a landowner identified as owning 60 acres statewide based on available county parcel data may actually own another 40 acres in a county where parcel data was unavailable. In actuality, the landowner would be ineligible for the exemption (because he/she owned greater than 80 acres) yet the Rural Technology Initiative analysis would identify the associated parcels as eligible.

Like the Rural Technology Initiative, Waldo and Wyman addressed the issue of total landownership using county parcel data. However, since their analysis was limited to a single region within the State, screening for statewide ownership only included data from four counties (Whatcom, Skagit, Snohomish, and King). As a result, the Waldo and Wyman data likely identified some parcels as exempt when in reality the parcel was ineligible because statewide ownership exceeded 80 acres.

The net effect of not fully accounting for statewide forestland ownership is an overestimation in the number of eligible parcels and associated exempt stream miles. Since neither analysis included data from all 39 counties in the State, the values reported in each analysis are affected by this factor. While this probably does not impact the reported exempt stream miles to a large degree, the effect would be greater for the Waldo and Wyman analysis since data from only four counties was included.

3.13.2 Summary

The results of the Rural Technology Initiative and Waldo and Wyman analyses differ for the following reasons:

The Waldo and Wyman analysis includes parcels that do not currently qualify for the exemption, but could qualify at some point in the future if parcel ownership is transferred or if the parcel is subdivided. The Rural Technology Initiative analysis is limited to those parcels that currently qualify for the exemption.

The analyses used different baselines for reporting the number of exempt stream miles. Waldo and Wyman considered only streams used by anadromous salmonids on lands regulated under the current Washington Forest Practices Rules while the Rural Technology Initiative considered all forested streams. The Waldo and Wyman baseline includes just nine percent of the streams that comprise the Rural Technology Initiative baseline. Waldo and Wyman's use of a smaller baseline is one reason their reported percentages of exempt stream miles are substantially higher than those reported by the Rural Technology Initiative.

The analyses used different approaches in identifying forested parcels. While the Rural Technology Initiative's use of tax class codes underestimates the number of exempt parcels and associated stream miles, Waldo and Wyman's use of National Land Cover Data overestimates these same parameters. The Rural Technology Initiative approach

excludes some eligible forested parcels currently in agricultural, residential or other non-forestry tax classes. The Waldo and Wyman approach includes some ineligible parcels that are in non-forestry land uses.

Waldo and Wyman's use of National Land Cover Data from 1992 contributes to their overestimation of exempt parcels and associated stream miles. Some parcels identified by Waldo and Wyman as eligible forested parcels based on 1992 National Land Cover Data may no longer be eligible if they have been converted from forestry to non-forestry land uses during the past 12-plus years.

Both analyses' limited screen of statewide land ownership contributes to an overestimation of exempt parcels and associated stream miles. In screening for statewide ownership, Waldo and Wyman only evaluated landowner data in four of the State's 39 counties while the Rural Technology Initiative evaluated data from 19 counties. Since neither analysis was capable of fully accounting for statewide ownership, results from both analyses probably overestimate the number of exempt parcels to some degree. However, it is more likely that the Waldo and Wyman analysis overestimates the number of exempt parcels since their assessment of the issue was more limited.

The actual length of streams flowing through exempt parcels in the North Puget Sound Region most likely lies somewhere within the range of values reported in Table 3-1. A more accurate assessment of exempt parcels could be conducted; however, such an analysis would require a substantial investment in time and money and would still suffer from some of the same data limitations described above.

3.14 CONVERSIONS

Many commenters expressed concern about conversion of forestlands to other uses and sought to minimize conversions. Some of these comments were directed at increasing regulatory certainty, some were directed at maintaining the economic viability of the timber industry. Others noted that conversion of forestland occurs because of a wide variety of reasons, not exclusively the regulatory environment within which forest practices occur. Some commenters were concerned that the DEIS seemed to differentiate the effect on the rate of conversion between small landowners and industrial landowners. At least one commenter provided historic information on conversions.

In response, the DEIS compares the anticipated change in the rate of conversion among the various alternatives. The Services agree that a variety of factors influence any particular decision to convert a parcel of land to other uses, but the Services also agree with the assertion in the DEIS that long-term regulatory certainty is thought to contribute to a reduced rate of conversion from the *status quo*. The Services agree with commenters that this effect is thought to be true for both small and large landowners. The DEIS has been modified to reflect this comment. At least one commenter believed that lands within urban growth boundaries of Snohomish, King and Pierce counties should be excluded from the FPHCP because they were likely to be converted.

Conversion of land to other uses, *per se*, is not regulated by the Forest Practices Act and is not a covered activity in the FPHCP (See below). However, for the purpose of determining whether the FPHCP meets the requirements of the ESA, the Services will

analyze how the anticipated rate of conversion will affect the conservation values of covered activities on lands remaining under the FPHCP, wherever they occur. They also will analyze the cumulative effects of activities across the landscape. Finally, the Services will determine whether the conservation values on lands that continue to be covered by the FPHCP are consistent with the standards required in ESA Sections 7 and 10. Those determinations will be documented in statements of findings documents and the biological opinions issued by the Services under the ESA.

Other commenters expressed the view that the ITPs should not be granted unless the FPHCP prevented conversion, or unless the FPHCP requires the subsequent uses of the covered land to maintain the same conservation values as required by the FPHCP. Some noted that other HCPs either prevent the sale of covered lands or require the HCP be implemented by any new owner. The Services are mindful that ESA Section 10 establishes a means to permit "otherwise lawful activities*"* of individuals or entities that may cause incidental take of listed species. Because a Section 10 ITP is voluntary, the Services are deferential to the HCP sponsor in determining what "otherwise lawful activities" are to be covered by the permit. However, the Services encourage the applicant "to include in the HCP a description of all actions within the planning area that: (1) are likely to result in incidental take; (2) are reasonably certain to occur over the life of the permit; and (3) for which the applicant or landowner has some form of control. For many HCPs, this will usually involve a specific well-defined project (e.g., home construction; water use development) or land use activity (e.g., forestry). *For regional and other large-scale planning efforts, the applicants will need to determine what activities they wish to include in the HCP and, if necessary, which ones they wish to exclude*." (Emphasis added. See Habitat Conservation Planning Handbook; Chapter 3). In the case of the FPHCP, the applicant (the State of Washington) and the landowners share "some form of control" over forest practices through the Forest Practices Act, and the Act forms the regulatory foundation for implementation of the FPHCP. The applicant has chosen to confine the FPHCP to activities regulated under the Forest Practices Act on lands to which the Forest Practices Act applies (See FPHCP Chapters 1-4 and 1-5). The applicant does not regulate or "control" conversions through the Forest Practices Act, nor does it regulate or control through the Forest Practices Act other potential uses to which lands may be converted.

As a result, inclusion of a requirement to control conversion of forestland or to require continuing regulation of new uses to preserve the conservation values of the FPHCP on "converted" land would require either 1) an expansion of the Forest Practices Act's breadth of jurisdiction and State authority over the use of land, or 2) the inclusion of local governments as the existing regulators of other land uses (and the agreement each to regulate to the necessary conservation provisions), or 3) changing the nature of the FPHCP from its regulatory foundation under the Forest Practices Act to a voluntary effort which would include contractual commitments of each landowner to maintain the conservation values on the land notwithstanding its use. The Services do not believe any of these options is necessarily required by the ESA to meet the ITP issuance criteria of Section 10. The Services view the FPHCP as a regional or large-scale planning effort and believe that sufficient information is provided to determine whether the State of

Washington's decision to confine covered activities to those subject to the Forest Practices Act is reasonable.

The DEIS has been modified to include more information on the environmental effects of conversions.

3.15 CUMULATIVE EFFECTS

3.15.1 Context for Analysis

One commenter stated that the DEIS recognizes the need for a more qualitative analysis, but is correctly constrained by the scope of the action area and complexity of the proposed action. The following approach has been suggested by the commenter for improving the cumulative effects analysis, which the commenter suggests the DEIS follows to some extent.

1. Identify the environmental parameters that may be affected by the alternatives.
2. Provide context for past and present land use activities that may have affected these parameters.
3. Describe how the alternatives may impact the identified parameters over time.
4. Identify State, local, and Federal programs that may act synergistically with the alternatives.
5. Summarize how the alternatives would affect the environment when added to past, present, and reasonably foreseeable future actions.

The Services believe all components of the suggested outline are described within DEIS Chapter 5, Cumulative Effects, with a few exceptions as noted below.

The parameters to be affected by the alternatives have been described for most of the resources analyzed, including subsection 5.3.1, Air Quality; subsection 5.3.2, Land Ownership and Use; and subsection 5.3.3.3, Cumulative Watershed Effects, *Analysis of Alternatives*. However, we recognize that these parameters may not be obvious to the reader; therefore, the DEIS has been modified to reflect this comment. Further, parameters were not described for subsection 5.3.3, Aquatic Resources; subsection 5.3.3.2, Fish and Fish Habitat; subsection 5.3.4.2, Wildlife; subsection 5.3.5.1, Archaeological, Historical, and Cultural Resources; and subsection 5.3.5.2, Social and Economic Environment. The DEIS has been modified to reflect this comment by adding parameters that may be affected in each of these resource categories.

The context for past and present land use activities that may have affected the parameters discussed in item 1) above, have been clearly described in various sections of the DEIS, and, in Chapter 5, Cumulative Effects, the reader was repeatedly referred to this information as incorporation by reference.

For example, subsection 5.2.1, Land Ownership and Past and Present Land Uses, clearly refers the reader to subsection 3.2, Land Ownership and Use, for historical information. Additionally, the reader is referred to more detailed information on historical impacts by reviewing subsection 3.4.2.3, History of Forest Practices Affecting Erosion and

Sedimentation; subsection 3.7.1.6, Historic Protection of Riparian Areas; and subsection 3.7.2.5, Historic/Current Wetland Protection. Note that the cross-reference to subsection 3.7.2.5 was incorrectly numbered. This should have been cross-referenced to subsection 3.7.2.3, Current Conditions of Wetlands (which also contains historical impact information). The DEIS has been modified to reflect this change in both Chapter 3 and Chapter 5. Finally, the reader was referred to DEIS Appendix A (Regional Summaries), which describes current conditions by analysis region, representing the effects of past land use practices.

Additionally, subsection 5.2.1.2, Past and Present Land Uses, does detail land conditions over time and highlights the impact of historical changes over the past 100 years, including the factors that have contributed to major affects.

Subsection 5.3.1, Air Quality, describes past conditions that continue today as current trends in air quality affects (e.g., population growth, motor vehicle use, wood stoves, outdoor burning, and industrial uses). Further, it describes conditions over time since 1987, and illustrates present conditions resulting from regulation implementation.

Subsection 5.3.2, Land Ownership and Use, describes historical conditions related to conversions and the rate of conversion over time. It then summarizes this rate of conversion as a current condition under each alternative.

Subsection 5.3.3, Aquatic Resources, clearly refers the reader to DEIS Appendix A (Regional Summaries), which is an important component of the cumulative effects analyses. As stated in subsection 5.3.3., the appendix provides "a description of historic practices and actions that produced the current resource conditions."

Paragraph one of subsection 5.3.3.2, Fish and Fish Habitat, describes historic practices that have contributed to the decline of fish habitat, and the current condition of these practices in terms of improving trends.

Past activities related to watersheds is defined in subsection 5.3.3.3, Cumulative Watershed Effects, as "a combination of forest practices over time, including those occurring on the same site over time, or widely dispersed, occurring simultaneously or in a sequential manner." The text then explains that cumulative watershed effects from forest practices are addressed in the Washington Forest Practices Rules. The analysis then focuses on subsequent changes from conditions under the Rules that would occur to watersheds under each alternative. In summary, the analysis correctly assumes that past conditions have lead to current watershed conditions. The text refers to the Rules to describe past conditions, but uses current conditions as a starting point for the cumulative analysis.

Subsection 5.3.4, Vegetation and Wildlife, does not specifically describe past actions that have altered vegetation (and therefore, general wildlife habitat) across the State. This resource is very broad, and impacts to general vegetation are numerous and difficult to categorize or to quantify, but general forest practice activities over time have contributed to vegetation and wildlife habitat alterations. Therefore, subsection 5.3.4.2, Wildlife, does refer the reader to DEIS Appendix A (Regional Summaries) and historic activities described in subsection 3.2, Land Ownership and Use. The analysis assumes that past

forest practices and land conversions have altered vegetative cover, and focuses on forestland cover and seral stages. The Services do not see the benefit in conducting an exhaustive review of all potential vegetation alterations across the State since the cumulative analysis is properly based on the current condition that resulted from these alterations and a focus on forestlands.

Past activities affecting archaeological, historical, and cultural resources are clearly described in subsection 5.3.5.1. Past activities for these resources can only be analyzed in terms of current protections since current conditions require that they be protected.

Subsection 5.3.5.2, Social and Economic Environment, necessarily describes current conditions by illustrating past trends in the economic parameters. It concludes by illustrating the current condition and how each alternative would contribute to these factors.

The identified parameters are analyzed in terms of impact under each resource category in subsection 5.3, Analysis of Cumulative Effects. As examples, subsection 5.3.1, Air Quality, describes how each alternative would contribute to outdoor/slash burning potential (again, which is described as parameter and an historical activity in this subsection). Subsection 5.3.2, Land Ownership and Use, describes how conversion rates would be affected under each alternative (again, conversion rates were described as the parameter to be affected and in terms of historical trends). Subsection 5.3.3.1, Water Resources, describes impacts to water quality and peak flow parameters in conjunction with past action trends, such as growing urban areas.

Subsection 5.2.2, Statutes, Regulations, Plans, and Programs, identified State, local, and Federal programs that may act synergistically with the alternatives, and describes the cumulative effect of these programs when combined with activities under the proposed action. However, the analyses does not address the combined effect of these programs with alternatives other than the proposed action, therefore, the DEIS has been modified to include these analyses.

Each resource topic (beginning with subsection 5.3, Analysis of Cumulative Effects) summarizes cumulative effects by: 1) identifying resource parameters of concern, 2) acknowledging past actions that have lead to current conditions, and 3) describing anticipated trends based on current conditions (resulting from past actions), known future activities, and information provided from the regulatory review, which indicates other conditions that may occur in the future.

At least one commenter suggested that the cumulative effects analysis is a qualitative ranking of various options rather than an analytically sound attempt to address cumulative effects; that there is no substantive content to the cumulative effects analysis and no explicit evaluation of ecological outcomes or the consequences for populations and habitat of species of concern.

For example, the water resources section concludes that the proposed action “poses no increased potential for adverse cumulative effects to water quality or peak flows. Over time, the potential for adverse cumulative effects would likely decrease due to adaptive

management." The commenter believes this conclusion fails to meet the standard for addressing cumulative effects for several reasons:

1. It combines all potential cumulative effects from all sources and all parameters of water quality and peak flows into one vague term - "adverse cumulative effects." The commenter believes the analysis needs to address specific impacts on specific resources from specific sources.

2. The analysis only addresses the relative potential to increase or decrease cumulative effects without quantifying what the terms mean in relation to risk, uncertainty, or magnitude. The analysis relies on improving or degrading trends rather than on quantified results.

3. The analysis only describes cumulative impacts in terms of increased potential rather than actual impacts on-the-ground.

4. The conclusion that Alternative 2 poses no increased potential for adverse cumulative effects is unjustified and unsupported given that compliance with water quality standards has not been established, the inadequacy of the Washington Forest Practices Rules to address cumulative watershed effects, and the unjustified reliance on the assumption that adaptive management will function as predicted.

The analysis should be conducted to address all Federal and non-Federal actions affecting each species covered by the ITP(s). The analysis should also address all past, present, and reasonably foreseeable future actions across the species ranges.

The Services note that in the beginning of the cumulative effects chapter, it states, "Due to the large geographic scope of the analysis area, it is not feasible to analyze all habitat-specific activities that are occurring, have occurred in the past, or that will occur in the future in a quantitative manner." Statewide quantitative data do not exist for each parameter analyzed in Chapter 5, Cumulative Effects. Further, the impacts of each alternative have also been analyzed in Chapter 4, Environmental Consequences. Quantitative data were used in both Chapters 4 and 5 when available.

The analysis addresses past Federal and non-Federal actions that have lead to current conditions, a description of current conditions as defined in Chapter 3.0, Affected Environment, and anticipated future actions that would occur under the regulatory framework within the State as well as known future outcomes. Each resource is reviewed for cumulative effects that would occur under each alternative given specified parameters of concern and past, present, and future conditions.

The Services believe the cumulative effects analysis is "analytically sound" and is a "substantive analysis." Council on Environmental Quality regulations and the Services' implementing regulations do not require that site-specific information be provided for each parameter analyzed in the cumulative effects review. The review provides information for decision-makers to determine the cumulative significance of the proposed action and alternatives on each resource, including listed species by describing past, present, and reasonably foreseeable actions.

Analyzing each habitat area across the State for each species covered in the analysis would be an unnecessary and lengthy exercise; further, complete and consistent quantitative data do not exist at this scale. The result of such micro-analyses would likely reveal the same information as the current analyses provided, which illustrates trends that have occurred, and expected trends into the future on each resource as a whole under each alternative.

The analysis does analyze actual impacts rather than relative impacts. It describes specific historical activities that have led to current conditions such as past forest practices, hydropower projects, urban growth, agricultural practices, employment data over time, and land conversion rates. The analysis then describes the specific current conditions that have resulted from these specific past actions, including, among others, the most current information on existing conversion acreages, percentages of forestland that is currently unavailable for timber production, current dominant land uses and competing land uses by percentages, percent of streams protected by the Washington Forest Practices Rules, current buffer area percentages under the Rules, and current logging-related employment data.

Finally, the analysis describes reasonably foreseeable future trends that are anticipated. As examples, expected land use conversion rates, employment trends, future impacts to cultural resources given regulatory constraints, buffer area percentages under each alternative, and expected seral stages under each alternative. The analysis also includes expected conditions when combining the proposed action with the regulatory framework across the State. The Services believe a review of the related regulations on land use activities is an important analysis tool. It provides a future view of expected trends since all land use activities must comply with the environmental goals and objectives of these regulations. For example, under the Northwest Forest Plan, the U.S. Forest Service anticipates millions of acres of additional late successional forest will be created (subsection 5.2.2, Statutes, Regulations, Plans, and Programs, *Northwest Forest Plan*). This is important information and data to consider when addressing the cumulative effect of the State's proposal on forest conditions. The Services believe an analysis of land use regulation objectives is an appropriate method for estimating the impacts of future actions.

The Services believe the conclusion that "the proposed action poses no increased potential for adverse cumulative effects to water quality and peak flows" is accurate. In comparison to current conditions, the Services do not believe that these water quality parameters will be further impaired over time under the proposed action. The goal of the proposed action is to improve conditions, not to further impair them. This will be monitored, and management measures will be modified over the 50-year term if conditions are being impaired that indicate that resource protection goals are not being met. The DEIS has been modified to clarify this statement based on this comment.

As suggested, the analysis does combine cumulative effects from all sources and all parameters of water quality and peak flows into one term – "adverse cumulative effects." This is the purpose of a cumulative effects analysis – to summarize the cumulative effect on a resource once the parameters and expected past, present, and future actions are

defined. Together, these actions would likely result in an adverse cumulative effect on water quality and peak flows under some alternatives, as the analysis correctly summarizes. Finally, identifying each specific source of impact and location on 9.3 million acres and adjacent lands would not likely lead to a different conclusion. Past activities and resulting current conditions indicate that, when combined with some alternative actions and possible future activities, such as urban growth, water quality effects would remain impaired.

The analysis does identify risks and uncertainties for resource impacts. For example, the analysis of past land use actions clearly states that "Some resources, such as large woody debris (LWD), may require many additional decades to fully recover" (subsection 5.2.1.2, Past and Present Land Uses). Subsection 5.3.3.2, Fish and Fish Habitat, states that "Many of the factors that have contributed to the decline of salmon, steelhead, and trout are a result of historic practices that have and/or will continue to be improved as knowledge of land use impacts to habitat and species improves." The conclusion to this subsection states that "While some adverse cumulative effects from the wide variety of land use activities are unavoidable, these effects should diminish over time…Many efforts have been underway for many years; some have just begun and are yet to begin. Thus, it will likely take many years for the various efforts to interact in such a way as to halt and reverse negative cumulative effects." The wildlife analysis under Alternative 2 states that wildlife protection would be more predictable based on continued implementation of the Washington Forest Practices Rules…"

Regarding number 4) in the above list of reasons from the commenters, the current Washington Forest Practices Rules, and any future changes to the Rules, that affect water quality must be approved by Ecology. Adaptive management studies are already in progress to investigate the effectiveness of the Washington Forest Practices Rules at protecting water quality and other functions of riparian areas. Ecology will analyze the results of these studies using temperature criteria in effect at the time the studies are completed, including antidegradation requirements. If current prescriptions are degrading water quality, Ecology will request changes to the Washington Forest Practices Rules to prevent any future degradation. Intensive monitoring and adaptive management studies will provide information on whether or not current forest practices are cumulatively increasing stream temperature.

Another commenter stated that the FPHCP provides no process for the effective regulation of cumulative watershed effects and no analysis of the consequences of this omission. The commenter stated that past impacts from forest practices have compromised the resilience of the present ecosystems, and as a result, even relatively small actions may have proportionally large and adverse effects, often expressed as eliminating, hindering, or delaying natural recovery processes. The commenter further stated that the cumulative effects analysis in Chapter 5 of the DEIS is devoid of meaningful content as it is politically motivated and does not account for and discuss the real biological consequences of harm and loss of habitat from past actions.

In response, the DEIS and Draft FPHCP both include detailed discussions of current conditions on the landscape caused by previous management practices. Sections 3.2 and

4.2 of the DEIS specifically discuss Land Ownership and Use, while the evaluation of the alternatives includes discussions of how these past practices will affect the implementation of each of the alternatives. The FPHCP discusses the cumulative effects of other management activities in Washington State in Chapter 2, including the history of forest practices regulation in Washington, other salmon recovery efforts in Washington, and the relationship of the FPHCP to other laws and regulations. Additionally, the results of over 60 Watershed Analyses completed across the State were considered during the development of the Washington Forest Practices Rules that are consistent with FFR.

However, as appropriate under the NEPA guidelines, the DEIS presents the widest discussion of cumulative effects from the proposed alternatives. Specifically, cumulative watershed effects are discussed in subsection 5.3.3.3 of the DEIS. In general, the DEIS states that rule changes or modifications to the Washington Forest Practices Rules envisioned under each of the alternatives that could cumulatively affect water quality and hydrology include Watershed Analysis, RMAPs, hydrologic maturity (rain-on-snow rule), riparian and wetland buffer widths, the fate of the adaptive management program and possible changes in the rate of forestland conversion.

Further, the Washington Forest Practices Rules include a cumulative effects rule (WAC 222-12-046), which identifies how the Washington Forest Practices Rules address changes to the environment caused by two or more forest practices. Concerning Alternative 2, which is the FPHCP Alternative, the DEIS states that Alternative 2 would likely produce the least potential for watershed cumulative effects due to a more fully supported adaptive management program.

3.15.2 Length

One commenter expressed concern that the analysis is only 23 pages long despite the fact that the FPHCP covers over 9 million acres, indicating the level of effort for the analysis was very low. Because the covered land area is so large, the cumulative effects analyses should have been more in-depth.

The Services do not take the position that page length in an EIS equates to adequacy of the review. The cumulative effects review addressed all elements required by NEPA, as described above.

3.15.3 Ineffective Review

At least one commenter stated the belief that the cumulative analysis is rife with logical and factual errors and internal contradictions that render it useless and misleading. Another believed the entire analysis should be scrapped since it does not qualify as either a credible analysis or public disclosure; unless a list of contrived and unchecked distortions and fabrications based on wishful thinking can be considered disclosure.

The Services cannot identify any factual errors, “unchecked distortions,” or internal contradictions in the cumulative effects analysis, and the commenter provided no specific examples. None of the analysis was “fabricated” by the Federal government on “wishful thinking” rather; it was based on a working knowledge of forest and species conditions. The Services have not employed “wishful thinking” to somehow downplay cumulative conditions. The Services have disclosed those resource effects that they believe would be

further impaired by various alternative actions, and those that the Services believe will be improved over time when compared to current conditions. As described above, the cumulative effects analysis will provide the decision-makers with valuable information on past actions that have lead to current conditions and reasonably foreseeable future actions based on known trends and the regional regulatory framework. This information is available for all resources of concern under each alternative. For example, the Northwest Forest Plan goal of creating millions of acres of late successional forest over time will assist the Services in assessing cumulative future improvements in connective habitats when combined with our actions (subsection 5.2.2, Statutes, Regulations, Plans, and Programs, *Northwest Forest Plan*). Combined with results of the pending biological opinions and ESA findings documents, as well as an assessment of the direct effects expected under each alternative (DEIS Chapter 4.0, Environmental Consequences), the decision-makers will have adequate information to determine the level of significant impact on the direct, indirect, and cumulative levels given the specific components of each alternative (e.g., adaptive management, monitoring, specific Washington Forest Practices Rules under each alternative).

3.15.4 Support for Alternative 2

One commenter noted that given the beneficial nature of Alternative 2, as demonstrated by information in the FPHCP, as well as the scope and complexity of Alternative 2 and other alternatives, the commenter believes the DEIS contains a reasonable analysis of cumulative impacts that comports with the requirements of NEPA.

The Services note this comment.

3.15.5 Species Habitat

One commenter believed the DEIS fails to describe the relative importance of different lands within the ranges of the covered species in Washington to their survival and recovery. For example, the DEIS fails to examine where species may be more dependent on coastal forests and other low elevation forests that are predominantly managed by non-Federal landowners.

The Services note that the Regional Summaries in Appendix A of the DEIS provide baseline information for each of the 12 regions identified for analysis in the DEIS. Each summary includes the following seven sections: physical description, landownership and use, forestland ownership and management, habitat limiting factors, habitat trends, fish resources, and amphibians. DEIS subsection 4.8.4, Synthesis by Analysis Region, provides a regional perspective of the alternatives and a discussion of how the alternatives might affect the status of covered fish species and recovery of listed fish species found in the analysis regions. The discussion of affects among the alternatives on covered amphibians relies mostly on the importance of specific habitat variables and less on the distinctions among analysis regions (DEIS subsection 4.9, Amphibians and Amphibian Habitat).

3.15.6 Species Survival and Recovery

At least one commenter believed the DEIS fails to examine where and when specific habitat, ecosystem, or population conditions needed for each of the covered species

survival or recovery will be attained across the species' ranges. The DEIS does not examine the cumulative amount, intensity, and extent of take that will occur under the FPHCP combined with all other activity on private, tribal, State, Federal, and other lands across the species' ranges in Washington. The commenter believes that the DEIS should discuss whether this cumulative take will significantly and appreciable harm each of the covered species' chances of survival and recovery and discuss conditions needed for full recovery of each covered species. The commenter believes there is no basis in the DEIS for determining whether the Washington Forest Practices Rules, in conjunction with other reasonably foreseeable actions, will be protective enough, or whether the proposed action will meet ESA goals of minimizing and mitigating take, or the FFR goals of restoring harvestable levels of salmon.

The Services note that aspects of recovery were described in various analyses in Chapter 5, Cumulative Effects. For example, the conclusion to the Fish and Fish Habitat review stated that "The various programs and plans described above reflect a substantial wide-spread effort and financial commitment to improve water quality, putting listed species on a positive trend towards recovery…" (subsection 5.3.3.2, Fish and Fish Habitat). The conclusion continues by stating that "From the perspective of cumulative effects No Action Alternative 1-Scenario 2 is unlikely to meet the level of protection needed for the long-term recovery and conservation of listed species." The wildlife review acknowledges that there are a number of protection measures, at all levels of government, throughout Washington to maintain and recover listed species (subsection 5.3.4.2, Wildlife). The discussion of Recreation and Commercial Fishing states that "No Action Alternative 1-Scenario 2 is unlikely to meet the level of protection needed for the Washington Forest Practices Rules to play a role in the overall recovery process" (subsection 5.3.5.2, Social and Economic Environment). As more fully discussed in the Adaptive Management response (subsection 3.5) and the Endangered Species Act response (subsection 3.1), a thorough analysis of species recovery would be conducted in recovery plans that are developed for endangered and threatened species pursuant to ESA Section 4.

The Services will analyze the impact of take under ESA Section 7. The biological opinions that document the Services' analyses of take will be reflected in the NEPA Record of Decision, the statement of findings documents under ESA Section 10, and in the Services' decisions whether or not to issue ITPs.

ESA Section 10(a)(2)(B) requires that the Services determine whether the FPHCP meets the issuance criteria for issuing an ITP. The issuance criteria includes: 1) the taking will be incidental; 2) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; 3) the applicant will ensure that adequate funding for the plan will be provided; 4) the taking will not appreciably reduce the likelihood the survival and recovery of the species in the wild; and 5) other measures that may be required as being necessary or appropriate for purposes of the plan. The Services will each describe how the FPHCP meets or does not meet the issuance criteria in the Services' statement of findings documents.

3.15.7 Covered Activities/Covered Lands

One commenter stated that the analysis must address each covered activity and the resulting impacts to covered species and consistently describe the covered lands.

The covered forest practices activities are described in the FPHCP, which is incorporated by reference in the DEIS. However, the DEIS has been modified to include a description of these activities under the description of the proposed action (see DEIS subsection 2.3.2, Alternative 2).

The Services' analysis in Chapter 4, Environmental Consequences, addresses the effects of the forest management prescriptions under each alternative (which constitute the covered activities under the proposed action) on specific habitat elements that create a properly functioning aquatic ecosystem for covered fish species (DEIS subsection 4.8.3, Evaluation of Alternatives). For example, road use and construction are covered activities, and subsection 4.8.3.2, Fine Sediment, *Overview of Effects*, addresses sediment impacts to fish habitat resulting from road-related management prescriptions. The Services believe the assumption, that a properly functioning aquatic ecosystem is good for all of the covered fish species, holds true. Also, there is a discussion in DEIS subsection 4.8.4, Synthesis by Analysis Region, of how the alternatives would affect covered fish species from a regional perspective. For covered amphibian species, the Services described in DEIS subsection 4.9.2, Evaluation of Alternatives, how the alternatives would affect microhabitat and unique habitats that amphibians need for their life history strategies. The Services believe the assumption, that protected and functioning microhabitat and unique habitats will be beneficial to the covered amphibian species, holds true.

Regarding the covered lands, Chapter 5 (Cumulative Effects) begins by providing the reader with the context for the analysis, including a description of the analysis area for the cumulative effects review (subsection 5.2, Context for Analysis). DEIS Appendix A (Regional Summaries) is a lengthy review of all the covered lands across the State. It is divided into 12 analysis regions to help describe the affected environment and the impacts associated with each alternative. This appendix was incorporated into the document by reference because of its length and as valuable background information. The reader is referred to the covered lands descriptions from DEIS Appendix A in the beginning of Chapter 3, Affected Environment, (subsection 3.1, Introduction), the beginning of Chapter 4, Environmental Consequences (subsection 4.1.1, Analysis Area), and throughout Chapter 4 within various resource reviews, such as the first paragraph of subsection 4.4, Geology, Soils, and Erosional Processes. However, the DEIS has been modified to reflect this comment. Additional cross-referencing to Appendix A (Regional Summaries) has been provided in the FEIS at the beginning of Chapters 4 and 5.

One commenter was concerned that the cumulative effects analysis addresses water resources and water quality at the regional scale although the processes that control these effects operate at the watershed scale. As a result, the commenter believed the scale of analysis is inadequate.

In response, subsection 5.3.3 (Aquatic Resources) addresses cumulative effects for water resources at both the landscape and watershed levels, as stated in the introduction to this

subsection. Specifically, subsection 5.3.3.1, Water Resources, and subsection 5.3.3.2, Fish and Fish Habitat, reviews impacts at the landscape level. Subsection 5.3.3.3, Cumulative Watershed Effects, addressed cumulative impacts at the watershed scale.

One commenter suggested the FPHCP fails to provide adequate information on each of the covered species' distributions, abundance, population trends and dynamics, unique habitat and ecological requirements, life history, causes of endangerment, or likely threats. The commenter also suggested the FPHCP fails to adequately examine the significance of the covered lands to each of the species' and their chances of survival and recovery, and where different watersheds and other subsets of the covered lands may be especially important to different species.

The commenter also suggested the FPHCP fails to accurately specify which forest management practices will be covered by the ITPs.

In response, the FPHCP proposes coverage for 53 fish species and seven riparian-obligate amphibian species. Varying levels of data exist for each of these species. For example, extensive data on life histories, population status, limiting factors, etc. exists for anadromous salmon species; considerable data exists for resident salmonid species; much less data exists for nongame fish and amphibian species. Various available resources (scientific journals and publications, WDFW SASI reports, technical reports, distribution databases, etc.) were consulted for species status, life histories, and distribution. Limiting factors reports, Watershed Analyses, and other scientific publications were consulted for factors affecting the status of covered species. Life histories are described for each covered species within the FPHCP (see Section 3-1.1, Life History of Covered Fish Species). Distribution, status, and limiting factors were described for species (as available) on varying scales such as by FPHCP Planning Region, WRIA, and Watershed (see FPHCP Section 3-1.2, Status and Distribution of Fish Species/Populations; and DEIS Appendix A, Regional Summaries).

The FPHCP attempts to describe the significance of covered lands for covered species by describing their distribution, status, and limiting factors within each EIS planning region. Life history needs are described for covered species, as well as how forest practices can impact those life history needs within each FPHCP planning region.

The FPHCP (Section 1-5, Lands covered by the plan) defines covered lands by five forest zones (based on forest type) to help describe how these areas vary by physical characteristics (geology, soil type, hydrology, etc.). These physical variations need to be considered when describing the natural species distribution, life history needs, natural limiting factors, as well as how past and future forest practices might impact covered species.

Section 1-4, Activities covered by the plan, describes forest practices activities proposed to be covered under this FPHCP. The main categories of forest practices activities are: timber harvesting, road construction, road maintenance and abandonment, reforestation, and site preparation. Under each of these categories, further detail of each activity is described. For example, the timber harvesting category includes: intermediate (thinning)

and final harvest, cutting and felling of trees, the limbing and bucking of trees into logs, and yarding.

The DEIS also evaluates the current status and environmental effects to covered species from implementation of the Alternatives, including the proposed FPHCP. The Services will also be analyzing these issues for the proposed FPHCP as part of the ESA Section 7 biological opinions.

A commenter states that "*The HCP's conservation measures do not fully prevent, minimize, provide replacement habitats for, or otherwise mitigate "take" and the impacts of "take" for each of the covered species*." In response, HCP applicants are not required to "fully" prevent, minimize, and provide replacement habitats for each covered species. HCP applicants are, however, required to implement conservation measures that minimize and mitigate the impact of incidental take to the maximum extent practicable. The same commenter states, "*The HCP's definition of the covered activities is far too cursory and open-ended.*" The Services note that the activities proposed for coverage under the FPHCP is consistent with the State's Forest Practices Act definition of regulated activities. Therefore, the same activities regulated under the Act are covered by the FPHCP. DNR has regulated forest practices in accordance with the Act since 1974. During that time, DNR has had little problem or confusion distinguishing between regulated and unregulated activities. As a result, the Services view the FPHCP definition of covered activities as sufficient.

Contrary to the claim that "*The HCP fails to provide species-specific impact minimization and mitigation measures, including cases where the covered species have unique or differing needs,*" there are multiple examples of species-specific or process-specific protection measures in the FPHCP. Streams designated as bull trout habitat have heightened shade requirements, reflecting the cold-water habitat requirements for this species. Habitats important to stream-breeding amphibians such as seeps and springs are priority areas for protection. Headwater protection follows a hydrologically-based water typing system where perennially flowing streams that provide amphibian habitat receive higher levels of protection than seasonal streams. Headwater protection also recognizes the importance of perennial headwater streams to downstream fish-bearing reaches by providing for large woody debris recruitment, shade, and litterfall.

The same commenter claims "*The HCP's conservation measures also largely fail to account for variations in environmental conditions within Western and Eastern Washington*". In response, this is inaccurate, since there are several examples of regionally specific protection measures included in the FPHCP. RMZ widths differ between eastern and western Washington, reflecting differences in site productivity and maximum tree heights. Default basin sizes that define the upstream extent of perennial flow also differ due to variations in annual precipitation. Headwater stream protection varies between regions, reflecting different forest types and associated silvicultural strategies (i.e., clearcut vs. partial cut) that exist in eastern and western Washington.

The commenter claims "*The HCP also fails to provide permanent habitat protection*". In response, it is unclear what is meant by "permanent" habitat protection. If it means areas that are off-limits to all management activity, the statement is inaccurate. All Channel

Migration Zones, riparian management core zones, Type Np RMZs in western Washington, and Type Np sensitive site buffers are off-limits to management barring a few exceptions like road crssings. In addition, management is not allowed in western Washington riparian management inner zones where DFC targets cannot be attained. While management activities are allowed in other "protected" areas such as riparian management outer zones, these sites still receive "permanent" protection in the sense that forest practices activities are restricted in these areas.

The FPHCP shows that nearly 80 percent of areas important to the long-term conservation of covered species receive protection under the plan. In these "critical areas," forest practices activities are prohibited or restricted so that natural ecological processes that create and maintain riparian and aquatic habitats are conserved. Forest practices are also regulated outside critical areas in order to limit adverse effects to habitats within critical areas. For example, forest roads outside critical areas must be maintained to the same standard that applies within critical areas. While the State acknowledges that FPHCP implementation will not "fully prevent or offset" take of covered species, the level of take is expected to be minimal and the proposed conservation measures will mitigate take by protecting important habitats during forest practices activities and allow for the recovery of habitats that have been adversely impacted by past forest practices.

3.15.8 Adjacent Lands

At least one commenter was concerned that adverse effects on adjacent public lands could impact streams on private lands, urging that the DEIS look at impacts expected to occur outside the immediate geographic area of the proposed action.

The Services agree that impacts on adjacent lands are an important factor in considering the cumulative effect of each alternative within the analysis area. As with the scale of the analysis area, however, a complete site-specific review of all past, present, and foreseeable future actions on adjacent lands bordering 9.3 million acres would have been nearly impossible to capture. As a result, we identified past actions and resulting future actions that have generally occurred within the entire State. To address potential future actions, the Services looked to the Federal, local, and State regulatory framework to describe expected outcomes regardless of the specific activity or specific location.

As examples, subsection 5.2.2., Statutes, Regulations, Plans, and Programs, describes the various regulations and their conservation objectives that are implemented throughout the State. In particular, the Northwest Forest Plan description includes a review of land categorizations and explains how some management may have short-term impacts although long-term protection measures are being applied. Further, this discussion explains the Northwest Forest Plan goal of creating millions of acres of late successional forest over time, which will assist the Services in assessing cumulative future improvements in connective habitats when combined with our actions. Subsection 5.3.3.2, Fish and Fish Habitat, describes how Federal forest practices have affected fish habitat and U.S. Forest Service conservation planning. The review of these planning objectives on adjacent lands was then combined with the expected impacts under each alternative to derive an estimate of cumulative effects.

Each of the resource reviews in subsection 5.3, Analysis of Cumulative Effects, does address how each alternative will affect the environment in conjunction with known impacts.

3.15.9 Watershed Analysis

Some commenters were critical of the current Washington Forest Practices Rules (and therefore the FPHCP protection measures), saying they lack measures to prevent cumulative watershed effects. The commenters point to a large reduction in Watershed Analysis as the main support for their claim, with one commenter saying that in place of Watershed Analysis, the State has substituted "*…state-wide experimental, high-risk standard guidelines that do not scientifically conserve the habitat of listed species.*"

In response, during the 1990's over 60 Watershed Analyses were completed and approved throughout the State of Washington. These analyses covered more than 3,000 square miles of FFR lands or more than 20 percent of the lands proposed for coverage under the FPHCP. Analyses were completed in each forested ecoregion and FPHCP planning region in the State. Management prescriptions were developed for each analysis. The prescriptions became the operating standards for that geographic area, replacing the Washington Forest Practices Rules. Prescriptions addressed mass wasting, surface erosion, large woody debris recruitment, solar energy/water temperature, and rain-on-snow related hydrologic changes. The prescriptions were intended to reduce (or in the case of large woody debris, increase) these geomorphic inputs to improve water quality and habitat conditions throughout the watershed. A basic premise of Watershed Analysis was as follows: if inputs of sediment, woody debris, solar energy, and water could be returned to near-background levels through the implementation of better forest practices on specific parts of the landscape, then cumulative watershed effects would be less likely to occur.

The Watershed Analysis approach served as a model for scientists, resource managers, and policy-makers in other States and even other countries. DNR maintained a list of "qualified analysts" who had completed the agency's Watershed Analysis training and certification process. By the year 1999, that list included over 470 professionals – one indication of the broad support for, and interest in, Washington's Watershed Analysis approach.

By the time FFR negotiations began in 1998, scientists, managers, and policy-makers had a vastly improved understanding of the cause-and-effect relationships between forest practices, geomorphic processes, and habitat conditions. While part of this knowledge was gained through research and monitoring efforts, most was a direct result of Watershed Analyses that had been conducted in Washington. FFR negotiators relied heavily on the published literature as well as Watershed Analysis findings when crafting recommendations for overhauling the Washington Forest Practices Rules. Watershed Analysis highlighted the need to better address mass wasting, road surface erosion, and riparian protection. Specifically, Watershed Analysis findings were used to develop the list of high hazard unstable slopes and landforms that trigger SEPA review; to develop improved road construction and maintenance BMPs; and to develop standards for increased riparian protection. As a result, the information generated through more than

60 statewide Watershed Analyses was integrated into new Washington Forest Practices Rules that took effect in the year 2000.

It stands to reason that if Watershed Analysis was effective in assessing and addressing cumulative effects and the results of over 60 Watershed Analyses served as the basis for many FFR-related protection measures, then those protection measures should also be effective in preventing cumulative watershed effects. In fact, FFR included recommendations that increased habitat protection beyond what had been prescribed through Watershed Analysis. For instance, few Watershed Analyses included prescriptions that addressed Channel Migration Zones and non-fish-bearing streams. FFR recommended, and the FPHCP includes, protection for Channel Migration Zones and perennial non-fish-bearing streams.

While it could be argued that the FPHCP represents a level of protection equal to (and in some cases greater than) that provided by Watershed Analysis, the reality is that we still don't know if the FPHCP protection measures will prevent cumulative effects. This uncertainty will be addressed through the intensive monitoring program within adaptive management. The purpose of intensive monitoring is to evaluate the collection of FPHCP protection measures by "intensively" monitoring geomorphic processes and habitat conditions in selected watersheds within the State. Unlike effectiveness monitoring where the objective is to determine if a single protection measure is meeting its performance target, the idea behind intensive monitoring is to evaluate the integration and interaction of multiple protection measures to determine if resource objectives are being met at the watershed scale. Since cumulative watershed effects would preclude attainment of resource objectives, intensive monitoring is a de facto way of evaluating cumulative effects.

One commenter stated the problem with cumulative effects is made even greater because the FFR explicitly removes the ability to modify riparian prescriptions based on Watershed Analysis, and eliminates all previously completed Watershed Analysis and related riparian prescriptions. Thus, the information cannot be used to design riparian protections specific to certain areas to prevent cumulative impacts. Further, the commenter stated that given the major problems with cumulative effects of loss of aquatic and riparian functions there is a growing need for Watershed Analysis, however, the tool itself is still inadequate as a cumulative effects evaluation method.

In response, Appendix G of the FFR covers Watershed Analysis; G.2 (a) states, "The new regulations for riparian management zones supersede existing watershed analysis prescriptions." Although Watershed Analysis was a useful tool for determining cumulative effects to watersheds, it was found to be very time-consuming and expensive to conduct. As a result, some of the incentive to perform Watershed Analysis - regulatory stability for the landowner - was undermined. Therefore, at the time of the writing of FFR, it was anticipated that the Washington Forest Practices Rules themselves would be changed in order to include the mitigation measures commonly prescribed following Watershed Analyses. In fact, the statement is made many times in the DEIS that many of the sediment minimization prescriptions in the current Washington Forest

Practices Rules arose from information learned through the completion of over 60 Watershed Analyses conducted across the State since 1992.

Another commenter said the DEIS states that Watershed Analyses have decreased since 1999. The commenter went on to state that it actually decreased before that date as landowners and anyone who could participate in Watershed Analysis were, instead, directing their efforts toward FFR negotiations which led to the current Washington Forest Practices Rules. Further, the commenter suggested that while it is fair to say that the number of Watershed Analyses has decreased, the DEIS should explain why that is, rather than leave the reader with an impression that Watershed Analysis is no longer being conducted.

The DEIS states in at least two places (subsections 3.4.2.3 and 4.8.4) that Watershed Analysis was conducted primarily between 1991 and 1996 resulting in approximately 60 completed Watershed Analyses across the State. The DEIS goes on to explain that the majority of watersheds in the State have not undergone analysis, due in part to the time and expense associated with performing them and many of the components of the revised Washington Forest Practices Rules, based on the FFR, were derived from Watershed Analysis prescriptions. The most common problem areas found during Watershed Analyses - riparian buffers, roads and unstable slopes - were the priority issues addressed in the FFR and the subsequent revised Washington Forest Practices Rules. Further, through the FPHCP, the State of Washington is pursuing incidental take coverage of aquatic species for the Forest Practices Regulatory Program and Washington Forest Practices Rules. Therefore, much of the benefit from and incentive to perform Watershed Analysis has been realized, or no longer exists, respectively. The DEIS will be modified to more clearly explain why Watershed Analysis is no longer being performed.

Another commenter, referring to the FPHCP section on unstable slopes and landforms, said the statements made in this section do not reflect the current situation in the Tribe's Usual and Accustomed Areas. Despite the completion of six Watershed Analyses in the Tribe's Usual and Accustomed Areas, not one forest practice application in an unstable area designated to be a "no-harvest area" in a Watershed Analysis has been restricted or denied.

While it is difficult to know exactly what geographical area the comment is referring to, in general, the current Washington Forest Practices Rules are designed to restrict activities on unstable slopes or landforms prior to the submittal of a forest practices application. As stated above, the Washington Forest Practices Rules were designed to incorporate prescription elements from completed Watershed Analysis, and therefore take into account protection on unstable areas (see subsection 3.4.2.3 of the DEIS). The section on Unstable Slopes and Landforms in the FPHCP explain that protection measures related to unstable slopes and landforms are primarily an outcome-based, decision-making process that includes evaluations to determine if activities will have a "probable significant adverse impact." The only exception to this occurs in areas where Watershed Analysis has been conducted and approved and where management prescriptions are in place to address unstable slopes. Where forest practices are determined to have a probable significant adverse impact, then the applicant must either

prepare an Environmental Impact Statement through SEPA, and/or incorporate mitigation measures. Mitigation measures range from avoiding unstable slopes to altering the methods or techniques used in timber harvest and/or road construction. Unstable slopes avoidance is the most commonly used mitigation measure and results in the lowest hazard and risk.

3.15.10 Regulatory Review

One commenter objected to the cumulative effects analysis in the DEIS because it uses the local, State, and regional regulatory framework as a proxy for other past, present, and reasonably foreseeable future actions.

The Services refer the commenter to responses above under the subheading *Context for Analysis* regarding the rationale for utilizing the regulatory framework to support the analysis on reasonably foreseeable future actions.

The Federal government necessarily assumes that other Federal, State, and local regulations are effective and enforceable. It is not the Services position to counter this premise or to scrutinize the objectives and outcome of these legislative actions. We recognize that no regulation functions to its full intent because of on-the-ground circumstances and changing political environments, however, we are confident that other Federal, State, and local agencies continually work to improve conditions to meet the environmental objectives of their programs, and that, for the most part, these programs are effective. For these reasons, and because it is unlikely that quantitative data exist for all ongoing programs statewide, we do not believe that a review of all compliance and effectiveness information for each program described in the DEIS would garner additional useful information. The DEIS acknowledges that past actions have resulted in current impaired conditions, many of which will take years to restore under current programs and those yet to begin.

The comment regarding unenforceability of regulations analyzed in the DEIS on private lands is unclear. In response, private landowners are subject to State, Federal, and local regulations.

The DEIS does not assume that existing regulations are sufficiently protective of listed species, and the commenter did not provide evidence from the document to support this claim. The DEIS does take a "hard" look at how effective the regulations are at protecting species, acknowledging that there is much need for improvements and continued work at the State, local, and Federal levels.

As clearly described above, the Services acknowledge that programs are consistent with recovery, but the Services do not state that recovery has been achieved because it is dependent upon many other factors. Subsection 5.3.3.2, Fish and Fish Habitat, states that "Many of the factors that have contributed to the decline of salmon, steelhead, and trout are a result of historic practices that have and/or will continue to be improved as knowledge of land use impacts to habitat and species improves." The conclusion to this subsection states that "While some adverse cumulative effects from the wide variety of land use activities are unavoidable, these effects should diminish over time…Many efforts have been underway for many years; some have just begun and are yet to being.

Thus, it will likely take many years for the various efforts to interact in such a way as to halt and reverse negative cumulative effects."

The Services note that each regulation, policy, and plan was described in terms of its environmental goals and objectives to determine if those objectives would be compatible with objectives under the proposed action. The intent of the analysis was to capture impacts and parameters of possible future actions that are currently unknown and to combine those with anticipated impacts under the proposed action. The Services did not intend to overstate the effectiveness of these programs, as described in the paragraphs above. The introductory text to DEIS Chapter 5, Cumulative Effects, and to subsection 5.2.2, Statutes, Regulations, Plans, and Policies, has been modified to more clearly explain the intent of this review.

The conservation measures required under each program was described. For example, the review of the ESA describes the requirement for HCPs and recovery plans (subsection 5.2.2.1, Federal Statutes, Regulations, Plans, and Programs, *Endangered Species Act*). Note that the site-specific conservation measures employed under the ESA are specific to each ITP and recovery plan, and these were not described because: 1) it would be a lengthy process to catalogue all of these measures, and 2) the Services do not believe the analysis results would be different from those presented in this subsection (i.e., that combined with the goals of the ESA, the proposed action will work to improve conditions over time as compared to current conditions). The National Historic Preservation Act (NHPA) requires an agreement with the State Historic Preservation Officer and Tribes regarding clearly documented resources that would be affected by the proposed action and mitigation measures to minimize impacts (subsection 5.2.2.1, Federal Statutes, Regulations, Plans, and Programs, *National Historic Preservation Act*). The review of the Northwest Forest Plan describes all of the land use designations aimed at resource improvements (i.e., conservation measures) and the U.S. Forest Service Aquatic Conservation Strategy, aimed at restoring aquatic ecosystems (subsection 5.2.2.1, Federal Statutes, Regulations, Plans, and Programs, *Northwest Forest Plan*).

For reasons stated in above, the DEIS did not include an analysis of specific impacts associated with actions possible under each of the regulations. However, the analysis of each resource and the parameters to be affected under each alternative were analyzed in subsection 5.3, Analysis of Cumulative Effects. The conclusions contemplated future actions where they were known supplemented by a review of unknown actions derived from the regulatory analysis.

The anticipated cumulative effect on listed salmonids under each alternative is described in subsection 5.3.3.2, Fish and Fish Habitat, *Conclusion.* The cumulative effect will also be analyzed in the NMFS biological opinion and ESA findings documents. Further, the determination of potential jeopardy is not prepared in a DEIS, but in the ESA biological opinion and findings document.

The DEIS did not include an analysis of regulations that would not likely have an effect on the analysis area. For example, activities during the next 50 years by the Federal Energy Regulatory Commission on or near the analysis area would more than likely include only relicensing efforts. It is unlikely that new dams would be built, and removal

of specific hydropower operations is unknown at this time and would be speculative. Regardless, the impact of hydropower operations was incorporated throughout the analysis (as an example, see subsection 5.3.3.2, Fish and Fish Habitat).

Agriculture, instream flow, and diversion regulations have been captured in the analysis under the Clean Water Act, Ecology's Water Quality Plans and Programs, Hydraulic Project Approvals, Comprehensive Watershed Planning Act, Shoreline Management Act, Washington Pesticide Laws and Regulations, and the State Salmon Recovery Strategy. Agricultural activities, instream flow management, and diversion actions are regulated by these programs.

The commenter is correct that the analysis did not include a description of the environmental objectives under the U.S. Army Corps of Engineers wetland regulations. The DEIS has been modified to reflect this comment.

3.15.11 Water Quality Compliance

One commenter was concerned about the deferral of TMDLs on FFR lands until 2009 is not analyzed and that the DEIS incorrectly states that forestlands have a lesser role in maintaining water quality when the spatial extent of commercial forestland on the landscape is smaller.

In response, the DEIS recognizes that the combined effect of FPHCP implementation and current State water quality regulations have a consistent goal, which is aimed at improvements over current water quality conditions by continuing to employ conservation measures. Because Ecology and the Forest Practices Board are partnered in rule development for activities on forestlands, we anticipate that the documented locations of noncompliance in forested watersheds will decrease over time under the proposed action.

Ecology and EPA consider implementation of the Washington Forest Practices Rules to be the quickest and most efficient means for achieving State water quality standards, which is why they agreed to defer developing TMDLs in waters covered by the FPHCP until 2009. At this time, data from adaptive management and compliance monitoring studies will help Ecology and EPA to determine if implementation of the Washington Forest Practices Rules will allow streams to meet State water quality standards. If there is insufficient data to make this determination, EPA and Ecology may need to elevate the priority of forestry TMDLs and re-evaluate the best way to attain State water quality standards. Clean Water Act assurances and, if ITPs are issued, ESA assurances would be conditioned on results of future water quality monitoring.

The Services were unable to locate a statement in either the DEIS or Draft FPHCP that "forestlands have a lesser role in maintaining water quality when the spatial extent of commercial forestland on the landscape is smaller." Without understanding the context for this assertion, the Services are unable to respond to the comment that this statement is incorrect. Further, this statement is unclear, so the Services are unable to clarify or verify its meaning.

3.15.12 Small Landowner Disincentives

At least one commenter was concerned about the effectiveness of buffers if the stream flows to an area that is not forest related because Washington Forest Practices Rules do not apply to these areas. The Services acknowledge that the protections of the FPHCP do not apply to lands not regulated by the Washington Forest Practices Rules. See also the Conversions response (subsection 3.14) and the discussion in the DEIS at subsection 4.2.3.2, Forestland Conversion.

3.15.13 General Salmon Protection

One commenter wanted NMFS to provide strong protections for salmon. Forest buffers should be mandatory, forest roads should be restricted until road erosion problems have been mitigated, and hatchery salmon should not count towards population abundance since they are damaging the gene pool. The numbers of spawning salmon are dwindling, and they need to be protected.

The Services respond that salmon protective measures are addressed in the DEIS subsection 5.3.3.2, Fish and Fish Habitat. However, this subsection has been modified to provide additional information on recovery plans, a web link to NMFS' salmon recovery efforts, and information on other protective measures for salmon.

3.15.14 Other Habitat Conservation Plans

At least one commenter stated that there is no discussion of the cumulative effects of this HCP when combined with other HCPs. Many of the other HCPs have less effective conservation measures for amphibians, salmon, and bull trout, and this impact should be described as a cumulative outcome. As examples, the Plum Creek HCP allows significant amounts of logging in limited buffers on Type Np streams, does not protect unstable slopes, and provides fewer protections to seeps and headwalls. The West Fork HCP contains measures that are only marginally improved over prior Washington Forest Practices Rules.

In response, the analysis does describe the effect of other HCP measures when combined with expected trends of the FPHCP. Subsection 5.3.3.2, Fish and Fish Habitat, acknowledges other Washington HCPs as employing conservation measures aimed at fisheries improvements. Table 5-1 outlines all the HCPs that are currently implemented in Washington, covered areas, initiation dates, and covered species. The objective of each of these HCPs is to improve species conservation using the adaptive management strategy to make modifications over the term of the ITPs. The DEIS has been modified to reflect this comment by adding additional information about the cumulative effect of ESA actions under subsection 5.2.2.1, Federal Statutes, Regulations, Plans, and Programs, *Endangered Species Act*.

Regarding the Plum Creek and West Fork HCPs, the Services disagree with this comment and believe that other HCPs (e.g., Plum Creek, West Fork) retain objectives and prescriptions for effective conservation of amphibians, salmon, and bull trout habitat, recognizing that these prescriptions are different than the prescriptions in the FPHCP. The Plum Creek or West Fork HCPs both require protective measures for perennial, non-fish-bearing streams, hillslopes (i.e., unstable slopes), and sensitive sites used by

amphibians. The commenter's statements that these HCPs are inadequate are not, according to the Services, accurate descriptions of these HCPs.

The Services are uncertain where the DEIS makes assumptions that other HCPs are immune from contributing to cumulative watershed effects. The Services believe that other HCPs are aimed at improving habitat conditions when compared to conditions prior to HCP implementations, and that these improvements will continue to occur over the terms of these approved ITPs.

USFWS disagrees that protection measures for the DNR State Forests HCP have been weakened. DNR recently fulfilled their commitment under the State Lands HCP for aquatic and riparian protection, and it is not a lesser prescription that the HCP called for.

Forest landowners that currently hold valid ITPs for their own HCP are unlikely, in the Services' opinions, to voluntarily terminate their HCP so as to come into the FPHCP. These landowners negotiated with the Services over several years and spent significant financial resources to develop an HCP for their specific land ownership, forest management objectives, and ITP duration. However, the Services acknowledge that land may come in and out of the FPHCP as forest landowners sell and buy forestland over the lifetime of the FPHCP and that the FPHCP is robust in its conservation measures to account for such modifications to land covered by the FPHCP.

3.15.15 Critical Habitat Designations

One commenter expressed the concern that the DEIS does not discuss the cumulative effects of the Services' proposal to exclude HCP-covered lands from agency designations of critical habitat for various listed species and potential impacts associated with the proposed action.

In response, the exclusion of HCP-covered lands from designated critical habitat is discussed in the Services' proposed and final rules designating critical habitat for listed species. Also, the Services' biological opinions will describe the cumulative effects of the proposed FPHCP on designated and proposed designated critical habitat.

3.15.16 Limited Resource Review

One commenter believed the analysis is incomplete because it only addresses aquatic resources.

The Services believe this is an incorrect conclusion. Chapter 5, Cumulative Effects, begins with a discussion on land ownership and past and present land uses (subsection 5.2.1). It then summarizes the resource categories that were analyzed at the end of subsection 5.1, Introduction (e.g., air quality, land ownership and use, aquatic resources, vegetation, wildlife, cultural, and social and economic resources). Subsection 5.2.2., Statutes, Regulations, Plans, and Programs, describes many programs aimed at conservation improvements for wildlife, air quality, cultural resources, and other non-aquatic resources. Finally, subsection 5.3, Analysis of Cumulative Effects, reviews anticipated impacts to all resources potentially affected including air quality, landownership and use, aquatic resources, fish and fish habitat, watersheds, vegetation, wildlife, cultural resources, and social and economic resources.

3.15.17 Limited Alternatives Review

A commenter believed that only the proposed action received a cumulative effects review.

The Services point out that, beginning in subsection 5.3, Analysis of Cumulative Effects, each resource topic addresses impacts under each alternative, including the No Action Alternative scenarios.

3.15.18 No Action Alternative

One commenter pointed out that Alternative 1-Scenario 2 would be incompatible with water quality regulations, Wild Salmon Policy, and the State Salmon Recovery Strategy, which rendered it an unviable alternative that should have been dropped from analysis.

The Washington Forest Practices Rules under Alternative 1-Scenario 2 are not necessarily incompatible with the programs mentioned in the comment, although specific research to show incompatibility has not been conducted. However, according to Ecology, the current Rules are less likely to meet current State water quality standards compared to the other alternatives.

3.15.19 Resources Analyzed

One commenter said that the DEIS fails to analyze cumulative effects for the topic areas the State chose to include in the analysis.

The Services clarify that the State did not chose topics to be analyzed in the DEIS. The Services determined the resource areas for environmental review based on public and internal scoping.

3.15.20 Baseline/Current Conditions

Several commenters believed the analysis was flawed because it relied on an inappropriate environmental baseline, but the commenters had different views about what the flaws were.

In response, past conditions were thoroughly described in the Chapter 3, Affected Environment, and in DEIS Appendix A (Regional Summaries). These past conditions were then equated to current conditions and trends, which was used as the baseline to measure all direct, indirect, and cumulative effects (subsection 3.1, Introduction). The DEIS has been modified to reflect this comment in subsection 5.2.1, Land Ownership and Past and Present Land Uses.

The Services believe that the use of past conditions as the baseline for measuring future impacts would be invalid. Knowledge of past conditions is useful in understanding current conditions of the environment, and possible continued trends. The analyses contemplate these past conditions. However, the current resource conditions represent a more realistic scenario to measure the alternative components against.

As the comment suggests, the DEIS does not address how current conditions that include habitat degradation in conjunction with past habitat and population losses would be sufficient to maintain or recover species. With the exception of the No Action Alternative, the review required in an EIS is not to assess effects of current conditions,

but the effects of proposed alternatives in conjunction with current conditions. It is the change in effect from current to anticipated conditions that renders the EIS useful for a decision-maker, not the effect of current conditions themselves on various resources.

In theory, the No Action Alternative properly captures the effect of current conditions because it assumes that no change to the environment would occur as a result of the alternatives. In this DEIS, the No Action Alternative represents "bookends" of possible regulatory outcomes and resulting impacts to current conditions.

The DEIS discusses loss of habitat from past actions in the following subsections:

- 3.4.2.3, History of Forest Practices Affecting Erosion and Sedimentation
- 3.7.1.6, Historic Protection of Riparian Areas
- 3.7.2.2, Historic/Current Wetland Protection (Note: historic information is correctly found in 3.7.2.3, which has been re-titled in the FEIS as Historic and Current Condition of Wetlands)

The Services interpret one commenter's reference to use a baseline reflecting "harvestable levels of fish" to mean that fish populations are abundant enough to provide harvest opportunities for all types of tribal and non-tribal fisheries. In response, this does not represent the current condition of the fisheries resource in the State of Washington. NEPA implementing regulations require that an EIS describe the environment of the area to be affected (Council on Environmental Quality Part 1502.15). Using "harvestable levels of fish" would not accurately describe the environment of the area to be affected under the DEIS. Therefore, the Services believe the environmental baseline for the various resources analyzed in the DEIS are appropriate as described in Chapter 3, Affected Environment.

3.15.21 Alternative 2 Analysis

One commenter believed that the net result of Alternative 2 should be described as an improvement on environmental conditions into the foreseeable future, and amelioration of past environmental impacts that have occurred on forestlands.

The Services do not dispute this conclusion, but are unsure where this overall conclusion would be presented in the cumulative effects chapter. However, the intent of this comment to refine the conclusion regarding improvements over baseline conditions has been modified under each of the regulatory review conclusions specific to Alternative 2.

One commenter strongly encourages the development of improved conservation measures beyond the levels in the FPHCP for imperiled salmonids, amphibians, and other aquatic species that rely on non-Federal forest habitats in Washington for their survival and recovery. The commenter felt that there are still serious gaps in the current Washington Forest Practices Rules' protection measures.

In response, the FPHCP provides improved habitat conservation measures over those in place prior to the implementation of the current Washington Forest Practices Rules in effect since January 1, 1999. In addition, the FPHCP contains an adaptive management program to produce technical information and science-based recommendations to assist

the Forest Practices Board in determining if and when it is necessary or advisable to adjust the Washington Forest Practices Rules and guidance in order to achieve program goals, resource objectives, and performance targets. Further, the commenter is free to participate in the FPHCP's adaptive management program, provide public comment at the Forest Practices Board meetings, and lobby Washington (State) legislators.

3.15.22 Review of Non-Critical Areas

One commenter expressed a belief that the DEIS did not address cumulative impacts to non-critical areas, such as uplands. The Services note that subsection 5.3.4.1 (Vegetation) discusses the cumulative effects of the alternatives on forest vegetation conditions and in particular late seral forests and rare plants. These effects would influence upland areas somewhat, however, effects are primarily related to riparian and aquatic areas.

3.15.23 Upland and Amphibian Species

One commenter stated that the DEIS fails to address cumulative effects on upland species that would not be covered by the ITPs. The analysis should examine how changes in forest management in conjunction with upland forestry will affect species such as black bear, elk, deer, etc. The DEIS does describe late seral forest conditions, but not the impact of these conditions on non-listed species or the distribution of late seral stands across the landscape. One commenter held the position that there is no cumulative analysis of covered amphibian species. In response, the DEIS has been modified to clarify cumulative effects on upland species and amphibians. The Services believe the analysis is adequate even though some specific upland and amphibian species are not addressed individually, but rather collectively through changes in habitat protection within RMZs.

3.15.24 Exemptions

One commenter was concerned about what the commenter called "the large number of logging plans that were grandfathered into FFR" or other significant exemptions that still exist in the Washington Forest Practices Rules and the FPHCP mitigation measures.

The Services are uncertain what the commenter is referencing. It is true that forest practices applications submitted prior to the change in Washington Forest Practices Rules in 1999 were approved by DNR in the normal course of administering the Forest Practices Regulatory Program. These forest practices applications would have been allowed to follow the previous Washington Forest Practices Rules and would have expired two years from forest practices application permit issuance, sometime in 2001. The effects of these practices are analyzed, as are all other effects of prior activities, in the environmental baseline. The Services do not know the "exemptions" to the Rules to which this commenter refers.

3.15.25 Future Actions

Commenters thought that the DEIS should have looked at reasonably foreseeable future actions such as population growth, land use planning, demand for recreational properties, global timber markets, effect of small landowner exemptions, climate change, agriculture, and future harvest levels. One commenter stated that the government needs the freedom

to revisit these issues if the environment changes or if science provides new information about salmon interactions with the human environment.

The DEIS does address future issues such as population growth, land use planning, and increased use demands through the analysis of laws that regulate these activities. As described in this subsection under the subheading *Context for Analysis*, it is impossible to determine how these changes would specifically interact with the FPHCP on 9.3 million acres of land since specific actions at specific locations are currently unknown. However, these issues are controlled by legislative actions that carefully contemplate their eventual occurrence. The DEIS focuses on the environmental objectives of these regulations and combines that with the intent of the FPHCP to improve various resources.

Regarding climate changes, the Services acknowledge that future conditions will likely be altered. For example, future conditions could be impacted by increased forest fires as a result of global warming and its attendant drought conditions. Future conditions under continuing global warming were considered for this response, based partially on information disseminated by the Climate Impacts Group at the University of Washington.

Global warming predictions suggest wetter winters and drier summers in the future. The most significant change for water resources will be a reduced snow cover in coming decades. During the winter, warmer temperatures will mean that precipitation falls less as snow and more as rain, reducing the amount of water stored as snowpack and released over a relatively longer period of time (as opposed to rainfall). Higher winter runoff will increase peak river flows and the likelihood of floods, mostly in lower elevation river basins. Less snow means earlier and lower spring runoff and less water available for summer use. "The future, therefore, probably holds increases in winter flooding and – paradoxically – increases in summer drought." (Mote et al. 1999, as cited in Storedahl HCP FEIS, November 2003).

McKenzie et al. (2004) state that:

> …in contrast to a common view that past forest management practices are solely responsible for a recent spate of years with very large forest fires, we found that in most western states, the area burned by wildfire in a given year was very strongly influenced by that year's summer climate. In particular, large fire years are much more likely to occur during warm dry summers and future warming - even at the low end of projected climate scenarios – and may lead to at least a doubling in average area burned. The implications of more frequent, extensive fires include an increased probability of losing local populations of species dependent on late seral habitat.

Additionally, increased temperature in the future will likely extend fire seasons throughout the western United States, with more fires occurring earlier and later than is currently typical, and will increase the total area burned in some regions. If climate change increases the amplitude and duration of extreme fire weather, we can expect significant changes in the distribution and abundance of dominant plant species in some ecosystems, which would thus affect habitat of some sensitive plant and animal species.

Some species that are sensitive to fire may decline, whereas the distribution and abundance of species favored by fire may be enhanced. The effects of climatic change will partially depend on the extent to which resource management modifies vegetation structure and fuels (McKenzie et al. 2004).

The Services agree that the government must be able to revisit these issues over the 50 year period of the ITPs, should circumstances warrant. Issues such as sediment loading and water temperature were analyzed in the DEIS as direct and cumulative effects. The Services believe that the FPHCP's adaptive management program provides for the monitoring of changing environmental conditions to these and other parameters and for modifications in Washington Forest Practices Rules in response to those changes.

Regarding agricultural practices, the DEIS does address the affects of this land use. For example, irrigation is acknowledged as a contributor to Columbia River system land uses and effects (subsection 5.2.1.2, Past and Present Land Uses), as a pesticide contributor (subsection 5.2.2.2 State Statutes, Regulations, Plans, and Programs, *Washington Pesticide Laws and Regulations*), as a population increase concern (5.2.2.2 State Statutes, Regulations, Plans, and Programs, *Growth Management Act*), as a key factor influencing habitat and population conditions for fish (subsection 5.3.3.2, Fish and Fish Habitat), and as a contributor to aquatic resource conditions in general (subsection 5.3.3.1, Water Resources).

One commenter stated that the assumptions, that this HCP is needed to (or will) help stop urban sprawl in the State of Washington, are unfounded.

The FPHCP and DEIS do not make the assumption that the FPHCP will help stop urban sprawl. Instead the documents recognize the economic impacts forest landowners will and have been incurring due to the more restrictive Washington Forest Practices Rules that have been in place since January 1, 1999. When a landowner loses potential income there is always a risk that the landowner will find a way to replace the income. One way to regain income lost is to convert the land to a more profitable venture. Due to population growth and development, forestlands are sometimes converted to another use for a higher profit than can be obtained through forestry. As profit margins are reduced due to increased restrictions on harvest, the likelihood of conversions increase.

3.16 ECONOMICS

3.16.1 Social and Economic Environment

Many of the comments received bearing directly or indirectly on the general topic of "economics" were written concerning both "the HCP and the DEIS." Furthermore, many of the these comments concerned both general and specific observations regarding aspects of economics that fell outside of the scope of the economic analysis presented in the DEIS which focused both on the predictable effects on labor and employment under each of the DEIS alternatives, and the effects on non-use and ecological services values under each of the alternatives.

Some of the comments on economics criticized the economic analysis in the DEIS for not focusing on whether or not the proposed FPHCP alternative minimized and mitigated the effects of the proposed incidental taking to the maximum extent practicable. That was

not the function of the DEIS, so that observation is not addressed here, but is addressed in the Endangered Species Act response (subsection 3.1).

In addition, some comments provided suggestions on further elements of the social and economic environment that should be considered along with the labor and non-use or ecological services values mentioned above. Some of these comments included observations regarding the notion of the "economically viable timber industry" mentioned in the FPHCP. Again, these comments fall outside the scope of the economics analysis prepared for the narrow proposed action of issuing the proposed ITPs.

Finally, other comments criticized the apparent absence of certain factors from the Social and Economic environment analysis. These comments will be summarized and addressed below. Additionally, to the extent that comments on subjects outside of the scope of the DEIS' social and economic environment analysis bear on aspects of the analysis presented, the Services will provide a brief response here.

At least one commenter disagreed that riparian harvest restrictions equate to lost money for forest landowners. That commenter suggested that trees retained in RMZs increase the value of those zones making them more desirable for purchase as conservation areas. However, the DEIS' social and economic environment analysis only considers the economic effects of riparian reserves as they might be experienced by landowners as a subset of the social and economic environment. Foremost, the analysis focuses on the likely and readily discernable effects of various riparian conservation regimes on the employment sectors most likely to be affected by increased or reduced harvest, in comparison to that from the level of harvest predicted for the FPHCP Alternative. The analysis also considers the effects of the various alternatives on other employment sectors for which there would be an indirect, but still somewhat predictable relationship (commercial and recreational fishing). The analysis also considers the effects on Natural Amenities, Quality of Life, Non-use values, and Ecological Services.

The prominent difference between each of the alternatives is the extent of harvest that might occur, and that difference is a highly illustrative organizing basis for the economic effects analysis. Given the ready availability of data regarding the relationship between harvest and employment in the forest products industry, the differences in employment in the various forest products sectors is highly descriptive of the economic effects of the various alternatives. Given the absence of data or even anecdotal examples that riparian reserves generate any sort of market value to offset the opportunity cost of tree retention strategies, the concept is too speculative to influence the findings from Perez-Garcia et al. (2001), O'Neill (2003), and Zobrist (2003), that inform the DEIS' basis for concluding that timber reserved in RMZs affects land values as presented, the Services believe that any such offset would be too speculative to be useful as an element of that analysis.

One commenter suggested that the definition of "Economic Viability" include and be balanced with other considerations such as cultural and religious values important to Indian Tribes and other citizens affected by the decision [on the proposed action]. As mentioned above, the concept and values embodied in the term "economic viability" as it appears in the DEIS is not related to the NEPA social and economic environment

analysis. Economic viability is a value mentioned in Washington State law and brought to the FPHCP development process by certain participants in that process.

At least one commenter made several observations critical of the methodology and correlations present in the social and economic environment analysis. One observation was that evidence from the recent past (as shown in years 1990-97 of DEIS figure 5-2) undermines the relationship between timber harvest and forest products employment. In response, this observation is incorrect in two respects. First, isolating a subset of years from a larger sample is inappropriate when trying to dissemble the larger pattern reported. Second, even taken out of context, these years follow the general relationship illustrated by the larger sample. When harvest decreased, so did forest products employment. When harvest increased, so did forest products employment. The commenter makes this incorrect observation to support an argument that is irrelevant to begin with even if it is correct; that increased logging will not result in increased employment. This argument is irrelevant because the DEIS makes no such finding with respect to the alternatives analyzed. The DEIS analysis of forest products employment only goes as far as to illuminate the likely result that differing harvest regimens will create different results in forest products employment, and what those results will be. Thus, the Services disagree with this comment.

The commenter asserted that timber industry effort at lowering unit production cost was more responsible for lower employment. However, as the trends in employment followed the trends in harvest, the Services determined that this indicator effectively illustrates and discloses the relative effects on the social and economic environment of the various harvest changes that would occur under each of the alternatives. Since the timber industry would be expected to make the same effort at unit production cost reduction regardless of the alternative, harvest changes are a valid basis for discerning the effects of the proposed action.

The same commenter suggested the DEIS analysis errs in using information presented in Perez-Garcia et al. (2001). Specifically, the commenter asserts Perez-Garcia et al. (2001) ignored the increased demand for computer trained labor in the forest products sectors. The Services disagree with this comment. To forecast changes in employment in the forest products sectors analyzed, Perez-Garcia et al. (2001) used multipliers to help predict the number of jobs affected per thousand board-foot change in harvest. These multipliers were developed by the United States Department of Commerce, Census Bureau according to the Standard industrial Classification (SIC) code for each of the forest practices sectors analyzed in the DEIS. These sectors include every sector that could be patently linked to harvest, transportation, processing (milling and pulp and paper for example), among others. The SIC codes do not distinguish within these sectors whether the operators are computer operators, machine operators, or manual laborers. Instead, these classifications are meant to be broad enough to capture the employment populations within each sector as fully as possible. For example, within the logging sector (SIC 241) the standard industrial classification does not distinguish between sawyers, yarding operators, and truckers. These classifications do differentiate between employment in logging, milling, pulp and paper, and related sectors, leading to the development of different multipliers for these sectors. Therefore, the use of these

multipliers provides a comprehensive, comprehensible, and highly illustrative tool for the discussion of the range of employment effects predicted to occur under each of the alternatives.

This commenter also submitted a separately prepared analysis of the February 21, 2001 New Proposed Forest Practice Rules Cost Benefit Analysis (Perez-Garcia et al. 2001). The Services appreciate the length this commenter went to in supporting the many arguments presented in it comments on the presently proposed action and through the present NEPA process. However, the Cost Benefit Analysis was prepared in accordance with Washington State law, meeting distinct State procedural and content requirements, for a separate State process than the one for which the Services are presently providing public environmental review. The Services note that unlike the Small Business Economic Impact Analysis (Perez-Garcia et al. 2001) the present NEPA environmental review made little if any use of or reference to Perez-Garcia et al. (2001). The appropriate forum in which to have criticized the Cost Benefit Analysis would have been the relevant State process, carried out in 2001 by the Board of Natural Resources, not the present NEPA process for the proposed action of issuing ITPs under the ESA. Therefore, the Services note the submission but will not respond further to the arguments contained therein.

One commenter provided statistical information to support its assertion of the importance of the forest products industry in the Washington State economy. This comment is noted.

One comment asserted the applicant must provide supporting economic information (unless proprietary) to support the use of economic considerations when choosing one land management choice over another one. This comment falls outside the scope of the NEPA social and economic environment analysis. Again, the NEPA analysis must disclose and describe the social and economic effects of the proposed action in comparison to the other alternatives analyzed in detail. In fact, the NEPA environmental review process is not intended to facilitate the selection of an economically or environmentally preferable alternative, but to illustrate the relative effects of the alternatives so that the action agency decision is made with full knowledge of the likely effects.

Two commenters suggested the Services need to account for factors offsetting the cost of land management restrictions (the "compliance cost") such as the tax deductibility of that cost. Compliance cost effects of the alternatives are compared, in qualitative terms, in a subsection of DEIS 4.14.2.1 entitled "Effects on Forest Businesses." The Services believe the commenters concern with the tax deduction offset is misplaced as the deduction has no bearing on the qualitative analysis. Given the increased riparian buffers and other operating requirements embodied in the Washington Forest Practices Rules, forest businesses would incur a cost to comply with those Rules when they decide to harvest and sell their timber or sell their land. That cost is defined as a loss in current revenue *plus* a loss in asset value, in addition to higher operating cost. Since the tax deduction is proportional and only bears on loss of current revenue, it would not influence the outcomes presented in the qualitative analysis of the effects on forest

businesses. Therefore, it would not enhance the disclosure and description of the economic effects of the alternatives.

One commenter asserted that compliance costs would be offset by higher stumpage prices based on the supply-reducing effect of the proposed harvest restrictions. The Services do not believe that the effect on overall timber supply from any of the analyzed alternatives (among the myriad other things that drive the stumpage price of timber) would be capable alone of driving the market price of timber on the stump. The Services neither possess nor are aware of any data that support that argument, let alone the argument that any increase in stumpage price would offset the compliance cost as analyzed in the DEIS.

One commenter asserted the economic analysis is flawed with respect to the finding that certain economic outcomes would create incentives for landowners to convert forestlands to other more profitable land-uses. The commenter argued that since the State of Washington is the ultimate authority on land-use and the applicant for the subject ITPs, it could reconcile these potential outcomes. The Services note that the social and economic environment effects analysis merely states this possible outcome in passing, in a qualitative analysis of the compliance cost of the alternatives. This analysis is meant to disclose and describe these effects under each of the alternatives including the proposed action. The issue of conversions and land-use authority is well beyond the scope of this analysis.

Another comment criticized the economic analysis for not addressing the conclusion that the FPHCP minimizes and mitigates the effects of take to the maximum extent practicable. While the Services agree generally with the idea that costs, and therefore "economics" can bear on the practicability of certain conservation measures, this comment concerns an issue that is outside of the scope of the NEPA social and economic environment analysis. Instead, that comment concerns whether one of the several ESA Section 10(a)(2)(B) criteria for issuing an ITP is met. The commenter is referred to the Endangered Species Act response (subsection 3.1).

One comment noted the timber industry is a source of family wage employment and that the proposed alternative would have the least effect of the alternatives on such employment. The Services agree that the analysis supports this comment.

One commenter addressed several issues in the course of criticizing the content and method used in the social and economic environment analysis. As did a commenter above, this commenter assailed the correlation between the amount of harvest and the number of jobs in the various forest products sectors. This comment is addressed above. The commenter also argued that certain covered forestlands would never be logged and that as a result, the DEIS overstates the economic effect of the alternatives. This comment is specious. The State applied for ITPs covering forest practices activities wherever the Washington Forest Practices Rules apply. While it is possible, even likely that some of these covered lands might never be logged, the analysis must address the effects across the lands for which permit coverage is sought.

A commenter observed the economic analysis does not quantify the effects of the alternatives on jobs outside of the forest products sectors, arguing that salmon recovery

would lead to increased jobs in commercial and recreational fishing and other sectors. The comment is correct but the social and economic environment does present an equally extensive qualitative analysis on sectors outside of the forest products industry. Not only does the analysis cover commercial and recreational fisheries, it discusses natural amenities and quality of life as elements of the human environment, as well as non-use and ecosystem services values. Obviously these latter sectors are very difficult to evaluate so they lend themselves to qualitative analysis. Similarly, the effects on jobs in the fishing sectors are better described qualitatively. Unlike the forest products industry sectors analyzed for the DEIS, the commercial and recreational fishing sectors do not lend themselves to the development of multipliers that neatly describe the relationship between predicted harvest amounts and numbers of jobs affected. Furthermore, the appropriate relationship at issue in this comment is between the number of fish produced and the number of jobs. Since forest practices under the proposed FPHCP alternative are but one of myriad conservation actions required to contribute to the recovery of affected salmonids, no such multiplier could be developed. In contrast, there is a certain basic logic behind the idea that improved habitat on covered lands will contribute to increased fish populations which could lead to increased fishing opportunity. Hence, the analysis provides a qualitative comparison of the relative effects of the alternative in this regard.

The same commenter noted the DEIS did not assess non-use or ecosystem services values or the value of carbon sequestration within the conserved areas. On the contrary, the DEIS does assess non-use and ecosystem services values (DEIS subsection 4.14.3.1, Non-Use Values). Carbon sequestration was not analyzed in and of itself. While carbon banking is an interesting idea that is getting some traction in academic and international forums with respect to the issue of global warming, the Services are unaware of and possess no information substantiating the use of carbon sequestration to offset the compliance cost analyzed in the DEIS, especially not at the scale of the proposed FPHCP alternative. Thus, the concept is too speculative to have been included in the DEIS analysis in any way that supports the purposes of NEPA. Finally, this commenter observed the DEIS does not examine the relationship between forcing landowners to follow longer timber harvest rotations and an increase in jobs in the forest products sectors. The Services are unaware of and possess no data supporting the argument that longer rotations will increase employment in the forest products sectors.

One comment observed that the legal benefits of receiving an ITP confer an economic benefit on landowners that should have been considered. The Services agree that some incidental take permittees are motivated by concepts like “regulatory certainty” and the assurances that accompany holding an ITP. However, the compliance cost analysis summarized in the DEIS clearly portrays the cost associated with the burden on the land asset of providing the underlying conservation function (Perez-Garcia et al. 2001), and the Services disagree that regulatory certainty can be evaluated against these obvious costs.

One comment suggested the tax implications of the Washington Forest Practices Rules would make it more economically practicable to implement more restrictive conservation measures. This comment is flawed in several respects, many of which have been addressed in the several responses above. First, analysis of the tax deductibility of certain

forestland areas is outside the scope of the NEPA social and economic environment analysis. Second, the extent to which any deductibility actually offsets the compliance costs is arguable to the extent that it was not featured, if even considered in Perez-Garcia et al. (2001). Third, practicability is an element of the one of the ESA Section 10(a)(2)(B) ITP issuance criteria and will be analyzed separately when the Services prepare their statements of findings on those criteria. The DEIS is never the correct place to conduct such an analysis. Fourth, while cost can be an element of the consideration of "practicability," the ability of an applicant to pay is not the starting point for determining the content of an HCP. HCP development focuses first on creating a plan that will meet the ecological needs of the affected species in view of the effects of the underlying covered activities on those species. Applicants, ever mindful of the cost of implementation, can consider cost when working with the Services to develop an HCP, but the Services never participate with an eye toward the most that the applicant can pay. As stated above, there is more to the Services' response on minimizing and mitigating to the maximum extent practicable in the Endangered Species Act response (subsection 3.1).

A final comment recommended that the analysis illustrate and compare the economic differences of the use of different harvest regimes under the alternatives. The Services do not find that such analysis would enhance the social and economic environment analysis presented in the DEIS. The basic difference in the forest management aspects of the various alternatives in the DEIS is the extent of harvest restriction and road condemnation and obliteration. These differences by themselves create a range of environmental outcomes, that when compared to no-action, well-disclose and describe the differences between the alternatives and the proposed action alternative.

One comment asserted the goal of protecting the economic value of timber has not been balanced with the economic value of fishing, tourism, agriculture and the forest ecosystem's contribution to the State ability to attract business and commerce based on a clean, alive, and beautiful place to live. As stated above, the function of the DEIS is to present and compare the predictable effects of the proposed action with alternatives to the proposed action (including no-action) on various elements of the human environment, including the social and economic environment. The DEIS presents this analysis in subsections 4.14 (Social and Economic Environment) and 5.3.5 (Social and Economic Environment and Archaeological, Historical, and Cultural Resources). In this analysis, the DEIS presents the Services' assessment of the affects on employment in forest products and commercial and recreational fishing, land values, non-use values, ecosystem services, and aesthetics and quality of life. The Services find that the analysis of each of these sectors is illustrative of effects on each of the topics the commenter raises, except agriculture for which the Services could not derive a logical connection. As to the balance the commenter believes is missing, the Services find that the goals of the proposed action are misstated in the comment. To clarify any misunderstanding with respect to the purpose and need for the proposed action, the Services direct the commenter to DEIS subsection 1.2, Purpose and Need for Action.

3.16.2 General Economic Viability

Comments were received concerning the term "economic viability," stating that it cannot stand alone, as solely applied to timber production, without being balanced by the economic, religious, and cultural aspects to the Tribes and other citizens affected by these decisions.

Where the DEIS uses the term economic viability, it is to address the specific circumstance associated with the economic well-being of forest landowners who harvest portions of their land for economic return. In particular, the term economic viability is used in conjunction with Alternative 4 and the likelihood that landowners will maintain their lands as forestlands or whether they will choose, due to economic losses, to sell or convert their land to non-timber uses. Other issues, such as economic, religious and cultural concerns of the Tribes, are also addressed in the DEIS (see subsection 4.13, Archeological, Historical and Cultural Resources), but are not combined with the economic viability of forest landowners. The goal in addressing these issues separately was to better identify specific impacts to both forest landowners and Tribes. This does not mean that one set of issues is more or less important than the other in that they should thus be weighed more heavily in the decision-making process, nor is it meant to ignore the fact that there are overlapping issues that affect both forest landowners and Tribes. It is simply meant to respect the fact that there are different interest groups affected by the Washington Forest Practices Rules and to clearly identify issues specific to those interests. Subsection 4.14 (Social and Economic Environment) addresses issues other than the economic welfare of private and State forest landowners in Washington and strives to create a balanced assessment based on both social and economic issues.

Further comments stated that having a strong and healthy timber industry in the State helps to optimize the use of logs from private lands and operation of private manufacturing and distribution facilities. Logging supports a strong economy in Washington State.

Comment noted.

Other comments stated that approval of the FPHCP could help create a climate in which the forest products industry could thrive and grow. There are enormous opportunities to increase timber growth rates on most non-Federal lands in Washington. The Washington Forest Practices Rules consistent with FFR reduce the amount of non-Federal forestland available for management by about 10 percent. If sufficient capital were invested in more intensive forest management, timber growth rates on intensively managed lands could increase substantially. Approval of the FPHCP in combination with other public policy initiatives could attract enough silvicultural investment to significantly increase timber growth rates on the lands remaining available for timber harvest, bringing the total commercial timber growth above pre-FFR levels. Increased growth rates eventually could lead to increased timber harvests and a stronger, more vibrant and healthy timber industry.

Comment noted.

Another comment stated that more intensive management of less sensitive areas would allow the timber industry to expand. The commenter went on to state that this could provide sustainable business opportunities for those private landowners who chose to engage in commercial timber production and a non-development market for those landowners who wish to sell timberlands.

Comment noted.

One comment stated that complying with the requirements of the current Washington Forest Practices Rules already costs landowners a tremendous amount of money. The Forest Practices Board's New Proposed Forest Practices Rules Cost Benefit Analysis shows that the benefits to public resources provided under the new proposed Rules narrowly outweigh the costs. Increasing the cost of regulations will tip the scale and increase conversion rates. The economic tipping point can be described as a point in time where enough land has been withdrawn from production in a given area such that the necessary underlying infrastructure (fixed costs such as mills, forest roads, etc.) can no longer be supported and forestry is no longer viable. Once the tipping point has been reached, commercial forestry is no longer economically viable, and conversion to other uses is a natural result.

Comment noted.

Further comments stated that the Washington Forest Practices Rules consistent with FFR were found to take over $2.3 billion in timber assets out of production, and cost more than $4.5 billion, which is over 21 percent of the asset value of the private timberland base. In comparison, Alternative 4 of the DEIS was found to take over $7.3 billion in timber asset out of production, and cost more than $10.3 billion, which is over 48 percent of the asset value of the private timberland base.

Comment noted.

Some commenters were concerned that the FPHCP lacks supporting analysis to demonstrate each alternative's impact on the viability of the timber industry. The FPHCP also lacks discussion about specific actions that the timber industry has taken to reduce its viability prior to changes in the Washington Forest Practices Rules (i.e., zoning changes to non-forestry uses, housing proposals, etc.).

ESA Section 10 provides a voluntary process for applicants. The process is flexible and does not require economic analyses of the entity submitting the application. However, prior to submitting the FPHCP, during the SEPA process for the adoption of the Washington Forest Practices Rules consistent with FFR, the State conducted two economic analyses, the *New Proposed Forest Practices Rules Cost Benefit Analysis and the Small Business Economic Impact Statement.* These analyses are incorporated by reference in the FPHCP.

3.17 ANALYSIS

3.17.1 Recovery Period

Some commenters were concerned that consideration of how conditions change with re-growth of the harvested stand is generally ignored in the alternative comparisons. The analysis treats the landscape as if it were all to be harvested at one point in time, which overstates the impacts of all the alternatives, but especially Alternative 1, Alternative 2, and Alternative 3. The time over which the effect from harvest occurs, and the rate at which the effect declines with time following harvest, are elements that should have been evaluated in comparing the alternatives

In response, it is difficult to assess re-growth of harvested stands on such a large and diverse landscape such as the one considered in this DEIS. Re-growth involves many different site-specific variables. However, the Services agree with the comment that timber harvest occurs across the covered lands at many points in time. The DEIS does not suggest otherwise. For the purpose of the DEIS, for ease of comparison, a "snapshot" in time right after harvest is taken to assess effects of each alternative against the No Action Alternative.

3.17.2 Blowdown

A commenter felt the discussion on blowdown in the DEIS failed to mention that this process was considered in the development of the basal areas standards in the current Washington Forest Practices Rules.

The Services note that potential blowdown was taken into account when RMZ prescriptions were determined in the Washington Forest Practices Rules. However, the means of comparing alternatives in the DEIS is based on available scientific literature relating to the buffer widths found among the alternatives. Pollock and Kennard (1998) concluded that buffers of less than 75 feet have a higher probability of appreciable mortality from windthrow than wider buffers. The DEIS uses a 75-feet buffer width as a general guideline. Blowdown is a concern because if an RMZ experiences substantial windthrow, it may not be capable of maintaining desired functions. However, windthrow does improve LWD recruitment during the short-term. The RMZs under all alternatives are likely to experience some degree of windthrow in localized areas. Windthrow is a normal occurrence in forests, but is known to increase along harvest unit edges after timber harvest opens formerly interior forest trees to more direct wind effects (Harris 1989). However, since blowdown is generally greater at the windward edge of a buffer, alternatives with wider RMZs should provide more protection for riparian function. Blowdown levels would be expected to decrease after about 5 years following harvest, the time when trees are most susceptible to blowdown.

3.17.3 Bank Stability

One commenter felt the word "even" on page 4-56, line 23 of the DEIS should be removed. The qualifier is unnecessary to make the point that Alternative 1-scenario 2 will "result in an improvement in bank stability." The DEIS has been modified to reflect this comment.

Commenters were concerned that discussion on bank stability in the DEIS was inadequate because two factors were not accounted for when the DEIS concluded that Alternative 4 would provide better bank stability than the remaining alternatives. The two factors were increased numbers of conversions leading to less overall stream protection and loss of live trees due to increased forest health problems and fire.

In response,conversions and increased forest health problems would likely effect streambank stability but it is difficult to determine the magnitude of that effect. The DEIS does conclude that conversions may increase under Alternative 4 compared to No Action. This would likely result in bank stability effects. However, the DEIS analysis criteria for comparison of streambank stability is based on RMZ widths and management activities allowed within the RMZ or stream channel that may affect root strength and thus streambank integrity. The DEIS does address alternatives and their effect on conversions and the fact that conversions could result in overall reduced riparian functions. The DEIS also addresses forest health issues among the alternatives.

3.17.4 Forest Health

One commenter stated that the FPHCP does not address forest health issues on the eastside and the inevitable harm to wildlife and the air if we fail to provide the management and flexibility to move away from the catastrophic fire hazards and back towards the historical species mix and sustainable stocking levels. Another commenter stated the DEIS correctly concludes that the risk of fire is greatest under Alternative 4 because while the riparian areas under Alternative 4 are larger, no management is permitted within these areas.

In response, there is no one specific section that focuses solely on eastside forest health issues. The DEIS does address the forest health issues associated with catastrophic wildfire throughout subsection 4.1 Introduction, subsection 4.3 Air Quality, subsection 4.6 Vegetation, and subsection 4.7 Riparian and Wetland Processes, stating specifically that no-harvest buffers under Alternative 4 may increase the incidence of forest health problems and wildfire.

The section on air quality and vegetation both state the following:

"The likelihood of wildfire is expected to be slightly higher under Alternative 4 than either scenario of No Action Alternative 1, due to the wider unmanaged riparian buffers, which would result in greater fuel buildup in riparian corridors compared to other alternatives. Unmanaged stands tend to have higher amounts of both down and standing dead fuel and a wide range of tree sizes, from seedlings and saplings to mid-canopy trees to upper canopy trees."

Further, the section on vegetation states, "Any fires that do start would likely burn hotter and for a longer time under Alternative 4 than under either scenario of No Action Alternative 1. Therefore, the potential for intense, stand-replacement fires would be highest compared to other alternatives because of the lack of thinning or understory burning within the riparian zone."

At least one commenter stated that management under Alternative 2 would allow landowners to remove small trees, underbrush, and dead wood thereby reducing the chance of catastrophic wildfire.

Another commenter felt that forest health risks will likely increase under Alternative 4 due to a restriction on management activities in riparian areas. The Services have noted these comments.

Other comments stated that the DEIS is incorrect in its assessment of the effect of logging and roads on forest diseases and pests, asserting that there is no evidence to support that cycles of disease and pests can be eliminated by logging and roads. Instead, logging and roads contribute to increased problems by their effects on forest structure, creating even-aged plantations, and damaging soil productivity, exacerbating drought stress.

The Services note that the DEIS does not make claims that increased logging or road construction will eradicate forest diseases and pests from specific stands of timber. In fact, subsection 3.6.3.3 of the DEIS, Insects and Pathogens, describes instances where management activities may potentially increase insect or disease outbreaks. However, the DEIS makes the point that different insects and diseases respond to different treatments and therefore it is important to maintain flexibility in management options. For example, while there is evidence that the spruce budworm and the Douglas-fir tussock moth may benefit from an increase in forest density and continuity found in many even aged stands (Hessburg et al. 1994), there is also evidence that other insects and diseases, such as the white pine weevil, Annosum root and butt rot will benefit from increased openings in forest stands associated with uneven aged harvest or with an increase in stumps or basal wounds associated with harvesting (Schmitt et al. 2000).

One commenter stated that the DEIS incorrectly asserts that alternatives that have greater restrictions on logging and roading contribute to increased risk of fire and forest pest outbreaks, and their negative effects on aquatic systems.

In response, one purpose of the DEIS is to compare a reasonable range of alternatives to a No Action Alternative. The DEIS used different methods and criteria to provide a comparison for different environmental effects. The method used for comparison of alternatives and their effects regarding wildfire considered the size of the RMZ area left after harvest and the amount of snags and downed wood or potential fuel available after harvest in these areas. The basis for a potential increase in forest health problems in some alternatives was the unnaturally dense RMZs left post harvest particularly in eastern Washington where historically, open ponderosa pine forests were found. Crowded trees in dense stands are excellent habitat for defoliating caterpillars such as the western spruce budworm and Douglas-fir tussock moth. The comparison provided in the DEIS was not intended to mean that greater restrictions on logging and roading contribute to increased risk of wildfire. It is simply noted that if you compare a buffer that has more acreage to a buffer with less acreage, there will likely be more fuel in the larger acreage than in the smaller acreage. Based on this assumption, a determination was made that a likely outcome for Alternatives with larger RMZs is an increase in the likelihood of wildfire. By maintaining standing trees and snags in RMZs, surrounded by dead fuel on the ground

as the result of logging operations, all alternatives contribute to the risk of a wildfire occurring. The extent of the risk is likely to be greater in those alternatives that leave more standing trees and snags and more down woody debris.

One commenter stated, "Logging does nothing to reduce the extent, frequency, or severity of fires."

In response, factors that affect/determine fire intensity and fire size are fuels, weather, and topography. Factors that affect/determine fire frequency are fuels, weather, topography, and human interface. Many things can influence these factors which can in turn affect the frequency, intensity and size of wildfires. Logging can affect available fuels for wildfires by increasing or decreasing fuel levels. The type of logging and the hazard abatement actions taken during logging determine if fuel levels increase, decrease, or remain the same. However, it is not the intent of the DEIS to determine the effect of logging on wildfires. The goal in the DEIS is to provide a comparison between RMZs left after harvest and any potential effect on wildfires. The commenter provided the following references: Karr et al. (2004), Huff et al. (1995), and CWWR (1996). In our review, the "Status of the Sierra Nevada", written in 1996 by the University of California Centers for Water and Wildland Resources (CWWR), was a scientific review of the remaining old growth and an ecological review of the national forests of the Sierra Nevada. The CWWR review included a discussion on wildfires. It concluded that there is a higher frequency of contiguous areas of high-intensity larger fires today than in the past. According to the document, the fire regime of the Sierra Nevada had been changed dramatically due to fire suppression and human encroachment. This has markedly increased the abundance of live and dead fuels available for wildfires. The commenter stated that logging actually contributes to increased fire severity and its negative effects on aquatic systems, due to its effects on stand structure, the substitution of young plantations for diverse forests, and activity fuels. The references the commenter used to substantiate this statement were Huff et al. (1995), CWWR (1996), Karr et al. (2004), and Odion et al. (2004). Our review showed that one of the references (CWWR 1996) states that timber harvest has been the leading factor in the increase in fire intensity in the Sierra Nevada; however, logging can serve as a tool to *reduce* fire if timber harvest incorporates hazard abatement. Hazard abatement is required by law when DNR determines there is an extreme fire hazard (WAC 222-30-100(3)). Our review showed that a second reference provided by the commenter, Odion et al. (2004), analyzed patterns of fire severity and forest conditions in the western Klamath mountains. Odion et al. 2004 had a concern that the conclusion documented by many authors that fuel build-up leads to increased fire severity was being applied across the board to all forests when in reality fire plays a different role in different forests. The setting for the research which led to the conclusion that fuel build-up leads to increased fire severity was in formerly open forests of ponderosa pine that have historically been maintained by frequent surface fires. Comparing this information to eastern Washington lands under the Washington Forest Practices Rules, we see that this is the exact setting that exists in eastern Washington where forest practices riparian rules consistent with FFR take historical fire patterns into account following the goal of reducing stand destroying fires and increasing forest health.

One commenter stated the DEIS fails to disclose that fire has critically important ecological benefits to aquatic systems while logging and roads have none and only degrade systems and that the effects of fire alone pose little threat to aquatic populations. The commenter provided two references to support this statement, Lindenmayer et al. (2004) and Karr et al. (2004).

In response, it was not the intent of the DEIS to compare the effects of fire on the ecosystem versus the effects of logging on the ecosystem. Our review of Lindenmayer et al. (2004) indicates that fire can have important ecological benefits, and of Karr et al. (2004) indicates that fire can also threaten aquatic populations depending on the condition of the habitat prior to a fire. Karr et al. (2004) states that if the habitat has been degraded, as is the case in many watersheds in Washington State, fire can further degrade the habitat and threaten aquatic species.

Our review of Biswell (1989) indicates that fires can degrade ecosystems in various ways. Heavier fuel on the ground resulting from non-harvest buffers could mean a hotter fire that burns for a longer period of time. This volatilizes nitrogen, a nutrient often deficient in forest soils, and can cause greater soil damage, resulting in increased soil erosion. Intense or stand replacement fires are considered to have negative effects on riparian functions and aquatic systems because of elimination of shade, potential for increased erosion and sediment inputs, and other factors. Therefore, optimum conditions are considered to be those that will maintain riparian functions while minimizing the potential for intense, stand-replacement fires.

A primary goal of FFR was to achieve restoration of high levels of riparian function and maintenance of these levels once achieved in order to provide habitat for salmon and other species. Existing riparian conditions include unnaturally high levels of early seral stage vegetation in RMZs on private forestland, primarily as a result of historic timber management activities. Allowing some harvest in riparian areas was an intentional strategy to move riparian areas more quickly toward mature forest conditions, the desired condition for salmon habitat. Mature forest conditions for eastern Washington are open pine forests, which would be emulated with allowed harvest in the riparian area under Alternative 2.

3.17.5 Air Quality

One commenter suggested air quality impacts described in the DEIS may be in error because wider RMZs may require more roads - as compared to that required under no-action - in order to access timber harvest units. Since more roads may be required and air quality is impacted by volume hauled and average haul distances, air quality impacts could be greater under Alternative 4 than was assumed in the DEIS.

Quantifying potential air quality impacts from harvest and hauling is difficult, and can easily reach a point of speculation. Attempting to quantify additional road construction (to access timber) resulting from the wider RMZ buffers required under Alternative 4, and translating that into air quality impacts, is highly speculative. The Services believe there is less speculation involved with associating air quality impacts with harvest volume, as the DEIS analyzes, and that harvest volume would likely be more under No Action Alternative 1 and less under Alternative 4, assuming all other factors are equal.

3.17.6 Visual Resources/Recreation

Some comments stated that all lands that are subject to the Washington Forest Practices Rules should have restrictions limiting timber harvest to maximize the visual quality of our forestlands and that visual preservation of high quality scenery of our forests and wildlife should be given stronger protection from timber harvesting and forestland conversion. The comments further stated that this strategy has economical value in making Washington a progressive environment where quality of life and respect for nature supersedes the short-term goal of harvesting timber for profit.

The Services note that maximizing visual quality and thus, dramatically reducing timber harvest would not meet the purpose and need for action under this EIS. Further, the Services have no control over forestland conversion under this proposed action.

3.17.7 Forest Vegetation

One commenter asked for a source for a statement made in the DEIS in the discussion of forest vegetation (subsection 4.6.2) describing most FPHCP covered forestlands in the State as early to mid-seral. In response, the citations for this information are: Knutson and Naef (1997), Washington Forest Practices Board (2001a), McHenry et al. (1998), and Lunetta et al. (1997). However, the Services note that Chapter 3 describes estimated percentage of seral stages for riparian areas, not for the whole State as the above statement describes.

3.17.8 Minimal Effects Strategy

One comment stated that fundamentally, the "minimal effects strategy" is not a "practicable" alternative to implement due to its significant regulatory and economic impacts on private forestlands. The commenter further stated that it is inappropriate to compare the current Washington Forest Practices Rules with an impracticable hypothetical situation that is not consistent with State law, has never been in effect, has never been proposed for adoption or analyzed in any detail, and is otherwise not supported by best available scientific and commercial information. Instead, to assist the Services in assessing the biological benefits of the proposed Federal action the FPHCP should assess the amount of biological harm thought to be associated with covered activities on covered lands.

The Services note that the minimal effects strategy was developed to fulfill a requirement of ESA Section 10 to identify the extent of effects and the anticipated level of take associated with a proposed HCP. It was not designed to be an alternative to the FPHCP but rather a tool to identify anticipated levels of take associated with the proposed action. Section 4e of the FPHCP discusses the direct and indirect effects of activities covered by the plan. Included in this section is a description of the purpose and various aspects of the minimal effects strategy. As stated in subsections 4e-1 and 4e-2, the minimal effects strategy was designed to meet a mandatory element of habitat conservation plans; a description of the "…impacts likely to result from the proposed taking of the species for which the [incidental take] permit coverage is requested (USFWS and National Marine Fisheries Service 1996)." Therefore, the minimal effects strategy serves as a baseline for evaluating and comparing management under the FPHCP. The basic concept is that by comparing protection of two primary forest components, RMZs and unstable slopes,

which have been scientifically linked to the quality of salmonid habitat, it is possible to quantify anticipated levels of take associated with the proposed FPHCP. In this way, the minimal effects strategy was specifically designed to do as the comment above requests, assess the amount of biological harm thought to be associated with covered activities on covered lands.

Another commenter stated that even as a "low take" scenario, the minimal effects scenario of the FPHCP suffers from several fundamental flaws. The scenario does not examine the unique needs of different covered species, such as the needs of species such as amphibians that often rely heavily on non-fish-bearing stream segments and how logging and other operations in and around non-fish-bearing stream segments can contribute sediment and pollutants to downstream stream segments. Contrary to this comment, the FPHCP does take into account the needs of species that rely on perennial non-fish-bearing (Type Np) waters in the minimal effects strategy. As stated in Section 4e of the FPHCP, under the minimal effects strategy, Type Np waters receive protection from 100-year site index RMZs. RMZs are established along the entire length of the non-fish-bearing perennial network. No management activity is allowed within RMZs under the minimal effects strategy.

The commenter further stated the FPHCP does not address the impacts likely to result from the "minimal effects" scenario's lack of protection for seasonal non-fish-bearing streams. The "minimal effects" scenario also provides significantly less protection to salmonids and other species than the "no take" scenarios used in the analyses of other west coast HCPs.

In response, the FPHCP states in Section 4e that RMZs adjacent to Type Ns waters were not considered critical areas under the minimal effects strategy. Critical areas did, however, include all Type Ns-associated unstable slopes. The assessment assumes that forest practices conducted in Type Ns RMZs that affect riparian function (i.e., reductions in LWD recruitment and shade supply due to harvest) would be unlikely to result in take of covered species, and that take would more likely result from activities that could accelerate mass wasting on Type Ns-associated unstable slopes (i.e., harvest or road-related landslides) which, in turn, might directly or indirectly affect covered species and their habitats in downslope and/or downstream areas.

Further comments stated the FPHCP does not provide species-specific analysis, take, impacts, and mitigation measures; all of which are required, especially for threatened and endangered species. The HCP is based on a "low take" scenario rather than the "no take" scenario used by other HCPs. Another comment stated the FPHCP does not have specific compliance plans and programs, which are critical, especially with an adaptive management process.

In response, the FPHCP does in fact provide information regarding species-specific analysis, take, impacts and mitigation measures in Chapter 3 (Biological Data on Factors Affecting Covered Species), as does the DEIS in Sections 4.8 (Fish and Fish Habitat), 4.9 (Amphibians and Amphibian Habitats), and 4.10 (Birds, Mammals, Other Wildlife, and Their Habitats), and Appendix A (Regional Summaries). Additionally, both USFWS and NMFS are in the process of developing biological opinions for the State's applications,

which will further address these issues. Further, approval of an HCP includes the issuance of an ITP to the applicant, in this case from each of the Services, which implies that some take may occur incidental to otherwise lawful actions. The legal requirements for the issuance of an ITP are the same no matter who applies for an HCP. The specific compliance plans and programs are spelled out in several areas within both the DEIS and the FPHCP. Chapter 4 of the FPHCP describes the overall structure and processes within the Forest Practices Regulatory Program and the role of cooperating agencies and organizations. Specifically, Section 4a-3.1.3 of the FPHCP addresses Compliance and Enforcement of the Washington Forest Practices Rules including compliance checks of ongoing forest practices, compliance monitoring, and enforcement. Likewise, the DEIS also specifically addresses the compliance plans and programs of the Forest Practices Regulatory Program in Chapter 2.

The Services believe that sufficient information exists within both the FPHCP and the DEIS regarding the overall effects of the proposed action on specific species as well as the effectiveness of the compliance plans and programs in order for the Services to make an informed decision regarding the State's applications. However, the FPHCP's compliance monitoring information has been updated in the Final FPHCP.

3.17.9 Water Typing

One commenter expressed concerns that the water typing system is an interim system and is still in development. Another questioned the statistical accuracy of the model.

The Services note that the interim water typing system was originally put into place via emergency Washington Forest Practices Rules in late 1996. The new, permanent model-based water typing system has been delayed due to concerns over model validation and other concerns. The Services are involved in the technical and policy discussions to resolve the development and use of the model-based system. However, the Services are aware that whatever the outcome, the water typing system requires identifying fish habitat and protecting habitat accordingly.

One commenter stated that Section 4b-1 and 4b –1.1 of the FPHCP need to be updated to reflect the current status of the water typing rule, since landowners are currently under a modified interim Rule, using the new maps (westside) as a base map and following the provisions of the original interim Rule. The commenter also suggested the FPHCP should focus on water typing policy objectives, rather than quote specific Rules and how those objectives will be met (e.g., use of interdisciplinary teams, etc.), since it is important for the Forest Practices Board to have latitude to adopt new or amend existing WACs, if necessary to achieve policy goals.

The Final FPHCP has been updated to reflect the current status of the Water Typing Rule. However, the description of the Water Typing Rule in the Final FPHCP reflects the current rule language. This in no way prevents the Forest Practices Board from adjusting rules if necessary to meet policy goals. Adaptive management is fully incorporated into the FPHCP and allows for rule adjustment to meet policy goals.

Another commenter suggested the proposed water typing model doesn't account for the fact that "'end of fish use" can change significantly on an annual basis.

The Services note that the adaptive management program is conducting research to determine the extent to which fish use may or may not vary seasonally and annually, and how determining fish-use variability may be used to determine the upper extent of fish habitat. These studies are being conducted in an effort to field validate the water typing model. Preliminary results from eastern Washington indicate little annual variability. Seasonal variability may be greater in some cases. Western Washington research is scheduled for 2006. These studies will be ongoing in order to estimate the extent to which fish use and fish habitat are related. Once these studies are completed, the CMER Committee will forward peer-reviewed reports to the TFW/FFR Policy Group for consideration. The TFW/FFR Policy Group will determine, based on the study findings, if recommendation(s) to the Forest Practices Board for changes to Rules, guidance and/or model implementation procedures are warranted. In the mean time, new western Washington water-type maps, resulting from the water typing model, are available for use. However, the interim water typing rule (WAC 222-16-031) used to define types has not changed. New eastern Washington maps are scheduled for release in March 2006.

One commenter suggested the DNR water type maps are inadequate because they do not include floodplain areas that are vital over-wintering habitat for coho salmon. The commenter also suggested the water typing system relies heavily on habitat default methods instead of actual survey of fish use, and therefore important questions that depend on knowledge of unique species requirements cannot be raised and specific problems such as disconnected habitats cannot be addressed.

In response, under the interim and permanent water typing systems, off-channel habitat is classified as Type 2 (interim system) or Type F (permanent system) water and protected accordingly. In addition, floodplains adjacent to streams or rivers considered Channel Migration Zones are treated as no-management areas due to their high ecological value. As a result, most if not all over-winter habitat important to species such as coho salmon receives protection under the proposed FPHCP. Under the interim water typing system currently in use, surveys of fish use are commonly used to classify surface waters. While the permanent water typing system will be model-based, the data used to construct the predictive model originates from actual field surveys of fish use. In order to improve the predictive capacity of the model, new information regarding fish distribution will be incorporated at five-year intervals. This new information will reflect changes in fish distribution that result from habitat recovery and seasonal or annual variations in streamflow.

One commenter suggested stream classifications should be based on the presence of usable and/or restorable fish habitat rather than the actual presence of fish, and changes should be allowed based on new observations of the presence of fish or new knowledge pertaining to usable fish habitat. Another commenter suggested it should be noted in both the FPHCP and the DEIS that many landowners reported finding no fish further downstream than the maps recognized, resulting in an over-prediction of fish habitat.

While output from the water typing model may be somewhat unbalanced between over and under-prediction at this point, the water typing model field validation studies are intended to improve the prediction accuracy of the model over time. In addition, the

current water typing rule (WAC 222-16-031) does allow for changes through the water type modification form procedure.

One commenter disagreed with the use of emergency water typing rules in developing the alternative analysis. Another commenter took issue with the conversion of the permanent water typing system (WAC 222-16-030) to the interim water typing system (WAC 222-16-031) for the purpose of comparing alternatives in the DEIS.

In response, there were three different water typing systems and associated RMZ prescriptions used to determine stream miles and associated RMZ acreage in the DEIS alternatives analysis. The emergency typing rule was not used in any of the alternatives, rather the interim rule was used, which incorporates physical criteria (gradient and basin area) into determining the demarcation between Type 3 and 4 (for Alternative 1-Scenario 2) and Type F and N (for Alternative 1-Scenario 1 and Alternatives 2 and 3). In order to more accurately identify this demarcation, a modeling procedure was used to better reflect applying the water typing rule on the ground as opposed to simply relying on the map demarcation. The interim rule was used since there is an established history of using this system within the Washington Forest Practices Rules to determine RMZ requirements, and it was the system in place when the DEIS was written.

3.17.10 General Harvest

There were comments expressing concerns on minimizing wastage of harvested wood and on-the-ground fire prone conditions. A few commenters noted that the timber industry is gearing towards shorter cutting rotations and smaller timber, and focusing heavily on the most marketable species.

In response, the FPHCP is a conservation plan for aquatic species. It does not address wastage of harvested wood or on-the-ground fire prone conditions due to slash, length of rotations, loss of logging and sawmill jobs, and monoculture. However, certain aspects of the Washington Forest Practices Rules and the FPHCP objectives may affect these issues.

There are Washington Forest Practices Rules restrictions that apply to even-age harvest. WAC 222-30-025 states that even-age harvest units larger than 240 acres on land owned or controlled by one landowner are prohibited. Additionally, even-age harvest between 120 acres and 240 acres on land owned or controlled by one landowner can be reviewed by an interdisciplinary team if deemed necessary by DNR.

The conservation objective of the Riparian Strategy in the FPHCP is to restore riparian functions to high levels on lands covered by the FPHCP and to maintain those levels once they are attained (WAC 222-30-010(2) and the FFR, Appendix B). In western Washington, protection measures place riparian forests on growth trajectories toward a mature forest. A mature forest stand is expected to provide the range of ecological functions important for the survival and recovery of covered species. In eastern Washington, protection measures are intended to provide for stand conditions that vary over time. Varying stand conditions are designed to mimic natural disturbance regimes within a range that meets resource objectives and maintains general forest health. This

stand condition is intended to decrease forest fire hazards by maintaining the natural open stands of eastern Washington.

Some commenters expressed concerns with major timber companies who are neither accessible nor accountable in any real way to prevent any serious consideration of the technical and scientific issues.

In response, landowners are required to comply with Washington Forest Practices Rules, and the Forest Practices Board is obligated to ensure Rules are effective in protecting public resources.

Others noted edit suggestions and a lack of harvest information for old growth trees.

In response, harvest of old growth trees was not a specific focus in the Forests and Fish negotiations; however, the protections provided in the riparian areas and sensitive sites may lead to protection of old growth trees found in these areas. In western Washington, riparian areas have to be on a trajectory toward or meet the DFC. DFC means the stand conditions of a mature riparian forest at 140 years of age. The goal is to create a mature stand that provides necessary riparian function for aquatic species. In eastern Washington, 21 of the largest trees must be left un-harvested along with other trees of specific sizes when harvesting in the riparian area is allowed.

3.17.11 Rate of Harvest

One commenter stated that the FPHCP and DEIS rely on the DNR Rate of Harvest Study while there were actually two studies conducted by DNR and one conducted by the University of Washington. Further, the results recorded in the FPHCP for the first rate of harvest report are not consistent with other analysis of the same study. The commenter further requested that information reported for rate of harvest should be reconsidered. Another commenter expressed the view that the limit on clearcut size would only be meaningful when combined with controls on the rate of harvest.

The Services agree that the DEIS referred to two related DNR studies, but not to a related study by the University of Washington (See below). Additional information from the two studies is included in subsection 3.2.4 of the FEIS.

The Washington Forest Practices Rules include provisions for limiting clearcut size and timing. Two examples include the green-up rule and the rain-on-snow rule. These restrictions provide multiple benefits, including conserving wildlife habitat, minimizing aesthetic impacts, and maintaining watershed hydrology. The proposed FPHCP addresses two of these issues: the conservation of wildlife (i.e., riparian-dependent amphibian) habitat and the maintenance of watershed hydrology.

Both Rules limit the rate of harvest. The green-up rule requires that trees in regenerating harvest units be at least four years of age or an average of four feet tall before adjacent harvest units can be clearcut. A mature forest buffer of at least 300 feet in width must separate adjacent clearcut harvest units where these conditions cannot be met. In addition, maximum clearcut size under the green-up rule is 240 acres. Together, these restrictions limit the rate at which individual landowners can clearcut harvest within a watershed.

The rain-on-snow rule gives DNR the authority to further restrict clearcut harvest in watersheds where it finds that peak flows are causing material damage to public resources. Under this rule, DNR can condition forest practices applications to restrict the size of clearcuts or even prohibit clearcutting in favor of uneven-aged (i.e., partial cut) harvest techniques. Therefore, the rate of clearcut harvest can be substantially reduced under the provisions of the rain-on-snow rule.

3.17.12 Timber Supply

One commenter pointed out that in 1990, the Washington State Legislature commissioned reports from the University of Washington to analyze public and private timber supplies. The independent reports, "Future Prospects for Western Washington's Timber Supply" (Timber Supply Study) were produced by the College of Forest Resources in 1992 (Western Washington) and 1995 (Eastern Washington), produced important data for understanding the future shape of forests and related habitat conditions in Washington. This information should be included in both the FPHCP and the FEIS. In response, information from the report mentioned above has been added to subsection 3.2.4 of the FEIS.

One commenter stated that the FPHCP should address the rate of harvest in Washington State.

The Services note that the FPHCP deals with activities over which the Forest Practices Board has rule-making authority, and rate of harvest is not within that authority (although some Rules indirectly address harvest rates, such as limits on the timing and size of even aged harvests (WAC 222-30-025)).

However, additional information was added to subsection 3.2.4 of the DEIS pertaining to harvest rates in Washington, which demonstrated that the overall harvest rates in both western and eastern Washington were fairly consistent between 1965 and the early 1990s.

3.17.13 Ownership of Forestland

One comment stated that consideration should be given to purchase of forestlands/water (including mineral rights) that are most important to at-risk fish and wildlife species/stocks, so that such lands could be made part of the National Wildlife Refuge System. The Services have noted the comment, although it is outside the scope of the DEIS.

3.17.14 Mapping

One commenter stated the landownership map and data used in Chapter 3 is incomplete, noting that State regulated lands within the boundary of the Reservation of the Colville Confederated Tribes are not depicted on the map, Figure 3-1. As stated in the DEIS subection 4.1.3, Available Information, the data and level of analysis used were commensurate with the importance of possible effects. Much of the analysis was based on the GIS databases of DNR and other agencies, using the most current data available. However, some detail such as private inholdings within Federal or tribal boundaries were not available in these data layers. Consistent with the level of analysis appropriate for this DEIS, the Services believe that although this information would have added precision to estimates, the basic data and central relationships were sufficiently well

established and that new information about these inholdings would not change the direction of the analysis or the conclusions.

3.17.15 Soil Productivity

One commenter stated that the DEIS should adequately disclose the alternatives' long-term impacts on soils, their productivity, and resulting impacts on watershed processes and aquatic resources. The DEIS discusses Washington Forest Practices Rules that would be in place under each of the alternatives that would collectively limit the amount of soils erosion that takes place. These Rules are discussed in primarily in subsection 4.4 (Geology, Soils, and Erosional Processes). Likewise, subsection 4.4 also discusses impacts from roads including runoff from compacted soils associated with roads and road abandonment. The Services believe that there is sufficient information within the DEIS regarding erosion of soils on which to base a determination.

3.17.16 Road Density

One commenter felt that the DEIS failed to take a hard look at the impacts of increases in road density allowed under the alternatives.

In response, road density was discussed throughout the DEIS. Alternatives were developed with varying degrees of protective measures related to forest road impacts on public resources including one Alternative (Alternative 4) which included a protective measure of "no net increase in forest roads." The differences amongst the alternatives helped to expose potential effects from roads. The analysis showed the potential of each alternative to avoid negative effects from roads. Information and analyses were provided in the DEIS in subsections 3.4.2.2 Forest Practices Effects on Erosion and Sedimentation, 4.4.1 Surface Erosion, 4.4.2 Mass Wasting, 4.8.2.3 Hydrology, and 4.8.3.2 Fine Sediment (which mentions that "many watersheds are currently at road densities considered too high for a properly functioning aquatic ecosystem"), Appendix D, and elsewhere. This information and analysis will be used by the Services in their decision-making process.

One commenter suggested the Services minimize the density of roads by requiring landowners to match road construction mile for mile with abandoning roads within their ownership when at all feasible.

The purpose of an EIS is to disclose environmental effects through a comparison of various alternatives against the "no action" alternative. The Services believe the alternatives within the DEIS effectively provide information about the effects of forest roads in order to make appropriate determinations. While a "mile-for-mile" alternative may have attributes the commenter favors, it would not add significantly to the analysis of environmental effects.

Another commenter stated that the DEIS inaccurately states, "as the density of roads increases, road impacts on riparian areas will inevitably increase" because riparian buffer requirements often require construction of additional roads upland, thus increasing road densities. Also, the commenter suggested, road patterns can facilitate use of harvesting equipment that disturbs less soil than occurs with longer yarding distances. The DEIS has been modified to remove the absolute statement that roads inevitably increase impacts on riparian areas.

Other comments stated that the DEIS statewide road density estimate of 3.4 mi/mi^2 was underestimated because the DNR transportation layer is considered incomplete, dated from 1996, and more recent information is available.

In response, although it is true that there may have been some additional information available (from the RMAP reporting requirements and previously completed Watershed Analysis), the information provided by these sources is inconsistent and is generally not available electronically statewide. Although RMAP rules require maps of roads, the information is not generally compatible with the DNR transportation layer. Likewise, completed Watershed Analyses also provides maps with completed plans, but they have not been incorporated into a statewide database.

Commenters stated that the FPHCP should include limits on road density in order to reduce adverse impacts to fish and water quality. In response, road density is commonly used as a measure of road-related resource impacts and is oftentimes positively correlated with sediment inputs and hydrologic effects. However, the use of road density alone may not be useful in quantifying road impacts. A range of factors affects the extent to which roads deliver sediment to streams and alter the hydrologic regime of a watershed. Some of these factors (climate, geology, soils, and topography) are environmental in nature and determine the background erosion rate of a watershed independent of human activities. Others, such as the design, location, age, use, and maintenance of the road network, are wholly human-related. Thus, while two watersheds may have similar road densities, sediment inputs may differ markedly due to differing environmental and/or human factors. For this reason, the Washington Forest Practices Rules and proposed FPHCP address sediment and hydrology impacts at the site-scale by requiring the implementation of specific BMPs. BMP implementation is a much more effective means of regulating road-related impacts to aquatic resources because corrective actions can be tailored to the site and problem. Site-by-site correction of road problems ensures that entire road networks will meet forest practices rule standards and resource objectives for sediment and hydrology will be achieved. Limits on road density would not provide this same assurance; while limits may be an effective means of limiting road-related impacts in some areas, it is likely other areas would continue to experience negative effects even though road density targets were met.

3.17.17 Steep Slopes

Another commenter stated the steep slope regulation in the FPHCP is not prescriptive, but instead is based on "administrative review," which the State promises will ensure compliance and minimize impacts.

Although the regulations for steep and unstable slopes are not prescriptive in nature, this does not mean that they are any less stringent. Instead, it is the delicate nature of unstable slopes that requires they receive more attention and are reviewed individually in order to ensure closer scrutiny during the application review process. As stated in the FPHCP in Section 4c-1, protection for unstable slopes and landforms is provided through an outcome-based, decision-making process that is conducted in accordance with the Washington Forest Practices Rules and SEPA. Through this process, DNR evaluates proposed timber harvest and construction activities on unstable slopes to determine if the

activities will have a "probable significant adverse impact." This process is appropriate in identifying risks to unstable slopes because of the difficulty in identifying unstable slopes through prescriptive descriptions. Therefore, the forest practices forester relies on screening results through the application process along with his/her own knowledge of the area to further assess the presence of unstable slopes. If field review confirms the presence of unstable slopes and timber harvest and/or construction is proposed in those areas, the forest practices application is classified as a Class IV-Special and becomes subject to review under SEPA.

The commenter refers directly to the use of "landslide hazard ratings" and indirectly to the Landslide Hazard Zonation (LHZ) project that DNR and CMER are currently implementing. The original comment letter states *"…the FPHCP proposes to shift the trigger for SEPA review over time to substitute for these definitions the results of statewide hazard zonation mapping based on patterns of landsliding observed over the past several decades."* The commenter misunderstands the LHZ project and its intended use. The LHZ project is a statewide effort to map potentially unstable slopes on forestlands regulated under the Forest Practices Act. The methods used are very similar to those employed in the State's Watershed Analysis process. The LHZ project, like Watershed Analysis, will produce maps that show landslide hazard zones and their corresponding sensitivity to forest practices. The LHZ maps will be used as a screening tool during the forest practices application review process. DNR forest practices foresters and staff from cooperating agencies, Tribes, and other organizations will use the maps to assess the presence of unstable slopes within or adjacent to a proposed harvest operation or road construction project. The LHZ maps are not intended to replace the current unstable landform definitions for triggering SEPA review. The unstable landform definitions will continue to be used as the basis for determining if a forest practices application is subject to SEPA review. Other unstable landform definitions may be added to the Washington Forest Practices Rules in the future through the Regional Landform Identification Project or as a result of adaptive management research and monitoring.

Several of the comments were critical of the unstable slopes protection measures, claiming that the approach permits too much risk, that many of the mitigation measures required by DNR haven't been proven effective and that it doesn't address potential cumulative effects. The following overview of forest practices research and regulation, including the proposed approach to protecting unstable slopes, addresses these comments.

The history of regulating forest practices on unstable slopes mirrors that of other forest resource management issues in Washington. Many of the negative impacts of logging on aquatic resources were largely unrecognized until research in the 1960's and 1970's began to document the effects of accelerated mass wasting and sediment delivery on water quality and fish habitat. Since that time, our understanding of the cause-and-effect relationship between forest practices and mass wasting has increased substantially. We now know that forest roads typically pose the greatest risk of management-related mass wasting but that timber harvest and yarding practices may also accelerate landslide rates. We also know that improper surface water management is the most common triggering mechanism for road-related landslides. While some of this knowledge has been gained through formal research and monitoring efforts, much of it has resulted from less formal

watershed-scale assessments (i.e., Watershed Analysis) and the accumulated experience of foresters, engineers, geologists, and hydrologists working to address forest slope stability issues. The combination of research, Watershed Analysis findings, and anecdotal observations from professionals working in the field has produced significant changes in the way unstable slopes issues are addressed on State and private forestlands in Washington State. Management-related landslides have gone from an issue that was largely unregulated just three decades ago to a high-priority issue regulated in accordance with a formal, structured environmental review and decision-making process under current Washington Forest Practices Rules.

Some of the comments equate the terms "risk" and "impact." Several times the comments imply that any increase in risk will automatically result in an adverse impact. As an example, when discussing the shortcomings of the proposed regulatory approach for addressing unstable slopes, one commenter states "*Although the protocols for addressing harvest-related activities on unstable slopes will lead to increased risk* [emphasis added] *of harvest-related landsliding – by an amount that will vary depending upon the site-specific mitigation employed – the potential for such impacts* [emphasis added] *to prove significant is just assumed away*."

The Services agree that management activities on unstable slopes increase the risk of mass wasting; however, increases in risk do not necessarily translate into adverse resource impacts. For example, permitting road construction across a potentially unstable slope increases the risk of landsliding, it does not mean that a management-related landslide will occur and negative impacts will result. There are many examples where harvesting or road construction on potentially unstable slopes has been permitted yet management related mass wasting has not occurred. Nonetheless, the Washington Forest Practices Rules in the FPHCP that address unstable slopes are important to minimize and mitigate actual impacts that could occur.

One commenter stated "…*nowhere is evidence presented that the permissible mitigation measures will in fact prevent or avoid harvest-related landslides, and therefore achieve the stated objective*…" The commenter is correct that no formal assessment of the mitigation measures commonly required to prevent management-related landsliding has been conducted. However, the cumulative experience of professionals who regularly work on forestry-related unstable slopes issues indicates that many of these mitigation measures, when implemented correctly, are effective in preventing mass wasting.

While support for the aforementioned claim is largely anecdotal, the history of regulating unstable slopes issues in Washington spans nearly 20 years and includes hundreds of foresters, engineers, geologists and hydrologists who have worked cooperatively in forums such as TFW interdisciplinary team reviews and Watershed Analysis. These individuals have taken what might be called a "trial-and-error" approach when addressing unstable slopes over the past several decades. This approach, while much less formal than the current adaptive management program, represents an early form of adaptive management that yielded valuable information regarding the efficacy of different unstable slopes mitigation measures. From this approach, these professionals learned which techniques worked and which did not. To more formally evaluate the

effectiveness of unstable slopes mitigation measures, the CMER Committee is developing a comprehensive research program to assess the current mass wasting regulatory approach, including mitigation measures required by DNR.

The same commenter also states "*…the only way to avoid the potential for cumulative impacts would be to preclude harvest on potentially unstable slopes."* In response, since adoption of SEPA unstable slope rules in 1987, experience with rule implementation shows that by far, the most common unstable slopes mitigation measure employed by landowners is avoidance. Because landowners typically avoid operations on rule-defined unstable landforms, all management activities (not just harvest as the commenter suggests) are precluded on potentially unstable slopes. This approach to mitigation effectively eliminates any management-related landslide risk. Unfortunately, there is no easy way to quantify the use of avoidance as a mitigation measure, since the decision to avoid operations on unstable slopes are made by the landowner prior to submittal of the forest practices application.

While avoidance is the most common unstable slopes mitigation measure employed on FPHCP lands, the need to access large blocks of forestland for management purposes makes this approach impractical in some situations. Harvest unit boundaries can usually be configured to exclude potentially unstable slopes but road construction across these areas is often necessary to gain access to adjacent lands. By obtaining road use easements from adjacent landowners, altering yarding configurations, and using different yarding systems, landowners can often locate roads to avoid the highest risk slopes but may still need to cross potentially unstable landforms under certain conditions. In these situations, the implementation of appropriate mitigation measures (as discussed above) is critical to minimizing the risk of management-related mass wasting.

The current approach to protecting unstable slopes is based on individual site-by-site forest practices application review. Some comments are critical of this approach, saying that it does not adequately address the potential for cumulative watershed effects associated with proposed forest practices. As stated earlier, one of the FPHCP goals is to "prevent or avoid forest practices-related landslides." This goal applies at all spatial scales including the site-scale, watershed-scale, and region-scale. As discussed above, an important part in achieving this goal is the implementation of effective mitigation measures when forest practices are carried out on unstable slopes. Mitigation measures that prevent management-related landslides and operations that avoid unstable slopes will ensure the goal is achieved.

One commenter believed that Alternative 2 may increase protection from mass wasting somewhat but does not necessarily provide the level of protection that is needed.

The FFR and FPHCP goal relative to unstable slopes is to "prevent or avoid management-related landslides." This is a high performance standard that can only be achieved by implementing protection measures that minimize the risk of forest practices-triggered landslides. The most common form of unstable slopes protection employed by forest landowners is avoidance. This approach effectively eliminates any management-related risk of increased mass wasting. In cases where forest practices activities are proposed on unstable slopes, DNR must evaluate the proposal relative to the standards

established in the Forest Practices Act, Washington Forest Practices Rules, and SEPA. Where the proposal presents an unacceptable level of risk, DNR must require the implementation of mitigation measures that will achieve the regulatory standards (i.e., "prevent or avoid management-related landslides").

Several commenters stated that the new Washington Forest Practices Rules would supercede the prescription for unstable slopes developed under Watershed Analysis. These Rule changes make it impossible to design watershed specific prescriptions that would avoid contributing to cumulative impacts resulting from unstable slopes.

Current Washington Forest Practices Rules do not necessarily supersede unstable slopes prescriptions developed through Watershed Analysis. Where Watershed Analysis has been conducted and approved, unstable slopes prescriptions exist, and those prescriptions include specific language that does not call for additional site-scale geotechnical analysis, the prescriptions will continue to represent the protection standard. Where unstable slopes prescriptions call for additional slope stability analysis, current Rules will supersede Watershed Analysis prescriptions.

There are currently a variety of map-based products being used to screen forest practices applications for potential slopes stability issues. Maps produced from the Landslide Hazard Zonation project are the most recent products, but Mass Wasting Map Unit (MWMU) maps from Watershed Analysis are also valuable tools. Since the resolution of these maps is fairly coarse, they are not being used to identify unstable slope boundaries in the field. Instead, written descriptions are used to define the location and spatial extent of unstable slopes and landforms for regulatory purposes.

One commenter believes that the Draft FPHCP conservation measures for logging and other activities on steep, unstable slopes are far less protective than assumed in the FPHCP and DEIS analyses but rely heavily on processes that could easily allow logging, road construction, and other operations to continue in these areas.

Contrary to the commenter's claim, the Services believe that the Washington Forest Practices Rules for unstable slopes consistently result in the implementation of protection measures that minimize management-related risks to unstable slopes. The FFR, Forest Practices Act, Washington Forest Practices Rules, and SEPA (and therefore the FPHCP) each include performance standards for unstable slopes. For example, the FFR Schedule L-1 performance standard is to "prevent or avoid management-related landslides". Similarly, the Rules/SEPA require that operations must not have a "substantial adverse environmental impact." These high performance standards make it necessary that DNR require, and landowners implement, management strategies that pose a low risk of triggering landslides.

Again, the most common form of mitigation is avoidance of unstable slopes. Resource protection, operational, economic, and legal considerations are the most common reasons this approach is used so frequently. Avoiding operations on unstable slopes effectively eliminates any management-related risk of increased mass wasting.

At least one commenter was concerned that the landowner is responsible for indicating the maximum slopes and for buffering unstable areas, resulting, the commenter believes,

in underestimation of the risks which DNR and Ecology are too understaffed to adequately counter. In response, prior to conducting forest practices activities, forest landowners and operators must receive approval from DNR. DNR grants approval through a forest practices application process. On the forest practices application, applicants must illustrate and describe their property including (as the commenter indicates) characteristics such as maximum slope gradient and the location of unstable slopes. DNR staff review all forest practices applications for potential impacts to public resources and public safety. Any forest practices application known or suspected of having unstable slopes receives a field-based environmental review from DNR staff. In some cases, unstable slopes may not be disclosed on the forest practices application yet local knowledge on the part of agency or cooperator staff suggests the potential for unstable slopes presence. In these cases, the proposal would receive a field-based review irrespective of the information included in the forest practices application. Since DNR places high priority on proposals with known or potential unstable slopes issues, the Services expect forest practices applications involving unstable slopes to receive field review.

Where field review determines that forest practices activities are proposed on unstable slopes, DNR classifies the forest practices application as a Class IV-Special application that is subject to review under the SEPA. Class IV-Special designation requires preparation of a geotechnical report by a qualified expert who is also licensed as an Engineering Geologist with the State of Washington. The commenter suggests these reports somehow direct or control the decision-making of DNR with respect to the forest practices application ("*In cases where a challenge is made, the landowner normally can override them by hiring a geological consultant…*"). DNR would consider the information contained in geotechnical reports and considers all credible, scientifically sound information when developing required mitigation and/or making a SEPA determination.

Finally, the commenter suggests that mitigation is limited to post-landslide situations (i.e., mitigation after-the-fact). "Mitigation" in these situations includes both measures that mitigate risk (i.e., reduce the risk of landslide occurrence) and measures that mitigate impacts (i.e., reduce continuing negative effects and/or encourage system recovery). Most often, mitigation measures pertain to mitigation of risk since the main objective is to prevent or avoid management-related landslides and not to mitigate landslide effects.

One commenter thought there would be an increase in landslide rates, even if the landslide reduction protocol in the proposed action is perfectly implemented, because human-caused landslides will inevitably occur as a result of logging on unrecognized unstable slopes. Another thought that the FPHCP and DEIS do not adequately address deep-seated landslides that may be reinitiated or accelerated by increased soil moisture as a consequence of tree removal on a site up-slope.

The FFR and FPHCP goal relative to unstable slopes is to "prevent or avoid management-related landslides." To achieve this goal, the FPHCP employs a management strategy that provides measures and procedures to effectively identify unstable slopes during the forest practices application review process and protect them

while forest practices activities are being carried out. The FPHCP includes several mechanisms to ensure this. Forest practices applications receive broad environmental review, not just by internal DNR staff but also by external FFR cooperators. This increases the likelihood that unstable slopes issues will be detected because many cooperators have specific knowledge about local geologic conditions and mass wasting processes. Also, technology-based screening tools such as Watershed Analyses and Landslide Hazard Zonation assist forest practices application reviewers in detecting unstable slopes. Unstable slopes training for internal staff and external cooperators increases awareness of unstable slopes issues and increases the likelihood that they will be identified during the forest practices application review process.

Once identified, unstable slopes must be protected to meet the "prevent or avoid" goal. Any forest practices activity proposed on an unstable slope that also has the potential to impact public resources (including habitat) or threaten public safety is subject to environmental review under SEPA. This also includes activities within the groundwater recharge area of deep-seated landslides in glacial sediments as referenced by one commenter. The FPHCP requires implementation of specific mitigation measures to reduce the risk of management-related landsliding in cases where the protection measures proposed by a forest practices appplication are judged inadequate to meet the goals of SEPA and the Forest Practices Act. Mitigation measures vary widely, are specific to the site or forest practices application, may apply to timber harvesting or road construction (or both), and are often developed in consultation with both internal and external slope stability specialists. The Services believe this approach adequately addresses risks associated with forest practices on unstable slopes, including deep-seated landslides.

One commenter is critical of this strategy, stating "*Even if the…* [aforementioned approach] *is perfectly implemented, human-caused landslides will inevitably occur as a result of logging on unrecognized unstable slopes.*" This may be true, particularly early on in the implementation of the current Washington Forest Practices Rules and the FPHCP. However, the detection and protection of unstable slopes has increased dramatically over the past decade largely due to experience gained from Watershed Analysis. Anecdotal evidence suggests these improvements have resulted in substantial reductions in the frequency of mass wasting events on managed forestlands. As time goes on and improved screening tools are developed and collective awareness and recognition of unstable slopes issues further increases, continued reductions in management-related landsliding are expected. While it could be argued that any management-related landslide represents an increase above the natural or background rate, FPHCP implementation is expected to reduce landslide frequencies to a point very close to (and in some watersheds at) the background rate. Adaptive management effectiveness and extensive monitoring will assess the degree to which the FPHCP unstable slopes goal being achieved.

When forest practices activities are conducted in areas where unstable slopes are present, the most common form of mitigation employed by landowners is avoidance. By avoiding operations on unstable slopes, the risk of management-related landsliding is eliminated. In the small percentage of forest practices activities where operations on unstable slopes occur, DNR requires landowners to implement mitigation measures that will meet the

performance standards established in the Forest Practices Act (i.e., prevent or avoid management-related landslides) and SEPA (i.e., substantial adverse impact on the environment). This typically means restricting harvest levels and implementing road construction techniques that maintain road prism stability.

Several commenters point out that no formal effectiveness assessment of these mitigation measures has been conducted. The cumulative experience of professionals who regularly work on forestry-related unstable slopes issues indicates that many of these mitigation measures, when implemented correctly, are effective in preventing mass wasting. While support for this claim is largely anecdotal, the history of regulating unstable slopes issues in Washington spans nearly 20 years and includes hundreds of foresters, engineers, geologists and hydrologists who have worked cooperatively through forums such as TFW interdisciplinary team reviews, Watershed Analysis, operational compliance monitoring of active forest practices activities, and post-landslide investigations. These individuals have taken a "trial-and-error" approach when addressing unstable slopes over the past several decades. This approach, while much less formal than the current adaptive management program, represents an early form of adaptive management that yielded valuable information regarding the efficacy of different unstable slopes mitigation measures. From this approach, these professionals learned which techniques worked and which did not. Those measures that proved effective continued to be implemented over time, providing direct evidence that past experience guides future management decisions.

One commenter claims the decision-making process used to regulate activities on unstable slopes is "*subject to no standard other than judgment.*" There is a considerable degree of cumulative professional experience within DNR and among its many cooperators and DNR relies heavily on this collective experience when evaluating proposals involving unstable slopes and determining if they pose an unacceptable level of risk to public resources or public safety. Therefore, judgment does play an important role in the decision-making process related to unstable slopes protection.

To more formally evaluate the effectiveness of unstable slopes mitigation measures, the CMER Committee is developing a comprehensive research program to assess the current mass wasting regulatory approach, including mitigation measures required by DNR.

Another commenter expressed concern over one aspect of the Landslide Hazard Zonation (LHZ) project, saying that there is a flaw in "…*how the landslide hazard rating based on the observed annual rate of land sliding normalized by area is converted to a "low medium, high, very high" hazard classification*…" The commenter claims the conversion is arbitrary and should be based on the natural or background rate of landsliding. Establishing the natural or background rate of landsliding is difficult, if not impossible, for most areas of Washington. This is because the earliest available aerial photos generally date to the 1950's or 1960's. By that time, many private lands in Washington had already been harvested. To establish a background landslide rate, aerial photos that cover at least two to three decades prior to the onset of management are needed. Such aerial photo coverage is not available for private forestlands in Washington.

The LHZ methodology, including the assignment of hazard classes, was subject to an extensive peer review process and has been approved by CMER through the adaptive

management process. Placing quantitative values (e.g., 2 X 10^{-4}) into qualitative categories (e.g., "high") is often a subjective process involving numerous opinions as to how the classification should occur. Nonetheless, the LHZ project has received broad support both at the technical and policy levels and has yielded valuable information with respect to the protection of unstable slopes. Most importantly, contrary to claims made by other FPHCP commenters, LHZ map products are not replacing the rule-defined unstable landforms used in classifying forest practices applications. LHZ map products are used by DNR staff and staff from cooperating agencies and organizations to screen forest practices applications for unstable slopes presence.

At least one commenter felt that clearcutting should be stopped on steep slopes (all slopes over 25 degrees) because all slopes become unstable once trees are harvested.

Available scientific evidence does not support the claim that all slopes over 25 degrees "become unstable" once trees are harvested. The published literature, Watershed Analysis, and anecdotal information all provide evidence that refutes this claim.

Another commenter was generally concerned about the many examples throughout the Cascades and Olympics where wasteful and sloppy timber harvesting have triggered mass wasting events.

The DEIS states, "Various watershed analysis and limiting factors analysis have documented mass wasting as being one of the most substantial impacts associated with recent forest practices, primarily from clearcuts and roads…" In response, these reports document impacts from past forest practices, most pre-Forest Practices Act, that did not require slope stability BMPs. The word "recent" in this context does not imply forest practices that have occurred since slope stability BMPs have been required.

It is true that past forest practices in Washington have increased the rate of mass wasting on Federal, State, and private forestlands from background levels. It is also true that awareness of the connection between forest practices and mass wasting has increased over time. As this awareness has increased, so have forest practices regulatory requirements protecting unstable slopes. The commenter is correct in saying that many, if not most, of the landslides documented through Watershed Analysis and other recent landslide inventory efforts occurred prior to implementation of FFR-based protection measures in the year 2000 (and even TFW-based measures adopted in 1987). The DEIS has been modified to reflect this comment.

3.17.18 Surface Erosion

At least one commenter believed that Alternative 4 would provide the least amount of surface erosion from harvest activities because it provides wider buffers, completion of RMAPs sooner, and caps road densities. Another challenged this view, believing that if implemented, Alternative 4 could result in a higher risk of landslides due to the higher incidence of forest health problems and fire.

The DEIS concludes that management-related mass wasting would be lowest under Alternative 4. The Services note that while the possibility exists that more extensive riparian and unstable slopes buffers could increase the risk of fire, disease, and insect

outbreaks, they are aware of no scientific evidence to support this leading to a higher risk of landslides.

3.17.19 Sediment

One commenter stated that the prescriptions in the DEIS and Draft FPHCP do not account for the crucial roles of headwater streamside forest along Type Np streams as filters to reduce the delivery of sediment from upslope sources, such as landslides, and yarding scars, and others. The analysis of forest practices under RMAP standards purports that adverse effects from roads is eliminated. The commenter believes this assumption is unrealistic and indefensible. One commenter noted that the FPHCP states that Alternative 2 will try to minimize sediment inputs but that "sediment inputs will remain above natural or background conditions" and that "chronic inputs of fine sediment from road and harvest surface erosion are expected to continue, as are episodic inputs of fine and coarse sediment associated with harvest and road-related mass wasting."

In response, any land use activity that results in soil disturbance will inevitably increase the rate of erosion and sedimentation. Thus, erosion and subsequent sediment delivery to streams under the FPHCP will be higher than that expected under natural or unmanaged conditions. However, when compared to management practices implemented under the no-action alternative (i.e., Alternative 1), erosion and sediment delivery under the FPHCP would be substantially lower. The purpose of the DEIS is to compare the environmental impacts associated with each “action” alternative to those expected under the “no-action” alternative.

The FPHCP includes multiple protection measures that reduce management-related erosion and sedimentation. They include: no-management Channel Migration Zones along some Type S and Type F waters, no-management core zones along all Type S and Type F waters and some Type Np waters, Equipment Limitation Zones along Type Np and Type Ns waters, unstable slopes buffers adjacent to and upslope from fish-bearing and non-fish-bearing waters, mandatory, short-term road maintenance and abandonment planning and implementation for most covered lands, and numerous other restrictions on operating in or adjacent to surface waters and wetlands. Together, these measures will minimize, but not eliminate, management-related increases in sediment delivery to streams relative to natural or unmanaged conditions. The Services considered this set of protection measures when evaluating the FPHCP (i.e., Alternative 2) against the no-action alternative.

Contrary to the claim of one commenter, the DEIS does not conclude that the FPHCP will eliminate all road-related habitat effects. Limits on road density may help reduce sediment inputs and associated habitat effects; however, the use of road density as a regulatory tool would be potentially ineffective due to the large number of environmental and management-related factors that influence sediment delivery to streams. The most important factors influencing sediment inputs to streams include road age, road use, and road drainage-stream network integration. The latter two (road use and road-stream integration), can be addressed through ongoing compliance, road maintenance and abandonment planning and implementation, and compliance monitoring.

One commenter was concerned with the vulnerability of Type N streams to sediment under Alternative 2. Ephemeral streams should have the same buffer protection as perennial streams to protect water from sedimentation. Sediment input into streams should comply with State water quality standards.

In response, surface erosion and subsequent sediment delivery typically occurs when soils are disturbed (i.e., mineral soils are exposed), compacted, or both. Soil disturbance may result from log yarding (i.e., dragging logs along the ground) or the use of wheeled or tracked equipment. When soils are disturbed, the protective organic layer is often compromised, exposing the underlying mineral soils to raindrop splash and on steeper slopes, ravel. Soil compaction is generally associated with the repeated use of wheeled or tracked equipment in a specific area, such as a skid trail. Compacted soils are not capable of absorbing water at the same rate as non-compacted soils, which often results in overland flow and associated rill or gully erosion.

Nearly all management-related surface erosion on forestlands of the Pacific Northwest results from a change in the structural characteristics of the soil (typically a reduction in infiltration capacity) and has little to do with the actual removal of trees. As a result, Washington Forest Practices Rules aimed at reducing surface erosion focus on limiting soil disturbance and compaction in stream-adjacent areas rather than tree retention. Measures to reduce surface erosion and sediment delivery to seasonal non-fish-bearing streams (Type Ns) are the same as those for perennial non-fish-bearing streams (Type Np); namely, a 30-foot Equipment Limitation Zone where equipment use is limited and site-specific mitigation measures are required if more than 10 percent of the zone area is disturbed. These measures, in conjunction with other sediment-related protection measures, are designed to ensure that forest practices meet State water quality standards for sediment. The establishment of Equipment Limitation Zones to prevent surface erosion and sediment delivery is consistent with the recommendations of Rashin et al. (1999) where the effectiveness of timber harvest BMPs were evaluated.

At least one commenter was concerned that the DEIS fails to take a hard look and adequately disclose the effects of the alternatives on sediment delivery and resulting aquatic impacts. One commenter referenced a variety of "failures" of the DEIS to cite relevant information from a variety of studies.

Temperature and sediment protection measures included in the FPHCP are based on the Services' current scientific understanding of forest practices effects on water temperature and erosion processes. The FPHCP protection measures are designed to meet water quality standards. The effectiveness of the various protection measures in meeting water quality standards will be evaluated through adaptive management. Adaptive management monitoring will also assess the appropriateness of various protection measures in light of the variability that exists between different regions of the State. For example, should culvert spacing requirements for western and eastern Washington differ given the different climatic regimes, and if so, what requirements are necessary to meet performance targets and water quality standards?

One commenter said the DEIS does not adequately address peakflow and sediment effects on channel width and water temperatures. The purpose of the DEIS is to evaluate

the degree to which management under each alternative alters a given watershed process or parameter (e.g., peakflows or sediment inputs) relative to the no-action alternative (i.e., Alternative 1). Evaluating these types of primary or direct effects associated with forest practices typically involves a qualitative assessment of the expected level of change. For example, "*Alternative 2 would result in a low to moderate likelihood of coarse sediment delivery due to wider buffers and improved harvest and road maintenance practices relative to No Action Alternative 1-Scenario 2.*" The DEIS is limited to these types of qualitative assessments due to the often complex and site-specific nature of the cause-and-effect relationship that exists between forest practices activities and watershed processes. In addition, the large geographic area under consideration limits the predictive capability of the assessment resulting in broader, more generalized conclusions about expected effects. The commenter felt the DEIS should extend these primary or direct effect assessments into conclusions about secondary or indirect effects. For example, if the DEIS concludes there is a low to moderate likelihood of coarse sediment delivery under Alternative 2 relative to the no-action alternative, then the resulting effects on channel width and water temperatures should also be estimated. Using qualitative, direct effects statements as the basis for describing secondary or indirect effects would produce speculative results in which end-users would have little confidence.

Another commenter claims the DEIS includes no analysis of the difference in sediment inputs between Alternative 2 (the FPHCP) and Alternative 4. As stated above, the purpose of the DEIS is to evaluate the environmental effects of each alternative relative to the no-action alternative. Therefore, the commenter is correct that the analysis is absent from the document.

The same commenter is critical of the DEIS, saying that it lacks "*specificity about the mechanisms of impact that link proposed management actions to fish* [sic] *individual and population responses.*" The Services feel the DEIS contains an appropriate level of specificity regarding the cause-and-effect relationships between forest practices and aquatic resources. DEIS Chapter 3 (Affected Environment) describes the ecological functions that create and maintain riparian and aquatic habitat but which are also affected by forest practices. Changes in those ecological functions represent the impact mechanisms the commenter references. For example, streamside timber harvest can reduce potential large woody debris recruitment to streams. Reduced large wood recruitment in turn reduces available pool habitat, sediment storage, and overall channel complexity. Thus, the impact mechanism in this example is the reduction in in-channel large woody debris associated with the removal of potentially recruitable riparian trees.

DEIS Chapter 4 (Environmental Effects) describes the extent to which the various alternatives alter ecological functions. The analysis evaluates the effects of each alternative on each ecological function relative to the no-action alternative. Quantitative data was used when available. However, due to the large scope and scale of the proposed FPHCP, the effects analysis necessitates a qualitative assessment of the alternatives for much of the analysis in Chapter 4. In addition, the effects analysis focuses on forest practices-related changes in ecological processes and associated habitats and does not attempt to translate these changes into species-based population responses. To do so would introduce substantial speculation into the analysis, since multiple factors exclusive

of forest practices affect the health of many populations. For example, anadromous fish are impacted by fisheries harvest practices, intra-specific competition from hatchery fish, dams, and agricultural, commercial, and residential land use practices. Isolating the effects of forest practices from these other factors is difficult given our current understanding of population dynamics and the associated cause-and-effect relationships.

Rashin et al. (1999) found that harvest operations carried out under earlier Washington Forest Practices Rules (i.e., prior to 2000) often resulted in soil disturbance, surface erosion, and sediment delivery to stream channels. The report included recommendations for reducing these undesirable effects. Specifically, the authors suggested "*a buffer or stream side management zone of at least 10 meters should be maintained on all streams in order to avoid chronic sediment delivery and direct physical disturbance of streams from harvest-related erosion.*" In contrast to the claim made by one commenter, the harvest-related surface erosion protection measures recommended in the FFR and now included in the Washington Forest Practices Rules and proposed FPHCP are consistent with this recommendation. FFR recommended, and the Rules include, the establishment of an Equipment Limitation Zone of 30 feet (about 10 meters) in width adjacent to all non-fish-bearing waters. Also, a 50-foot core zone where no activity is allowed must be retained along all fish-bearing waters. Together, the Equipment Limitation Zone and core zone requirements ensure that soil disturbance, associated surface erosion, and sediment delivery to all surface waters is minimized.

Like Rashin et al. (1999), Jackson et al. (2003) also found that harvest operations adjacent to small headwater streams in western Washington resulted in increases in fine sediment delivery. However, the harvest operations included in the study occurred prior to adoption of the current Rules and thus, prior to Equipment Limitation Zone requirements. Other studies have also shown implementation of BMPs similar to Equipment Limitation Zones are an effective means of reducing sediment delivery to streams (Martin et al. 2000; Kreutzweiser and Capell 2001).

As one commenter correctly notes, Rashin et al. (1999) did not evaluate Washington Forest Practices Rules in light of cumulative sediment effects. The authors performed individual, site-scale assessments of surface erosion and sediment delivery associated with a range of road and harvest-related BMPs. However, as noted above, many of the FFR recommended sediment protection measures were based on the findings of Rashin et al. (1999) as well as Watershed Analysis assessments and prescriptions. To the extent that Watershed Analysis is an effective cumulative effects assessment process, current sediment-related protection measures should adequately address cumulative effects. However, this issue will be evaluated through the intensive monitoring program within adaptive management.

Finally, since Rashin et al. was published in 1999 (i.e., prior to development of the DEIS Alternatives), the report did not evaluate sediment delivery under the various DEIS alternatives (or the FFR) as one commenter suggests.

One commenter made the following statements: The DEIS states, "While other factors such as addition of stream nutrients and highly biodegradable organic matter can affect dissolved oxygen levels in water systems, these are usually of minor concern in forest

streams and would have very low likelihood of affecting dissolved oxygen levels under any alternative." This statement indicates that no further analysis is necessary. The analysis is contradictory to this statement and misleading to the reader.

In response, the detailed effects analysis in the DEIS does not analyze stream nutrients and highly biodegradable organic matter. The analysis covers fine sediment inputs and its effects on streams.

Another commenter stated that in order to adequately evaluate the impacts of the FPHCP on water quality, the EIS must include adequate baseline data, which specifically describes the habitat structure and quality of different streams and watersheds in the FPHCP area. This includes stream temperatures, sedimentation and turbidity, percentage of shade canopy, and the location, quality and quantity of large woody debris, spawning gravel, riffles, pools, fish spawning and rearing sites, and key forest plant and animal species. Streams, roads, road crossings, landings and skid trails should be described and mapped. The commenter further states that in addition, the EIS must identify the steepness, stability and erosion of hazard rating slopes, and the location of any previous slope and road failures, erosion and mass wasting incidents. The EIS also must assess and map upslope activities that would potentially deliver sediment to streams and are potential sources of slides, erosion, and mass wasting.

In response, the programmatic nature of the FPHCP, and the other alternatives, makes it difficult to provide the level of detail the commenter feels is necessary in the EIS. The Services have covered a broad range of resource variables in which to analyze the action alternatives against "no action" regarding water quality impacts (DEIS subsection 4.5 Water Reources).

3.17.20 Sediment Risk

One commenter believed the DEIS statement that there would be a "moderate likelihood of debris torrent initiation because of the potential for management activity in areas of susceptibility" should say "low likelihood" because of the protection measures in place for unstable slopes that are designed to screen and familiarize personnel with landslide hazards in different geological conditions.

The Services have noted this comment and have modified the DEIS to be consistent with the unstable slopes related risk statements to read "low to moderate."

One commenter believed that Alternative 2 should result in a very low risk of landslides related to timber harvest, rather than "moderate" as stated in the DEIS.

In the DEIS, the likelihood that a particular alternative will alter a specific watershed process or parameter is assessed relative to the likelihood that the same process or parameter will be altered under the no-action alternative (i.e., Alternative 1). Thus, the "slight to moderate" rating for harvest-related landslides under Alternative 2 is based on the assessment of Alternative 1 and the likelihood that management under Alternative 1 would lead to harvest-related landslides. Further, the slight to moderate rating for Alternative 2 assumes that over time, the likelihood of harvest-related landslide occurrence would decrease (from moderate to slight) due to improved screening and

detection of unstable slopes, implementation of RMAPs, and implementation of more effective mitigation measures.

3.17.21 Hydrology

3.17.21.1 Stream Flow

Some commenters expressed concerns about the risk ratings assigned to various alternatives' effects on stream flow. There were many commenters concerned with the effects of forest management on stream flows in a changing environment. At least once commenter questioned whether compliance with the current Washington Forest Practices Rules would achieve compliance with water quality laws.

In response, while all land uses alter watershed hydrology by changing the character of soils and vegetation, forestry is recognized as having relatively small impacts on water yield, peak flows, and low flows. On managed forestlands of the Pacific Northwest, research has shown that forest practices typically increase streamflows due to reductions in interception and evapotranspiration. In areas where rain-on-snow conditions commonly occur, timber harvesting may lead to increased snow accumulation and melt rates and associated increases in peak streamflows. Increased peak streamflows may also result from integration of road drainage systems with the stream network.

In general, changes in watershed hydrology due to current forest practices are thought to have relatively small impacts to aquatic habitat relative to historic changes in large woody debris loads, stream temperatures, and sediment loads. Protection measures included in the proposed FPHCP would reduce hydrologic changes associated with forest practices. Higher retention of forest cover (i.e., RMZs, Channel Migration Zones and unstable slopes buffers) and improved road maintenance and abandonment practices will help mitigate increases in peak flows that may have occurred under earlier Washington Forest Practices Rules. Under the proposed FPHCP, managed forestlands will continue to serve as reliable domestic water sources.

One of the primary purposes of the Adaptive management program is to evaluate the effectiveness of the proposed FPHCP protection measures in achieving established resource objectives and performance targets. In some cases, performance targets are based on State water quality standards. Therefore, the FPHCP includes a formal strategy for determining if compliance with Washington Forest Practices Rules will achieve compliance with water quality laws. Because instream flow issues are generally associated with land use practices that reduce low flows (i.e., irrigation and commercial/residential withdrawals) and forest practices typically increase low flows (due to reductions in evapotranspiration), FPHCP performance targets for hydrology are not linked to Ecology's instream flow targets.

At least one commenter believed there should be a more thorough discussion of specific case examples of how forest practices have been and can be adaptive to protect and restore hydrologic function. Another stated that overland flow only rarely occurs on Pacific Northwest soils, usually only when significant compaction of soil has occurred. Equating the probability of sediment transport by overland flow with proportion of trees

removed from the riparian area is not a reasonable approach to comparing the alternatives relative to this function.

The DEIS assessment method assumes the level of harvest adjacent to the stream channel can be used as an index of soil disturbance. It further assumes that soil disturbance is a reasonable index of stream sediment delivery. The assessment method assumes that once disturbed, soil can be eroded and transported to streams via several processes including overland flow, streambank disturbance, and ravel. The commenter is correct in saying that overland flow is a rare occurrence in the Northwest and is typically only associated with compacted soils. However, soils adjacent to Type Np and Type Ns waters may be compacted as a result of log yarding or skid trail construction outside of Type Np RMZs and Equipment Limitation Zones, which may lead to overland flow and sediment delivery. Thus, the Services feel the approach taken in the DEIS is reasonable and needs no modification.

Also, a comment was made that the FFR acknowledges that forest roads frequently intercept subsurface flow and re-route it to surface flow. In response, road interception with subsurface or groundwater flow does not generally occur during the warmer months (e.g., July through September), when this circumstance would effect water temperature the most, because groundwater levels drop below the level of subsurface interception (Brooks et al. 1991).

However, the FPHCP addresses new road construction with design standards that include water management requirements focusing on maintaining hydrologic flowpaths and minimizing sediment delivery by limiting road-induced rerouting of water. The FPHCP requires that roads be designed so that ditch water is relieved onto the forest floor to facilitate infiltration and minimize sediment delivery to streams. Also, the FPHCP describes the priorities under RMAPs, required for all landowners other than those defined as small forest landowners (see WAC 222-16-010 for forest landowner definitions), and lists repairing or maintaining stream-adjacent parallel roads and restoring hydrologic flowpaths among the priorities (see WAC 222-24-051). Specifically, with stream-adjacent parallel roads, the Services believe there is no incentive in the FPHCP for landowners to construct these types of roads. WAC 222-24-020(2) explains that except for crossings, new stream-adjacent parallel roads shall not be located within natural drainage channels, Channel Migration Zones, sensitive sites, Equipment Limitation Zones, and RMZs when there would be substantial loss or damage to fish or wildlife habitat, unless DNR has determined that other alternatives will cause greater damage to public resources. A forest practices application with a proposal that includes a new, stream-adjacent parallel road would require an on-site review by an inter-disciplinary team. Federal representatives would be invited to attend to determine if the proposal would be in compliance with the ESA and ITPs if issued.

3.17.21.2 Low Flow

Commenters expressed concern over the potential for forest practices to reduce low flows (also known as baseflows) by reducing the capacity for soils to absorb and store water. In response, the vast majority of research into the effects of forest practices on low flows indicates that timber harvesting increases low flows due to reduced interception and

evapotranspiration associated with timber harvest. In the Pacific Northwest, increases in low flows following timber harvest have been documented by Rothacher (1970), Harr and Krygier (1972), Harr et al. (1982), Cheng (1989), Keppeler and Ziemer (1990), Hicks et al. (1991), and Bowling et al. (2000). Most of these studies found that increases in low flows diminished over time as vegetation re-growth progressed. In most cases, low flows returned to pre-harvest levels within 15 years following harvest. Only one of these studies (Hicks et al. 1991) documented a decrease in lowflows following timber harvest. The authors attributed the decrease (which followed an initial eight-year increase in low flows) to the replacement of the original conifer-dominated riparian forest with more water-consuming tree species such as red alder, cottonwood, and willow – not to a reduction in soil organic matter or infiltration capacity.

One commenter stated that the DEIS fails to analyze effects of the alternatives on low flows, including the result of Hicks et al. (1991), Bowling et al. (2000), and Jones and Post (2004). Notably, the DEIS does not even cite the only long-term study of flow alteration by logging in the Pacific Northwest, which documented that logging persistently reduce low flows (Hicks et al, 1991). It also wholly fails to disclose the likely impacts of these effects on water temperature and aquatic biota.

In response, nearly all hydrologic research conducted in the Pacific Northwest has documented increased low flows following timber harvest (see Rothacher 1970, Harr and Krygier 1972, Harr et al. 1982, Cheng 1989, Keppeler and Ziemer 1990, Hicks et al. 1991, Bowling et al. 2000 and Jones and Post 2004). Of these studies, only Hicks et al. (1991) and Jones and Post (2004) documented harvest-associated reductions in low flows.

Hicks et al. (1991) evaluated hydrologic changes following logging in small, forested watersheds in the H.J. Andrews Experimental Forest in Oregon's western Cascades. Watershed 1 was 100 percent clearcut, Watershed 2 was the unlogged control, and Watershed 3 was 25 percent patch-cut. The authors found that following logging in Watershed 1, August streamflows increased in Watershed 1 compared to Watershed 2 by 159 percent following logging in Watershed 1, but this increase lasted for only eight years following the start of logging in 1962. August streamflows for the period 1970-1988 in Watershed 1 were 25 percent less than predicted from the control.

In Watershed 3, 25 percent patch-cutting produced increases in August streamflows of 59 percent. In contrast to Watershed 1, however, August streamflows from Watershed 3 were consistently greater than predicted for 16 years following the start of logging through to 1978. For the 10-year period from 1979-1988, August streamflows in Watershed 3 were not different than predicted from the control. The authors attributed the differences in streamflow response between the two watersheds to differences in riparian vegetation associated with different geomorphic conditions. A relatively wide valley floor in Watershed 1 facilitated the development of hardwoods in the RMZ following clearcut logging, but a narrow valley in Watershed 3 and limited sediment deposition prevented the establishment of riparian hardwoods. The authors concluded that the hardwoods in Watershed 1 were higher water-users than the original conifer-

dominated riparian forest, resulting in lower than expected streamflows later in the monitoring period.

More recently, Jones and Post (2004) analyzed low flow response to timber harvesting in six small, paired watersheds in the Pacific Northwest (including H.J. Andrews Watershed 1 analyzed by Hicks et al. 1991). Prior to logging, all watersheds were dominated by mature to old (90 to 450 years of age) conifer forests. Five of the six study watersheds were 100 percent clearcut and the sixth was 96 percent clearcut. Like other researchers noted above, the authors documented short-term (i.e., less than 10 years) increases in August low flows following logging in all watersheds. These short-term increases were followed by longer-term (i.e., greater than 20 years) reductions in low flows in three watersheds where the post-treatment period of record exceeded 20 years (the post-treatment period of record in the remaining three watersheds was limited to 11 years). While the August flow reductions were small when measured in absolute terms (i.e., millimeters), they were large when expressed as a percentage of streamflow. While Hicks et al. (1991) attributed reduced low flows to changes in riparian vegetation following logging, Jones and Post (2004) concluded the observed reductions in low flows occurred because young forests in the Pacific Northwest (10 to 30 years of age) are higher water users than older forests (90 to 450 years of age).

The results of Jones and Post (2004) contrast with those reported in another long-term hydrologic study, where increased summer low flows associated with timber harvesting were documented for 23 basins in western Washington (Bowling et al. 2000). Similar to many other hydrologic studies, the authors attributed their findings to reductions in evapotranspiration following harvesting. Streamflow records used in the analysis ranged from 36 to 66 years and study watersheds were representative of mixed ownership forested basins in the region.

The different conclusions regarding the long-term effects of timber harvesting on low flows between Jones and Post (2004) and Bowling et al. (2000) may be associated with differences in harvest treatment. While the small experimental watersheds studied by Jones and Post were 96 to 100 percent clearcut, Bowling et al. (2000) evaluated larger watersheds with varying levels of harvest distributed over time. Due to these variable harvest patterns, a relatively small portion of the watersheds studied by Bowling et al. (2000) was in a clearcut condition at any one time. The varying age classes of forests may have affected the hydrologic response in these watersheds, resulting in low flow surpluses as opposed to deficits such as those observed by Jones and Post (2004). Also, as noted by Jones and Post (2004), differences in analytical techniques may have contributed to differing data interpretations and conclusions.

The findings of Jones and Post (2004) probably have limited applicability to the lands and forests proposed for coverage under the FPHCP. First, and most importantly, rarely if ever will entire watersheds be clearcut under the FPHCP. Mixed landownership patterns combined with restrictions on the size and timing of clearcut harvesting reduces the chances of large-scale, concentrated clearcutting. Second, the lands included in the FPHCP include forests that are substantially younger than the pre-harvest forests studies by Jones and Post (2004). While FPHCP forests are generally less than 70 years of age,

the pre-harvest forests included in the Jones and Post (2004) study ranged from 90 to 450 years of age. And as noted by Jones and Post (2004), forest age is one factor that affects hydrologic response.

The results of Bowling et al. (2000) have greater applicability to the FPHCP. Many of the watersheds analyzed by the authors included private forestlands proposed for coverage under the FPHCP. Therefore, the forest age classes and some of the management practices are representative of what is expected under the FPHCP; however, in most cases, proposed protection measures represent improvements over practices implemented during the period of study (1930-1996). Therefore, implementation of the FPHCP is expected to result in continued increases in summer low flows as a result of reductions in evapotranspiration following timber harvest.

3.17.21.3 Peak Flow

Commenter had concerns with timber harvest effects on peak flows and hydrology and ultimately their impacts on aquatic resources.

Some commenters expressed concerns about the risk ratings assigned to various alternatives effectives on hydrology in particular peak flow.

The effects of the proposed FPHCP protection measures on peak flows are difficult to predict. Based on forest hydrology research conducted throughout the Pacific Northwest, it is reasonable to assume that some increase in peak flows can be expected, particularly in areas where rain-on-snow is a common peak flow generating mechanism. The size of the increase is likely to vary across time and space and will be affected by watershed, storm, and management factors. Because tree retention and road maintenance under the proposed FPHCP will be greater than under any previous regulatory strategy, it is reasonable to assume that peak flow increases will be smaller compared to management under previous Washington Forest Practices Rules. Restrictions on harvest within Channel Migration Zones, RMZs, and unstable slopes will increase the level of hydrologic maturity within watersheds. Implementation of RMAPs will disconnect roads from the natural drainage network. Together, these protection measures will aid in restoring watershed hydrology and minimizing peak flow increases. Given this, the Services feel the evaluation of the various DEIS alternatives with regard to peak flow changes is appropriate and do not find it necessary to modify the DEIS conclusions.

Predicting the degree to which harvesting will affect peak flows is difficult due to the wide range of environmental and management factors that influence watershed hydrology. Antecedent watershed conditions, storm characteristics, and road and harvest patterns all interact to affect peak flow response. Translating predicted peak flow increases into channel effects (i.e., scour/deposition) is similarly complicated by the highly variable nature of streamflow through natural channels. Estimating streambed scour and subsequent deposition in uniform, human-made channels can be a relatively straightforward engineering exercise; however, the hydraulics of natural channels are affected by spatial and temporal variations in streambed and streambank sediments, large woody debris, and streamflow. Converting physical channel effects (e.g., changes in scour and deposition patterns) into a biological response (e.g., egg-to-fry survival) is somewhat problematic. Because it is often necessary to make numerous assumptions

when quantifying a biological response to habitat disturbance, there is typically a high degree of uncertainty associated with these types of predictions. Thus, a claim that allowable timber harvest under the FPHCP will "*significantly reduce egg-to-fry survival of salmon*" is a claim that cannot be substantiated given our current understanding of the effects of forest practices on physical watershed processes and the associated biological response(s).

To date, the mechanism that has been most widely used to assess and regulate the effects of timber harvesting on rain-on-snow generated peak flows in Washington has been Watershed Analysis. During the early and mid-1990's, Watershed Analysis was conducted on over 60 watershed administrative units throughout the State. Management prescriptions were developed to limit clearcut timber harvest in watersheds identified as being sensitive to rain-on-snow effects. The vast majority of these analyses (over 90 percent) found that rain-on-snow peak flow increases attributable to timber harvest were small (i.e., less than 20 percent) and did not pose an adverse risk to fish and public capital improvements based on model projections. As a result, no management prescriptions were developed to specifically address rain-on-snow beyond those already in place under the standard Washington Forest Practices Rules. However, management prescriptions developed to address other resource issues (i.e., mass wasting and road surface erosion) likely helped mitigate any rain-on-snow peak flow increases associated with timber harvesting.

Because there is some uncertainty regarding: 1) the effectiveness of Washington Forest Practices Rules in meeting the FFR performance targets for hydrology, and 2) the appropriateness of the hydrology performance targets for FPHCP covered resources, the CMER Committee has incorporated a hydrologic component into its adaptive management program. Hydrology-related research and monitoring projects will be evaluated relative to their scientific uncertainty and perceived resource risk and prioritized accordingly. Currently, most hydrology-related work (with the exception of roads monitoring) is considered a low priority compared to water typing-, riparian-, and sediment-related work.

3.17.21.4 Rain-On-Snow

There were comments concerning the adequacy of the Rain-on-Snow rule: enforceability issues, documentation of damage occurrence prior to action being taken, accountability issues to landowners when damage has occurred, clearcut sizes, and definition of hydrological immaturity. There also was a commenter who believed that the Washington Forest Practices Rules' greenup rules are also unlikely to sufficiently reduce the impacts of rain-on-snow events or intensive logging effects on hydrological patterns. One commenter is concerned over language in the DEIS that suggests rain-on-snow effects may increase when widespread clearcut harvesting occurs within a watershed during a short period of time. The commenter suggests the DEIS should be modified because "*…watersheds are never logged completely in less than 30 years.*"

Generally, the comment is correct and there is strong anecdotal evidence that supports this claim. Mixed landownership patterns combined with restrictions on the size and timing of clearcut harvesting reduces the chances of large-scale, concentrated

clearcutting. However, the DEIS language was provided as context so the reader understands that one of the primary factors influencing rain-on-snow processes is the level of hydrologic maturity in a watershed. Therefore, it is not necessary to modify the existing DEIS text.

Typically, the highest frequency of rain-on-snow occurrence is within the rain-on-snow precipitation zone. In Washington, the rain-on-snow zone generally lies between 2,800 and 4,000 feet in elevation. In most areas of the State, forests are the predominant vegetation type at these elevations. Even though rain-on-snow conditions can occur at any elevation, and therefore in any vegetation type, they are most often associated with forested areas. While it is true that "*many watersheds are not entirely forested so rain-on-snow events may not even be related to timber harvest in many cases,*" the scientific literature suggests that changes in hydrologic maturity on forestlands probably have the greatest influence on rain-on-snow processes.

The rain-on-snow rule is an integral part of the forest practices regulatory approach to regulating hydrologic impacts associated with timber harvesting (see Draft FPHCP Section 4c-3). Thus, if the proposed FPHCP is approved, the rain-on-snow rule will be an enforceable FPHCP protection measure. Because many of the protection measures are extremely detailed and lengthy, the FPHCP provides a summary of the most important rule requirements and includes a complete listing of the requirements in appendices.

The DNR memorandum included in Appendix M of the FPHCP provides guidance for implementing the rain-on-snow rule. It is clear from this memorandum that DNR must condition the size of clearcut harvest applications in the significant rain-on-snow zone if local evidence shows that peak flows have caused material damage to public resources. The memorandum also clearly states, in addition to restricting the size of clearcut harvest units, DNR may consider alternatives to clearcutting including strip-cutting or partial cutting.

This Rule does not rely solely on landowners to show that damage to a public resource has occurred. Public resource damage may be documented and reported to DNR by any cooperating agency or organization, including DNR, WDFW, Ecology, Indian Tribes, or environmental organizations. Staff from many of these agencies and organizations are familiar with local, on-the-ground conditions, often providing DNR with important information during the forest practices application review and approval process.

The Rule includes specific thresholds for conditioning forest practices applications for rain-on-snow effects. The thresholds are based on the proportion of the basin in the significant rain-on-snow zone (i.e., the rain-on-snow and snow-dominated precipitation zones defined by DNR) and the proportion of the basin in a hydrologically immature condition. From a rain-on-snow standpoint, hydrologic maturity refers to the forest canopy's capacity to intercept and retain snow. Tree species (i.e., conifer versus deciduous) and crown structure affect snow interception and retention. Thus, mature conifer forests will have a greater capacity for intercepting and retaining snow than young conifer forests or forests dominated by deciduous tree species. Forest age can be used as an index of hydrologic maturity, but due to differences in growth rates associated with site productivity and elevation, age is not always a reliable metric. While forests on

highly productive sites at low elevations may be considered "hydrologically mature" at 30 years of age, forests on low productivity sites at higher elevations may not reach hydrologic maturity until age 50 or more. The implementation memorandum acknowledges these differences and suggests using site-specific information to define hydrologic maturity.

While the green-up rule was not specifically designed to address hydrologic impacts associated with harvesting, it somewhat mitigates rain-on-snow effects due to restrictions on the size and timing of clearcut harvesting. The FPHCP does not promote green-up rule requirements as a key protection measure for addressing rain-on-snow effects; it simply acknowledges the rule's existence and describes it as complementary to the rain-on-snow rule and Watershed Analysis prescriptions.

One commenter claims "*rain-on-snow in logged areas can cause flooding.*" From a technical standpoint, a "flood" occurs when the channel's capacity to carry water is exceeded and water begins to spill out onto the adjacent floodplain. Research results and Watershed Analysis findings indicate timber harvest effects on rain-on-snow peak flows are typically small. While even small timber harvest effects may be undesirable, the scientific literature suggests they generally do not cause small magnitude peak flows to become large magnitude floods. Also, the lack of rain-on-snow conditioning of forest practices applications in the referenced Usual and Accustomed Areas suggests, as the commenter indicates, that the level of hydrologic maturity in those watersheds is sufficiently high to eliminate the need for such conditioning.

Some commenters were critical of the FFR goal of limiting 2-year peak flow increases in western Washington to 20 percent over background. During the early and mid-1990's, Watershed Analysis was conducted on over 60 watershed administrative units in Washington State covering more than 3,000 square miles. TFW cooperators including State agencies, forest landowners, Tribes, and environmental interests cooperatively developed the Watershed Analysis process as a means of addressing cumulative watershed effects associated with forest practices. Included in the Watershed Analysis process was an assessment of the potential for timber harvesting to increase rain-on-snow generated peak flows. Where watersheds were identified as being sensitive to the effects of timber harvest on peak flows, management prescriptions were developed to limit peak flow increases through limits on clearcut timber harvest. The vast majority of these analyses (over 90 percent) found that rain-on-snow peak flow increases attributable to timber harvest were small (i.e., less than 20 percent) and did not pose an adverse risk to fish and public capital improvements based on model projections. As a result, no management prescriptions were developed to specifically address rain-on-snow beyond those already in place under the standard Washington Forest Practices Rules. However, management prescriptions developed to address other resource issues (i.e., mass wasting and road surface erosion) likely helped mitigate any rain-on-snow peak flow increases associated with timber harvesting.

Given that Watershed Analysis was conducted widely throughout the State, and rain-on-snow was identified as a significant resource issue in only a handful of those analyses, the Services feel that current Washington Forest Practices Rules requirements are adequate to

address rain-on-snow peak flow effects. These requirements include approved Watershed Analysis prescriptions and the rain-on-snow rule (WAC 222-22-100), as well as indirect benefits associated with the green-up rule. The rain-on-snow rule gives DNR the authority to condition the size of clearcut timber harvest in the significant rain-on-snow zone where it determines that management-related peak flow increases have resulted in material damage to public resources. Other protection measures included in the FPHCP will increase the level of tree retention across the landscape, further mitigating potential rain-on-snow peak flow increases (e.g., Channel Migration Zones, RMZs, and unstable slopes buffers). Implementation of RMAPs will also reduce the potential for road-related peak flow increases by disconnecting road drainage systems from the stream network.

The adaptive management program will evaluate hydrology-related protection measures and associated resource objectives and performance targets through effectiveness and validation monitoring. Currently, the CMER Committee is developing two projects that address hydrology and roads: one that will evaluate the effectiveness of road-related Washington Forest Practices Rules in meeting site-scale performance targets for hydrology and another that will evaluate effectiveness at the sub-basin scale (FPHCP Appendix H). Currently, CMER-sponsored research and monitoring related to rain-on-snow hydrology has not been a high priority due to the lower scientific uncertainty and resource risk assigned to the issue by CMER.

3.17.21.5 Water Storage

At least one commenter stated that the FPHCP fails to sufficiently address water storage and aquifer recharge. A simple measure with well-documented success is to preserve and enhance areas where beaver dam-building activity has occurred in forested watersheds.

In response, beavers are not included as a "covered species" under the proposed FPHCP, and the plan does not directly address beaver management on covered lands. While the habitat benefits associated with beavers are well documented, the introduction of beavers on land covered by the FPHCP is a decision left to individual landowners. The Services understand that WDFW often provides technical assistance to landowners interested in managing beavers on their lands. Some protection measures included in the FPHCP may indirectly benefit beavers through harvest restrictions in RMZs, Channel Migration Zones, and wetlands.

3.17.22 Equivalent Buffer Area Index

Several commenters were concerned about the Equivalent Buffer Area Index approach. Specifically, at least one commenter believed that the assumption that the alternatives would result in a reduction in delivery potential proportional to the reduction in stem density caused by thinning in the inner zone under Alternative 2 and Alternative 3 was not appropriate. The comments further state that one of the purposes of thinning allowed is to accelerate the generation of LWD large enough to maintain position in larger channels.

The analysis for LWD in the DEIS incorporates both quantitative and qualitative components, of which the Equivalent Buffer Area Index methodology is only a part. The

Equivalent Buffer Area Index for LWD takes into consideration both RMZ width and the management activities that occur within the RMZ, and as stated in the Overview of Effects for LWD Recruitment in DEIS subsection 4.7. The Equivalent Buffer Area Index is only one approximate measure of full recruitment potential because it does not account for all factors that either contribute to recruitment or reduce the amount of recruitment of LWD. For example, the Equivalent Buffer Area Index does not account for redistribution of LWD within streams from events such as landslides or floods, reductions that could occur from yarding corridors or roads, LWD enhancement, or additions from mass wasting or channel migration. The Equivalent Buffer Area Index values are useful in that they do account for variable management prescriptions within the RMZs under the different alternatives, such as the immediate effects of the partial harvest buffers under Alternative 1-Scenario 1, Alternative 2 and Alternative 3 as compared to no-harvest buffers under Alternative 4. However, the Equivalent Buffer Area Index does not reflect the long-term benefits associated with thinning. Thinning boosts the growth rates of source trees remaining in the RMZ, the benefits of which appear to be substantial for large streams near highly productive stands (100-year site index of 128 or greater). Benefits not included in the Equivalent Buffer Area Index calculations are further discussed in the DEIS in the quantitative portion of the analysis description (Subsection 4.7.1.1.2, LWD Recruitment).

Other commenters on the Equivalent Buffer Area Index methodology were concerned that only one citation was used as a basis for this assessment (McDade et al. 1990), a study which did not investigate heavily managed stands which, the commenter suggested, often expose riparian buffers to damaging winds that can significantly reduce long-term LWD recruitment levels by toppling large numbers of trees immediately after adjacent clearcutting. The comments also stated that the Equivalent Buffer Area Index formula incorrectly assumes a random tree falling pattern, which other researchers have dispelled.

McDade et al. (1990) was used in the DEIS primarily because this study was performed in the Cascade and Coast ranges of Oregon and Washington, which are representative of the same environmental conditions being considered in this DEIS. The mature conifer curve from McDade et al. (1990) was used to approximate the cumulative percentage of LWD contribution in relation to the distance from the stream. For purposes of the Equivalent Buffer Area Index calculations, the Equivalent Buffer Area Index values were based on the values from the McDade curve, which were then multiplied by the percentage of trees retained in each of the different RMZ zones. This provided a weighted average indicative of the variable harvest rates that occur within the inner and outer zones under the Washington Forest Practices Rules. The Equivalent Buffer Area Index values for LWD are not intended to account for patterns of large woody debris recruitment, random or otherwise. As stated above, the Equivalent Buffer Area Index for LWD is limited to RMZ width and the management activities that occur within the RMZ and is only one approximate measure of full recruitment potential because it does not account for all factors that either contribute to recruitment or reduce the amount of recruitment of LWD. While it is true that there is some evidence that reduced recruitment may occur in some cases where windthrow is an issue, this is highly variable and there is arguably an equal likelihood that windthrow could actually increase the

amount of LWD within an RMZ, depending on the direction of the prevailing winds. As stated in subsection 4.7 of the DEIS, observed blowdown levels average about 15 percent, but vary widely depending upon site characteristics (Steinblums 1978; Steinblums et al. 1984; Harris 1989; Grizzel and Wolff 1998).

Another comment stated that the Equivalent Buffer Area Index formula (as described in Appendix B of the DEIS) for estimating LWD recruitment values for FFR RMZs is inconsistent with research conducted in Washington State by Grizzel et al. (2000) indicating that debris is being recruited from the outer portions of wider buffers which suggests that narrower buffers limit recruitment.

Actually, what Grizzel et al. (2000) stated was that if RMZs are left that are narrower than the height of the trees in the buffer, then you could potentially have limited recruitment. So for example, if you have trees that are 150 feet tall in a 100 foot wide riparian buffer, then potentially you have about 50 feet where trees could be removed that could have otherwise fallen into the stream and therefore contributed to LWD recruitment. However, as stated in McDade et al. (1990), more than 70 percent of the woody debris observed during the study originated within 20 meters (or about 60 feet) of the channel, with the maximum distance from the channel being 60.5 meters (or about 180 feet). The objectives in the FFR and the FPHCP are to reach a performance target of 85 percent of the recruitment potential for RMZs in western Washington, with eastern Washington targets to be developed based on eastside disturbance regimes (Schedule L-1, Appendix N).

Another comment was received stating that the Equivalent Buffer Area Index approach for sediment filtering is not appropriate and that the degree of effort spent comparing riparian buffer effects on sediment delivery was far greater than warranted by the significance of this process.

As stated in Appendix B of the DEIS, it was determined that it would be practicable to develop the Equivalent Buffer Area Index because studies in the literature typically evaluate buffer widths based on "no harvest," or retention of mature forest with no disturbance. Management strategies include riparian areas that are divided into zones with different levels of timber harvest and thus are not directly comparable to the buffers in the literature. In addition, because these buffer requirements for sediment filtration and LWD recruitment may be more restrictive than RMZ requirements for protection of other riparian functions (e.g., stream temperature, and detrital inputs (Johnson and Ryba 1992, Spence et al. 1996), the Equivalent Buffer Area Index can also be used to compare relative protection for those parameters as well.

One commenter stated that primarily using FEMAT 1993 as a basis to evaluate sediment filtration and microclimatic issue is inappropriate.

The DEIS does not cite just FEMAT to evaluate sediment filtration and microclimatic effects from the alternatives. Subsection 4.9.1.1 states that "Target widths for sediment filtration and microclimatic parameters are chosen from FEMAT (1993), Brosofske et al. (1993), and Chen (1991)," and refers readers to also read the discussion preceding this statement in the same subsection.

Another commenter stated that since overland flow only rarely occurs on Pacific Northwest soils, equating the probability of sediment transport by overland flow with the proportion of trees removed from the riparian area is not a reasonable approach to comparing the alternatives relative to this function.

The DEIS addresses overland flow in relation to sediment Equivalent Buffer Area Index in Section 6 of Appendix B, as well as Sections 4.4, 4.7, 4.8, and 4.9 in Chapter 4. Specifically, the DEIS describes the value of having a vegetated buffer to intercept overland flow and allowing a chance for fine sediments to settle out. Appendix B describes potential sources of fine sediment in overland flow, including erosion from hillslope logging activities, and road surface erosion that comes from drainage relief culverts. These sources of sedimentation can occur and therefore it is appropriate to attempt to quantify the effects of these actions. Additionally, as with the analysis for LWD, the analysis for sedimentation includes both quantitative and qualitative descriptions, which is described in Chapter 4.

3.17.23 Listed and Covered Species

A commenter expressed the concern that the FPHCP does not adequately and consistently identify population and distribution levels that correspond to the recovery of each of the covered species within and across the planning and permit areas.

The Services note that the FPHCP, describing the Forest Practices Regulatory Program and Washington Forest Practices Rules, is not directed at species population levels, but focuses on riparian habitat protection for covered species. The Services are responsible for managing the recovery of threatened and endangered species.

Some commenters were concerned that the FPHCP and DEIS generally fail to examine whether the species' specific needs will actually be met- including in different locations and at different times- as a result of the FPHCP's impact minimization measures. One commenter stated that the DEIS failed to provide projections of affected species' populations under the ITPs and comparison to historic baseline populations. The commenter felt the DEIS should provide a detailed biological analysis of the impacts of harvesting and resource extraction on each wildlife and plant species. One commenter suggested that the DEIS should estimate the impacts of "take" on species' viability.

In response, the purpose of the DEIS is not to examine whether the species' specific needs will be met. Under NEPA, a reasonable range of alternatives is developed, which includes an alternative representing the proposal submitted to the Services. The DEIS assessment compares each alternative, including the proposed action, to a no-action alternative. Scientific literature is used to determine sideboards and criteria to rank alternatives. The DEIS also does not analyze "take." The Services' biological opinions under ESA Section 7 will provide the "take" analysis.

The approach to habitat conservation under the FPHCP includes the development, implementation, and refinement of Washington's Forest Practices Regulatory Program through the collaborative efforts of Program participants. During development of the FFR, policy-makers consulted and considered the available scientific information when crafting the management recommendations that later became Washington Forest

Practices Rules. The FPHCP and the DEIS describe the likely impacts of Alternative 2 in terms of the amount of habitat affected. Both the FPHCP (Section 3-1.3) and the DEIS (subsections 4.8 and 4.9) provide descriptions of habitat requirements for the covered species. In addition, both documents explain the habitat protection provided by the Forest Practices Regulatory Program and how these protections relate to covered species requirements. The habitat protection measures are broken into western and eastern Washington. The DEIS analysis of how the alternatives affect the status of covered fish species is broken down into the 12 analysis regions delineated in the DEIS (subsection 4.8.4). The impacts of each alternative on Amphibians were analyzed for the State as a whole (DEIS subsection 4.9). Chapter 4e in the FPHCP clearly describes the impact of the FPHCP covered activities on habitat. This habitat approach to species conservation is complementary to other plans created to protect public resources such as the Federal Northwest Forest Plan. In addition, both documents describe the adaptive management programs present in the alternatives. These programs allow for change in the Rules, based on feedback from research and monitoring activities.

3.17.24 Coho Habitat

One commenter suggested that the DEIS was incorrect with regard to the statement and implication that "certain habitat structure is better for coho." Contrary to the commenter's argument that Scrivener and Anderson (1982) do not support this theory, F.K. Sandercock cited Scrivener and Anderson (1982) in Pacific Salmon Life Histories (Groot and Margolis 1991): "The abundance of coho in a stream is limited by the number of suitable territories that are available. More structurally complex streams contain stones, logs, and bushes in the water support larger numbers of fry." The statement in the DEIS is further supported by Swales et al. (1986): "During winter, most juvenile salmonids appear to show restricted movements, with most fish being closely associated with instream cover areas such as log jams, root wads, and other instream organic debris. It has been suggested that in some streams, the major factor limiting salmonid abundance may be the extent of overwintering habitat."

The same commenter noted that the following statement in the DEIS is factually incorrect: "There is a positive correlation between their (coho) primary diet of insect material and the extent the stream is overgrown with vegetation." The Services disagree with the comment and refer the commenter to Sandercock, F.K., as cited in Scrivener and Anderson (1982).

3.17.25 Citations

At least one commenter believed the use of Knutson and Naef (1997) is inappropriate since there are peer-reviewed documents that can be used to support riparian disturbance and management related statements.

As a point of clarification, the information supported by Knutson and Naef (1997) in DEIS subsections 3.10.1, Introduction; 3.10.3.2, Snags and Downed Woody Debris; and 3.10.3.3, Edge Effect is not specific to riparian disturbance and management regimes. Rather, these are statements regarding general species habitat and foraging conditions. The Services believe the very broad and general information cited by Knutson and Naef

(1997) is also well supported in other, peer-reviewed studies, and is, therefore, valid and reliable.

One commenter believed the DEIS should use peer-reviewed literature, and preferably more than one peer-reviewed study, to support the statements being made.

While it may be optimal to use peer-reviewed literature for every source cited in an EIS, we disagree that non-peer-reviewed literature is rendered less reliable or valid, particularly when used to support general and well-known facts. The Services believe that the citations provided in the DEIS support the assertions. However, a number of citations have been added to the DEIS to further support the conclusions being drawn.

At least one commenter expressed the view that the use of personal communications to introduce concepts and grey facts should be avoided throughout the document (commenter provides several examples of personal communication citations). Personal communications introduce grey facts into the document that are not necessary. Scientific credible sources should be used to substantiate a point.

The Services disagree that personal communications introduce grey facts into the DEIS. In many cases, the information provided by personal communications with outside experts is more reliable than outdated published literature. The personal communication examples provided by the commenter represent instances where the most current information could only be available by a direct source, and would not be found in any published literature. For example, the citation by Charlene Rodgers, DNR, presents clarifications on FPHCP harvest measures outside of RMZs. This is information that only the applicant could provide; it would not be available from published sources. Similarly, the TMDL information cited by Laurie Mann, EPA, provided readily available predictions on natural temperature conditions. The Services believe the EPA is the most reliable source for its own TMDL program.

Often, the information needed to support an assertion is not easily found, is not on point, or clarifications are needed for the particular issue being analyzed. In these cases, it is scientifically legitimate to contact the source directly and to document the information provided by that expert as a personal communication. Personal communications can take the form of telephone conversations, but documents can also be provided by the source such as letters, data, or inhouse draft studies. The Services believe all are valid if provided by the source expert.

3.17.26 Other

Two commenters noted that sea lions are causing declines in salmon in the Columbia River. The Services are aware of myriad factors that may contribute to the decline of salmon, including predation of salmon by sea lions. The FPHCP is designed to address forestry-related activities and therefore the effects of forestry activities on covered species. Other mechanisms for reversing the decline of salmon from other factors are outside the scope of this EIS.

Another commenter suggested that fishing opportunities will be limited until habitat degradation issues are corrected. The Services agree and point out that a goal of the FPHCP is to restore and maintain riparian habitat to support a harvestable supply of fish.

One commenter suggested that the DEIS analysis of the effects of the FPHCP on Lake Ozette Sockeye was insufficient. The Services believe that the level of analysis provided in DEIS Sections 3.8.5.4 and 4.8.5.4 is sufficient for the purpose of comparing various alternatives to the "no action" alternative. However, NMFS will be providing a separate analysis in the NMFS biological opinion for the purposes of determining whether the proposed action will lead to jeopardy of the species or adverse modification of its critical habitat.

The Services received a comment in the form of a poem about the life cycle of salmon. The Services appreciate the creative expression and acknowledge that the public sees not only the technical and policy issues surrounding a proposed HCP, but also the artistry in the species we are trying to conserve.

At least one commenter recommended using semi-retired people as volunteers for monitoring. The Services appreciate the idea of volunteers for monitoring. Aside from compliance monitoring where DNR is the lead, other monitoring efforts are within the adaptive management program and are generally under the CMER committee. CMER meets monthly and these meetings are open to the public to provide input. Contact the Olympia DNR Forest Practices Division for more information on CMER or visit the following DNR website: http://www.dnr.wa.gov/forestpractices/adaptivemanagement/.

One commenter mentioned [former President] Clinton's roadless rule. Another comment mentions people's voting behaviors. One comment stated "Please save our Northwest home." Another comment said that all old-growth forests must be maintained. Yet another comment said no clearcuts should be allowed. These comments do not provide specific comments relevant to this EIS in which the Services could respond or the comments are beyond the scope of this EIS.

3.18 TRIBAL AND CULTURAL ISSUES

3.18.1 Regional Summaries

Several Tribes expressed concerns about the data/information used in the regional analyses: 1) there is no tribal specific data in the WRIA 20 discussion in DEIS Appendix A; 2) data used in reference to the Tribe has been extrapolated from dissimilar watersheds with a completed Watershed Analysis; and 3) other concerns regarding lack of inclusion of information from partially completed Watershed Analysis or the lack of timely completion of Watershed Analysis so that data may be included in the DEIS.

The DEIS Appendix A has been modified to reflect this comment.

The broad geographic coverage of the proposed action negates assessing lands on strictly a watershed level. Instead, the DEIS describes issues that occur on a WRIA or regional basis with supporting information from the watershed level where information is available.

3.18.2 Funding for Tribal Participation

At least two Tribes expressed concern that the documents [DEIS and Draft FPHCP] do not ensure adequate base funding for tribal participation throughout FPHCP implementation, and that the FPHCP needs to strongly emphasize support for tribal funding in order that they may continue to be involved in forest management decisions that affect the aquatic resources upon which their treaty rights exist.

Similar to previous biennium, the draft DNR budget for the 2005-2007 biennium includes $410,000 for tribal participation in adaptive management. Continuation of this funding is largely dependent on a number of variables, including continued tribal participation in adaptive management and also available funding from State and Federal sources. As stated in the DEIS, it is expected that Alternative 2 will result in the best opportunity for continued long-term stakeholder support and ultimately future State and Federal funding.

3.18.3 Co-management

Several comments stated that Tribes have not been adequately included in the management of forest resources as required under the Centennial Accord, Millennium Agreement, Governors Proclamation dated 4/28/05, Presidential Executive Order, and the FFR (Background Section G), which in general state that the Tribes must be involved in forest management decisions that affect the aquatic resources upon which their treaty rights exist, and in all phases of the regulation of forest practices including without limitation the development of Washington Forest Practices Rules by the Forest Practices Board. There is no improvement or guarantee of tribal participation in this HCP even though the intent is laid out in the Forest Practice Act (Chapter 77.85.180 RCW and Chapters 76.09 RCW). Several commenters expressed concern that consultation under WAC 222-46-020 is by invitation by DNR only; that there is no guidance on how to use interdisciplinary team information in field decision-making; and that WAC 222-12-046 is silent as to consultation. Further, comments stated that consultation with affected Indian Tribes as per WAC 222-10-30(3) needs to be clearly defined (as prescribed in the FFR).

The Washington Forest Practices Rules specifically direct times when DNR is required to engage Tribes in the process as decisions affecting forest resources are made. WAC 222-10-30(3) states, “The department WILL [emphasis added] evaluate the proposal, using appropriate expertise and in consultation with other affected agencies and Indian Tribes.” This statement is not intended to limit the role of Tribes in the consultation on unstable slopes issues, but rather states that DNR is required to consult with affected Indian Tribes regarding unstable slopes. The term “consultation” is not defined in the Rules under WAC 222-16-010, but it is generally understood to mean having a discussion and/or otherwise receiving input from affected Tribes regarding the possible impacts of the proposed action.

WAC 222-12-046, which addresses cumulative effects of forest practices, states under part (3)(f), “Chapter 222-46 WAC establishes the enforcement policy for forest practices. The board [meaning the Forest Practices Board] shall continue consultation with the departments of ecology, fish and wildlife, natural resources, forest landowners, and federally recognized Tribes to further protect cultural resources and wildlife resources issues.” This statement is then followed up under WAC 222-46-012 which requires DNR

to invite representatives of affected Tribes to participate in all interdisciplinary teams appointed by DNR for any pending application in connection with Watershed Analysis.

3.18.4 Communications

Several Tribes commented that consultation and further discussion is needed to elucidate a government-to-government relationship between DNR, other Washington State entities, and the Tribes. Another Tribe said it would be appropriate to develop a programmatic agreement between Washington State and the Tribe regarding the FPHCP and its potential impacts to tribal resources.

The FPHCP does not propose any rule changes. In the months leading up to the adoption of the July 2001 Washington Forest Practices Rules, there was an extensive stakeholder participation process where tribal representatives were invited to participate in drafting rule language. Additionally, during its October 3, 2000 meeting, the Forest Practices Board invited interested Tribes to participate in a government-to-government discussion of the Rules. Representatives from the Lummi Indian Nation, Nooksack Indian Tribe, Suquamish Tribe and the Puyallup Tribe were present and spoke to the Forest Practices Board. As stated above, under the subheading *Co-Management*, Tribes have many opportunities to aid in decisions affecting forest practices – through Rule development, review and input on specific forest practices, and through participation in CMER and TFW/FFR Policy Group.

3.18.5 Cumulative Effects

At least two Tribes commented on cumulative effects stating 1) that the Washington Forest Practices Rules (WAC 222-12-046(f) requiring tribal consultation needs confirmation and clarification, and 2) that the documents do not incorporate estimated tribal uses of treaty-reserved fish and wildlife into the environmental baseline, in the cumulative effects analysis, for purposes of determining the FPHCP's adverse impacts.

The WAC referenced above has been changed to WAC 222-12-046(4), Cumulative effects. *[Effective 7/1/05]*, which states, "The board shall continue consultation with the departments of ecology, fish and wildlife, natural resources, and archaeology and historic preservation, forest landowners, and affected Tribes to further protect cultural resources and wildlife resource issues." The purpose in changing this Rule was to confirm that consultation with affected Tribes, among other entities, would occur when forest practices are reviewed through SEPA for cumulative effects. These changes include requiring consultations with ANY affected Tribe rather than only consulting with federally-recognized Tribes.

The EIS, rather than the FPHCP, is the appropriate document to address analysis pertaining to the estimated tribal uses of treaty-reserved resources. A basic assumption of the baseline conditions in the DEIS is that the current level of all uses of fish and wildlife, including tribal uses, will continue at approximately the same level in the future. Although the point of this comment is well taken, it would be extremely difficult to demonstrate, with any reasonable level of accuracy, the exact amount that each Tribe will use from year to year because these uses vary by Tribe, by individual, by year, and by harvest type, be it commercial or subsistence harvesting.

3.18.6 Interdisciplinary Teams

Several more comments cited a concern that tribal participation on interdisciplinary teams is required only by invitation by DNR per WAC 222-46-012, and that there is inconsistent application across regions and rules. Further, there is no guidance on how to use team information in field decision-making. The Tribes need certainty in any authorization of incidental take that the tribal co-management role will be protected.

The WAC cited in the comment above, 222-46-012, pertains to interdisciplinary teams that are convened in connection with Watershed Analysis, and does not pertain to other actions outside of Watershed Analysis. However, this WAC specifically states that "…the department [DNR] WILL [emphasis added] invite representatives of other agencies necessary to provide specific expertise to resolve issues that have been raised, [T]ribes, and interest groups, to accompany a department representative and, at the landowner's election, the landowner, on any such inspections." This statement is not meant to limit tribal involvement on interdisciplinary teams. To the contrary, by stating that DNR WILL invite representatives of Tribes to participate on these teams, DNR is required to extend an invitation to all Tribes affected by the proposed action.

If an affected Tribe feels they have been excluded from such an interdisciplinary team, they should contact the DNR region office. A Tribe may also contact Forest Practices Division staff, or the Tribal Relations Manager at DNR in Olympia.

3.18.7 Impacts on Tribal Resources

One commenter stated that there are projects currently pending or underway, the combined effects of which need to be addressed through the NEPA process. This is not adequately evident in the FPHCP or DEIS regarding cumulative impacts to tribal resources.

Cumulative impacts are generally discussed in two places in the DEIS; Chapter 5, which discusses cumulative impacts on more of a general statewide basis, and the Regional Summaries in Appendix A, which delves into more specific details, as available, on a regional and WRIA basis. The large scale of the proposed project does not generally lend itself to discussions on a very small, local scale, however both Appendix A and Chapter 5 strive to capture general issues that demonstrate trends affecting specific regions or the State as a whole including tribal resources such as fish and cultural issues.

Another commenter said the interests of the Tribes in their traditional areas may extend beyond areas considered under the ESA as critical habitat, and any contemplated take of resources or habitat in traditional areas must first be agreed to by a programmatic agreement or other agreed upon protocol. Sufficient habitat protection and recovery within private forests across the State are critical to the tribal livelihood.

In response, the Services will evaluate the proposed FPHCP under ESA Section 7 for the proposed Federal action of issuing ITPs. Determining the effects on critical habitat is a part of these analyses for each of the Services. Also, the analysis must consider the entire action area, the extent of the potential physical, chemical, and biological effects. Often this is much larger than the "footprint" of the proposed action.

Several comments suggested that the extent, nature, and scope of forest practices activities within tribal traditional areas should be discussed further in consultation with the Tribes. Specific concerns for impacts to tribal resources in traditional areas included the use of clearcuts unless specifically agreed to by the Tribes, the impacts to erosion and habitat, issues relating to roads and changes in impervious surfaces resulting from forest activities, and the use of pesticides.

The Washington Forest Practices Rules provide for protection of tribal resources and usual and accustomed areas through the use of interdisciplinary teams and consultations with affected Tribes. It is through these venues that Tribes may communicate their concerns on a case-by-case basis and suggest changes to forest practices that will better protect resources of special interest to the Tribes.

Another comment stated that Tribes in the Northwest have seen first hand how forest practices have impacted their rights as reserved by treaties over time, i.e., impacts on fisheries, limitations on gathering, hunting, harvesting, and disturbance of culturally sensitive areas.

In response, the approval of an HCP does not negate tribal rights to voice their concerns regarding individual forest practices or protections afforded to their reserved treaty rights. The State will still be required to consult with Tribes and to invite Tribes to participate on interdisciplinary teams. Likewise, Tribes are encouraged to participate in the adaptive management process and to bring their issues and concerns to the table. Tribes will still have the right to petition for rule changes to the Forest Practices Board and to the State Legislature.

One commenter stated that they strongly disagree with the assertion that the small forest landowner exemption will have a negligible impact on treaty resources. The Draft FPHCP provides an analysis that attempts to minimize the extent of the exemption. The Services direct the commenter to the 20-Acre Exemption response (subsection 3.13).

At least one commenter said DNR has not shown the Tribes it has the desire and commitment to manage lands in a manner that protects resources vital to the Tribes' cultural and economic well being. Another commenter said the FPHCP and Implementation Agreement force the Tribe to bear a disproportionate burden of the conservation responsibility because of the substantial take of trust resources by non-fishing activities, and because they transfer a greater burden of resource conservation to the Tribe.

The Services note that the Washington Forest Practices Rules are designed to take into consideration issues and resources important to Tribes' cultural and economic well being. As stated elsewhere in the Services' responses to comments, DNR has incorporated into the Rules numerous opportunities for tribal participation in forest practices, including notification of pending forest practices applications (WAC 222-20-120), participation on interdisciplinary teams (WAC 222-12-0401), consultations with DNR and landowners (WAC 222-10-030, 222-12-040, 222-20-120), and scientific research and monitoring (WAC 222-12-044) through adaptive management (WAC 222-12-045). Additionally, should Tribes feel they have a concern that has not been heard or adequately resolved,

they may at any time exercise the option to contact DNR through the region, the division office, or they may contact the Forest Practices Board directly either in writing or by making a verbal public comment. It is not the intent of the FPHCP to limit the amount of involvement Tribes have in Forest Practices.

Likewise it is not the intent of the FPHCP and Implementation Agreement to force Tribes to bear a disproportionate burden of the conservation responsibility. As stated in the DEIS under subsection 4.14.4 (Environmental Justice), Alternatives 2, 3, and 4 are likely to result in improvements in the availability of salmon and in tribal access to traditional places and usual and accustomed use areas as opposed to the No Action Alternative Scenarios.

One commenter stated the same is true of the Environmental Justice section of the DEIS, which meaninglessly concludes, "The alternatives have the potential to affect Washington's Native American Tribes by affecting the availability of salmonid species and potentially altering access to traditional places and usual and accustomed use areas."

The statement made in the comments is taken slightly out of context from the DEIS. Subsection 4.14.4.1 (Salmon) under subsection 4.14.4 (Environmental Justice) states, *"The alternatives have the potential to affect Washington's Tribes by affecting the availability of salmonid species. While there are no provisions in Washington Forest Practices Rules and the proposed alternatives that affect future tribal harvest any differently than they affect the other types of harvest, the potential exists for American Indians to be disproportionately impacted. This potential is due to the relatively important role that commercial fishing plays in tribal economies, as well as the significance of salmon and bull trout for ceremonial and subsistence purposes."* The DEIS later goes on to state that Alternative 2 would likely result in long-term improvements over the No Action Alternative 1-Secenario 1 and that, *"Access to traditional places and usual and accustomed use areas would be similarly affected by the alternatives…"* as compared with the No Action Alternative 1 Scenarios.

3.18.8 Government to Government Relations

Several commenters addressed the Services tribal trust responsibilities saying the FPHCP fails to expressly describe how issuance of the ITPs will be consistent with the Federal trust responsibilities toward Indian Tribes. Concerns were expressed that the Services have failed to carry out their respective trust responsibilities by failing to: (1) carefully consider and expressly disclose all adverse effects on tribal rights, such as treaty-reserved fishing rights; (2) take action consistent with restoring commercially significant (sustainable) quantities of anadromous fish; (3) disallow activities that interfere with restoration; and (4) ensure tribal consultation throughout the 50-year HCP implementation process.

Another Tribe stated that as its trustees they believe the Services must develop a report card that monitors the continued funding and compliance efforts under a deadline that must be met in order to keep the assurances active.

Another comment stated that for the reasons described herein, the documents do not comply with the following Federal laws: The Treaty of Point Elliott; Federal trust

responsibilities; the Administrative Procedure Act; NEPA; ESA; the Pacific Salmon Treaty; the Puget Sound Management Plan; the Magnuson Fishery Management and Conservation Act; the International Convention on Geological Diversity; the Pacific Salmon Treaty; and the March 7, 1985, Stipulation entered in Yakima Indian Nation v. Baldridge, 605 F. Supp. 833 (W.D. Wash, 1985). The documents are also inconsistent with Secretarial Order No. 3206, American Indian Tribal Rights, Federal - Tribal Trust Responsibilities, and the ESA.

The Assistant Secretary for Fish and Wildlife and Parks, in coordination with USFWS, NMFS, and the Bureau of Indian Affairs worked with Native American representatives to develop Secretarial Order 3206, issued June 5, 1997. The Order clarified the responsibilities of the component agencies, bureaus and offices of the U. S. Department of the Interior and Department of Commerce when actions taken under authority of the ESA and associated implementing regulations affect, or may affect, Indian lands, tribal trust resources, or the exercise of American Indian tribal rights. The Order further acknowledged the trust responsibility and treat obligations of the United States toward Indian Tribes and tribal members and its government-to-government relationship in dealing with Tribes. This Order is guidance within the Departments and was adopted pursuant to, and consistent with, existing law. Additional guidance in the form of an appendix addresses Habitat Conservation Plans (HCPs), wherein the Services "…shall coordinate with affected Indian Tribes in order to fulfill the Services' trust responsibilities and encourage meaningful tribal participation in…" the HCP program. The Services are to 1) facilitate tribal participation in the HCP development process by providing timely notice that an HCP may affect tribal resources or the exercise of tribal rights; 2) encourage HCP applicants to cooperate with affected Indian Tribes and advocate for tribal participation in the development of HCPs; 3) advocate the incorporation of measures into HCPs that will restore or enhance tribal trust resources; and 4) advocate and encourage early participation by affected tribal governments in the development of region-wide or statewide HCP efforts and the development of any related implementation documents.

The Services believe that they have followed this guidance by working with Tribes and the other FFR stakeholders to address tribal concerns, and incorporate those concerns and the best available scientific and commercial data into the draft documents. Subsequent input from Tribes on the draft documents will also be incorporated as appropriate into the FEIS, the Final HCP, and the Final Implementation Agreement. Individual Tribes, and tribal representative organization, have made there concerns known, and the Services believe that tribal input into development of the HCP has been properly solicited and considered throughout the HCP and NEPA processes through the multi-stakeholder TFW/FFR Policy Group /Technical meetings over a period of years, in addition to opportunities to provide input at the NEPA scoping meetings, and during the NEPA environmental review public comment period. The TFW/FFR Policy Group /Technical forum is expected to remain in place, according to the HCP (and the Forest Practices Regulations), allowing the Tribes to consult, and have input to the process of change to the HCP, throughout the 50-year term of the ITPs. Even if the Rules were to change, for some unknown reason, such that the Tribes' ability to consult with other stakeholders was

restricted, the Services will always be available to consult with the Tribes on tribal resource issues, according to law and the Secretarial Order.

Although HCPs are not intended to be 'recovery plans,' they are intended to contribute to the recovery of declining populations. One of the four overarching goals of the FFR, upon which the FPHCP was designed, is "to restore and maintain riparian habitat on non-Federal lands to support a harvestable supply of fish." The collaboration of stakeholders, including Washington native Tribes, presented the FFR to the Forest Practices Board and the Governor's Salmon Recovery Office as recommendations that were designed to achieve this goal. The Services have yet to develop their decision documents that analyze the effects of the FPHCP on the covered species but the overall expectation by the stakeholders is that the FPHCP is designed to achieve this goal.

With respect to monitoring and funding, the Services believe these should be elements of every HCP. In fact, adequate funding to properly implement the FPHCP is a "finding" the Services must make in order to issue the ITPs. The "report card" the commenter suggests is already built into the FPHCP in the form of annual monitoring and compliance reports. This reporting will include reports on the status and funding of the adaptive management program. If the FPHCP is not being properly implemented, i.e., fails to meet the ITPs' issuance criteria, the ITPs can be revoked.

As to the legality of the final documents, the Final HCP and Implementation Agreement must be implemented according to all other laws or the ITPs, if issued, can be revoked. With respect to being consistent with the Secretarial Order, please see the first part of this response.

3.18.9 Treaty Rights

Several Tribes cited their rights under specific treaties, e.g., Treaty of Point Elliott, stating that issues such as access to usual and accustomed areas, and impacts to tribal resources, have not been adequately addressed in the FPHCP. Programmatic agreements with the Tribe may be a way to potentially address these matters. Others said that a treaty takes precedence over any conflicting State laws by reason of the Supremacy clause. Treaties are to be liberally interpreted to accomplish their protective purposes, with ambiguities to be resolved in favor of the Indians.

As stated earlier, the FPHCP does not change any standing commitments the State or Services have with Tribes. As such, the FPHCP does not circumvent or otherwise compromise any previous agreements the Services or State have with Tribes, including any and all treaty rights.

Another commenter said the Services have a legal obligation and a trust obligation to honor and uphold the Tribe's treaty rights as a higher priority than its agreements with State agencies as well as public and private companies. Another commenter said the documents should either expressly disclaim that they meet treaty fishing responsibilities, or be modified to comply with the Treaty.

With respect to the Services legal and trust obligations, please see the response under the subheading Government to Government Relations within this subsection (subsection 3.18.8).

One commenter favors restoration of habitat to facilitate the rights within traditional territories, as exercised from time immemorial, and reserved through the signing of treaty. The temporal aspect of potential effects also is of importance when discussing restoration and mitigation, so the plans of forest activities within tribal traditional areas should also contemplate effects beyond the 140 years discussed in the FPHCP.

The analysis in the DEIS suggests that Alternatives 2, 3, and 4 will restore habitat conditions in many areas over baseline conditions, primarily because they include wider buffers that are more protective of riparian functions than the Washington Forest Practices Rules were in the past. As stated in subsection 4.1.4 of the DEIS, the FPHCP and associated ITPs have a proposed permit duration of 50 years. Consequently, the effects analysis in the DEIS generally considers long term effects out to around 50 years, although in some circumstances, the timeframe could be longer. However, since each of the action alternatives are expected to result in at least some restoration of habitat conditions over current baseline conditions, it is anticipated that this trend will continue in the future.

At least two Tribes commented on Treaty rights and the ESA. One said that the Federal government's and State's Treaty obligations are not satisfied solely by compliance with the ESA. The ESA is narrowly focused addressing only listed stocks, while Treaty rights apply to all species of fish. Another Tribe said the FPHCP and Implementation Agreement violated the standards established by the ESA, the Treaty, and the other State and Federal laws mentioned herein.

Although the ESA primarily addresses listing and recovery, under Section 4; it also provides for conservation of listed and unlisted species under Section 10, the section under which HCPs can legally be developed. The FPHCP was designed to benefit not only listed anadromous fish, but all Washington native fish. That is one of the many positive points of the HCP process; that it allows for flexibility in addressing a multitude of fish and wildlife species in the FPHCP plan area. Thus, the HCP process, including development of the HCP and Implementation Agreement, actually fulfills the standards of the ESA.

3.18.10 Cultural Resources

One commenter stated that many of the most culturally important species to tribal gatherers and artisans are considered nuisance species by the commercial timber industry and are sprayed to assist conifer release.

In response, the State application for Federal assurances does not include application of pesticides. Therefore, the Washington Forest Practices Rules regarding this forest practice would not be covered under the FPHCP. Concerns regarding these activities should be directed toward DNR and the Forest Practices Board.

Other comments stated that the FPHCP's cultural resources component fails to adequately protect tribal cultural interests including traditional places, materials, historic sites, spiritual sites, archaeological resources, and treaty fishing, hunting, and gathering rights.

The FPHCP does not change any standing commitments DNR has with Tribes. Cultural resource or habitat issues will continue to be addressed through the Washington Forest Practices Rules including WAC 222-20-120, which requires DNR to notify affected Indian Tribes of all forest practices applications of concern (including those involving cultural resources). If a cultural resource is found or is otherwise known to occur in an area, the landowner is required to offer to meet with the affected Tribes with the objective of agreeing on a plan for protecting the archaeological or cultural value, and the affected Indian Tribes determine whether the plans for protection of cultural resources will be forwarded to the Office of Archaeological and Historic Preservation.

3.18.11 Archaeological and Historic Preservation

Two tribal commenters said there is no ambiguity as implied in the DEIS as to whether or not Washington State's application for ITPs is an "undertaking." The Federal agency is substantially involved in this proposed action since it cannot move forward without the ITPs. When an undertaking is proposed by an applicant, the applicant may choose to participate in the Section 106 process. However, a Federal agency's responsibility to comply with Section 106 cannot be relinquished to others. A condition of issuing the ITPs can be that the benefiting entity accepts the burden of completing the Section 106 requirements but if they fail to meet the requirements, the responsibility remains with the Federal agency. The effects of the undertaking on sites listed or eligible for inclusion in the National Register of Historic Places must be considered by the Federal agency considering the undertaking. Therefore, all lands to which the ITPs apply shall be subjected to the Section 106 process. To comply with the NHPA, the Federal agency must make a reasonable and good faith effort, i.e., develop a strategy, to identify historic properties that may be affected by the undertaking and gather sufficient information to evaluate the eligibility of these properties for the National Register of Historic Places (NRHP) [36 CFR 800.4(b)].

In response and to clarify, Washington State’s application for ITPs is not an undertaking as defined in the NHPA. It is the Federal agency’s action of issuance of the ITPs that is considered to be an undertaking. The Services agree with the commenters that the Federal agency’s responsibility to comply with Section 106 cannot be relinquished to others. However, if more than one Federal agency is involved in the action, one of them may take on the compliance responsibility as the designated lead Federal agency. In this case, that agency will be USFWS. We agree, also, with the remainder of the comments that reiterate, as specified in 36 CFR 800, a Federal agency’s responsibilities but add that a reasonable and good faith effort to identify historic properties is made taking into consideration the magnitude and nature of the undertaking and the degree of Federal involvement.

Three tribal commenters said the Cultural Resources Protection and Management Plan, the Cultural Resources Module of Watershed Analysis, and other voluntary processes identified in the DEIS do not meet the requirements of the NHPA. Section 106 is not

voluntary. It was suggested that rather than conduct cultural surveys of all potential permitted lands prior to issuing the ITPs, a reasonable strategy may be for the Federal agencies to condition the permits to include cultural resources surveys on a project-by-project basis. DNR can pass the costs of those professional surveys on to the proponents of forest practices applications. If the surveys are not conducted and identified sites protected, the ITPs would be revoked.

The Services agree with the comments that Section 106 is not voluntary, and we appreciate the suggestion to conduct a phased approach to identifying cultural resources that may be eligible for placement on the National Register of Historic Places. As the lead Federal agency, the USFWS will determine how best to meet the Section 106 compliance responsibilities in consultation with the State Historic Preservation Office and interested Tribes.

One commenter, recognizing that the FPHCP may impact cultural resources necessitating a Section 106 consultation under NHPA, requested involvement in the NHPA Section 106 process.

The USFWS, the designated lead Federal agency for compliance with NHPA Section 106, will consult with any Tribe that may be interested. This will be done by contacting key tribal members and representatives of the Northwest Indian Fisheries Commission with a request to consult and coordinate with them on our Section 106 responsibility.