A Citizen's Guide to the 4(d) Rule

For

Threatened Salmon and Steelhead on the West Coast

National Marine Fisheries Service
Northwest and Southwest Regions
June 20, 2000

Table of Contents

Introduction. 1

Background 1
- Purpose of this Guide 1
- Salmon in Decline 1
- Saving the Salmon 2
- What does the 4(d) Rule do? 2
- What is Take? 4
- Take Guidance 4
- Evaluating Potential ESA Take Liability 6
- Effective Dates 7
- Useful Concepts for Understanding the Limits 7

The 13 Limits 8
- Description of the Limits 8

Regular Evaluation of Limits on Take Prohibitions 19

Other ESA Mechanisms. 20

How NMFS Decides What May Be Included In a 4(d) Rule Limit 20
- Submitting a Program for 4(d) Limit 21
- Contact Information 22

Additional Information on the Final 4(d) Rule 23
- Effective Dates of Final 4(d) Rule 23
- Finding Your Way Around the 4(d) Rule 24
- Technical Issues: Aids for Understanding the 13 Limits in the 4(d) Rule 24
  - Viable Salmonid Populations 24
  - Properly Functioning Condition 25

Introduction

In June 2000, the National Marine Fisheries Service (NMFS) adopted a rule prohibiting the "take" of 14 groups of salmon and steelhead listed as threatened under the Endangered Species Act (ESA). NMFS adopted the take rule under section 4(d) of the ESA. This rule prohibits anyone from taking a listed salmon or steelhead, *except* in cases where the take is associated with an approved program. The 4(d) rule approves some specific existing state and local programs, and create a means for NMFS to approve additional programs if they meet certain standards set out in the rule.

State and local governments, tribes and others throughout the Northwest have stepped forward and assumed leadership roles in saving these species. Efforts include the Oregon Plan for Salmon and Watersheds, the State of Washington's Extinction is Not an Option Plan, Metro's Functional Plan, the Puget Sound Tri-County Initiative, the Lower Columbia Fish Recovery Board, the Eugene, Oregon-area Metro ESA Coordinating Team, and the Willamette Restoration Initiative. NMFS believes it is these local efforts that will ultimately save the salmon. A central goal of this 4(d) rule is to encourage such state and local efforts by providing the means for NMFS to approve local efforts and limit liability under the ESA.

Background

Purpose of this Guide

This *Citizen's Guide to the 4(d) Rule* introduces and explains the rule. It complements the final rule published in the *Federal Register* in June of 2000 by providing a more user-friendly description of why the rule is needed, what it contains, how it will affect citizens, and how to get more information. This Guide is not binding Federal language or regulation. Individuals should refer to the Federal register notice for the regulatory language governing activities under the rule.

Salmon in Decline

In 1994, in response to growing concerns about salmon health on the West Coast, NMFS began the most thorough scientific review of Pacific salmon ever undertaken. The review looked at salmon and steelhead from desert-like areas in California to coastal rain forests, and from the high mountains of central Idaho to lowland basins within sight of the Pacific Ocean. The review identified 52 distinct populations, known as Evolutionarily Significant Units (or ESUs) of Pacific salmon in Oregon, Washington, Idaho, and California. Of these populations, 26 have been listed as threatened or endangered under the ESA and most others are in decline or at very low levels.

These populations of salmon and steelhead are likely to become endangered species within the foreseeable future and their current threatened status cannot be explained by ocean cycles or other natural events. NMFS has concluded that these species are at risk of extinction primarily due to human activities. Salmon and steelhead populations have been depleted by over-fishing, past and ongoing habitat destruction, hydropower development, hatchery practices, degraded water quality and other causes.

Chum Salmon: Populations are down throughout Oregon and Washington. Summer-run chum have disappeared from many Hood Canal streams, and numbers in the Columbia Basin have declined to less than one percent of their former abundance.

Chinook Salmon: Only two of 13 different stocks in Puget Sound are considered healthy. Only slightly more an 1,000 fish return annually to the entire Willamette Basin. Recent returns of spring-run Chinook to the Upper Columbia have averaged only 5,000 naturally-produced fish and are the lowest on record.

Steelhead: Willamette River fish are in steep decline and returns during 1995 were the lowest in 30 years of record keeping. Returns have dropped to as low as 500 fish in the middle Columbia rivers like the Yakima and Umatilla, and steelhead are extinct in the Crooked and Metolius rivers in Oregon.

A species is considered *endangered* when it is "in danger of extinction throughout all or a significant portion of its range" and *threatened* when it is "likely to become endangered within the foreseeable future throughout all or a significant portion of its range." Copies of these studies are available to the public and can be obtained by calling any of the NMFS offices listed at the end of this Guide, or one of our websites at www.nwr.noaa.gov or swr.ucsd.edu.

Saving the Salmon

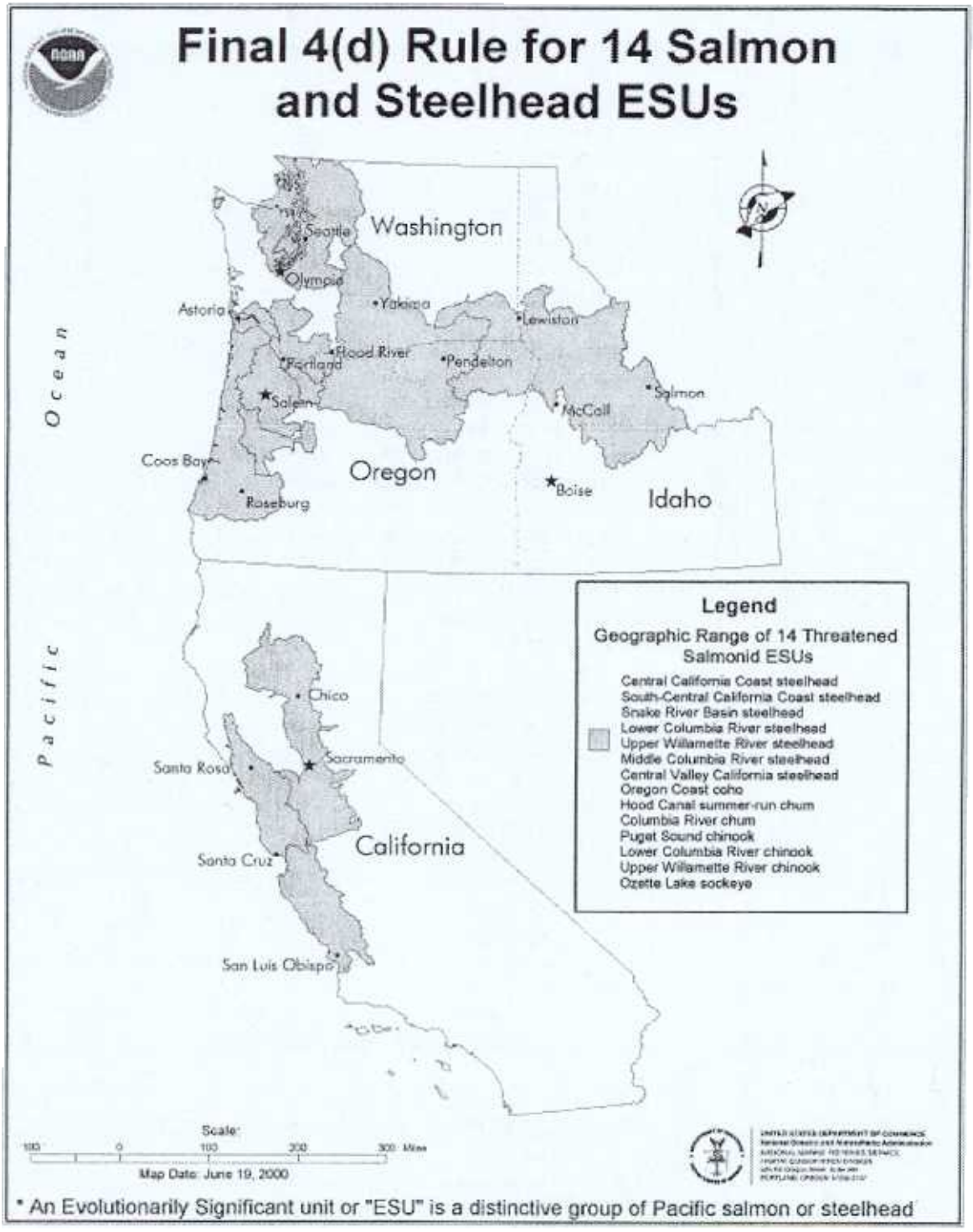
The ESA provides a variety of tools for saving species threatened with extinction. Under section 7 of the ESA, no Federal agency may fund, permit or carry out any activity that will jeopardize their continued existence. In many cases, this restriction on Federal activity is not enough by itself to recover threatened species. When the activities of state and local governments and private citizens harm listed species, section 4(d) of the ESA requires that harm be controlled so it does not lead to extinction.

Section 4(d) requires NMFS to issue regulations deemed "necessary and advisable to provide for the conservation of the species." NMFS must establish protective rules for all species now listed as threatened under the ESA. These protective rules for threatened species may apply any or all of the ESA section 9 protections that automatically prohibit take of species listed as endangered. The rules need not prohibit all take. There may be an "exception" from the prohibitions on take so long as the take occurs as the result of a program that adequately protects the listed species and its habitat. In other words, the 4(d) rule can "limit" the situations to which the take prohibitions apply.

Incorporating such "limits" into a 4(d) rule can be good for NMFS, state agencies, government entities, private citizens, and the fish. Activities carried out in accordance with 4(d) rule limits can help protect threatened species and their habitats while relieving state agencies, government entities, tribes and others from liability for take that results from those activities. By providing limitation from take liability, NMFS encourages governments and private citizens to adjust their programs and activities to be "salmon safe." NMFS anticipates that programs and activities included as a 4(d) rule limit will ultimately be incorporated into ESA Recovery Plans for listed salmon and steelhead.

What does the 4(d) Rule do?

This rule protects 14 ESUs of salmon and steelhead in Idaho, Washington, Oregon, and California (depicted in the map on the following page). The rule follows the standard practice of prohibiting the killing or injuring of a threatened species (i.e. "take") without specific written authorization; that is its principal function.


Final 4(d) Rule for 14 Salmon and Steelhead ESUs
Washington
Seattle
Olympia
Yakima
Lewiston
Astoria
Portland
Hood River
Pendelton
Salem
Salmon
McCall
Coos Bay
Roseburg
Oregon
Boise
Idaho
Pacific Ocean
Chico
Sacramento
Santa Rosa
California
Santa Cruz
San Luis Obispo
Legend
Geographic Range of 14 Threatened Salmonid ESUs
Central California Coast steelhead
South-Central California Coast steelhead
Snake River Basin steelhead
Lower Columbia River steelhead
Upper Willamette River steelhead
Middle Columbia River steelhead
Central Valley California steelhead
Oregon Coast coho
Hood Canal summer-run chum
Columbia River chum
Puget Sound chinook
Lower Columbia River chinook
Upper Willamette River chinook
Ozette Lake sockeye
Scale:
100 0 100 200 300 Miles
Map Date: June 19, 2000
* An Evolutionarily Significant unit or "ESU" is a distinctive group of Pacific salmon or steelhead

The rule applies to ocean and inland areas, and to any authority, agency, or private individual subject to U. S. jurisdiction. Activities or development not likely to kill or harm protected species will not be affected by the rule. The rule does not prohibit actions or programs—it prohibits illegal take. Activities that do not kill or injure protected salmon and steelhead do not require any special authorization. Limits can be thought of as "exceptions" to the take prohibitions. These limits represent programs or activities, or criteria for future programs or activities, for which NMFS will not apply the take prohibitions. This is because NMFS has determined that these programs or activities minimize impacts on threatened salmon and steelhead enough so that additional Federal protections are not needed to conserve the ESU. NMFS will monitor the activities that have been granted a limit to make certain there is no unexpected take or harm.

What is Take?

The ESA makes it illegal for any person subject to the jurisdiction of the United States to take any species of fish or wildlife that is listed as endangered (ESA section 9[a][1]) without specific authorization. The final 4(d) rule puts in place the same take prohibitions for threatened salmon and steelhead, except for certain limits that apply to the activities specified in the rule. This prohibitions applies within the United States and its territorial waters as well as on the high seas.

"Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (ESA section 3[19]). It is also illegal under ESA section 9 to possess, sell, deliver, carry, transport, or ship any species that has been taken illegally (ESA section 9[a][1]). Violating the take prohibitions may result in civil or criminal penalties.

"Harass" is defined as an intentional or negligent act that creates the likelihood of injuring wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering (50 CFR 17.3).

"Harm" is defined as an act that actually kills or injures a protected species (50 CFR 222.102 (64FR 60727)). Harm can arise from significant habitat modification or degradation where it actually kills or injures protected species by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering.

Take Guidance

The likelihood that an action will take a listed species must be evaluated on a case-by-case basis. NMFS has described the kinds of activities (e.g., blocking fish from reaching spawning and rearing areas, illegal fishing etc.), that are likely to injure or kill threatened salmon and steelhead in a "Take Guidance" section in the Federal Register Notice. ***This guidance is not regulatory.*** Rather it provides guidance on what actions are very likely to take threatened species and identifies where NMFS will focus its enforcement actions. This is not a list of prohibited activities.

Based on available information, NMFS believes the categories of activities listed below are those activities that, as a general rule, are most likely to harm listed fish. NMFS wishes to

emphasize at the outset that the potential for these activities to harm listed salmon and steelhead depends entirely upon the facts and circumstances of each case. The mere fact that an activity may fall within one of these categories does not automatically mean that it causes harm. These types of activities are, however, those most likely to cause harm and thereby violate this rule. NMFS' ESA enforcement will focus on these categories of activities.

A. Constructing or maintaining structures like culverts, berms, or dams that eliminate or impede a listed species' ability to migrate or gain access to habitat.

B. Discharging pollutants, such as oil, toxic chemicals, radioactivity, carcinogens, mutagens, teratogens, or organic nutrient-laden water (including sewage water) into a listed species' habitat.

C. Removing, poisoning, or contaminating plants, fish, wildlife, or other biota that the listed species requires for feeding, sheltering, or other essential behavioral patterns.

D. Removing or altering rocks, soil, gravel, vegetation or other physical structures that are essential to the integrity and function of a listed species' habitat.

E. Removing water or otherwise altering streamflow in a manner that significantly impairs spawning, migration, feeding, or other essential behavioral patterns.

F. Releasing non-indigenous or artificially propagated species into a listed species' habitat or into areas where they may gain access to that habitat.

G. Constructing or operating dams or water diversion structures with inadequate fish screens or passage facilities.

H. Constructing, maintaining, or using inadequate bridges, roads, or trails on stream banks or unstable hill slopes adjacent to or above a listed species' habitat.

I. Conducting timber harvest, grazing, mining, earth-moving, or other operations that substantially increase the amount of sediment going into streams.

J. Conducting land-use activities that may disturb soil and increase sediment delivery to streams—such as logging, grazing, farming, and road construction—in riparian areas and areas susceptible to mass wasting and surface erosion.

K. Illegal fishing. Harvest that violates fishing regulations will be a top enforcement concern.

L. Various streambed disturbances may trample eggs or trap adult fish preparing to spawn. The disturbance could be mechanical disruption caused by constructing push-up dams, removing gravel, mining, or other work in a stream channel. It may also take the form of egg trampling or smothering by livestock in the streambed or by vehicles or equipment being driven across or down the streambed (as well as any similar physical disruptions).

M. Illegal interstate and foreign commerce dealing in, imports, or exports listed salmon or steelhead.

N. Altering lands or waters in a manner that promotes unusual concentrations of predators.

O. Shoreline and riparian disturbances (whether in the river, estuary, marine, or floodplain environment) may retard or prevent the development of certain habitat characteristics upon which the fish depend (e.g., removing riparian trees reduces vital shade and cover, floodplain gravel mining, development, and armoring shorelines reduces the input of critical spawning substrates, and bulkhead construction can eliminate shallow water rearing areas).

P. Filling or isolating side channels, ponds, and intermittent waters (e.g., installing tide gates and impassable culverts) can destroy habitats that the fish depend upon for refuge during high flows.

This list is not exhaustive. It is simply intended to help people avoid violating the ESA and to encourage efforts to save the species. Determining whether take has actually occurred depends on the circumstances of a particular case. Many activities that may kill or injure salmon are regulated by state or Federal rules such as fill and removal authorities, National Pollutant Discharge Elimination System or other water quality permitting, pesticide use, and the like. For those types of activities, NMFS would not tend to focus enforcement efforts on those who operate in conformity with current permits. Rather, if the regulatory program does not provide adequate protection, NMFS will work with the responsible agency to make necessary changes in the program.

For example, concentrations of pesticides may affect salmon behavior and reproduction. Current EPA label requirements were developed without information about some of these subtle but real impacts on aquatic species such as salmon. And they were not developed with the intent of protecting or recovering threatened salmon. Where new information indicates that label requirements do not adequately protect salmon, NMFS will work with EPA through the section 7 consultation process to develop more protective use restrictions, and thereby provide the best possible guidance to all users. Similarly, where water quality standards or state authorizations lead to pollution levels that may cause take, NMFS intends to work with the state water quality agencies and EPA to bring those standards (or permitting programs) to a point that does protect salmon.

Those who believe their activities are likely to injure or kill salmon are encouraged to immediately change that activity to avoid take (or adequately limit any impacts on the species) and seek NMFS' authorization for incidental take under either (a) an ESA section 10 incidental take permit; (b) an ESA section 7 consultation; or (c) a limit on the take prohibitions provided in this rule. The public is encouraged to contact NMFS (see contact list) for help in determining whether circumstances at a particular location (involving these activities or any others) constitute a take in violation of the 4(d) rule.

Take of listed fish resulting from actions in compliance with a permit issued by NMFS under section 10 of the ESA do not violate this rule. Section 10 permits may be issued for research activities, activities that enhance a species' survival, or to authorize incidental take occurring in the course of an otherwise lawful activity. In addition, NMFS consults—under section 7 of the ESA—on a broad range of activities conducted, funded, or authorized by Federal agencies. These include fish harvest, hatchery operations, silviculture activities, grazing, mining, road construction, dam construction and operation, fill material discharge, and stream channelization and diversion. Federally funded or approved activities for which ESA section 7 consultations have been completed will not constitute violations of this rule—provided the activities are conducted in accord with all reasonable and prudent measures and the terms and conditions stated in the incidental take statement.

Evaluating Potential ESA Take Liability

The June, 2000 4(d) rule's prohibitions on take applies to the activities of everyone—every state, city, and county government, every business, and every citizen. The Take Guidance provides information about what types of activities may be most likely to cause harm and thus violate the 4(d) rule. However, each activity and circumstance must be evaluated on a case by case basis to determine if it is likely to cause a take. After reviewing the take guidance, many governmental entities, businesses, and individuals may question how the 4(d) rule and its take guidance affects them. Any governmental entity, business or individual can use the following risk assessment evaluation steps:

(1) Identify the program or activity (for state and local governments, this may include activities it funds, authorizes, or carries out);
(2) Evaluate whether the program or activity is likely to take or harm listed fish;
(3) If the program or activity is not likely to take or harm listed fish, then there is no need to modify the activity, or to contact NMFS;
(4) If, however, after reviewing the program or activity, it seems likely it will take or harm listed fish, or there is uncertainty about whether take or harm may occur, the acting agency, entity, or individual should contact NMFS to seek more information on evaluating the activity's impacts and determining ways to avoid harming the fish and violating the ESA.

There are many sources of information on improved best management practices to avoid take or harm and to reduce ESA liabilities. In addition, professional associations, state and Federal resource management agencies that provide technical information to landowners and others, watershed councils and non-governmental organization can be important sources of information about how to modify activities to avoid or reduce impacts on threatened salmon and steelhead.

Effective Dates

State, tribal, and local governments, stakeholder groups, and citizens across four states need to familiarize themselves with the guidance provided in the rule, assess the consequences of their individual authorities and activities, and make any necessary adjustments to protect the fish. After sufficient time to review the new rule, NMFS will hold a number of public forums in rural and metropolitan communities to engage interested parties in constructive discussion about salmon recovery. For these reasons, the 4(d) rule for chinook, coho, chum, and sockeye salmon will take effect 180 days after it is published in the *Federal Register*. Those in the range of threatened steelhead have had more notice that efforts to save the fish are needed, so the 4(d) rule for steelhead will take effect 60 days after publication.

A 1997 interim 4(d) rule (published in 1997) remains in place for the Southern Oregon/Northern California Coast (SONCC) coho ESU. The SONCC 4(d) rule included several limitations based on adequately protective state programs in Oregon and provided a model for developing the three 4(d) rules proposed in January of 2000. The final 4(d) rule for 14 additional threatened ESUs does not affect this earlier rule.

Useful Concepts for Understanding the Limits

The final rule incorporates two scientific concepts NMFS will use when determining whether particular programs may receive limits on the take protections. The first applies primarily to harvest and hatchery activities, and is described in a scientific paper entitled *"Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units"* (NMFS 2000). The Viable Salmonid Population (VSP) paper describes the importance of identifying individual populations within an ESU, and the importance of identifying abundance levels and other characteristics that may be considered "critical" (where abundance is so low the population requires special protections) or "viable" (where abundance is high enough the population may be considered healthy). Generally, programs and activities will receive a 4(d) limit only if they do not increase the risks to critical populations, and if they do not preclude populations from attaining or maintaining viability.

The second concept applies to programs and activities that affect salmon habitat. For habitat, NMFS uses the concept of Proper Functioning Condition (PFC). Properly functioning habitat is habitat that provides for the biological requirements of the fish. PFC is defined in terms of the natural processes and functions that lead to habitat conditions that will

meet the biological requirements of the fish. NMFS offers 4(d) limits only for those programs or activities that will not impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or will not retard the long-term progress of impaired habitat toward PFC.

The concepts of VSP and PFC are described in more detail at the end of this guide.

The 13 Limits

When the final 4(d) rule becomes effective, the take prohibitions will apply to actions carried out by state, tribal, and local governments and private parties that take listed salmon and steelhead, except take that is associated with those activities that come under one of the 4(d) limits and those already permitted under other sections of the ESA. The take prohibitions would be limited for the programs and activities identified in the 4(d) rule because NMFS has determined that they impacts on threatened fish sufficiently that additional Federal protections are not needed.

The final rule describes two types of limits on the take prohibitions. One type includes specific programs NMFS has already reviewed and determined will minimize harm to threatened fish or contribute to their conservation. The other type includes general categories of programs that NMFS may evaluate in the future. For this second type of limit, the 4(d) rule sets out the standards NMFS will use when it reviews activities and programs for inclusion in the rule, how the public will be given notice in the *Federal Register* of the opportunity to review the program being submitted and, if the limit is determined to sufficiently conserve the listed species, how it will be approved by the Northwest or Southwest Regional Administrator, whichever is appropriate. NMFS has also established a process for periodically evaluating the limits, making recommendations for adjusting the programs, and alerting the public in cases when the limit would be withdrawn and take prohibitions re-applied.

Some of the broad categories of activities covered by limits in the final rule are:

- Scientific research conducted or supervised by, or coordinated with, state fishery agencies
- Fish harvest activities
- Artificial propagation programs
- Habitat restoration based on watershed plans
- Properly screened water diversions
- Routine road maintenance
- Municipal, residential, commercial, and industrial development and redevelopment
- Forest management practices in the State of Washington

NMFS is not requiring states, local governments or private parties to change their practices to conform to any of the take limits described in the final rule. The limits provide one way to be sure an activity or program does not risk violating the take prohibitions. Simply because a program is not within a limit *does not* mean that it automatically violates the ESA or the 4(d) rule. However, it *does* mean that any program or jurisdiction would risk ESA penalties if the activity in question takes a listed fish. By receiving a limit, governments and individuals receive assurance that their activities do not violate the take prohibitions and will not be subject to enforcement.

Description of the Limits

Limit No. 1 – ESA Permits

This limit recognizes that those holding permits under section 10 of the ESA (or receiving other exemptions under the ESA) are free of the take prohibitions so long as they act in accordance with the permit or applicable law. Land management activities associated with a habitat conservation plan and scientific research are examples of activities for which a section 10 permit may be issued.

Limit No. 2 – Ongoing Scientific Research

This final rule does not restrict ongoing scientific research that affects threatened ESUs for up to eight months (i.e., through February 2001) provided an application for a research or enhancement permit reaches the Assistant Administrator for Fisheries, NOAA, within 90 days after the rule is published. The take prohibitions will extend to these activities if the Assistant Administrator rejects an application as insufficient, if a permit is denied, or if six months have elapsed since the effective date of the final rule, whichever occurs earliest. It is in the interest of conservation to not disrupt ongoing research and conservation projects, some of which are of long duration. This limit on the take prohibitions ensures there will be no unnecessary disruption of those activities yet provides NMFS with the ability to halt the activity if it will have unacceptable impacts on a listed ESU.

Limit No. 3 – Rescue and Salvage Actions

This limit relieves certain agency and official personnel (or their designees) from the take prohibitions when they are acting to aid an injured or stranded fish or salvage a dead fish for scientific study. Each agency acting under this limit is to report the numbers of fish handled and their status on an annual basis. This limit on the take prohibitions will conserve the listed species by preserving life or furthering our understanding of the species' biology.

Limit No. 4 – Fishery Management

NMFS believes recreational, commercial, and tribal fisheries can be managed to protect salmon and steelhead listed under the ESA and allow them to recover. The 4(d) rule provides a way to permit the "take" of listed fish in fisheries. A fishery management agency can develop a Fisheries Management and Evaluation Plan (FMEP) and seek NMFS' approval for it. Some of the benefits of the FMEP approach are long-term management planning, more public involvement, less government paperwork, and more certainty that there will be fishing opportunities in the future.

NMFS will use the same standard to evaluate FMEPs as those used for section 10 permits: the fisheries must not jeopardize listed salmon and steelhead, nor lessen the protection they receive. In the FMEPs, fisheries will be managed according to the listed fishes' status. This will be determined by using the concept of "Viable Salmonid Populations." Fisheries will be scaled to the degree of risk the listed fish face. When a listed population is at a "critically" low level, harvest impacts will be strictly controlled. Once a population achieves a "viable" level, fisheries could be less restrictive.

An FMEP must address the specific criteria outlined in the 4(d) rule. An FMEP must (1) define its objectives and management area, (2) define the populations within the affected ESUs, (3) establish the populations' "critical" and "viable" threshold levels, (4) set escapement objectives or maximum harvest rates, (5) demonstrate that the fisheries will not jeopardize listed fish, (6) establish the monitoring and evaluation process to assess how the FMEP is working and set conditions for revising management, and (7) be consistent with tribal trust obligations. All of these criteria were developed to answer the following questions: Where and how should the fisheries occur? What are their impacts on listed fish? How can it be demonstrated that an FMEP conserves listed fish and allows their recovery?

FMEPs are developed and approved in the following manner: A fish management agency, such as a state department of fish and wildlife, develops an FMEP that meets the 4(d) rule criteria. They send it to NMFS who then requests public review and comment. The public input is used to revise the FMEP, if necessary. Once the FMEP is deemed sufficient, NMFS writes a letter of approval to the agency that developed the FMEP. The FMEP is then implemented and the fisheries addressed in the FMEP will be covered under the ESA. NMFS then monitors and evaluates the FMEP to ensure that the listed fish are recovering.

Limit No. 5 – Artificial Propagation

NMFS believes hatcheries can be managed in a manner that conserves and recovers salmon and steelhead listed under the ESA. Therefore, the 4(d) rule provides a way to permit the "take" of listed fish for a variety of hatchery purposes. A state or Federal hatchery management agency can develop a Hatchery and Genetics Management Plan (HGMP) and seek NMFS' approval. Some of the benefits of the HGMP approach are long-term management planning, more public involvement, and less government paperwork.

NMFS will use the same standard to evaluate HGMPs as those used for section 10 permits: the hatchery program must not jeopardize listed salmon and steelhead, nor lessen the protection they receive. In the HGMPs, hatcheries will be managed according to the listed fishes' status. This will be determined using the concept of "Viable Salmonid Populations." Hatchery activities will be scaled to the degree of risk the listed fish face. When a listed population is at a "critical" level, broodstock collection will be strictly controlled. Once a population achieves a "viable" level, broodstock collection could be less restrictive.

An HGMP must address the specific criteria outlined in the 4(d) rule. An HGMP must (1) specify the goals and objectives for the hatchery program, (2) the donor population's "critical" and "viable" threshold levels, (3) prioritize broodstock collection programs in a manner that benefits listed fish, (4) specify the protocols that will be used for spawning and raising the fish in the hatchery, (5) determine the genetic and ecological effects arising from the hatchery program, (6) describe how the hatchery operation relates to fisheries management, (7) ensure that the hatchery facilities can adequately accommodate listed fish if they are collected for the program, (8) monitor and evaluate the HGMP to ensure that it accomplishes its objectives, and (9) be consistent with tribal trust obligations.

HGMPs are developed and approved in the following manner: A fish management agency, such as a state department of fish and wildlife, develops an HGMP that meets the 4(d) rule criteria. They send it to NMFS who then requests public review and comment. The public input is used to revise the HGMP, if necessary. Once the HGMP is deemed sufficient, NMFS writes a letter of approval to the agency that developed the HGMP. The HGMP is then implemented and the hatchery program addressed in the FMEP will be covered under the ESA. NMFS then monitors and evaluates the HGMP to ensure that the listed fish are recovering.

Limit No. 6 – Joint Tribal/State Plans Developed under the *United States v. Washington* or *United States v. Oregon* Settlement Processes

Non-tribal salmonid management in the Puget Sound and Columbia River areas is profoundly influenced by the fishing rights of numerous Indian tribes and must be responsive to the court proceedings that interpret and define those tribal rights. Various orders of the *United States v. Washington* court, such as the Puget Sound Salmon Management Plan (originally approved by the court in 1977; recently amended in *United States v. Washington*, 626 F. Supp. 1405, 1527 (1985, W.D. Wash.)), mandate that many aspects of fishery management, including but not limited to harvest and artificial production actions, be jointly coordinated by the State of Washington and the Western Washington Treaty tribes. The State of Washington, affected tribes, other interests, and Federal agencies are all working toward an integrated set of management strategies and strictures that respond to the biological, legal, and practical realities of salmon management in Puget Sound. Similar principles apply in the Columbia River basin where the States of Oregon, Washington, and Idaho and five treaty tribes work within the framework and jurisdiction of *United States v. Oregon*.

NMFS includes this limit on the take prohibitions to accommodate any resource management plan developed jointly by the States and the Tribes (joint plan) under the jurisdiction of *United States v. Washington* or *United States v. Oregon*. Such a plan would be developed and reviewed under the government-

to-government processes outlined in the final 4(d) rule for Tribal Resource Management Plans. Before any joint plan receives a limit on the take prohibitions, the Secretary must, after taking into account any public comment on the plan, determine that it will not appreciably reduce the likelihood of the listed species' survival and recovery. The Secretary shall publish in the Federal Register notice of any determination regarding a joint plan; the notice will include a discussion of the biological analysis underlying the determination.

NMFS will evaluate joint plans on a regular basis to determine if they sufficiently protect and conserve the listed fish.

Limit No. 7 – Scientific Research

In carrying out their responsibilities, state fishery management agencies in Washington, Oregon, Idaho, and California conduct or permit a wide range of scientific research activities on various fisheries. These include monitoring programs and other studies of the 14 ESUs affected by the final rule. In general, NMFS finds that such activities will help conserve the listed species by furthering our understanding of the species' status, risks, life history, and biological requirements, and that state biologists and cooperating agencies carefully consider the benefits and risks entailed in proposed research before approving or undertaking such projects. NMFS concludes it is not necessary and advisable to impose additional protections on such research by imposing of Federal take prohibitions, and NMFS will not apply take prohibitions to scientific research activities that have received written approval from NMFS' Northwest or Southwest Regional Administrator.

Limit No. 8 – Habitat Restoration Limits on the Take Prohibitions

Habitat restoration activities are likely to help conserve listed fish without incurring significant risks, and NMFS concludes it is not necessary and advisable to impose take prohibitions on those activities provided the activity is part of a watershed conservation plan. NMFS considers a "habitat restoration activity" to be an activity whose primary purpose is to restore natural aquatic or riparian habitat processes or conditions; it is an activity that would not be undertaken but for its restoration purpose. Projects planned and carried out based on at least a watershed-scale analysis and conservation plan and, where practicable, a sub-basin or basin-scale analysis and plan, are likely to be the most beneficial. NMFS strongly encourages those involved in watershed restoration to conduct assessments that identify the factors impairing watershed function, and to plan watershed restoration and conservation activities based on those assessments. Without the overview a . watershed-level approach provides, habitat efforts are likely to focus on "fixes" that may prove short-lived (or even detrimental) because the underlying processes causing a particular problem may not be addressed.

The final rule provides that take prohibitions will not apply to habitat restoration activities found to be part of, and conducted pursuant to, a watershed conservation plan that the state of Washington, Oregon, Idaho, or California has certified to be consistent with the state's watershed conservation plan guidelines. The state in which the activity occurs must certify in writing whether a watershed plan has been formulated in accordance with NMFS-approved state watershed conservation plan guidelines. NMFS will periodically review state Watershed Conservation Plan certifications to ensure that the Plans adhere to approved watershed conservation plan guidelines.

For this limit to apply, NMFS must find that the state's watershed conservation plan guidelines generate plans that: (1) Take into account the proposed activities' potential direct, indirect, and cumulative impacts in terms of their effect on listed species and populations; (2) will not reduce the likelihood of either survival or recovery of listed species in the wild; (3) ensure that any taking will be incidental; (4) minimize and mitigate any adverse impacts; (5) put in place effective monitoring and adaptive management programs; (6) use the best available science and technology, including watershed analysis; (7) provide for public and scientific

review and input; (8) include any measures that NMFS determines are necessary or appropriate; (9) include provisions that clearly identify those activities that are part of plan implementation; and (10) control risk to listed species by ensuring that the plan components are funded and implemented.

Before approving watershed conservation plan guidelines, NMFS will publish notification in the Federal Register announcing the availability of the proposed guidelines for public review and comment. Such an announcement will provide for a comment period of no less than 30 days.

The proposed 4(d) rules identified interim provisions for habitat restoration activity categories to which the take prohibitions would not be applied for two years while watershed conservation plans were being developed. Based on the misunderstandings generated by that proposal, the interim provisions were dropped from the final rule.

NMFS strongly encourages jurisdictions, entities, and citizens to use the habitat restoration guidelines and technical manuals listed below as readily available techniques to reduce the risks of harming or injuring the listed stocks.

Applicable state guidance includes:

> *Oregon Road/Stream Crossing Restoration Guide*, Spring 1999, selected portions of *the Oregon Aquatic Habitat Restoration and Enhancement Guide* (1999);
> Oregon Department of Forestry and Department of Fish and Wildlife's *A Guide to Placing Large Wood in Streams*, May 1995;
> Washington Department of Fish and Wildlife, (WDFW) Habitat and Lands Environmental Engineering Division's *Fish Passage Design at Road Culverts*, March 3, 1999;
> Washington Administrative Code rules for Hydraulic Project Approval; and Washington's *Integrated Streambank Protection Guidelines*, June, 1998;
> *Stream Corridor Restoration, Principles, Processes and Practices* by the Federal Interagency Stream Restoration Working Group, October, 1998; and,
> *California Salmonid Stream Habitat Restoration Manual*, January, 1998.

These documents are available through the NMFS web page or directly from the relevant agencies.

Limit No. 9 – Water Diversion Screening

Operating water diversions without adequate screening is a widely recognized cause of mortality among salmon and steelhead. Juveniles may be sucked or attracted into diversion ditches where they later die from a variety of causes, including stranding. Adult and juvenile migration may be blocked by diversion structures such as push-up dams. Juveniles are often injured and killed when caught in pumping facilities or forced against screens.

State laws and Federal programs have long recognized these problems in varying ways, and encouraged or required adequate screening of diversion ditches and structures. Nonetheless, large numbers of diversions are not adequately screened and remain a threat, particularly to juvenile fish. Eliminating that source of injury or death is vital to conserving listed stocks.

The final rule encourages all diverters to move quickly to provide adequate screening or other protections for their diversions. The rule does not apply take prohibitions provided that NMFS' engineering staff—or any resource agency or tribal representative NMFS designates as an authorized officer—has agreed in writing that the diversion facility is screened, maintained, and operated in compliance with NMFS' Juvenile Fish Screening Criteria (NMFS 1996) or, in California, in compliance with NMFS Southwest Region's Fish Screening Criteria for Anadromous Salmonids (NMFS 1997) or any subsequent revision. If a diversion is screened, operated, and maintained in a manner consistent with those criteria, adequate safeguards will be in place and no additional Federal protection is necessary or advisable for conserving listed fish.

The final rule also provides that NMFS or its authorized officer may review and approve for a take limit a proposed juvenile fish screen design and construction plan. The plan must describe interim operation measures that will avoid taking threatened fish.

Limit No. 10 – Routine Road Maintenance

NMFS does not find it necessary or advisable to apply take prohibitions to routine road maintenance activities provided that: (1) The activity constitutes routine road maintenance conducted by Oregon Department of Transportation (ODOT) employees or agents that complies with ODOT's *Transportation Maintenance Management System Water Quality and Habitat Guide* (July, 1999); or (2) it is conducted by employees or agents of a state, county, city, or port under a program that complies substantially with that contained in the ODOT Guide and has been determined to meet or exceed the protections provided by the ODOT Guide; or (3) by employees or agents of a state, county, city, or port that complies with a routine road maintenance program that maintains or attains proper functioning condition (PFC).

The ODOT's maintenance and environmental staff have worked with NMFS in developing a routine road maintenance program that works well within the mandates of the ESA and the Clean Water Act, while carrying out the agency's fundamental mission to provide a safe and effective transportation system. That work has resulted in a program that greatly improves protections for listed fish that might be affected by a range of routine maintenance activities by minimizing the activities' impacts on streams.

For a state, city, county or port program that is equivalent to the ODOT program (or any of its amendments) to receive a limit it must get written approval from the NMFS Northwest or Southwest Regional Administrator, whichever is appropriate. Any jurisdiction desiring its routine road maintenance activities to be within this limit must first commit in writing to apply management practices that provide protection equivalent to or better than those provided by the ODOT Guide.

Limit No. 11 – Portland Parks Integrated Pest Management

The City of Portland, Oregon, Parks and Recreation Department (PP&R) operates a diverse system of city parks representing a full spectrum of urban habitat from intensively managed recreation, sport, golf, and garden sites to largely natural, unmanaged parks, including the several thousand acre, wooded, Forest Park. The PP&R has been operating and refining an integrated pest management program for 10 years, with a goal of reducing its use of pesticides. The program's "decision tree" places first priority on preventing pests (weeds, insects, disease) through policy, planning, and avoidance measures (design and plant selection). Cultural and mechanical practices, trapping, and biological controls form the second priority. The use of biological products and, finally, chemical products, is to be considered last. The overall program affects only a small proportion of the land base and waterways in Portland, and serves to minimize any impacts on listed fish from chemical applications associated with that specific, limited land base. NMFS believes it would help conserve listed fish if jurisdictions would broadly adopt a similar approach to eliminating and limiting chemical use in their parks and in other areas.

After carefully analyzing PP&R's integrated program for pest management, NMFS concludes that it addresses potential impacts and provides adequate protection for listed fish with respect to the limited use the program may make of the listed chemicals. NMFS does not find it necessary or advisable to apply additional Federal protections in the form of take prohibitions to PP&R activities conducted under the Pest Management Program. Take prohibitions would not meaningfully increase the level of protection the listed fish receive.

Confining the limit on take prohibitions to a specified list of chemicals does not mean NMFS has determined that other chemicals PP&R employs will necessarily harm salmon and steelhead. NMFS intends to continue working with PP&R on the use of any other herbicide or pesticide.

The PP&R program includes a variety of monitoring commitments and a yearly

assessment schedule. If, at any time, monitoring information, new scientific studies, or new techniques cause PP&R to amend its program or if PP&R and NMFS wish to change the list of chemicals receiving limits on take prohibitions, PP&R must provide NMFS with a copy of the proposed change(s) for review. NMFS will publish notification in the *Federal Register* requesting public comment on the proposed changes. The comment period will be no less than 30 days; at its conclusion, NMFS will make a final determination on whether the changes will conserve listed salmon and steelhead.

Limit No. 12 – Municipal, Residential, Commercial and Industrial Development and Redevelopment (MRCI)

As a general matter, MRCI development (and redevelopment) have a significant potential to degrade habitat and injure or kill salmon and steelhead in a variety of ways. With appropriate safeguards, MRCI development can be specifically tailored to minimize impacts on listed fish to the extent that additional Federal protections would not be needed to conserve the listed ESU. Through the final rule, NMFS identifies a mechanism whereby cities, counties, and regional governments can ensure that MRCI development and redevelopment authorized within those areas are consistent with ESA requirements. Developers and their authorizing jurisdictions alike would benefit from the assurance that their actions conserve listed salmon and steelhead.

One example of an authorizing entity working toward the sort of plan envisioned in this limit is found in the fact that urban development in the Portland, Oregon metropolitan area may not occur outside of an adopted urban growth boundary (UGB). Metro, the regional governing body, is in the process of bringing some large areas currently designated as urban reserve areas into the UGB. Before development may commence in these newly included areas, the jurisdiction within which the area lies must prepare and adopt comprehensive plan amendments for urban reserve areas consistent with all provisions of the Metro Urban Growth Management Functional Plan. The amendments must show what development will be allowed and the conditions to be placed upon development.

NMFS will not apply take prohibitions to (1) MRCI development or redevelopment governed by and conducted in accordance with city, county, or regional government ordinances or plans that NMFS has found to adequately protect listed species; or (2) once NMFS has determined that Metro's Functional Plan is adequately protective, activities conducted under Metro's jurisdiction that are pursuant to ordinances that Metro has found comply with its Urban Growth Management Functional Plan. NMFS must agree in writing that the MRCI development ordinances and plans, including the Functional Plan, ensure that the plans and the development activities complying with them will conserve listed salmon and steelhead. NMFS will individually apply the following 12 evaluation considerations when determining whether MRCI development ordinances or plans adequately conserve listed fish:

(1) An MRCI development ordinance or plan ensures that development will avoid inappropriate areas such as unstable slopes, wetlands, areas of high habitat value, and similarly constrained sites. Activities such as development, timber harvest, or other soil disturbance should be sited in appropriate areas—avoiding unstable slopes, wetlands, areas already in a proper functioning condition, areas that are more functional than neighboring sites, and areas with the potential to be fully restored. A description of particularly sensitive areas is included in the Fish and Forest Report cited elsewhere in this guidance. Those sites include but are not limited to soils perennially saturated from a headwall or a sideslope seep or spring, the permanent initiation point of perennial flow of a stream, an alluvial fan, and the intersection of two perennial streams.

(2) An MRCI development ordinance or plan adequately prevents stormwater discharge impacts on water quality and quantity and stream flow patterns in the watershed—including peak and base flows in perennial streams. Stormwater management programs

must require development activities to avoid impairing water quality and quantity. These activities must preserve or enhance stream flow patterns so they are as close as possible to the historic peak flows, base flows, durations, volumes, and velocities. This can be accomplished by reducing impervious surfaces and maintaining forest cover and natural soils. These conditions will, in turn, maintain essential habitat processes such as natural water infiltration rates, transpiration rates, stormwater run-off rates, sediment filtering, and provide hydrographic conditions that maintain and sustain aquatic life.

(3) An MRCI development ordinance or plan protects riparian areas well enough to attain or maintain PFC around all rivers, estuaries, streams, lakes, deepwater habitats, and intermittent streams. Compensatory mitigation is provided, where necessary, to offset unavoidable damage to PFC in riparian management areas. Activities should be quite limited in areas adjacent to all perennial and intermittent streams and waters supporting listed salmon and steelhead in order to avoid soil disturbance and maintain vegetated riparian corridors. The existence of native vegetation along stream corridors is a condition that can support essential habitat processes such as temperature control, bank stability, stream complexity over time, the filtering of pollutants, or contributions of large logs and other woody debris to a stream.

Limiting activities in riparian areas helps protect or restore the condition and quality of soil and ensure that a diversity of plants and trees of all ages is well-distributed across a riparian area. Such conditions on the landscape contribute to the natural succession of riparian forest trees and protect the water quality and flow conditions necessary to meet salmonid habitat needs downstream. In urban areas, the riparian areas often face the added challenge of intercepting large amounts of nutrients, pesticides and sediment so that they do not directly enter a stream.

NMFS' determinations are significantly influenced by science indicating that essential habitat functions are affected to varying (but significant) degrees by streamside activities conducted within a distance equal to the height of the tallest tree that can grow on that site (known as the site potential tree height). The distance is measured not from the stream itself, but from the edge of the area within which a stream naturally migrates back and forth over time (the channel migration zone).

When the scope of an activity includes modifying a riparian site that has existing, non-native vegetation, it may be important to restore native vegetation on the site in order to recover the essential habitat functions discussed above.

(4) An MRCI development ordinance or plan avoids stream crossings—whether by roads, utilities, or other linear development—wherever possible and, where crossings must be provided, minimize impacts. One method of minimizing stream crossings and their associated disturbances is to optimize transit opportunities to and within newly developing urban areas. A plan should consider whether potential stream crossings can be avoided by redesigning the access. Where a crossing is unavoidable, the plan or ordinance should minimize its affect by preferring bridges over culverts; sizing bridges to a minimum width; designing bridges and culverts to pass at least the 100-year flood (and associated debris), and meet Oregon Department of Fish and Wildlife or Washington Department of Fish and Wildlife criteria (*ODFW's Oregon Road/Stream Crossing Restoration Guide, Spring, 1999 and WDFW's Fish Passage Design at Road Culverts, March 3, 1999*). In addition, all crossings must be regularly monitored and maintained and intermittent and perennial streams should not be closed over.

(5) An MRCI development ordinance or plan adequately protects historic stream meander patterns and channel migration zones and avoids hardening stream banks and shorelines. Any MRCI development should be designed to allow streams to meander in historic patterns of channel migration. Activities on the landscape must protect conditions that allow gradual bank erosion, flooding, and channel meandering in the zone within which it would naturally occur. This natural channel migration promotes gravel recruitment, geomorphic diversity, and habitat development. If an adequate number of riparian

management areas are linked to the channel migration zone, there should be no need for bank erosion control in all but the most unusual situations. In most circumstances, activities that call for hardening stream banks are not consistent with PFC.

If unusual circumstances require bank erosion to be controlled, it should be accomplished through vegetation or carefully bioengineered solutions. Rip-rap blankets or similar hardening techniques would not be allowed, unless particular site constraints made bioengineered solutions impossible. NMFS finds that the Washington Department of Fish and Wildlife's publication, "*Integrated Streambank Protection Guidelines*" (June, 1998) can provide sound guidance, particularly regarding mitigation for gravel recruitment.

The Fish and Forest Report, cited elsewhere in this guidance, includes a detailed description of the types of channel migration zones found in most geomorphic settings. Further, the Washington State Forest Practices Board has published its *Standard Method for Measuring Physical Parameters of Streams and Channel Migration Zones (March, 2000).* Though it is designed for the forested environment, NMFS finds the document a useful aid in determining channel migration zones in any setting.

(6) An MRCI development ordinance or plan adequately protects wetlands, wetland buffers, and wetland function—including isolated wetlands. Activities on the landscape must protect wetlands and the vegetation surrounding them to avoid disturbing soils, vegetation, and local hydrology. Such conditions on the landscape contribute to the natural succession of wetlands, and protect wetland functions necessary to meet salmonid habitat needs such as food chain support, shoreline protection, water purification, storm and flood storage, and groundwater recharge. These conditions are also necessary to protect the freshwater, marine, and estuarine wetland systems that provide specialized habitat for rearing and migrating salmon and steelhead.

(7) An MRCI development ordinance or plan adequately preserves permanent and intermittent streams' ability to pass peak flows. Activities that decrease a stream's hydrologic capacity by filling in its channel for road crossings or other development will increase water velocities, flood potential, and channel erosion, as well as degrade water quality, disturb soils, and groundwater flows, and harm vegetation adjacent to the stream. Preserving hydrologic capacity will provide conditions on the landscape necessary for maintaining essential habitat processes such as water quantity and quality, streambank and channel stability, groundwater flows, and succession of riparian vegetation. In combination with the riparian management areas or set-back provisions described above, this means that dredge and fill should be avoided unless they are conducted in conjunction with a necessary stream crossing whose impacts are mitigated to the greatest extent possible.

(8) An MRCI development ordinance or plan stresses landscaping with native vegetation to reduce the need to water and apply herbicides, pesticides, and fertilizer. Plans must describe the techniques local governments will use to encourage planting with native vegetation, reducing lawn area, and lowering water use. These provisions will maintain essential habitat processes by helping conserve water and reduce flow demands that compete with fish needs. They will also reduce applications of chemicals that contribute to water pollution in streams and other water bodies supporting salmon and steelhead.

(9) An MRCI development ordinance or plan contains provisions to prevent erosion and sediment run-off during (and after) construction and thus prevent sediment and pollutant discharge to streams, wetlands and other water bodies that support listed fish. These provisions, at a minimum, should include detaining flows, stabilizing soils, protecting slopes, stabilizing channels and outlets, protecting drain inlets, maintaining best management practices (BMPs), and controlling pollutants. These goals can be accomplished by applying seasonal work limits, phasing land clearing activities, maintaining undisturbed native top soil and vegetation, etc.

These stipulations will help maintain natural runoff rates and protect water quality.

(10) An MRCI development ordinance or plan ensures that demands on the water supply can be met without affecting—either directly or through groundwater withdrawals—the flows salmon need. A plan must ensure that any new water diversions are positioned and screened in a way that does not injure or kill fish.

(11) An MRCI development ordinance or plan provides mechanisms for monitoring, enforcing, funding, reporting, and implementing its program. Moreover, formal plan evaluations should take place at least once every five years. The plan should make a commitment to (and assign responsibility for) regular monitoring and maintenance activities for any detention basins, erosion and sediment control measures, and other management tools over the long term. Practices should be adopted as needed based on monitoring results. In addition, to ensure that development activities comply with the ordinance or plan and that PFC is attained or maintained, commitments must be made for regular funding, enforcement, reporting, implementation, and plan evaluations. These commitments are necessary to lead to conditions that will maintain the whole suite of essential habitat processes for salmon and steelhead.

(12) An MRCI development ordinance or plan complies with all other state and Federal environmental and natural resource laws and permits.

NMFS concludes that development governed by ordinances or plans that fulfill the listed considerations will address the potential negative impacts on salmon and steelhead associated with development and redevelopment. In such circumstances adequate safeguards will be in place that NMFS does not find it necessary or advisable to impose additional Federal protections through the take prohibitions.

Limit No. 13 – Forest Management in Washington

In the State of Washington, NMFS has worked with timber industry representatives, tribes, state and Federal agencies, and various interest groups for many months. The purpose of these discussions was to develop a set of forest practices that could be included in Washington Governor Locke's salmon recovery plan. The product of those discussions is the April 29, 1999, Forests and Fish Report (FFR) to Governor Locke. It provides important improvements in forest practice regulation which, if approved by the Washington Forest Practices Board in a form at least as protective as it is laid out in the FFR, will substantially protect and conserve listed fish in that state. The FFR also mandates that all existing forest roads be inventoried for their potential to affect salmon and steelhead and that all needed improvements be completed within 15 years. The impacts that inadequately sited, constructed, or maintained forest roads have on salmonid habitat are well-documented. This feature alone will help a great deal in conserving listed ESUs in Washington.

After carefully considering the above features—as well as others described in greater detail below—NMFS has determined it is not necessary to apply take prohibitions to non-Federal forest management activities conducted in the State of Washington. These activities may go forward provided that: (1) The action complies with forest practice regulations the Washington Forest Practices Board has adopted and implemented and that NMFS has found to protect habitat functions at least as well as the regulatory elements of the FFR; and (2) the activity also implements all non-regulatory elements of the FFR. It should also be noted that actions taken under alternative plans may be included under this limit provided the Washington Department of Natural Resources (WDNR) finds the alternate plans protect physical and biological processes at least as well as the state forest practices rules and that NMFS, or any resource agency or tribe NMFS designates, has the opportunity to review each alternate plan at every stage of its development and implementation. Given these conditions,

NMFS concludes that the FFR package conserves salmon and their habitat well enough that it is neither necessary nor advisable to impose take prohibitions.

NMFS believes that to conserve listed fish, it is important to rapidly adopt and implement improved forest practice regulations such as those found in the FFR. NMFS will provide an opportunity for the public to review and comment on all regulations developed to implement the FFR before making any determinations about how well they conserve listed fish.

Although NMFS will continue working with Washington (and other states) on broadening this limit, at this time NMFS lacks information to determine that pesticide provisions in the FFR package, sufficiently protect and conserve listed fish. Therefore, this limit does not extend to the use of herbicides, pesticides, or fungicides.

Elements of the FFR that protect and conserve listed salmon and steelhead are summarized below:

(1) It accurately classifies water bodies and makes stream typing information broadly available. It is tailored to protect and reinforce the functions and roles of different stream classes in the continuum of the aquatic ecosystem. These include fish-bearing streams—which may have either perennial or seasonal flow; perennial, non-fish-bearing streams—which include spatially intermittent streams; and seasonal, non-fish-bearing streams—which have a defined channel that contains flow at some time during the year.

(2) It lays out a plan for properly designing, maintaining, and upgrading existing and new forest roads. As stated previously, this is an important means of maintaining and improving water quality and instream habitats. The FFR provisions address: Road construction and reconstruction in riparian areas and on potentially unstable slopes; the potential for new and reconstructed roads to affect hydrologic connections between stream channels, ground water, and wetlands, and to add sediment to aquatic systems; the ability for road structures (e.g., culverts and bridges) to pass fish, 100-year flows, and instream debris; a plan to assess (within 5 years) the condition of all forest roads and to determine the need to repair, reconstruct, maintain, control access, abandon or obliterate them with work to be completed within 15 years; and BMPs for all other aspects of forest road operation.

(3) It protects unstable slopes from increased failure rates and volume.

(4) It allows properly functioning condition to be achieved in riparian areas along fish-bearing waters. Proper function refers to the suite of riparian and instream functions that affect both instream habitat conditions and the vigor and succession of riparian forest ecosystems. The functions include stream bank stability, shade, litterfall and nutrient input, large woody debris recruitment, and microclimate factors such as air and soil temperature, windspeed, and relative humidity. The FFR ensures properly functioning condition by establishing variable-width management zones within which silvicultural treatments are allowed. These treatments are prescribed through forestry guidelines that NMFS has determined will set a riparian forest stand on a growth and succession pathway toward a desired future condition (DFC) of a mature riparian forest. Once the stand is on the proper trajectory toward DFC, it must remain there without further harvest or silvicultural treatment. Riparian management includes the following provisions:

Continuous riparian management zones along all fish-bearing streams.

A core zone at least 50 ft (15 m) wide west of the Cascades and 30 ft (9 m) on the east side, within which no harvest or salvage occurs. This width is measured horizontally from edge of the bankfull channel, or where channel migration occurs, from the outer edge of the channel migration zone.

An inner zone that varies in width depending on the timber harvest strategy.

An outer zone extending to a site tree height (100 year base) that provides a

minimum of 20 conifer trees per acre that are greater than 12 inches (0.30m) in diameter at breast height.

Overstory canopy disturbance along a stream is limited to 20% for roads and yarding corridors and ground disturbance is limited to 10%.

A mature riparian forest is the DFC. Generally, mature riparian forest conditions are achieved after 80 to 200 years. Once this DFC trajectory has been achieved the riparian stand will be allowed to grow without further harvest or treatment.

A method for applying riparian prescriptions in the field so that DFC will be achieved.

Riparian conservation zone widths that provide bank stability, litterfall and nutrients, shade, large woody debris, sediment filtering, and microclimate functions in the near and long-term.

Mitigation for the effects permanent road systems near stream channels have on riparian function, water quality, and fluvial (floodplain) processes.

Treatment guidelines—by tree species, stand age and condition, and region—that address stocking levels, tree selection, spacing, and other common forest metrics needed to achieve DFC.

Guidelines for converting certain hardwood-dominated riparian areas to forest stands that can achieve the pathway toward DFC.

A strategy for conserving fluvial processes and fish habitats in the channel migration zone.

Guidelines for salvaging dead or downed timber in the inner and outer riparian zones.

Provisions for managing riparian areas along perennial and seasonal non-fish-bearing streams to achieve a large measure of riparian function.

(5) It sets up a process for evaluating the effects of multiple forest practices on the watershed scale.

(6) It ensures that any alternative plan would provide a functionally equivalent level of conservation.

(7) It includes a monitoring and adaptive management process that managers will use to determine how well the practices are being implemented, how well they comply with regulation, and how effective the regulations themselves are to assess implementation compliance with, and effectiveness of, current regulations, measured against a baseline data set. Over time, some forest practices will likely need to be replaced or adjusted as new information comes in. Whenever new information leads the state forest practice agency to amend a program under this limit, NMFS will publish a notification in the *Federal Register* announcing the availability of those changes for review and comment. Such a notice will provide for a comment period of not less than 30 days, after which NMFS will make a final determination on how well the changes conserve listed fish and thus whether they may be included under this limit on the take prohibitions.

Regular Evaluation of Limits on Take Prohibitions

In determining that it is neither necessary nor advisable to impose take prohibitions on certain programs or activities described in the final rule, NMFS is mindful that new information may require that conclusion to be reevaluated at some future point. NMFS will evaluate all of the limits on the take prohibitions described in the final rule on a regular basis to determine the program's effectiveness in protecting and conserving the listed fish. If the program is not sufficiently protective, NMFS will identify ways in which it needs to be altered or strengthened. Changes may be identified if the program does not protect desired habitat functions or, even if the program supports the originally targeted habitat characteristics and functions, the habitat does not uphold population productivity levels needed to conserve the ESU.

If any jurisdiction conducting activities that fall under a given limit does not make changes to respond adequately to the new

information in the shortest amount of time feasible—and in no case taking more than one year—NMFS will publish notification in the Federal Register announcing its intention to withdraw the limit and apply the take prohibitions to the program. Such an announcement would provide a comment period of at least 30 days, after which NMFS would make a final determination whether to subject the activities to the ESA section 9(a)(1) take prohibitions.

Other ESA Mechanisms

Section 10 of the ESA provides another mechanism for NMFS to permit take when it is the incidental result of carrying out an otherwise lawful activity. Applicants for an Incidental Take Permit must submit a Conservation Plan (CP) that identifies (a) the impacts expected from any take associated with activities covered by the plan, and (b) the steps that will be taken to monitor, minimize, and mitigate those impacts. For more information on CPs, see the publication entitled "*A Habitat Conservation Plans and the Incidental Take Permitting Process*," available on the U.S. Fish and Wildlife Service web site, at http://www.fws.gov/r9endspp/hcp/hcpplan.html, or speak with one of the NMFS contact people listed below.

Section 7 of the ESA requires that Federal agencies consult with NMFS on activities they authorize, fund, or carry out to ensure they are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of their critical habitat. This includes Federally funded projects such as road construction, stormwater management, rural and urban development, and many other activities conducted, permitted, or funded by Federal agencies.

How NMFS Decides What May Be Included In a 4(d) Rule Limit

Whether take prohibitions or other protective regulations are necessary and advisable depends largely upon the biological status of the species and the potential impacts of various activities on it. If programs contribute to conserving the species or adequately limit the impacts on the species, NMFS may find it is not necessary or advisable to impose the Federal take prohibitions. NMFS expects to continue to work with various entities after the final rule is published, and we will continue to incorporate other conservation efforts in future amendments or through other ESA mechanisms.

In assessing the impacts of a proposed action or program on a species= freshwater or estuarine habitat, NMFS considers the following factors:

> Will the action or program degrade existing habitat processes or functions?
> Will the action or program help restore degraded habitat processes or functions?

The limits in the current rule provide examples of how activities that may harm salmon and steelhead can be adequately controlled to minimize impacts and contribute to the conservation of salmon and steelhead.

All development activities need adequate funding and legal mechanisms for implementing, monitoring, maintenance, enforcement, and reporting in order to ensure that they comply with approved policies, ordinances, and permitting procedures. NMFS expects that programs proposed for a limit will be sufficiently described, guided, or governed by an applicable authority (other than just the ESA itself). These authorities could include state laws, county regulations, metropolitan master plans, local ordinances, official operating manuals, or other regulating mechanisms. In order to qualify for a limit, these mechanisms and the entities implementing them must provide a high degree of assurance that covered activities are being conducted in compliance with the specifications NMFS has analyzed and approved.

To be approved for a limit from ESA take prohibitions, a program must conserve salmon and meet their biological requirements. This criterion is the same for any program. These species span the entire West Coast, from coastal rainforests to arid inland areas to high

mountain regions nearly a thousand miles from the ocean. Specific requirements will differ from place to place. Some jurisdictions have asked for NMFS' help in learning how to avoid or limit adverse impacts on these species. In response, we have created this Guide and amended the final rule to make clear what must be done to protect and conserve listed fish.

Submitting a Program for 4(d) Limit

Any activity or program seeking a limit under a 4(d) rule should contain the following features.

- Descriptions of the activity or program being proposed, the geographic area within which the proposed action/program will apply or be carried out, and the jurisdiction or entity responsible for overseeing the action/program.
- A description of the listed species and habitat that will be affected by the action. This information should include fish distribution and abundance in the affected area and a description of the type, quantity, and quality of habitat in the affected area.
- A description of the environmental baseline. This information should describe existing habitat conditions in terms of water quality, access, riparian areas, stream channels, flow, and watershed health indicators such as total impervious area and any existing high quality habitat areas.
- A description of the anticipated short-term and long-term impacts the action is expected to have on the species (including all life-cycle stages) and its habitat. This description should include both positive and negative impacts and describe how any adverse impacts will be avoided, mitigated, or minimized.
- A discussion of the likelihood that the program or action will be implemented as described. Some questions that would need to be answered are: What commitment has been made to carry out the action or program? Are the legal authorities needed to carry out the program in place? Is implementation funding available and adequate? Is staffing available and adequate? What is the schedule for implementation? If the program is currently being implemented, what is its record of implementation and effectiveness to date?
- A program for monitoring both the action's implementation and effectiveness; it should include a schedule for conducting monitoring and submitting reports.
- A method for using monitoring information to change actions when needed—adaptive management.

Contact Information

The table below identifies the appropriate division and individual staff member at NMFS to contact regarding inquiries about initiating the process to receive a 4(d) limit or to identify other ESA permitting options:

TOPIC/TYPE OF ACTIVITY	NMFS DIVISION	FOR MORE INFORMATION
Ongoing Scientific Research Permit	Protected Resources	Leslie Schaeffer (503/230-5433)
Fishery Management	Sustainable Fisheries	http://www.nwr.noaa.gov/1fmep/index.html or Stephen Smith (503/230-5427) or Peter Dygert (206/526-6734)
Hatchery and Genetic Management Programs	Sustainable Fisheries	http://www.nwr.noaa.gov/1hgmp/hgmptmpl.htm or Stephen Smith (503/230-5427)
Scientific Research Conducted by States	Protected Resources	Leslie Schaeffer (503/230-5433)
Screened Water Diversions	Hydropower Program	http://www.nwr.noaa.gov/1hydroweb/ferc.htm or Bryan Nordlund (503/231-6816)
• Joint Tribal/State Plans • Routine Road Maintenance Activities • City of Portland Integrated Pest Management • Municipal, Residential, Commercial and Industrial Development (and Redevelopment) • Section 10 Incidental Take Permit • Section 7 Consultation	Habitat Conservation	**State of Washington** – Steve Landino (360/753-6054) **State of Oregon, but not including Snake River Basin** – Michael Tehan (503/231-2224) **State of Idaho, and the Snake River Watershed in Oregon** – Ted Meyers (208/378-5698) **State of California** – Craig Wingert (562/980-4021)

Additional Information on the Final 4(d) Rule

Please visit the NMFS Northwest Region Web Site at http://www.nwr.noaa.gov or the Southwest Region Web Site http://swr.ucsd.edu for additional information on the final 4(d) rule for salmon and steelhead. The sites contain the *Federal Register* notice, fact sheets, maps of threatened salmon and steelhead ESUs, press releases, copies of question and answer fact sheets, and documents referenced in the rule. The sites also contain a great deal of information on listed species in general: *Federal Register* notices, species maps, status reviews, fact sheets, and more. In addition, the following NMFS staff members can provide information on the final rule:

TOPIC/GEOGRAPHIC AREA	CONTACT
Final 4(d) Rule	Rosemary Furfey (503/231-2149) Rosemary.Furfey@noaa.gov
Puget Sound	Elizabeth Babcock (206/526-4505) Elizabeth.Babcock@noaa.gov
Upper Columbia Basin	Mike Grady (206/526-4645) Michael.Grady@noaa.gov
Mid-Columbia Basin	Kate Vandemoer (503/230-5422) Kate.Vandemoer@noaa.gov
Lower Columbia Basin	Rob Jones (503/230-5429) Rob.Jones@noaa.gov
Willamette Basin or Oregon Coast	Patty Dornbusch (503/230-5430) Patty.Dornbusch@noaa.gov
California Coast	Greg Bryant (707/825-5162) Greg.Bryant@noaa.gov

Effective Dates of Final 4(d) Rule

Species	Effective Date of 4(d) Rule
Threatened Steelhead ESUs	60 days after the final 4(d) rule is published
Threatened Salmon ESUs	180 days after the final 4(d) rule is published

Finding Your Way Around the 4(d) Rule

The proposed 4(d) rule included a preamble in which NMFS provided technical guidance, descriptions of the scientific principles upon which the limits were based, and descriptions of the limits' background and content. The proposed regulatory language was in a separate Code of Federal Regulation (CFR) section.

The final 4(d) rule for salmon and steelhead is divided into two sections—the preamble and the CFR language. The preamble includes the following sections:

A summary of the final rule and its effective dates
Supplementary Information—including the rule's background and a description of its content
A list of the threatened ESUs affected by the final rule
Notice of availability of documents referenced in the final rule
A summary of the comments received in response to the proposed rules
A section identifying the changes to the proposed 4(d) rule made in response to public comment
Take Guidance
A section detailing how the rule complies with the Regulatory Flexibility Act and various Executive Orders

The last section of the final rule includes the regulatory language that applies the section 9 take prohibitions to the 14 threatened ESUs listed below and creates 13 limits on those prohibitions. The regulations section describes each limit.

The following is a list of the 14 threatened ESUs covered in the final 4(d) rule:

Threatened Steelhead ESUs
- Central California Coast
- South-Central California Coast
- Snake River Basin
- Lower Columbia River
- Central Valley, California
- Upper Willamette River
- Middle Columbia River

Threatened Chum ESUs
- Hood Canal summer-run
- Columbia River

Threatened Chinook ESUs
- Puget Sound
- Lower Columbia River
- Upper Willamette River

Threatened Coho ESUs
- Oregon Coast

Threatened Sockeye ESUs
- Ozette Lake

Technical Issues: Aids for Understanding the 13 Limits in the 4(d) Rule

Viable Salmonid Populations

NMFS uses the Viable Salmonid Population (VSP) concept primarily in evaluating hatchery and harvest activities. NMFS defines populations following Ricker's (1972) definition of a "stock." Thus, a population is a group of fish of the same species spawning in a particular lake or stream (or portion thereof) at a particular season which to a substantial degree does not interbreed with fish from any other group spawning in a different place or in the same place at a different season. This definition is widely accepted and applied in the field of fishery management.

An independent population is an aggregation of one or more local breeding units that are closely linked by exchange of individuals among themselves, but are sufficiently isolated from other independent populations that exchanges of individuals among populations do not appreciably affect the population dynamics or extinction risk of the populations over a 100-year time frame. Such

populations are generally smaller than their entire ESU, and they generally inhabit geographic ranges on the scale of whole river basins or major sub-basins that are relatively free of outside migration. For several reasons, NMFS believes it important to identify population units within established ESUs and individually evaluate their extinction risk. First, many of the biological processes that can drive a species to extinction operate at the population level, so it is appropriate to manage at that scale. In addition, by identifying and assessing impacts at the population level, managers can gain a better understanding of the important biological diversity contained within each ESU—a factor considered in NMFS' ESU policy (Waples 1991). Further, given an ESU's scale and complexity, it is typically a more practical undertaking to assess impacts at the population level. Finally, assessing impacts at the population level helps ensure that listed salmon and steelhead are treated consistently across a diverse geographic and jurisdictional range.

NMFS will use four primary biological parameters to evaluate population status: (1) Abundance, (2) population growth rate, (3) population spatial structure, and (4) diversity. The relevance of these parameters to salmonid population status is discussed in a variety of scientific documents (e.g., Nehlsen et al. 1991; Burgman et al. 1993; Huntington et al. 1996; Caughley and Gunn 1996; Myers et al.,1998). Population abundance is important to evaluate because smaller populations experience relatively greater genetic, environmental, and demographic risks. Genetic risks associated with low population size include inbreeding depression, harmful mutation accumulation, and loss of genetic diversity. Demographic risks associated with low population size include random effects associated with environmental events.

Population productivity may be thought of as the population's ability to increase or maintain its abundance. It is important to assess productivity because negative trends in productivity over sustained periods may lead to the genetic and demographic impacts associated with small population sizes. Population spatial structure reflects the number, size, and distribution of habitat patches and the condition of the migration corridors that provide linkages among these patches. Population structure affects demographic processes and extinction risk in ways that may not be readily apparent from studies of abundance and population growth rate. In addition, spatial structure affects evolutionary processes and may affect a population's ability to respond to environmental changes or stochastic events.

Population diversity is important because it helps buffer a species against short-term environmental change and stochastic events. Population diversity may be assessed by examining life history traits such as age, and run and spawn timing distributions. Also, DNA analysis may provide an indication of diversity.

In applying the concepts discussed here to harvest and hatchery actions, NMFS relies on two functional thresholds of population status: (1) Critical population threshold, and (2) viable population threshold. The critical population threshold refers to a minimal functional level below which a population's risk of extinction increases exponentially in response to any additional genetic or demographic risks. The viable population threshold refers to a condition where the population is self-sustaining and not at risk of becoming endangered in the foreseeable future. This threshold reflects the desired condition for individual populations and encompasses their contribution to recovering the ESU as a whole. Proposed actions must not preclude populations from attaining this condition.

Properly Functioning Condition

The final rule limits the take prohibitions for certain land and water management activities that NMFS has determined will conserve listed salmonids' habitat even though they may incidentally take individual listed fish. To make these determinations, NMFS evaluated whether the activities would allow properly functioning habitat condition to be attained and persist. The NMFS defines properly functioning condition (PFC) as the sustained presence of natural habitat-forming processes (e.g., hydraulic runoff, bedload transport, channel migration,

riparian vegetation succession) that are necessary for the long-term survival and recovery of the species (*The Habitat Approach*, NMFS, 1999). Thus, PFC constitutes a species' habitat-based biological requirements—the essential physical features that support spawning, incubation, rearing, feeding, sheltering, migration, and other behaviors. Such features include adequate instream flow, appropriate water temperature, loose gravel for spawning, unimpeded fish passage, deep pools, and abundant large tree trunks and root wads.

There is more than one scientifically credible analytical framework for determining an activity's effects. However, NMFS has developed a default analytical method (*Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale*, NMFS, 1996). It is often referred to as the "Matrix of Pathways and Indicators," or MPI. In the MPI framework, the pathways for determining the effect of an action are represented as six conceptual groupings (e.g., water quality, channel condition) of 18 habitat condition indicators (e.g., temperature, width/depth ratio). Indicator criteria (mostly numeric, though some are narrative) are provided for three levels of environmental baseline condition: properly functioning, at risk, and not properly functioning. The effect of the action upon each indicator is classified by whether it will restore, maintain, or degrade the indicator.

Although the indicators used to assess habitat condition may entail instantaneous measurements, they are chosen, using the best available science, to detect the health of underlying processes, not static characteristics. "Best available science" advances through time, thus allowing PFC indicators to be refined, new threats to be assessed, and species status and trends to be better understood. Aquatic habitats are inherently dynamic, and the PFC concept recognizes that natural patterns of habitat disturbance will continue to occur. Floods, landslides, windstorms, and fires result in spatial and temporal variability in habitat characteristics, as do human activities. Indicators of PFC vary between different landscapes based on unique physiographic and geologic features. For example, aquatic habitats on timberlands in glacial mountain valleys are controlled by natural processes operating at different scales and rates than are habitats on low-elevation coastal rivers. The MPI provides a consistent but geographically adaptable framework for making effect determinations. The pathways and indicators, as well as the ranges of their associated criteria, are amenable to alteration through the process of watershed analysis.

Regardless of the analytical method used, if a proposed action is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it cannot be found to be consistent with the conservation of the species. If a program preserves existing habitat function levels and allows natural progression towards PFC where habitat is impaired, NMFS may determine that it qualifies for a limit on the take prohibitions. The NMFS has added language to the limits for road maintenance, pesticide management, municipal, residential, commercial and industrial (MRCI) development, and forestry that defines PFC and identifies how NMFS will evaluate programs with regard to meeting this biological standard. Specific criteria for applying this conservation standard are listed in each habitat-related limit.

The scope of any given activity is important to NMFS' effects analysis. The scope of the activity may be such that only a portion of the habitat forming processes in a watershed are affected by it. For NMFS to find that an activity is consistent with conserving listed fish, only the effects on habitat functions that are within the scope of that activity will be evaluated. For example, an integrated pest management program may affect habitat forming processes related to clean water, but have no effect on physical barriers that prevent fish from gaining access to a stream.