

A Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids



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Through:

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Acronyms and Symbols

§	Section
AFW	Agriculture, Fish and Water
AKART	All Known Available Reasonable Treatments
BMP	Best Management Practice
CFR	Code of Federal Regulations
CR	Code Reviser
CWA	Clean Water Act
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GIS	Geographic Information System
HCP	Habitat Conservation Plan
IPM	Integrated Pest Management
LC ₅₀	Lethal Concentration that results in the mortality of 50% of the population
NAWQA	National Water Quality Assessment
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OPP	Office of Pesticide Programs (EPA)
PSWQA	Puget Sound Water Quality Authority
QA/QC	Quality Assurance/Quality Control
RCW	Revised Code of Washington
SaSI	Salmonid Stock Inventory
SSHAP	Salmon and Steelhead Habitat Inventory and Assessment Program
T/E	Threatened or Endangered
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WQP	Water Quality Program
WRIA	Watershed Resource Inventory Assessment
WSDA	Washington State Department of Agriculture
WSU	Washington State University

I. Executive Summary

Several species of salmon and trout in Washington State have recently been listed for protection under the Endangered Species Act (ESA). Numerous factors, such as the deterioration or loss of freshwater and estuarine habitat, hydropower operations, hatchery practices and over-harvesting have contributed to the decline of these wild salmonid populations. As a component of habitat, the degradation of water quality contributes to salmonid population declines. Among the various factors that determine water quality in salmonid habitat, there is a growing concern that current-use pesticides could potentially harm threatened or endangered salmonids (T/E salmonids). Despite this concern, the effects of pesticides on salmonid health and aquatic ecosystems in the Pacific Northwest are not well understood.

An interagency Task Force was convened in March of 2000 to address the considerable scientific uncertainty surrounding the effects of pesticides on the essential biological requirements of salmonids. The Task Force is a collaborative effort between the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Environmental Protection Agency (Region 10), and Washington State Departments of Agriculture, Ecology, Fish and Wildlife, and Natural Resources. The U.S. Geological Survey and Washington State University have also contributed in an advisory capacity. The principal mission of the Task Force is to provide science-based guidance to natural resource and regulatory agencies on the potential adverse impacts of pesticides on salmonids and/or aquatic ecosystems.

A primary goal of the Task Force has been to develop an evaluation process that incorporates the best available scientific data and information on 1) the transport of pesticides to salmonid habitat, and 2) the toxicity of these chemicals to fish and/or the aquatic foodweb. The Task Force's screening process, or decision matrix, will be used to identify which individual pesticides are, and which are not, a potential risk to the biological requirements of T/E salmonids or their critical habitat in Washington State. Finally, this evaluation process is being designed to facilitate ESA compliance for registered uses of pesticides in Washington State.

This White Paper provides a brief background on the ESA and the geographical distribution of T/E salmonids in Washington State. In addition, it provides an introduction to current-use pesticides, the State's Agriculture, Fish and Water process, and the history and mission of the Washington State Pesticide/ESA Task Force. Specifically, the White Paper describes the Task Force's pesticide evaluation process that will be used to screen the approximately 750 pesticide active ingredients that are currently registered in Washington State. The current decision matrix does not contain a complete description of the decision criteria that will be used to evaluate individual chemicals. The Task Force intends to provide the scientific basis for each decision criteria in an expanded technical document. This White Paper contains the following:

- ◆ A description of the pesticide decision matrix and a general introduction to the approach that will be used to evaluate individual pesticide active ingredients at different steps in the process;
- ◆ Descriptions of the different categories in the matrix, and the Task Force's rationale for placing pesticides into each category; and
- ◆ Identification of important sources of scientific uncertainty.

The Task Force has also identified specific efforts to substantially improve data quality, quantity and management for the evaluation process. These include:

- ◆ A new monitoring effort for pesticides in Washington State surface waters that provide critical habitat for T/E salmonids, including sub-basins that have different land use characteristics (e.g., urban and agricultural); and
- ◆ The establishment of a geospatial database that can be used to identify pesticide exposure of T/E salmonids at more precise spatial and temporal scales.

The Task Force recommends using the pesticide screening process as part of a larger adaptive management program that will incorporate new scientific data as they become available. Moreover, if best management practices, use restrictions or other avoidance, minimization, or mitigation measures are enacted to reduce or eliminate the transport of pesticides to salmonid habitat, an integrated surface water-monitoring component would be needed to provide the necessary data to determine if such practices are effective or would require further modification.

II. Background

In December 1999, the National Marine Fisheries Service (NMFS) published “*The ESA Proposed 4(d) Rules for Pacific Salmon*” (FR 65, 170, Jan. 2000). These draft rules were released concurrent with the State of Washington’s Agriculture, Fish and Water (AFW) negotiations. AFW is a formal collaborative process established through the Washington State Governor’s Salmon Recovery Strategy. The goal of AFW is to develop conservation standards for agriculture that provide resource protection necessary for recovery of salmon and bull trout listed under the Endangered Species Act (ESA). The AFW negotiations include members from the Governor’s Office, the Washington State Departments of Agriculture (WSDA), Ecology (Ecology), Fish and Wildlife (WDFW) and the Conservation Commission; federal representatives from the U.S. Environmental Protection Agency (US EPA Region 10), National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), Natural Resources Conservation Service, U.S. Department of Agriculture’s Farm Service Agency and the Bureau of Reclamation; as well as tribal, local government, agricultural and environmental community representatives.

Prior to the publication of “*The ESA Proposed 4(d) Rules for Pacific Salmon*” it was generally assumed that pesticides applied according to the EPA-registered label directions would not harm ESA-listed species and are therefore in compliance with the ESA. After the publication of the proposed rules, it became clear that this was not necessarily the case. As a result, pesticide users became concerned that they could be in violation of the ESA via the otherwise-lawful use of pesticides under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA). Consequently, the agricultural caucus involved in the AFW negotiations insisted that WSDA address the pesticide issue relative to the ESA.

After discussions with State and Federal agencies, NMFS clarified its position on ‘take’ (see Section B) by pesticide exposure in the responsiveness summary to “*Endangered and threatened species: Final rule governing take of 14 threatened salmon and steelhead evolutionarily significant units*” (50 CFR Part 223). The NMFS’ clarification stated that there is considerable scientific uncertainty regarding the effects of pesticides on the essential biological requirements of T/E salmonids, and that their agency will continue to conduct research into the effects of pesticide exposure on salmonids to reduce this uncertainty. NMFS also stated that it would address pesticide issues through the ESA Section (§) 7 consultation process or discussions with responsible state authorities; and that it preferred this approach rather than using its enforcement authorities against individual applicators for the otherwise-lawful use of pesticides. The Washington State Pesticide/ESA Task Force (described below) was formed as a result of this commitment to work with the appropriate state and federal agencies to address pesticide issues relative to T/E salmonids.

A. ESA Overview: Threatened and Endangered Salmonids in Washington State

Washington's rivers, tributaries, and estuaries provide habitat for several species of salmon, steelhead, and trout. Some species exhibit anadromy, meaning they migrate as juveniles from freshwater to the ocean, and then return as adults to spawn in freshwater. Others reside for most or all of their life in freshwater. Among the anadromous species are the Pacific salmon, including chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*), chum (*O. keta*) and pink salmon (*O. gorbuscha*). Steelhead (*O. mykiss*), coastal cutthroat trout (*O. clarki clarki*), and bull trout (*Salvelinus confluentus*) differ from Pacific salmon in that they are iteroparous, which means they are capable of spawning more than once before they die. These species can also exhibit anadromy; however, cutthroat and bull trout generally spend more or all of their life in freshwater.

Many salmonid populations are in decline throughout Washington State. This has prompted federal protection for these species under the provisions of the ESA of 1973, as amended. Two federal agencies oversee the conservation of T/E salmonids. NMFS has jurisdiction over anadromous salmonids that spend the majority of their life in the ocean, including Pacific salmon, steelhead and their critical habitat. USFWS has jurisdiction over primarily freshwater species, including bull trout and coastal cutthroat trout. For the purposes of this document, fish species listed under the ESA as T/E include salmon, steelhead trout, bull trout and coastal cutthroat trout (all in the Salmonidae family).

The ESA defines the term *endangered species* as "any species, which is in danger of extinction throughout all or a significant portion of its range." The term *threatened species* is defined as "any species, which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." As amended in 1978, the ESA allows the listing of "distinct population segments" (DPSs) of vertebrates as well as named species and subspecies. In the case of Pacific salmon and steelhead, NMFS considers a population (or group of populations) as "distinct" for purposes of the ESA if it represents an evolutionarily significant unit (ESU) of the species. An ESU is defined as a population that 1) is substantially reproductively isolated from conspecific populations, and 2) represents an important component of the evolutionary legacy of the species (FR 56, 58612, Nov. 1991). NMFS has defined the term *critical habitat* as "the specific areas within the geographical area occupied by the species...on which are found those physical or biological features: 1) essential to the conservation of the species and 2) which may require special management considerations or protection." Those essential features may include, but are not limited to, spawning sites, food resources, water quality and quantity, and riparian vegetation (50 CFR Part 226).

Two salmon runs are currently listed as endangered in Washington State. These are the steelhead and spring-run chinook populations in the Upper Columbia River ESU. In addition, several chinook, sockeye, chum, steelhead ESUs, and bull trout DPSs have been listed as threatened in various river basins and estuaries throughout the state. Finally, coho salmon in the Southwest Washington/Lower Columbia River and Puget Sound/Strait of

Georgia ESUs and coastal cutthroat trout in the Southwest Washington/Lower Columbia River DPS, are currently candidate species, and may be proposed for listing in the near future. Figure 1 depicts watersheds that provide habitat for T/E salmonids in Washington State.

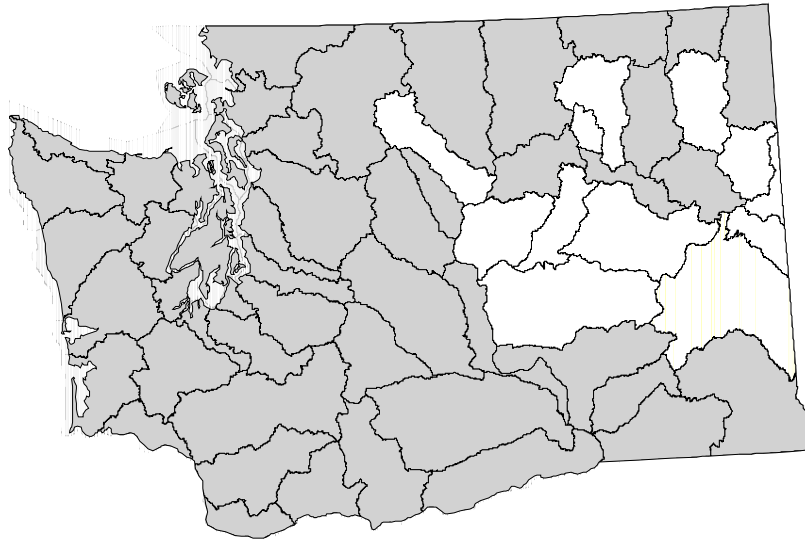


Figure 1. Map of federally listed and proposed fish areas by Watershed Resource Inventory Area (WRIA) Units in Washington State. (Shaded units are those that provide habitat for one or more proposed, threatened or endangered salmonid species.)

B. Factors Contributing to the Decline of Wild Salmonid Populations

Several factors have contributed to the decline of salmonid populations in Washington State. These include over-harvest, past and ongoing degradation of freshwater and estuarine habitats, water diversions, hydropower operations, hatchery practices, and other causes (NMFS, 1996; 1998). These factors combined are thought to have reduced the numbers of salmon returning to spawn from 10-16 million (historically) to approximately 1 million today. Harvest has reduced the number of adult fish returning to spawn, while hatcheries have increased competition and inbreeding and could possibly be a source of disease for wild salmonids stocks. Hydropower dams, particularly along the Columbia and Snake rivers have blocked, modified and inundated habitat, as well as altered flow and impeded passage of migrating fish. Finally, activities related to forestry, agriculture,

mining and development have modified or destroyed fish habitat. These modifications include but are not limited to channelization, bank degradation, flow modification and water quality degradation (Federal Caucus, 1999).

In the context of habitat, salmonids need cold clean water in adequate quantity to spawn and survive rearing and migration periods. Degraded water quality, therefore, places significant limits on the conservation of T/E salmonids (NMFS, 1996; 1998). The presence of chemicals, including pesticides, has the potential to degrade water quality.

Pesticides have been detected in river systems that provide habitat for T/E salmonids throughout Washington. For example, past and ongoing USGS National Water Quality Assessment (NAWQA) surface water monitoring studies in the Puget Sound basin (Bortleson and Davis, 1997), the Yakima basin (Rinella et al., 1999), and the Central Columbia Plateau (Williamson et al., 1998) have detected diverse mixtures of pesticides in rivers and streams that support listed species. While some of these pesticides are so-called legacy or persistent pesticides that were widely used in the past but have since been banned (e.g. DDT), the majority of surface water detections reflect pesticides that are currently in use.

Current-use pesticides are a large group of chemicals that are specifically designed to repel, kill, or regulate the growth of undesirable biological organisms. This diverse group includes fungicides, herbicides, insecticides, nematicides, molluscicides, rodenticides, fumigants, disinfectants, repellents, wood preservatives, and antifoulants. The most commonly used pesticides are insecticides, herbicides, and fungicides. These are used for pest control on forested lands, agricultural crops, tree farms and nurseries, highways, utility rights of way, parks, golf courses and residential areas (PSWQA, 1990).

Because pesticides have been detected in salmonid habitat, it is necessary to evaluate whether they occur at concentrations that may result in “take” of T/E species. “Take” is defined as activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct [ESA §3(18)]. Take may result from direct, indirect or cumulative actions. Harm is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as: breeding, feeding or sheltering [50 CFR §17.3]; and spawning, rearing, migrating, feeding, or sheltering (50 CFR Part 222).

As previously stated, a final ESA 4(d) rule governing the take of threatened salmonids was recently issued by NMFS (50 CFR Part 223). The rule adopts regulations necessary to conserve threatened salmonid ESUs, and it applies to several populations in Washington State. The final ESA 4(d) rule governing take acknowledges that some pesticides may kill or injure salmonids through impairment of essential behavioral patterns (50 CFR Part 223).

C. The Washington State Pesticide/ESA Task Force

In response to the pesticide issue identified during the AFW negotiations, the Washington State Pesticide/ESA Task Force (hereafter referred to as the Task Force) was established. The Task Force is an interagency technical and policy team composed of scientists and managers from resource and regulatory agencies. These include: NMFS-Northwest Region, USFWS-Western Washington Office, U.S. EPA (Region 10), Ecology, WDFW, Washington State Department of Natural Resources (WDNR) and WSDA. Scientists from the U.S. Geological Survey (USGS) and Washington State University (WSU) contribute to the Task Force in an advisory capacity.

The mission of the Task Force is to determine which pesticide uses may cause harm to T/E salmonids in the wild. The Task Force will then make recommendations to the appropriate regulatory agencies to reduce and/or eliminate exposure to, and therefore risk from, those pesticides. Through this process the Task Force will also identify pesticides that do not pose a risk to salmonids. By reducing the transport of pesticides to aquatic habitats, Washington State agencies will work to protect the status of healthy salmonid stocks as well as other fish populations.

As the Task Force moves to finalize its pesticide strategy and develop a mechanism for compliance to pesticide users under the ESA, the decision matrix and the categories may need modification. The policy arm of the Task Force is presently working to determine the most effective ESA mechanism (see Appendix C). This mechanism will provide both certainty to pesticide users that when a pesticide is used either as labeled or as defined by state rule that it is consistent with ESA requirements; and to the Services that pesticides used in Washington State are not a limiting factor precluding salmonid recovery.

III. Pesticide Decision Matrix

A. Introduction

As stated, the goal of the Task Force is to review and synthesize the available information on pesticides in Washington State as it pertains to: 1) salmonid exposure, and 2) the potential for adverse impacts on the biological requirements of T/E salmonids. A key element of this effort has been the development of an evaluation process, or a decision matrix, to incorporate the relevant scientific data. The matrix (Figure 2) will then be used to identify which pesticides are, and which are not, likely to pose a risk for salmonids. The matrix will also be used to identify important information gaps or areas of scientific uncertainty.

This section describes the Task Force's decision matrix for current-use pesticides. The process begins with a complete list of the approximately 750 pesticide active ingredients registered for distribution in Washington State by WSDA. The matrix incorporates several broad categories of information, each as a decision point in the pesticide evaluation process. These include:

- ◆ The patterns and amounts of pesticide applications in basins having different land use characteristics;
- ◆ The evidence for pesticide transport and delivery to salmonid-bearing river systems and estuaries;
- ◆ The distribution of listed species in these surface waters, and the evidence for exposure at different life history stages; and
- ◆ The scientific evidence that exposure to pesticides may result in adverse impacts on the essential biological requirements of listed species.

The decision matrix considers each pesticide individually and uses pesticide surface water detections as a direct measure of a chemical's entry into the aquatic ecosystem. The Task Force is aware that other pesticide transport pathways (e.g., ground water intrusion, sediment, dietary) may also be important for salmonid exposure. The Task Force intends to incorporate these other exposure routes into the matrix over time. Moreover, the decision matrix does not explicitly consider the issues of product formulation, pesticide mixtures, or environmental variables that may alter the relative toxicity of a pesticide (see 'uncertainties' in Section V below). Although these complex factors may contribute to the overall toxicity of a pesticide in salmonid habitat, they are beyond the scope of this initial process document.

The decision matrix uses the best available science throughout the process to determine whether a pesticide will adversely impact salmonids and/or their prey base. The evaluation of pesticide exposure will include listed species, their prey base and their habitat. In order to recover, T/E salmonids will need to occupy much of what remains of their critical habitat. Because the prey base is a significant component of salmonid habitat and allows them to carry out essential features of their life history, effects on prey organisms will be evaluated as well.

As an example of how this process will work, the Task Force will identify pesticides detected in surface waters using available surface water pesticide monitoring data. If a pesticide has not been measured, or is not routinely measured, the Task Force will determine whether it should or could be measured in the future. The next step will be to establish whether the pesticide was detected in salmonid habitat evaluating both urban and agricultural basins using the Salmon and Steelhead Habitat Inventory Assessment Program (SSHIAP) database. Once evidence of exposure of salmonids or their prey base has been

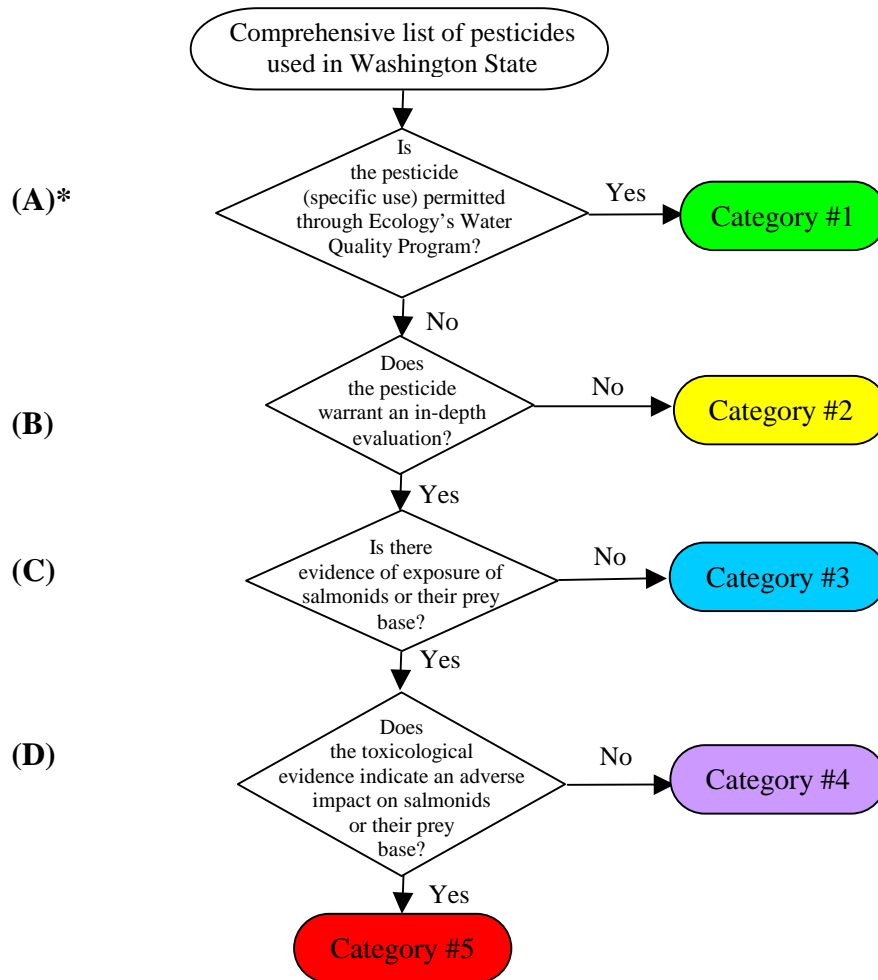
established, the Task Force will evaluate the available information to determine if the pesticide is inhibiting the biological requirements of T/E salmonids. Pesticides for which the Task Force has sufficient data to predict an adverse impact on salmonids and/or their prey base will be forwarded to WSDA for action. Where scientific data are lacking, the Task Force will recommend new surface water monitoring or toxicological research as appropriate. As new data become available, they will be incorporated into the pesticide screening process as part of a larger adaptive management program.

In this document, the Task Force describes the process that will be used to screen the available information and identify which pesticides do, and which do not, pose a risk for salmonids. The goal of the process is to quickly remove pesticides from consideration that do not pose a risk to salmonids in order to focus on the pesticides which might adversely impact the ability of these fish species to recover in the wild.

The Task Force recognizes that Ecology permits the use of certain pesticides for aquatic weed control, riparian habitat restoration, mosquito control, and other beneficial uses as short-term modifications of the State's surface water quality standards. Environmental Impact Statements (EISs) have generally been adopted for these special programs and, by state law, they incorporate Integrated Pest Management (IPM) as the preferred alternative. Moreover, as the State's aquatic pesticide use risk assessments are updated, they consider the potential for effects on the salmonid life cycle and their food chain. For these reasons, the Task Force will evaluate these aquatic and special use chemicals separately (Category #1 in Figure 2).

Finally, it is important to emphasize that this White Paper outlines a decision process to evaluate the potential impacts of current use pesticides on salmonids. With the exception of the example for Category #1, (see below), the Task Force has not yet applied the matrix to the complete list of pesticides that are currently registered for distribution in Washington State. The Task Force intends to provide an expanded technical description of each decision point in the matrix in a future document which will include the description and rationale for how the best available scientific information will be used in the pesticide evaluation process. The technical document will also include descriptions of how pesticides will be re-categorized as new information becomes available.

Figure 2. Pesticide Decision Matrix



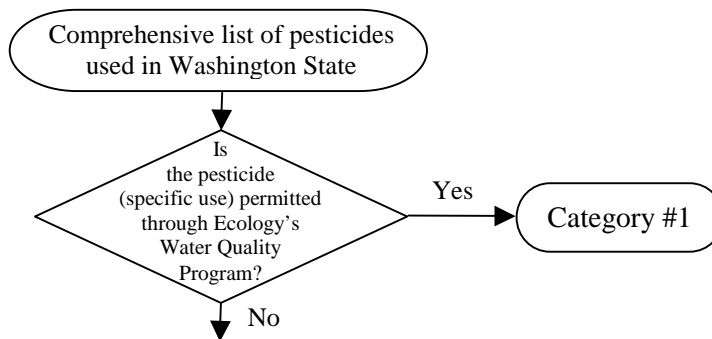
* Decision points further defined in text to follow.

Category	Description
Category #1	Pesticide uses permitted for special or aquatic use by Ecology.
Category #2	Pesticides that do not pose a risk to salmonids and do not warrant further evaluation.
Category #3	Pesticides used in proximity to salmonid habitat, but are either not monitored or not detected in surface water monitoring studies.
Category #4	Pesticides detected in surface waters; however, adverse impacts to salmonids or their prey base are unlikely or uncertain at the concentrations detected.
Category #5	Pesticides detected in surface waters at concentrations that are likely to have an adverse impact on salmonids or their prey base.

B. Decision Points in the Pesticide Evaluation Matrix & Category Descriptions

The process begins with a complete list of pesticides currently registered in Washington State.

A. *Is the pesticide (specific use) permitted through Ecology's Water Quality Program?*



Rationale:

Pesticides that are included in Ecology's Water Quality Program have generally been evaluated for their impacts on T/E salmonids through an EIS or similar process. Because the specific uses of these pesticides have been given a higher level of scrutiny, and they are permitted by Ecology, they will be evaluated as a separate category. Through this evaluation, the Task Force will work with Ecology to address ESA requirements for T/E salmonids. This will incorporate all relevant information regarding the potential effects of these special use pesticides on salmonids, their prey base, or their critical habitat.

Category #1: Pesticide uses permitted for special or aquatic use by Ecology.

Category #1 contains aquatic/special-use pesticides that are registered by EPA and WSDA, and are permitted for specific uses by Ecology. The seven areas for which aquatic/special-use pesticides are permitted by Ecology are, to control: 1) aquatic plants and algae, 2) noxious emergent plants, 3) mosquitoes, 4) burrowing ghost shrimp, 5) non-indigenous fish in selected waters of the state, 6) aquatic weeds and algae in irrigation ditches and 7) gypsy moth (when applications are associated with water bodies). Ecology has required individuals and entities proposing to use pesticides in this manner apply for and receive a short-term modification of the Water Quality Standards for Surface Waters of the State of Washington. The modifications, or permits, place restrictions on what chemicals may be used and include timing restrictions and buffer requirements as well as extensive public

notification and reporting requirements. Beginning in 2002, Ecology will start issuing National Pollutant Discharge Elimination System (NPDES) permits for aquatic pesticides. In addition to containing a short-term modification to the water quality standards, the NPDES permit will require an in-depth analysis of alternative control methods using “All Known, Available and Reasonable Treatments” (AKART). NPDES permit requirements are outlined in Title 33 United States Code, Section 1251 et seq., the Federal Water Pollution Control Act [Clean Water Act (CWA)].

Pesticide use and permit conditions must also be consistent with the State of Washington’s Integrated Pest Management Law (RCW, Chapter 17.15) and/or the provisions of an EIS adopted under the State Environmental Policy Act (RCW, Chapter 43.21C) or the provisions of the Department of Ecology’s policy WQP 1-06 and procedure WQP 1-06A on permitting of aquatic pesticides for mosquito control. The EISs include risk assessments for human health and aquatic life and mitigation measures for the various control methods; including biological, physical, mechanical, manual and chemical control. The aquatic life risk assessments for aquatic use pesticides often include seawater challenge tests to assess the impact to juvenile salmonid out-migration or smoltification and survival.

The Task Force acknowledges that the use of aquatic pesticides is often necessary to support habitat restoration efforts, protect public health and manage aquatic nuisance species. Upon first inspection, the Task Force recognized that Washington’s Water Quality Program provides an overarching process for detailed evaluation and balancing of the potential risks to resources that may be associated with the use of aquatic pesticides. However, the Task Force will work with Ecology to address salmonid-specific concerns related to aquatic-use pesticides, should they arise. If necessary, the Task Force may advise Ecology to apply additional protections to activities permitted under Washington’s Water Quality Program.

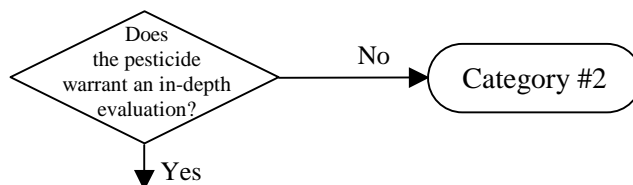
The Task Force and Ecology will continue to share information from monitoring programs, new scientific studies, and assessments of new aquatic pest control methods. If new information becomes available that indicates that the risks of a particular aquatic/special-use pesticide outweighs the benefits, the use of that pesticide would be subject to re-categorization. Finally, since only the specific use has been evaluated and approved by Ecology, only those uses permitted through the Water Quality Program are placed in Category 1. All other uses of the same pesticides not permitted through Ecology would still be processed through the decision matrix for categorization.

An example for Category #1

An example of a compound that falls into Category #1 is glyphosate. Glyphosate is the active ingredient in the herbicide Rodeo®. Rodeo® is used for the control of exotic smooth cordgrass (*Spartina* sp.) on the coastal and estuarine areas of Washington State as described in Washington State's Noxious Emergent Plant Management EIS. The non-native, invasive cordgrass out-competes native vegetation and eliminates important habitat for fish and wildlife. If not controlled, the exotic plant would continue to colonize and degrade physical habitats vital to juvenile salmonids and other estuarine species. To control the spread of *Spartina*, IPM practices currently focus on mowing the cordgrass as well as aerial and ground applications of Rodeo®.

Glyphosate has many other applications. These range from home use (Roundup®) to forestry applications (Accord® and Ranger®). Since these other uses do not fall under the definition for Category #1, glyphosate applied for these other uses would be evaluated through the decision matrix in the same manner as all other registered pesticides in Washington State.

B. Does the pesticide warrant an in-depth evaluation?



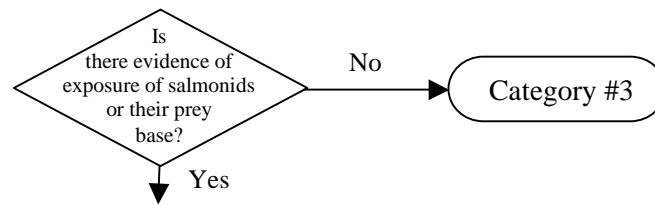
Rationale:

The term "pesticide" encompasses a large and diverse group of EPA-registered products. This decision point recognizes that some chemical substances, while technically a pesticide, are very unlikely to adversely affect the biological requirements of salmonids in Washington State.

Category #2: Pesticides that do not pose a risk to salmonids and do not warrant further evaluation.

Category # 2 contains pesticides that are practically nontoxic to fish. It also includes pesticides that are used so infrequently and in such limited locations that the small amounts applied are not expected to have adverse impacts on salmonids.

C. *Is there evidence of exposure of salmonids or their prey base?*



Rationale:

The most direct way to determine if salmonids or their prey base are exposed to pesticides is to measure pesticide concentrations in salmonid-bearing streams, rivers, and estuaries. Several agencies, counties and tribes have analyzed surface waters for pesticides. While these data sets provide valuable information that the Task Force intends to use, they are incomplete. Of the approximately 750 pesticides (active ingredients) that are currently registered in the state, only a fraction are included in surface water monitoring efforts. For example, the USGS' National Water Quality Assessment (NAWQA) program, which represents the most intensive sampling efforts in the state, analyzes surface waters for a maximum of 128 active ingredients and 57 degradation products. The USGS developed its national list of pesticides for analysis by combining the top 100 pesticides in terms of total amount used and the top 100 pesticides in terms of total area of land treated. In comparison with pesticides used in Washington State, the current USGS analytical schedule includes 45% of the Washington major use pesticides (personal communication, Washington Agricultural Statistical Survey and USGS). In the absence of surface water monitoring data for the majority of pesticides used in Washington State, the extent to which salmonids are exposed to these chemicals is not known. Where surface water data are lacking for a particular pesticide, decisions regarding whether the pesticide should be monitored will be based in part on the results of fate and transport models.

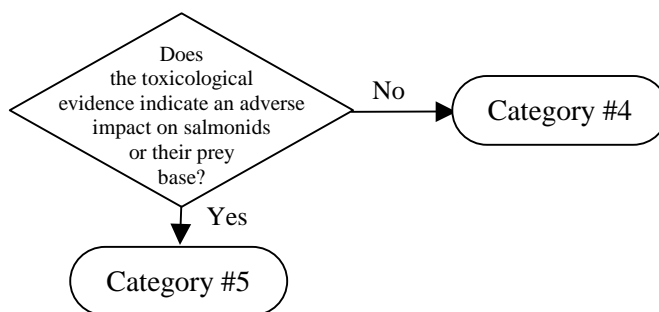
To determine whether surface water pesticide detections fall within salmonid habitat the Task Force will use WDFW's SSHIAP database. SSHIAP is linked to the Washington State Salmonid Stock Inventory (SaSI) which provides salmonid stock status for Washington State (SaSI 1992). The information contained in SSHIAP and SaSI will allow the Task Force to make determinations regarding specific life stage exposure by comparing the spatial and temporal distributions of both pesticides and salmonids in Washington State surface waters.

Category #3: Pesticides used in proximity to salmonid habitat, but are either not monitored or not detected in surface water monitoring studies.

Category #3 contains two groups of pesticides: those with direct evidence of no exposure (i.e., an exposure assessment has been completed and the Task Force concludes that there is no exposure of salmonids or their prey base), and those for which there is no evidence of exposure because there is not enough data to complete an exposure assessment.

In the absence of monitoring data, the extent to which salmonids are exposed to these pesticides is uncertain. To the extent possible, the Task Force intends to coordinate with monitoring entities to recommend additional salmon-specific surface water monitoring. New information generated from future pesticide monitoring studies will be incorporated into the matrix as it becomes available. If new data indicate that a pesticide exposure is occurring, the pesticide will be moved to decision point D in the matrix (see below). The distinctions between the groups in Category #3 will be further defined in a Technical Document to follow.

D. *Does the toxicological evidence indicate an adverse impact on salmonids or their prey base?*



Rationale:

The ESA requires use of the best available science to determine whether an action will harm a listed species, through modification of habitat or otherwise, resulting in take of that species. The Task Force will use the best available science to determine whether pesticides are likely to have an adverse effect on individual salmonids via the impairment of essential biological requirements. There are two categories of potential adverse effects. These include:

- ◆ **Direct effects on the physiology or behavior of an exposed animal.** Such effects might include the impairment of essential behavioral patterns, including predator avoidance, prey capture, migration or spawning. Direct adverse effects would also include impacts on key physiological systems, including the immune, nervous, reproductive, or endocrine systems. Finally, this category would include sublethal impacts on sensitive life history stages, including embryos, fry, and smolts.
- ◆ **Indirect effects via a reduction in the abundance of prey species.** This would include reductions of terrestrial insects in riparian zones as well as insects and crustaceans in freshwater and estuarine habitats. Changes in the abundance of prey

organisms could arise from 1) direct mortality (i.e., from exposure to an insecticide), 2) a shift in the demographic structure of invertebrate populations, or 3) a shift in the structure of aquatic communities in response to a pesticide application.

Data used to derive existing water quality standards and criteria will be incorporated into the review of available information as part of the best available science evaluation. While existing water quality standards have not been specifically derived to protect T/E salmonids, and have not been consulted on under the ESA, in some cases these standards, or the primary literature from which they were derived, may represent the best available science.

The Task Force will consider two major factors when reviewing the best available scientific data. The first is *data relevance*. The question of whether a pesticide impairs the essential biological requirements of a listed species depends on: 1) the unique biology or life history of the animal in question, and 2) the ecological exposure conditions in the animal's natural habitat. For T/E salmonids, highly relevant toxicological data are derived from studies on anadromous Pacific salmon or their prey species. Also, the studies with the most relevance are those that evaluate the effects of pesticides at exposure concentrations and durations that might be expected in salmonid habitat in Washington State. Finally, highly relevant studies are those that measure biological responses or endpoints that have clear significance for the individual fitness (e.g. the survival or reproductive success) of the listed species.

The second major factor is *data quality*. High quality data are derived from properly controlled studies in the laboratory or field. In addition, high quality studies are reproducible, and they use methods that are clearly defined. Such studies also include a sufficient number of quantitative measurements to allow appropriate statistical analyses. Finally, a high quality study reports a biological response in one or more treatments that is statistically different from the control.

In the context of assessing the potential impact of a pesticide on T/E salmonids, the best *possible* science refers to studies that are highly relevant and also a source of high quality data. In the instances where such studies have been conducted, they will be given priority in determining whether a pesticide application is likely to impact the biological requirements of listed salmonids. More often, the best available science will consist of toxicological studies of intermediate (or even low) relevance or data quality. To the extent possible, adverse effect determinations will be based on the studies that have the highest relevance and data quality.

Category #4: Pesticides detected in surface waters; however, adverse impacts to salmonids or their prey base are unlikely or uncertain at the concentrations detected.

Category #4 contains pesticides that have been detected in Washington State surface water monitoring studies. Pesticides in this category will be divided into two major groups: those with sufficient data available to determine that the concentrations detected do not indicate

an adverse impact on salmonids or their prey base; and those for which insufficient data are available to make a biological effects determination. As with Category #3, new data, (ecotoxicological in this case), will be incorporated into the evaluation process as it becomes available. If new data indicate that a pesticide in Category #4 is having an adverse impact on salmonids, it will be moved to Category #5 (see below). As with the groups in Category #3, the Task Force will further define the Category #4 groups in a Technical Document to follow.

Category #5: Pesticides detected in surface waters at concentrations that are likely to have an adverse impact on salmonids or their prey base.

Category #5 contains pesticides that the Washington State Pesticide/ESA Task Force will recommend for action to WSDA. WSDA will review the recommendation, and when appropriate, enact measures using the state rule-making process to avoid, minimize or mitigate the potential adverse impacts to T/E salmonids from pesticides (see IV. Program Elements, c. WSDA Action).

C. Fluidity

The Task Force intends the pesticide screening process to remain fluid. Therefore, if a pesticide is placed in one category it may not necessarily remain there. The Task Force will incorporate new scientific information into the process as it becomes available. The USFWS and NMFS have developed an interagency policy to provide criteria, establish procedures, and provide guidance to ensure that decisions made by the Services under the authority of the ESA, as amended, represent the best scientific and commercial data available (FR 59, 34271, June 1994). New scientific evidence may indicate that a pesticide should be moved to a different category than it was initially placed.

D. Data Acquisition and Management

The goal of the Task Force is to assess the potential impact of current pesticide use on T/E salmonids in Washington State. To this end, the Task Force has identified a need for increased surface water monitoring that reflects current land use patterns/practices as they relate to salmonid habitat and biology. Using the data available, and potentially new data, the Task Force intends to geographically reference pesticide detections with salmonid habitat information. In order to evaluate pesticide presence in habitat important for T/E salmonids, the Task Force has also highlighted the need for a relational database interfaced with a geographic information system (GIS) to create overlays of salmonid habitat with pesticide detections generated from a focused monitoring effort.

(1) Surface Water Monitoring

In general, the USGS' NAWQA program represents the most intensive surface water monitoring effort in the state. The data generated are part of a nationwide assessment of the water quality in urban and agricultural basins in the United States. The data have undergone strict quality assurance/quality control (QA/QC) and statistical analyses, and represent an accurate snapshot of pesticide concentrations in surface waters. While the data presently available are high quality and geospatially referenced, they lack salmonid-specific spatial and temporal components that are important to the process (i.e., decision matrix). Additionally, the NAWQA sampling sites do not represent many of the combinations of land uses and fish habitats of interest in Washington State. Also, the NAWQA program is not designed to be ongoing in all basins; rather each basin is typically revisited each decade to assess water quality changes. Finally, the earlier NAWQA data sets do not include the entire suite of pesticides currently being analyzed. To assess pesticide usage that may impact T/E salmonids, the Task Force needs key watershed data representative of both specific agricultural and urban pesticide use patterns.

To address the information gap in surface water monitoring, Washington State, with the support of the Task Force, is presently attempting to obtain federal funding to begin a new, expanded USGS-Washington State Surface Water Monitoring Program. This focused program, if funded, will provide a more detailed, ongoing monitoring effort for pesticides in Washington State surface waters. The Task Force has proposed the following five Water Resource Inventory Assessment (WRIA) units or basins for the monitoring program: the Lower Skagit, Lower Yakima, Lower Crab Creek and Walla Walla representing the agricultural basins; and the Cedar-Sammamish representing the urban basin. These agricultural basins contain a comprehensive representation of the various cropping patterns in Washington State. The urban basin characterizes a typical high-density urban use area. Sampling would occur in sub-basins or lower reaches within these WRIA units to meet the goals of the program. By increasing the existing state-wide monitoring efforts it is possible to identify the temporal and spatial distribution of pesticides in Washington's surface waters. The Task Force will also be able to address pesticides that are of interest in Washington that may not be of broad concern nationwide.

(2) Relational Database

A critical step in data management is the establishment of a relational database that links patterns of pesticide application and detection with salmonid presence and habitat. The database will include statewide pesticide use data (where available), data from previous and ongoing pesticide surface water monitoring studies, critical habitat designations, and habitat utilization data for listed fish species. This database will be essential for analyzing the diversity and distribution of pesticides in surface waters and the potential for exposure of salmonids and their habitat in Washington State. By querying the database according to the decision matrix, the Task Force will be able to address the following important management questions with a high degree of certainty:

- ◆ Which pesticides have been detected in habitat currently or historically utilized by salmonids, and at what concentrations?
- ◆ Do pesticides reach levels high enough to cause indirect or direct adverse effects on salmonids?
- ◆ Can mitigation measures, including Best Management Practices (BMPs), be used to limit pesticide transport to surface waters, thereby eliminating the risk that these chemicals pose to salmonids?

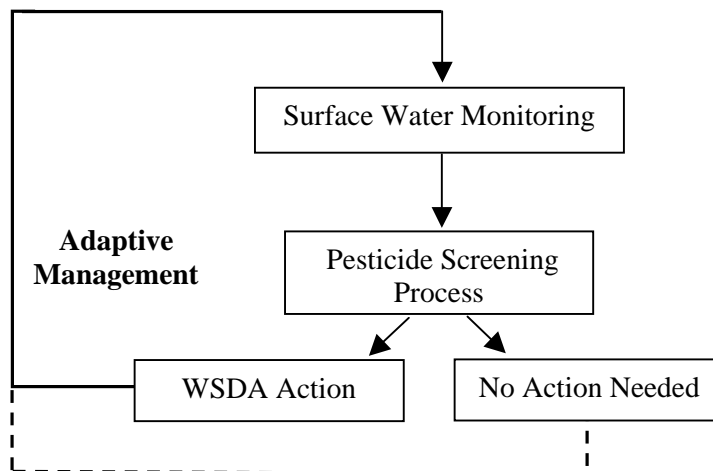
The geospatial database will consist of pesticide detections as well as species and/or habitat data sets which include point location surface water data linked to a GIS. The platform for the pesticide database is currently under consideration. Regardless of the platform the SSHIAP database will be used as the basis for identifying fish presence and population status. SSHIAP, with its link to SaSI, is the most current and comprehensive database of salmonid presence and habitat locations in Washington State.

IV. Program Elements

The proposed Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids contains the following key elements (Figure 3):

- Surface Water Monitoring
- Pesticide Screening Process - Decision Matrix
- WSDA Action
- Adaptive Management

Figure 3. Program Elements



A. Surface Water Monitoring

The Task Force intends to use surface water monitoring data for two functions: (1) to develop an exposure assessment of pesticides in Washington State surface waters to evaluate the potential risk to T/E salmonids, and (2) to measure performance of actions put in place to mitigate/minimize the transport of pesticide to surface waters.

A critical part in developing a pesticide exposure assessment for T/E salmonids is having high quality, GIS-coordinated monitoring data of representative watersheds in Washington State. Initially the Task Force will use available data to assess exposure, but with the limitations mentioned above, the need for additional monitoring data is integral to the success of this program. The Task Force is hopeful that funding will be obtained to enhance pesticide surface water monitoring in Washington State. The Task Force believes that this information will provide a more accurate exposure assessment of pesticides in surface waters that provide habitat for T/E salmonids, and will therefore provide regulatory agencies better information upon which to make decisions.

B. Pesticide Screening Process

The process, i.e., the decision matrix, was designed to identify those pesticides that may adversely impact T/E salmonids. The matrix presently incorporates surface water exposure data and the best available science to assess the potential for adverse effects on salmonids.

The Task Force recognizes a general need for new scientific research that specifically addresses the potential impacts of pesticides on salmonids in Washington State. This research should focus on the direct, sublethal effects of chemicals on salmonid essential behaviors, as well as the effects of pesticides on the abundance of invertebrate prey species in salmonid habitat. It is expected that academic institutions, registrants, local governments, state agencies, and federal research laboratories will or have generated the toxicological data necessary to make conclusions regarding toxicity (lethal and sublethal) of these pesticides. The Task Force will incorporate new scientific information into the pesticide evaluation process (the matrix) as it becomes available.

C. WSDA Action

WSDA has broad statutory authority to act on pesticides. WSDA is the state lead regulatory agency for pesticides, registering all pesticides distributed in Washington State (RCW 15.58.050). Based on the determined impact of a pesticide on T/E salmonid species, the agency could restrict, condition or prohibit the use of a pesticide in specific areas or

statewide by rule. Restrictions may range from timing of application to type of application equipment allowed. The agency also has the authority in RCW 17.21 to license pesticide applicators and/or require licensing for specific types of applications. For violations of either Chapter 17.21 RCW or Chapter 15.58 RCW, the agency has a range of penalties provided in rule ranging from notices of correction to civil penalties, suspension, revocation, or denial of pesticide applicator's or dealer's licenses.

Once the Task Force has made a determination that a pesticide may be a limiting factor for T/E salmonids, it will submit a formal request for action to WSDA. The request will include documentation, as appropriate, to describe the rationale and data to support the Task Force's recommendation. Once the request is received, WSDA will review it to ensure that it has been made in accordance with the process outlined in this document. If the request is in accordance with the approved process, WSDA will make the request and supporting documentation available to the public through the publication of a CR 101 (Pre-Proposal Statement of Inquiry). Filing the CR 101 will initiate a process through which all interested parties will have an opportunity to comment on the request.

While the CR 101 is out for public comment, WSDA will evaluate the mechanism of transport for the particular pesticide to surface waters. This review will include identifying the crop(s) the pesticide is used on, the method and timing of its application, the physical parameters of the environment where it is used, etc. Once that information is compiled, WSDA will develop an avoidance/mitigation/minimization plan to reduce transport of the pesticide to surface waters or to otherwise reduce impacts to T/E salmonids. The mitigation plans may include a wide range of responses, from educational to regulatory. The plans will be specific and made available for public review and comment. WSDA intends to work with the pesticide-user communities to ensure that mitigation measures are consistent with IPM programs and other pest management issues. If WSDA determines that rule making is necessary, it will begin the public rule making process by filing a CR 102 (Notice of Proposed Rule Making).

The key to the success of this effort is the ability of WSDA to act relatively quickly rather than having to wait for the much slower federal process of changing the pesticide label. Additionally, the federal label typically does not address state-specific issues; therefore action by the state is the preferred and customary alternative.

WSDA's involvement in this process is twofold: 1) to provide certainty to growers and other pesticide users, that if a pesticide is identified as a potential problem for T/E salmonids, WSDA will work with the regulated community to affect changes which will avoid/minimize/mitigate salmonid exposure to pesticides while taking into account pest management considerations; and 2) to work with the agencies with responsibility for T/E salmonids to ensure that pesticide use is not a limiting factor for their recovery. WSDA believes that involvement in this process provides a direct avenue for input on ESA/FIFRA/CWA issues that may impact Washington agriculture.

D. Adaptive Management

Success of the proposed program includes an overall adaptive management approach to ensure that mitigation measures are providing the expected benefits. The expanded monitoring program is integral to the success of this approach because it provides the relevant data needed to determine if mitigation measures are working. With this approach, data collected in the future will either validate that actions taken are having the desired effect (i.e., reducing or eliminating pesticide exposure, and therefore risk, to salmonids) in the watersheds; or indicate that additional actions are needed. The Task Force encourages the users and/or registrants of pesticides detected in surface waters to enact voluntary BMPs, educational programs or other mechanisms to inhibit pesticide transport to surface waters in the future. By reducing pesticide transport to surface waters, pesticide exposure and subsequent risk to salmonids, as well as other biological receptors, is avoided, minimized or mitigated. The Task Force has expressed its commitment to retain the fluidity this type of program needs to be successful. Using an adaptive management approach ensures this goal is achieved.

V. Uncertainties

There are several important sources of scientific uncertainty that are not explicitly considered by the pesticide decision matrix. For example, different formulations of the same pesticide active ingredient can vary in their toxicity to fish. Adjuvants that are co-applied with pesticides to aid in their physical dispersal or adherence may also have adverse effects on aquatic life. Despite the potential impact of adjuvants on water quality, the distribution of these chemicals in surface waters is almost completely unknown. Surface water monitoring data are also lacking for degradation products and metabolites of many pesticides, some of which may be more toxic than their respective parent compounds. Due to the limited availability of data for the environmental transport and fate of inert ingredients, adjuvants, and pesticide degradates, these factors are largely excluded from the pesticide evaluation process. However, where such data are available, they will be included in adverse effect determinations.

The toxicity of pesticide mixtures is also a major source of scientific uncertainty. Surface water monitoring studies have shown that current use pesticides often co-occur in surface waters that provide habitat for T/E salmonids. Despite these ecological exposure conditions, the impacts of pesticide mixtures on salmonids or their prey base are very poorly understood. Additive, synergistic, or antagonistic interactions between pesticides may alter the relative toxicity of individual active ingredients. For example, pesticides that belong to the same class and share a common mechanism of action may have additive effects on aquatic organisms. However, the vast majority of the available toxicological data are derived from exposures to single chemicals. Consequently, the Washington State process evaluates each pesticide individually. Where exposure and/or biological effect data

are available for mixtures, the Task Force will incorporate these data into the adverse effect determinations for the individual components of the mixture.

There are also important uncertainties associated with environmental monitoring for pesticides. Surface water monitoring studies have not been conducted for many of the streams, rivers, lakes, and estuaries that provide critical habitat for T/E salmonids in Washington State. Moreover, the monitoring studies that have been conducted have only analyzed a fraction of the active ingredients that are registered in the state. Analytical methods have not been developed for certain pesticides, and in some cases existing detection methods are relatively insensitive. The timing of ambient water quality sampling can also introduce uncertainties, especially if the maximum concentrations that may be associated with post-application conditions are not measured. Consequently, although the Task Force relies on surface water monitoring data to determine ecological exposures in the evaluation process, there are significant gaps in this information. In addition, other exposure pathways (e.g. sediment, groundwater intrusion and diet) may also be important.

The Task Force will rely on the available scientific literature to determine the pesticide's potential to adversely impact aquatic life. However, there are presently major gaps in our scientific understanding of how pesticides interact with the biology of anadromous salmonids. This uncertainty falls into two categories. First, there is limited data that documents the effects of the 750 pesticide active ingredients registered in Washington on aquatic ecosystems and the specific invertebrate prey of T/E salmonids. Second, the scientific studies that have been conducted on fish are largely limited to measures of acute mortality - i.e., the concentrations at which short-term exposures to a pesticide will kill fish outright (LC₅₀). Acute mortality data alone are generally inappropriate for estimating thresholds for sublethal toxicity in salmonids, including effects on essential behavioral patterns (e.g., feeding, spawning, or migration).

Another source of uncertainty arises from changes in pesticide use as a result of registration restrictions/cancellations. The regulatory changes regarding the registrations of azinphos-methyl, chlorpyrifos and diazinon are examples of how changes in federal pesticide labeling can influence applications in Washington State. Close coordination with EPA/Office of Pesticide Programs (OPP) will allow for communication on such changes.

The Task Force recognizes that these issues are relevant to assessing pesticide exposure and subsequent effects to T/E salmonids, and intends to consider new information as it becomes available. At present, however, the major focus will be on those pesticide active ingredients that have been detected in salmonid habitat in Washington State surface waters that may harm T/E salmonids.

VI. Conclusion

The Washington State Pesticide/ESA Task Force is a collaborative effort involving federal and state natural resource and regulatory agencies. Collectively, these agencies oversee various aspects of pesticide registration and use, water quality in the state's river systems and estuaries, and the health and viability of wild salmonids. The agencies also have a shared goal in ensuring that pesticides do not adversely impact the biological requirements of salmonids, and thereby harm T/E salmonids. The principal aim of the Task Force is to provide the agencies with science-based guidance on the exposure to and potential toxicity of pesticides to salmonids and aquatic ecosystems in Washington State.

This White Paper describes a framework that the Task Force will use to evaluate current-use pesticides in the context of T/E salmonids. The process considers pesticide use data (where available), species distributions, surface water exposure information, and scientific studies that address the toxicological effects of pesticides on fish and the aquatic food chain. The decision matrix will use the best available science and is designed to incorporate new scientific information as it becomes available.

The decision matrix does not include a complete technical description of each decision point in the pesticide evaluation process. Several decision criteria have yet to be clarified. For example, for each pesticide, what constitutes a significant application, or significant surface water detection? Which scientific studies should be used to determine whether a pesticide has an adverse impact on salmonids or their prey base? The Task Force intends to solicit public comment on these decision points in the form of public review of an expanded technical document where they will be presented. The Task Force will subsequently use the decision matrix to screen pesticides that are currently registered for distribution in Washington State.

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Appendix B: Policy Statement

National Coordination

This White Paper describes a process for addressing pesticide issues relative to threatened and endangered salmonids. It has been developed by the State of Washington and the regional office of the Environmental Protection Agency in Seattle, Washington, the Western Washington Office of the U.S. Fish and Wildlife Service in Lacey, Washington and the Washington State Offices of the National Marine Fisheries Service. Because this proposal was developed at the regional level it is important that it be recognized by, and coordinated with, the headquarters offices of the federal agencies.

On September 21, 2000 a meeting was held in Lacey, Washington to present the proposal to representatives of the Washington DC offices of the federal agencies; and solicit their support and endorsement prior to moving forward. The outcome of this meeting was support for the process from headquarters staff, subject to review of the completed white paper. Several agreements and commitments were made by the federal agencies on September 21. They are listed below.

- ◆ Each federal agency designated a staff person from their regional or state office and headquarters offices to form an "oversight group" to work with the state process.
- ◆ The US Fish and Wildlife Service and the National Marine Fisheries Service agreed to provide science and research support, as negotiated, recognizing resource constraints.
- ◆ EPA Office of Pesticide Programs agreed to assist the technical team to the best of their ability, recognizing their resource limitations.
- ◆ The Services agreed to address the ESA certainty issues with the state.
- ◆ The National Marine Fisheries Service agreed to internally discuss and resolve the issue of who and how to consult with EPA.
- ◆ It was reiterated that EPA had already designated Washington State as a non-federal representative.
- ◆ State and federal agencies agreed to work together to secure funding necessary to expand the current U.S. Geological Survey NAWQA program to sample for pesticides of concern in selected watersheds.
- ◆ State and federal agencies agreed to work together to secure funding necessary to establish or modify existing data management systems to handle data relative to pesticide use in Washington State, pesticide sampling data and threatened and endangered fish habitat information.

Appendix C: Endangered Species Act Application

Endangered Species Act and its application to the *Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids*.

This appendix describes how the *process* may interact with the Endangered Species Act of 1973, as amended (16 U.S.C. 1536 et seq.) to ensure that salmonid species are protected, as well as to identify how entities could receive ESA “coverage”.

Objectives:

1. Create/maintain incentives for the State of Washington and pesticide users to evaluate pesticides to ensure they are not a limiting factor for the recovery of ESA-listed salmonids.
2. Design a process that may complement EPA’s national Section 7 consultation. *There is a National 7(a)1 Proactive Conservation Review currently under way regarding the pesticide registration and re-registration process.*
3. Provide ESA limitations on take liability for the State of Washington and pesticide users for those pesticides in certain categories, and for those pesticides potentially regulated by the state more stringently than EPA’s label requires.
4. Maintain a collaborative process that is science driven with policy support.
5. As quickly as possible, absolve pesticides that are not limiting recovery of T/E salmonids, mitigate potentially problematic pesticides and resolve uncertainty.

Alternatives evaluated:

The ESA provides three mechanisms to grant incidental take and meet ESA compliance: Section 4(d), Section 7, and Section 10. In both Sections 7 and 10, incidental take would be authorized and permitted. Through the Section 7 mechanism, the US Fish and Wildlife Service and the National Marine Fisheries Service (Services) would evaluate the measures that evolve from this *process* in a biological opinion, and allow incidental take through an incidental take statement included in the opinion. Section 7 would require a nexus through which implementation of the measures by the State and pesticide users would become a Federal Action. In the Section 10 mechanisms, the Services would evaluate a Habitat Conservation Plan (HCP) developed by some non-federal organization, agency, or individual, and issue an incidental take permit to that party. The permit holder would be responsible for ensuring that the measures evolved from this *process* were implemented. Since the HCP creates legally-binding obligations, both the permit holder and the Services would forego some of their ability to modify or rescind its terms. Through Section

4(d), the Services would modify rules that prohibit incidental take and establish through rule-making that pesticides used in accordance with the measures/program that evolve from this *process* would not be a prohibited activity; but rather would be an exemption or limit to the ESA take prohibitions. As with an HCP, some nonfederal entity would need to be responsible for ensuring that the measures were implemented.

In all three mechanisms, both the entity responsible for implementing the measures and the individuals that acted in accord with those measures would be in compliance with the ESA. However, given the uncertainties as to whether a clear Federal nexus exists or which entity/individual would accept responsibility for the general incidental take permit, it appears that Section 4(d) could provide the greatest opportunity for meeting ESA compliance.

Application of a 4(d) rule would benefit pesticide applicators in the form of limitations on the prohibitions against take through compliance with the 4(d) rule for the pesticide *process*. Section 4(d) states in part “Whenever any species is listed as a threatened species...the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species.” The 4(d) rule [50 CFR part 223; FR vol. 65, No. 132, July 10, 2000] issued by the National Marine Fisheries Service (NMFS) notes that EPA has not completed consultation under Section 7 of ESA, and further notes that “...if NMFS finds that a limitation on the prohibition against take for the use of selected pesticides is necessary and advisable for the conservation of listed salmonids, it may amend this rule accordingly.” (FR 42457)

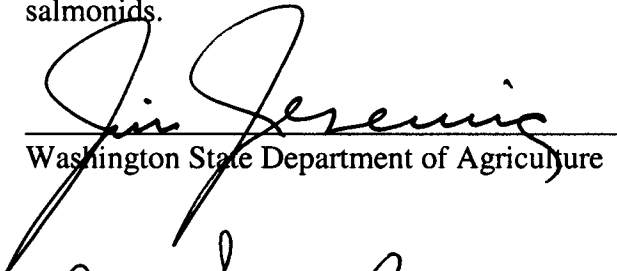
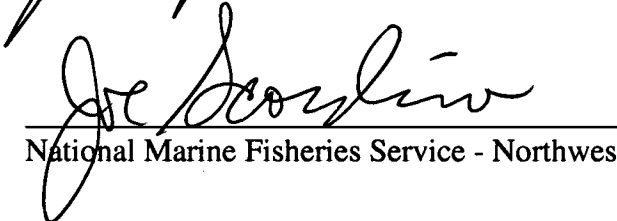

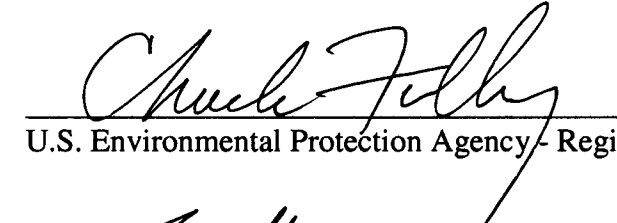



This evaluation process is being designed to facilitate ESA compliance for registered uses of pesticides in Washington State. In addition to identifying those pesticides detected in surface waters which result in an unacceptable level of take of T/E salmonids and hence require coverage, the Task Force will also identify those pesticides that have insignificant or discountable effects and therefore do not require coverage under the ESA. Identifying those pesticides that do not require coverage also ensures compliance with the ESA so that pesticide applicators can be confident that their activities are not precluding recovery of T/E salmonids. Additionally, the Services will be assured that conservation and recovery efforts are not being hampered by exposure of T/E salmonids to certain pesticides.

Thus, the *Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids* describes a *process* for evaluating pesticides that, when approved and implemented, could provide the foundation for a program (i.e., collective measures that are developed through implementing the process) that could achieve ESA compliance.

Regardless of the mechanism deemed most appropriate to meet ESA compliance, a monitoring program to ensure effectiveness of the measures instituted to avoid, minimize or mitigate take will be required. The monitoring program will be designed to track the review process for each chemical, and ground-truth the effectiveness of the pesticide evaluations as well as the mitigation measures implemented. This is necessary to provide the Services with assurances that exposure of salmonids to pesticides is minimized, thereby reducing the potential for adverse effects. By approving the process and participating in its implementation, the Services can with some degree of confidence provide a take limitation for specific categories of pesticides; assuring that the pesticide applicators are in compliance with ESA and reducing the potential for violations of Section 9 of the ESA.

Appendix D: Signature Page

This paper was developed by the Washington State Pesticide/ESA Task Force whose members are listed below. The Task Force is committed to beginning the process described, to more effectively and cooperatively protect threatened and endangered salmonids.

 Washington State Department of Agriculture	<u>9/19/01</u> Date
 National Marine Fisheries Service - Northwest Region	<u>10/4/01</u> Date
 U.S. Fish & Wildlife Service - Pacific Region Acting Regional Director	<u>9/28/01</u> Date
 U.S. Environmental Protection Agency - Region 10	<u>9-24-01</u> Date
 Washington State Department of Ecology	<u>9-21-01</u> Date
 Washington State Department of Natural Resources	<u>9/21/01</u> Date
 Washington State Department of Fish & Wildlife	<u>9/19/2007</u> Date

