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#### **Authors**

Vorass, Melany  
Portele, Gerald J.

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# WASHINGTON STATE DEPARTMENT OF TRANSPORTATION CONTAMINATED SITES AND ENDANGERED SPECIES ACT RISK REDUCTION

Melany Vorass, Senior Hazardous Materials Specialist  
Washington State Department of Transportation, Environmental Affairs Office  
6639 Capitol Blvd S., Tumwater, WA 98501-5592, Phone: 360-570-6658,  
Fax: 360-570-6633, Email: vorassm@wsdot.wa.gov

Gerald J. Portele, Director, Environmental Engineer  
Tetra Tech, Incorporated, 600 University Street, Suite 800  
Seattle, WA 98101-1129, Phone: 206-624-2692,  
Fax: 206-624-3679, Email: portelg@ttemi.com

Abstract: Washington State's regulatory criteria for prioritizing contaminated site cleanups are primarily based on human health risk; risks to Endangered Species Act (ESA)-listed aquatic species are not directly considered. Under existing state regulation, sites considered low priority for cleanup may pose considerable risk to ESA threatened and/or listed fish species. The objective of this project was to create an internal assessment tool for the Washington State Department of Transportation (WSDOT) to assess and prioritize contaminated site risks to ESA listed aquatic species. A three-tiered evaluation process was developed to determine relative potential for contaminated sites to affect ESA-listed fish species. Based on results of an initial screening, a determination was made regarding potential impact to listed fish and/or their habitat. Sites posing potential risk were then ranked in order of priority for remedial action. Tier I evaluated sites for their relative distance to the documented presence of listed fish and their critical habitat; Tier II evaluated the status of hazardous material releases and the potential for contaminants to impact surface water and/or critical habitat areas; Tier III assigned a quantitative site scoring to rank sites based on risk to ESA-listed fish species. Scores range between 0 and 100 with higher values assigned for higher risk sites. A total of 103 sites were evaluated. Of these, 41 were considered to pose potential risk and were assigned quantitative scores. For the 16 sites receiving scores of 75 or above, WSDOT will seek funding to conduct early cleanups. For remaining sites, WSDOT will further assess whether there is sufficient risk to warrant cleanup activities. Because this model has proved useful, WSDOT will continue to use it to measure the agency's ESA risk as it relates to contaminated sites and to support expenditures for conducting further site characterization and cleanup work. Though there remains uncertainty regarding relative toxicity of individual contaminant levels on fish species, this model should prove useful to the regulated community as well as to regulatory agencies in reaching defensible cleanup decisions as they relate to ESA-listed fish.

## Background

In 1999, the National Marine Fisheries Service (NMFS), a part of the National Oceanic and Atmospheric Administration (NOAA), added nine west coast salmon to the federal ESA list. Also in 1999, the U.S. Fish and Wildlife Service (USFWS) listed the Bull Trout as threatened under the ESA. In Washington State, four species of Pacific salmon have been listed by NMFS as threatened or endangered under ESA, including Chinook Salmon (*Oncorhynchus tshawytscha*), Chum Salmon (*Oncorhynchus keta*), Sockeye Salmon (*Oncorhynchus nerka*), and Steelhead (*Oncorhynchus mykiss*). NMFS has also designated Coho Salmon (*Oncorhynchus kisutch*) as a candidate species for listing. In addition, the USFWS proposed that Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*) be listed as a threatened species. The USFWS also listed Bull Trout (*Salvelinus confluentus*) as a threatened species in Washington State.

Currently, hazardous waste sites in Washington are ranked for cleanup priority by the state Department of Ecology (Ecology). Ecology's ranking criteria emphasizes human health risk; risks to ESA-listed fish species are not fully considered. For example, if the only contaminant migration pathway identified is surface water, Ecology will assign a low priority ranking for cleanup action. Sites receiving a low priority ranking may in fact pose substantial risk to listed fish species but often would not undergo cleanup action for many years.

WSDOT currently faces difficulty in acquiring funding to remediate such sites, but retains liability associated with impairing listed fish habitat.

## *Risk Reduction Framework Objectives*

The primary objective of WSDOT's ESA risk reduction effort is to independently assess liabilities associated with impacts to listed fish at sites that are otherwise determined to pose low risk. This paper presents a

decision-making framework developed to prioritize and support WSDOT actions to mitigate impacts to listed fish habitats.

*Summary of Risk Criteria Prioritization Methodology*

The three tiered decision making process developed for this project is illustrated in Figures 1 through 3. The outcome of the decision making process is a determination of the relative potential for a contaminated site to affect listed fish species. For sites that may adversely affect listed fish, ranking criteria are applied to support decisions for further site characterization and/or remedial action.

The Tier I screening process identifies the location of WSDOT sites relative to the documented presence of listed fish and their critical habitat. Sites may be eliminated from further evaluation based on the distance of listed fish/critical habitat relative to the subject site and/or distance from the site to the nearest receiving water body.

Tier II evaluates the status of hazardous material releases from the site and the potential for contaminant migration to adversely affect surface water and other critical habitat. In Tier II, sites may be eliminated from further evaluation based on site specific information pertaining to contaminant release, containment, toxicity, contaminant quantity, and contaminant migration potential.

Sites not eliminated as a result of Tier I or Tier II screenings are assumed to have a potential to adversely affect listed fish and are submitted to a Tier III evaluation. The Tier III evaluation results in a quantitative scoring that ranks potential risk to ESA-listed fish on a relative basis.

The following sections discuss relevant risk criteria and provide prioritization methodology and procedural guidance as necessary to complete the decision making framework established under the Tier I, II, and III processes.

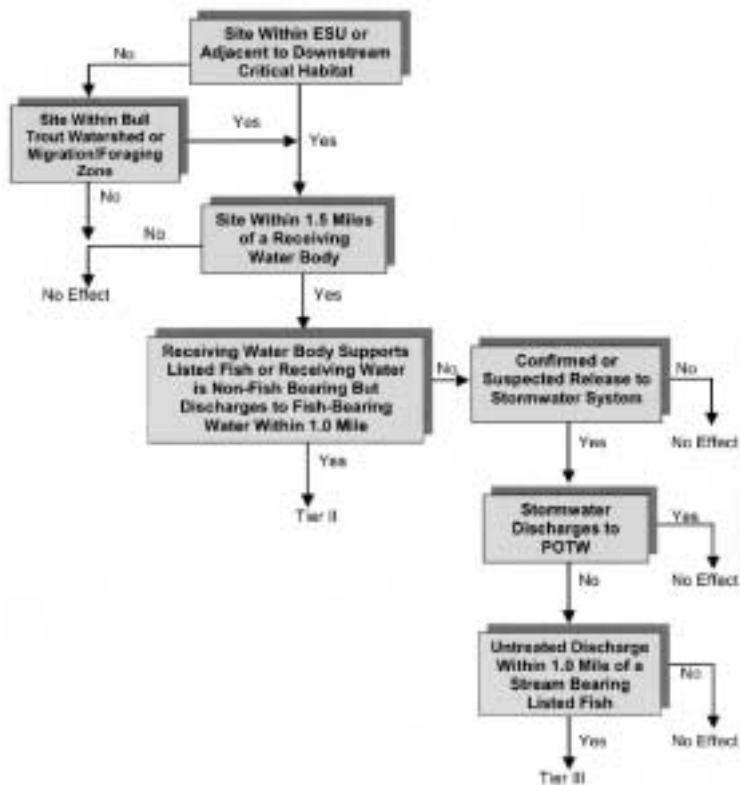


Fig. 1. Tier I Location / Surface Transport Screening

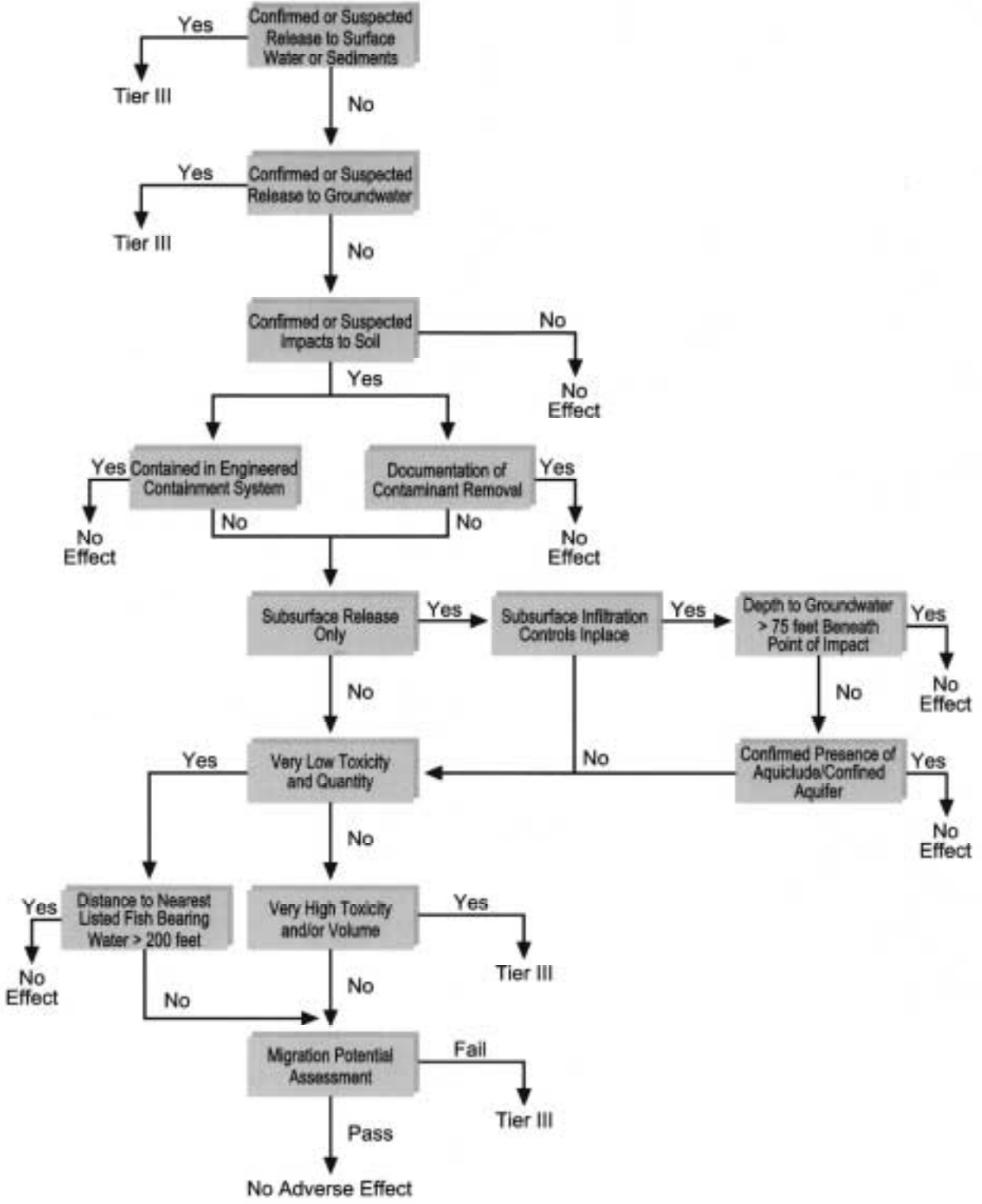


Fig. 2. Tier II Release and Migration Potential

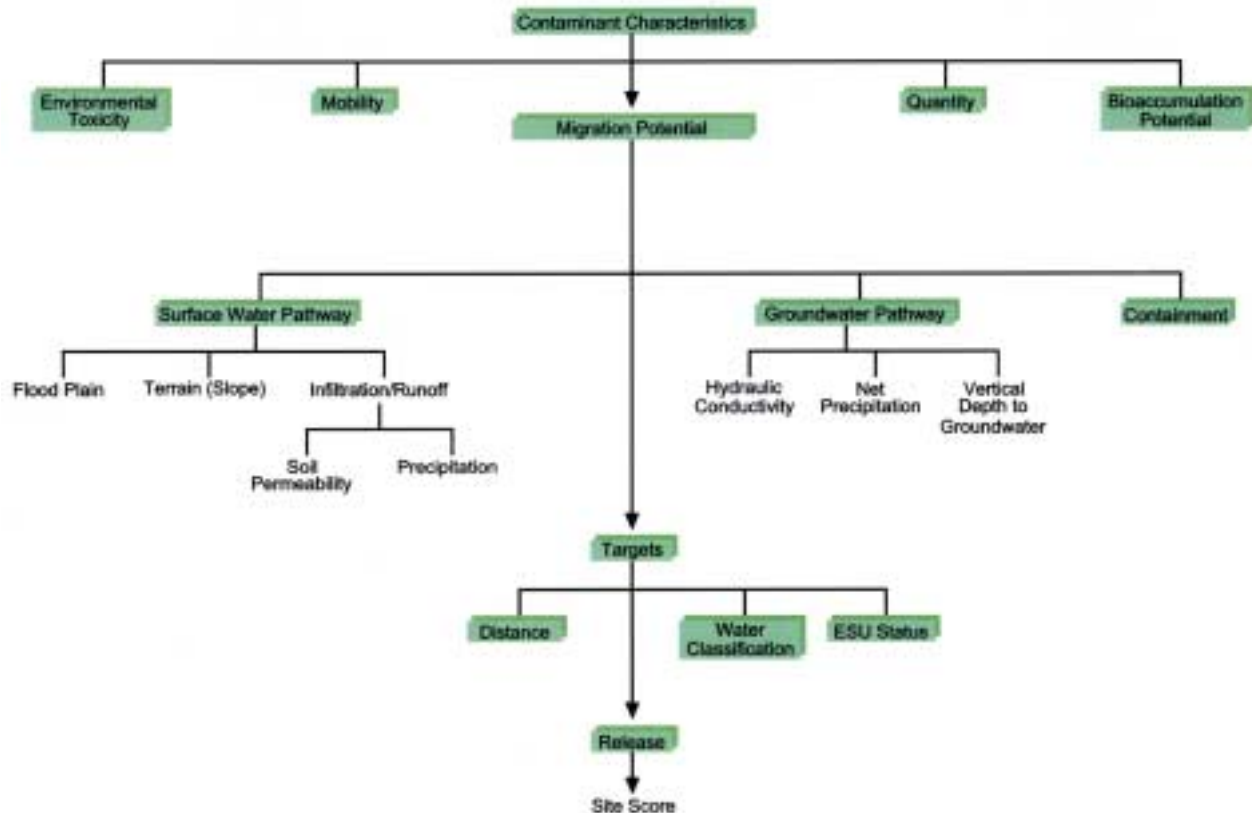


Fig. 3. Tier III Site Hazard Ranking Model

### *TIER I - Location and Surface Water Transport Screening*

The Tier I evaluation focuses on proximity to critical habitat of listed fish species. Generally, a site must be evaluated if it is: 1) within an ESA-defined evolutionarily significant unit (ESU) or its critical habitat; 2) adjacent to a downstream ESU critical habitat; 3) within a Bull Trout watershed; or 4) within a 1.5 mile distance of a Bull Trout migratory/foraging zone.

Sites meeting one or more of the above criteria are further evaluated to determine: 1) whether a receiving water body within 1.5 miles supports or is likely to support listed fish or a critical habitat and/or 2) any releases to stormwater conveyance systems within one mile of a listed fish/critical habitat which would not discharge to a publicly owned treatment works (POTW).

### *TIER II - Release and Migration Potential*

Sites meeting the above criteria are subject to a Tier II evaluation. Tier II further evaluates the potential for contaminants to be released from the site and migrate into water bodies containing listed fish. This evaluation includes a comprehensive review of existing site specific information to: 1) identify confirmed or suspected contaminant release(s) to surface water, sediments, groundwater, and/or soils; 2) evaluate the adequacy of existing containment systems and/or prior contaminant removal actions (if applicable); 3) assess potential subsurface contamination and the occurrence of groundwater; 4) evaluate the toxicity and quantity of existing soil contamination; and 5) perform a contaminant migration potential assessment if necessary.

The Tier II evaluation generally considers the following: contaminant containment or removal; depth to groundwater and any existing infiltration controls; and relative toxicity and quantity of contamination. Depending on the outcome of this general evaluation, a site specific contaminant migration assessment may be required. The contaminant migration assessment examines distance to critical habitat, terrain, soil permeability, precipitation, depth to groundwater, subsurface hydraulic conductivity, and contaminant mobility.

These criteria are given weighted consideration with the final outcome resulting in a site scoring. Sites failing two or more of the scoring criteria are then subjected to a Tier III site hazard ranking.

### *TIER III – Site Hazard Ranking Model*

Facilities or sites to be carried through the Tier III site hazard ranking process are considered to exhibit a potential to adversely affect listed fish or their associated habitats. The Tier III site hazard ranking model establishes a numerical site score as a basis for measuring relative risk. The model is based on Ecology's ranking method (Washington Ranking Method [WARM]), but adds specific emphasis regarding potential impacts to listed fish. The Tier III model includes the following primary site ranking criteria:

- CONTAMINANT CHARACTERISTICS – The assessment of hazardous substance characteristics includes: 1) ecological toxicity, 2) mobility, 3) quantity, and 4) bioaccumulation potential;
- MIGRATION POTENTIAL – The assessment of contaminant migration to surface water via either over land or groundwater flow includes: 1) soil permeability and precipitation, 2) flooding potential, 3) terrain slope, 4) subsurface hydraulic conductivity, 5) vertical depth to groundwater, and 6) containment;
- TARGETS – The target assessment for listed fish and their critical habitat includes: 1) distance to nearest ESA critical habitat, 2) classification of surface water type, and 3) identification of ESA status (e.g., species identified as candidate, threatened, or endangered); and
- CONTAMINANT RELEASE – The release assessment prioritizes documented contaminant release information for sites based on those affected media which reveal the highest potential to affect listed fish species or their habitats (e.g., in order of highest potential: surface water, aquatic sediments, groundwater, and soils).

## Results and Conclusion

### *WSDOT Site Prioritization Results*

A total of 103 contaminated or suspected contaminated sites were subjected to the screening evaluation. Of these sites, a total of 41 were considered to pose potential risk to listed fish and were subjected to the Tier III evaluation and assigned quantitative scores. For the 16 sites receiving scores of 75 or above, WSDOT will seek funding to conduct early cleanups in biennium 2003-2005. For the remaining sites receiving scores below 75, WSDOT will seek funding for the 2003-2005 biennium to conduct additional investigation to confirm whether or not these sites pose sufficient risk to warrant cleanup activities. WSDOT will continue to use this evaluation tool to help measure the agency's ESA risk as it relates to contaminated sites and to support expenditures for conducting further site characterization and cleanup work.

### *Implications for Future Research/Policies*

Though there remains uncertainty regarding relative toxicity of contaminant levels on fish species, this model should prove useful to the regulated community as well as to regulatory agencies in reaching legally defensible cleanup decisions as they relate to ESA listed fish. The decision-making framework will continue to be updated as chemical toxicity and threshold value information develops.

Biographical Sketch: Melany Vorass has eighteen years public sector experience in Washington State including stormwater planning, contaminated site investigation and cleanup, underground storage tank regulation, hazardous waste management, pollution prevention planning and spill prevention and response. She is currently manages the Washington State Department of Transportation's Hazardous Materials Team with statewide responsibility for contaminated site investigation and cleanup, spill prevention/response training and dangerous waste management.

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