SALMON AND STEELHEAD HABITAT LIMITING FACTORS

WATER RESOURCE INVENTORY AREA 16

DOSEWALLIPS-SKOKOMISH BASIN

Hamma Hamma River, Ecology Oblique Photo, 2001

WASHINGTON STATE
CONSERVATION COMMISSION

FINAL REPORT

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ABBREVIATIONS AND ACRONYMS

AIMT	Annual Instantaneous Maximum Temperature
7-DADMT	7-day Average of Daily Maximum Temperature
21-DADT	21-day Average Daily Temperature
BIBI	Benthic Invertebrate Biotic Index
cfs	cubic feet per second
CREP	Conservation Reserve Enhancement Program
Ecology	Washington State Department of Ecology
HCCC	Hood Canal Coordinating Council
HCSEG	Hood Canal Salmon Enhancement Group
JCCD	Jefferson County Conservation District
km	kilometers
LWD	Large Woody Debris
m	meters
MCCD	Mason County Conservation District
Mg/L	Milligrams per Liter
NTU	Nephelometric Turbidity Unit
NWIFC	Northwest Indian Fish Commission
PGST	Port Gamble S'Klallam Tribe
PNPTC	Point No Point Treaty Council
RM	River Mile
SaSI	Salmon and Steelhead Inventory
SASSI	Salmon and Steelhead Stock Inventory
SIT	Skokomish Indian Tribe
SSHEAR	Salmon Screening, Habitat Enhancement and Restoration
SSHIAP	Salmon and Steelhead Habitat Inventory Assessment Project
TAG	Technical Advisory Group
TFW	Timber, Fish and Wildlife
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WCC	Washington Conservation Commission
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resource Inventory Area

EXECUTIVE SUMMARY

Water Resource Inventory Area (WRIA) 16 is located within the eastern slope of the Olympic Mountains in Washington State. The WRIA extends from the Turner Creek watershed in southeast Jefferson County southward to, and including, the Skokomish watershed in northwest Mason County. The four principal watersheds, the Dosewallips, the Duckabush, the Hamma Hamma and the Skokomish, originate in the rugged terrain of the Olympic Mountains and terminate along the western shore of Hood Canal. Numerous smaller independent streams are interspersed between the larger river systems. The region has a temperate, marine climate with wet winters and dry summers with precipitation ranging from approximately 60 inches per year along Hood Canal to approximately 120 inches per year near the headwaters of the major rivers (USFS 1999).

Prior to 1855, the Twana people occupied all of WRIA 16, particularly the mouths of salmon streams and along the shoreline of Hood Canal where they could hunt, fish and gather shellfish and wild plants. Salmon were an important component of the Twana culture and certain ceremonies and rituals were followed when fishing in the rivers. Settlers arrived in the late 1800s and took up homesteads in the floodplains for farming or worked in logging communities in the upper watersheds.

The majority of WRIA 16 watersheds provide spawning and rearing habitats for all species of salmon: chinook, chum, coho, steelhead, and searun cutthroat trout. In addition, sockeye and bull trout are found in the Skokomish watershed. Hood Canal summer chum, Puget Sound chinook and bull trout are federally listed as threatened under the Endangered Species Act. Summer chum are documented in many WRIA 16 streams: Dosewallips River, Duckabush River, Hamma Hamma River, Johns Creek, and Lilliwaup Creek. They were recently extirpated from Finch Creek and the Skokomish River system. By state standards, chinook are considered critical in the west Hood Canal Rivers (Dosewallips, Duckabush and Hamma Hamma) and depressed in the Skokomish River. Coho stocks are healthy in the Duckabush, southwest Hood Canal and the Skokomish watersheds but their status is unknown in the Dosewallips and the Hamma Hamma rivers. Pink salmon are healthy in the Hamma Hamma River but depressed in the Dosewallips and Duckabush rivers. Winter steelhead are depressed throughout the WRIA and the status of summer steelhead is unknown.

The salmonid species found in WRIA 16 utilize specialized habitats at different times for different life stages. Individual species stagger their upstream migration and each has a unique rearing strategy. All species require adequate flow and water quality, ample and stable spawning gravels, instream structure in the form of large woody debris and/or large boulders, pools and a functional riparian zone while inhabiting the riverine system. While coho, chinook and steelhead remain in the freshwater for an extended period of time following fry emergence, pink and chum salmon tend to move directly out into the salt water. Estuarine, salt marsh, eelgrass and shallow water nearshore habitats are critical to all species of juvenile salmonids as they enter the marine environment. Pink

and chum salmon rely heavily on eelgrass beds for feeding and hiding and shallow water for prey avoidance. Studies also show that high salt marsh and estuarine tidal channels are critical habitats for chinook and coho as well.

Human alterations to salmonid habitat can be expected to have various consequences depending on species and life stage. While natural environmental conditions, such as fire, floods and mass wasting events create a disturbance/rebuilding cycle that tends to nourish the aquatic environment, human alterations to the landscape can impact the environment beyond its natural ability to heal and sustain fish resources. Freshwater rearing salmonids are particularly vulnerable to habitat impacts such as elevated water temperatures and dewatering as a result of riparian removal and water extraction, and lack of instream structure such as pool-forming large woody debris. In the marine environment, shoreline alterations, such as bank armoring, over-water structures, and intertidal fill, can disrupt important sediment input from eroding bluffs, alongshore sediment transport, and continuous eelgrass beds that are critical to migrating juvenile salmonids.

Land use activities associated with transportation, shoreline development, forest practices and agriculture have had negative impacts on salmon habitat in WRIA 16. A major impact to the nearshore environment is SR101, which extends north/south along the entire shoreline. The highway acts as a sea dike across the large estuaries, truncating tidal sloughs and distributary channels and impacting smaller estuaries by reducing and/or eliminating tidal influence and estuary function. The highway also interrupts backshore sediment delivery to the marine environment, thereby reducing longshore sediment transport processes that support and sustain the physical character and biological productivity of the upper intertidal habitats. Impacts to the nearshore are further exacerbated by shoreline development that extends into the intertidal area, resulting in elimination or degradation of intertidal and subtidal habitats that provide a wide range of diverse migration, rearing and refuge opportunities for juvenile salmon. These impacts involve the fragmentation of eelgrass beds, interruption of sediment drift and loss of valuable salt marsh and lagoon habitats. The removal of riparian vegetation weakens bank stability which could threaten home sites and often results in bank armoring/protection as well as the invasion of non-native species. Native riparian vegetation also provides an insect food source for juvenile fish, shaded cover from high temperatures in the upper intertidal zone, and woody debris to beaches to help build complex habitat and stability to beach substrate.

Forest practices have also had negative impacts on salmon habitat in WRIA 16. Habitat conditions in the federally owned lands that occur in many of the upper watersheds, managed by the US Park Service and the US Forest Service, are among the best in the WRIA. The Park Service strives to maintain natural habitats through preservation and their conservation measures protect downstream riverine function. The US Forest Service has improved their land management strategy and has adopted a Riparian Reserve Program which provides for well functioning riparian habitat that ensures conifer canopy cover for temperature control, large woody debris recruitment, natural

streambank stability to limit fine sediment input, and migratory corridors for numerous wildlife species. Their management strategy calls for selective thinning to rebuild the health of the watershed rather than clear-cutting remaining forested habitats. This is in contrast to the large clearcuts, numerous roads and often inadequate riparian zones on state-owned and private forest lands. The riparian zone's ability to intercept fine sediments resulting from exposed soils diminishes as the riparian buffers decrease as does large woody debris recruitment. The lower Dosewallips, McDonald, lower Hamma Hamma, lower Lilliwaup, Skokomish mainstem and its tributaries have degraded riparian habitats and consequently poor large woody debris recruitment. In addition to riparian degradation, mass wasting events and the subsequent above-normal delivery of sediments in the Skokomish, lower Duckabush, Schaerer and Johns Creek watersheds have been directly linked to improper forest road construction, maintenance and/or abandonment. Road densities are high in many of the WRIA 16 watersheds, particularly Rocky Brook, lower Hamma Hamma, lower Lilliwaup, many independent streams, and the mainstem Skokomish and its tributaries. The US Forest Service has properly decommissioned many roads in the South Fork Skokomish watershed which decreases road density and reduces the number of potential road failures. Their watershed restoration activities have also included reestablishment of riparian buffers and restoration of instream habitat complexity.

Agriculture activities and residential development within the floodplains of many WRIA 16 watersheds have channelized mainstems and tributaries, drained beaver ponds for livestock grazing, and eliminated forested riparian zones. These activities have degraded valuable juvenile overwintering and rearing habitat associated with beaver ponds, decreased broad channel meanders, eliminated floodplain connectivity to side channel habitats, reduced channel complexity and instream structure, minimized pool/riffle ratios, decreased streambed and streambank stability, and eliminated healthy riparian zones. The Skokomish River is a good example where agriculture activities, such as dike construction, channelization, riparian degradation and large wood removal have contributed to aggradation problems from excessive sediment loads and unstable streambeds and streambanks. The lower Dosewallips, Hamma Hamma, Lilliwaup, and many smaller independent tributaries experience floodplain and estuary degradation from channelization, dike construction, riparian removal and reduced channel complexity.

In order to ensure that salmonid habitats can produce sustainable and harvestable populations into the future, the Technical Advisory Group consistently placed as high priority action recommendations the preservation of properly functioning habitats, particularly estuaries, actively eroding feeder bluffs and riverine riparian corridors. Preservation of critical habitats is a cost effective tool to ensure that properly functioning habitats will remain as such into perpetuity.

When a watershed has been severely impacted and cannot heal itself within a reasonable time frame, habitat restoration may be necessary. Once the source of the problem has been identified, rehabilitation activities can be directed to restore properly function condition. Such activities in the riverine environment might include removal of artificial

barriers to fish passage, reestablishment of a healthy riparian zone, restoration of channel sinuosity and/or complexity, installation of cattle exclusion fences, abatement of mass wasting events, and/or removal of streambank armoring. Restoration activities in the nearshore might include removal of intertidal fill, restoration of lagoon and/or salt marsh connectivity, removal of shoreline armoring and/or removal of estuary constrictions that impede natural function. In some cases, property acquisition may be necessary prior to initiating restoration activities. The Technical Advisory Group identified restoration activities for the majority of the watersheds in WRIA 16 as well as along the entire nearshore environment. The Technical Advisory Group also identified assessments and studies needed to fill data gaps. In some cases, assessments might be necessary prior to beginning preservation or restoration activities.

Protection and restoration activities are only a part of the salmonid habitat equation. Land use regulations and their enforcement must be redirected to protect the valuable fish and wildlife resources that WRIA 16 has to offer. Preventing habitat degradation is a very cost effective tool to ensure sustainable populations of fish and wildlife into the future.

The Habitat Limiting Factors Analysis for WRIA 16 summarizes existing salmonid habitat data and represents the most current compilation and review of riverine and nearshore processes and human-induced impacts to salmon productivity. It does not cover salmonid productivity limited by hydroelectric dams, harvest or hatcheries. Data included or referenced in this report include watershed analysis, formal habitat inventories or studies specifically directed at evaluating fish habitat, salmon stock inventories and assessments, comparison of historic and contemporary mapping and photography, and other watershed data not specifically associated with fish habitat evaluation. Where data are lacking, the Technical Advisory Group (TAG) relied on its combined professional knowledge to assess the extent to which habitat conditions are affecting salmonid productivity. Where data and best professional knowledge are lacking, the habitat elements have been identified as data gaps and warrant additional specific watershed research or evaluation.

The following report is a detailed assessment of habitat limiting factors in WRIA 16. Each watershed assessment is complete with a list of action recommendations for that watershed. The nearshore discussion is followed by a prioritized list of nearshore projects for the entire WRIA. This report provides information that can be used in the development of salmonid habitat protection and restoration strategies. It is a snapshot in time that can be supplemented with additional data from habitat assessments and habitat restoration successes as information becomes available.