

2.2 STRATEGY FOR MULTI-SPECIES SALMONID RECOVERY IN THE GREEN/DUWAMISH WATERSHED:

Unlock the Natural Potential

WRIA 9

**Habitat Limiting Factors and Reconnaissance Report
December 2000**

2.2 STRATEGY

INTRODUCTION

The WRIA 9 technical committee has developed a strategy to help set initial actions for salmonid conservation and recovery in the Green/Duwamish River watershed of WRIA 9*. This strategy is based on the ecological principles discussed in this chapter and the habitat limiting factors discovered to date in WRIA 9. This is the first step to help focus future research, preservation, and restoration activities in the Green/Duwamish watershed.

"In environmental planning and management, it is important to distinguish between strategy and tactics (Bella and Overton 1972). Strategy concerns the comprehensive, large-scale marshaling and allocation of resources, whereas tactics concern local, immediate, and short-term activities. It is critical that tactics be congruent with, and directed by, an overall strategy. It is also necessary that strategy be shaped by the limitations of tactical capabilities."
(Frissell, 1997)

THE STRATEGY

The natural production of anadromous salmonids for the Green/Duwamish River watershed currently is limited to the Middle Green River (RM 64.5 to 32), Lower Green River (RM 32 to 11), and Duwamish River (RM 11 to 0) Subwatersheds, as well as the estuarine and marine waters. Two mainstem dams pose complete upstream barriers and keep anadromous salmonids from migrating to the Upper Green River subwatershed (RM 93+ to 64.5). A key component to realizing the recovery potential of the watershed will be efficient passage at the dams for both adults and juveniles. Efficient passage will dramatically increase available spawning and rearing habitat, especially for coho, steelhead and chinook salmon and possibly result in equal response in juvenile production. Another key component will be having adequate downstream habitat support that allows this potential increase in juveniles to complete their life cycle.

* Not included in this strategy is that portion of WRIA 15 known as Vashon-Maury Island (Vashon-Maury Island is included in WRIA 9 for planning purposes.) and tributaries along the west side of WRIA 9 that feed directly to the Puget Sound. Generally, a paucity of habitat information for the streams of Vashon and Maury Islands precludes an opportunity for an adequate assessment and development of a suitable strategy at this time.

PRECARIOUS STATUS QUO

The Lower Subwatersheds currently produce chinook, steelhead, coho, chum, cutthroat and some sockeye and pink salmon. This habitat must be maximized for the watershed to reach its potential. Some salmon stocks, such as chinook, appear to be stable due to recent escapement estimates yet the habitat has declined severely and steadily in these lower reaches. The dichotomy between apparently stable runs of some salmon vs. the documented habitat degradation has resulted in a precarious existence for naturally produced salmonids. Some of the primary limiting habitat factors (LHF) for each subwatershed and the salmonid species present have been briefly listed below:

MIDDLE GREEN RIVER SUBWATERSHED (RM 64.5. TO 32.0):

MAINSTEM LHFS & IMPACTS

- Dams, revetments, residential and agricultural land use resulting in: water withdrawals, changes in the natural flow regime; sediment starvation and scouring, loss of side channel and other off-channel habitats, loss of riparian habitat functions. Salmon species affected: Chinook, steelhead, coho, chum for spawning, some pink and sockeye. All species (including cutthroat) use for migration and feeding.

TRIBUTARY LHFS AND IMPACTS:

- Residential, agriculture and some urban development resulting in: wetland and riparian function removal and increasing impervious surfaces leading to hydrologic disruption to stream flow, channel degradation and decreased water quality; re-channeling streams and limiting their lateral migration to facilitate roads and protect property; removal of in-channel wood, barriers to migration.

CURRENT SALMONID USE:

- Mostly coho and cutthroat, some chinook, steelhead and chum, a few sockeye.

LOWER GREEN RIVER SUBWATERSHED (RM 32.0 TO 11.0):

MAINSTEM LHFS AND HABITAT IMPACTS

- Urbanization, the 1906 diversion of the White River from the Green River, dam flow manipulation and revetments resulting in: lowering of floodplain and disconnection of off-channel habitats such as sloughs and adjacent wetlands; reduction of instream complexity (wood), pools and riffles; barriers from flood control gates and chronic water quality problems; severely reduced riparian functions.

CURRENT SALMONID USE:

- Upstream and downstream migration and rearing for all species, some chinook salmon and steelhead spawning.

TRIBUTARY LHFS AND IMPACT

- Intense urbanization and infrastructure support: resulting in loss of forest cover and increased impervious surfaces which in turn result in unstable streambed channels and disruption to the natural flow regimes; roads and associated runoff and barriers; Water quality degradation; loss of riparian function; stream channelization for facilitating efficient agriculture and urbanization; non-native plant and aquatic species.

CURRENT SALMONID USE:

- Many tributaries can no longer maintain self sustaining runs, although some coho and cutthroat still use select tributaries. Some of the tributaries, especially near their confluence with the mainstem, may provide important rearing habitat for juvenile salmonids borne in other areas of the watershed.

GREEN/DUWAMISH ESTUARY SUBWATERSHED (11.0 TO 0.0):

MAINSTEM LHFS AND IMPACTS

- Urbanization/industrialization has resulted in: Dredging/channelization and filling 97% of the estuarine mudflats, marshes and forested riparian swamps; the remnant, shortened channel has been simplified and polluted by industry, stormwater and wastewater effluent.

CURRENT SALMONID USE:

- All species migrate, rear, and acclimate in this transitional area between river and marine waters. Juvenile chinook and chum salmon are most dependent on this type of habitat. Small numbers of char adults have been consistently documented to use this reach.

TRIBUTARY LHFS AND IMPACT:

- Aggressive development has made many tributaries inaccessible and inhospitable for salmonids. Most of the small patches of remaining marginal habitat are disconnected and heavily impacted by stormwater-associated flows and poor water quality. Functional riparian areas have been eliminated or fragmented to a few undeveloped areas.

CURRENT SALMONID USE:

- Some cutthroat and coho are observed in a very few streams, most are incapable of producing a self-sustaining run.

WRIA NEARSHORE:

Much of the estuary shoreline has been filled, hardened, or replaced with bulkheads. Extensive areas have been dredged to maintain navigation along piers and within marinas. The supply of beach sediment has been curtailed and water quality problems stemming from upland areas are affecting nearshore habitats. Riparian areas are absent or no longer function to support salmonids in the Green\Duwamish and other Puget Sound watersheds.

CURRENT SALMONID USE:

- Many species of juvenile salmonids, such as chinook, chum and pink salmon, are dependent on the nearshore for rearing prior to their rigorous ocean migration.
- The nearshore also produces important food items for all life stages of salmonids, especially important are the bait fish (i.e., sand lance, surf smelt, and herring) which require this area to spawn.

- The wide geographic scale and severity of the habitat loss implies that the apparent stability of naturally produced salmonid adults, such as chinook, is precarious at best and masked due to hatchery-produced adults that stray onto the spawning grounds. The principal hatchery operation itself is threatened by water quality degradation caused by rapid development in the Soos Creek subbasin upstream from the hatchery. An understanding of the natural production capacity – that is, production minus the contributions of hatcheries - in the existing WRIA 9 fresh and salt-water ecosystems is a priority data gap that is only beginning to be addressed.

UNLOCK THE NATURAL POTENTIAL

To recover salmonids in the face of this precarious status quo, we must unlock the natural potential of the Green/Duwamish watershed, maintain and enhance currently functioning habitat and search for opportunities to increase salmonid survival, especially in the Lower and Duwamish Subwatersheds.

The Upper Subwatershed (RM +93.0 to 64.5) holds the greatest potential for increasing natural salmonid production. Dams have blocked fish access to approximately 106 lineal stream miles and half of the Green-Duwamish River watershed acreage. The Upper Subwatershed contains many reaches of suitable spawning and rearing habitat, especially for chinook, steelhead, coho and cutthroat salmonids. This reach is not pristine, it has been adversely affected by logging, a dam, roads, a railroad, water withdrawals and reservoir flooding. Although, because of the limited range of land use practices and distance from population centers many of the basic habitat forming processes such as sediment transport and flow regimes can be recovered. This subwatershed is also large enough to function as salmonid refugia (Frissel, 1997) that can seed the precarious downstream habitat once efficient passage is provided through the dams. This is particularly important since the Lower Subwatersheds may no longer have the capacity to naturally rebound from disturbance events.

Restoring and reconnecting the Upper Subwatershed through efficient passage at the dams could dramatically increase the number of naturally produced juvenile salmonids. However, success in realizing this potential will depend on the availability of adequate habitats for all life stages. Juveniles from the upper and other subwatersheds will require the nurturing of the Lower

Subwatershed and nearshore to survive. All subwatersheds contribute vital functions necessary to recover naturally produced salmonids.

It will also be important to maintain and enhance existing habitats downstream of the dam to fully recover salmonid stocks. Areas that are currently providing critical functions should be targeted for protection. The Metzler-O'Grady reach (about RM 38 to 40) of the Middle Subwatershed is a good example of this kind of important habitat that is currently supporting naturally spawning chinook, steelhead, chum, some coho and a few sockeye and pink salmon. Other, smaller areas that are currently providing the same critical functions such as off-channel ponds or back-water sloughs should also be preserved or enhanced and noted as a high priority.

The severely modified landscape of the Duwamish and Lower Subwatersheds will make true restoration a challenge. It will be necessary to direct rehabilitation efforts through scientific research and capitalizing on significant habitat opportunities. These areas will be costly to rehabilitate and slow to respond but actions may be necessary to provide critical habitat functions for the survival of salmonids produced in upstream refugia and other areas.

INITIAL SUBWATERSHED ACTIONS

Initial Actions for each subwatershed will vary due to their respective differences in quality and quantity of existing habitats, critical habitat functions and data gaps.

The following set of initial recovery actions are not to be considered a complete suite but instead emphasize the primary method in each area as deduced from our Technical Committee's report. A more complete scientific assessment of habitats and ecological processes will occur in the years ahead, assembling the information needed for a comprehensive salmonid recovery plan in WRIA 9.

UPPER GREEN RIVER SUBWATERSHED:

RESTORE ACCESS: Efficient upstream and downstream passage of all species of adult and juvenile salmonids at Howard Hanson and Tacoma Water diversion dams. Also restore access from the Green River mainstem to tributaries.

PROTECT: critical habitats and habitat forming processes responsible for the natural production of salmonids.

MIDDLE GREEN RIVER SUBWATERSHED:

PROTECT: critical habitats and habitat forming processes responsible for the natural production of salmonids.

ENHANCE/REHABILITATE/MITIGATE: critical interrupted processes including LWD input, flow regimes, and gravel transportation. Restore access from the Green River mainstem to side channels. Enhance habitat and access within tributaries.

Note: The following downstream areas are characterized by a high degree of habitat loss and damage, extensive societal infrastructure, and a lack of information concerning basic salmonid habitat and survival requirements. Consequently, initial recovery actions should focus on filling knowledge gaps. Habitat restoration projects should be managed adaptively through scientific design, subsequent monitoring and making necessary changes.

LOWER GREEN RIVER SUBWATERSHED:

FILL DATA GAPS: through salmonid survival studies of behavior, survival needs, and habitat carrying capacity. Study results should lead to improved rehabilitation designs, clearer priorities for protection and acquisition along with an understanding of watershed natural production capability.

Rehabilitation/mitigation efforts should be based on science and managed adaptively.

PROTECT: habitat currently provides essential habitat or has reasonable potential for enhancement to keep rehabilitation options open while data gaps are being addressed.

GREEN/DUWAMISH ESTUARY SUBWATERSHED:

FILL DATA GAPS: through salmonid survival studies of the same type and for the same purposes already noted above

PROTECT: habitat currently provides essential habitat or has reasonable potential for enhancement to keep rehabilitation options open while data gaps are being addressed.

NEARSHORE:

FILL DATA GAPS: in the same manner as above

PROTECT: as noted above.

REHABILITATE/MITIGATE: critical damaged processes including sediment transport.

PRIORITY

The only over-all priority given at this time is to address the two keys to recovery noted in the opening paragraph: (1) provide efficient passage at the dams (2) initiate salmonid survival research in the lower areas.

STRATEGY SUMMARY

- Two key actions identified as early priorities for conservation of all salmonids in the Green/Duwamish watershed: (1) restoration of efficient upstream and downstream fish passage through the dams; and (2) supporting juvenile rearing in the subbasins below the dams.
- The upper subbasin has the potential to become salmonid refugia, especially for coho, steelhead, chinook, and cutthroat salmonids but must be protected and efficiently accessed.
- The severely degraded lower subbasin and estuary must provide essential ecological functions for salmonids to survive. Initial investigations should be directed at understanding and addressing the limitations these areas have on supporting salmonid juveniles from naturally spawning salmon.