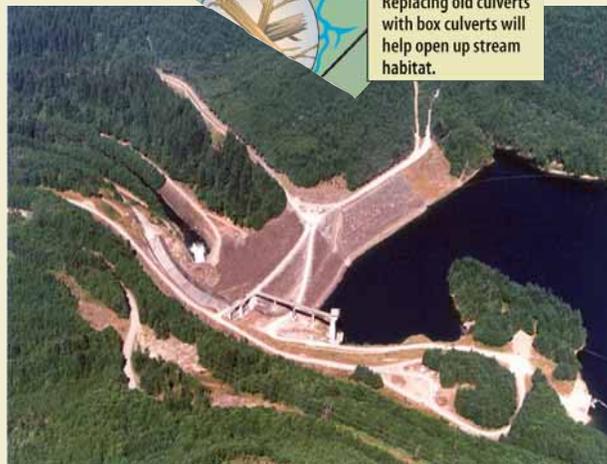


RECOMMENDED POLICIES AND ACTIONS FOR THE UPPER GREEN RIVER SUBWATERSHED

The Upper Green River Subwatershed is an historically significant and currently untapped source of spawning and rearing habitat for Chinook salmon and other salmonids. The subwatershed contains the headwaters of the Green River, and represents about 45% of the Green/Duwamish River watershed area and stream mileage. Chinook access to this subwatershed has been blocked by the Tacoma Headworks diversion dam and the Howard Hanson Dam. The primary land use is commercial forestry. Individual parcels and roads are owned by Tacoma Public Utilities, the U.S. Forest Service, private timber companies, the BNSF Railway, and the Washington State Department of Natural Resources. Although much of the subwatershed contains good habitat, other habitats have been reduced, blocked, and/or degraded by streamside roads and the railroad, through inundation from Howard Hanson Dam's reservoir, and by logging practices. Tacoma Public Utilities and Plum Creek Timber have 50-year Habitat Conservation Plans that require protection of threatened salmonids and other salmonids and their habitat. The U.S. Army Corps of Engineers is



Howard Hanson Dam influences the movement of water, fish, and sediment throughout the watershed.

working closely with Tacoma Public

Utilities to implement the mitigation requirements under the Howard Hanson Dam Additional Water Storage Project, which will open the Upper Green River to anadromous fish access for the first time in nearly a century. (See Chapter 4 for a more detailed description of conditions in the Upper Green River Subwatershed.)

The following portfolio of policies and actions is designed to:

- Facilitate Chinook salmon and bull trout access above Howard Hanson Dam by providing passage upstream (trap and haul) beyond Howard Hanson Dam and the reservoir for adult Chinook and other salmonids and downstream passage for their progeny;
- Remove instream barriers to fish passage (e.g., culverts);
- Protect, restore, and enhance habitat along the Upper Green River mainstem and major tributaries (e.g., North Fork, Smay Creek) by restoring the riparian corridor, increasing channel complexity, and decommissioning logging roads; and
- Protect and restore natural sediment recruitment processes by reducing slides and road-borne sediment.

POLICIES



PROGRAMS



PROJECTS





Policy UG1:

Encourage commitments made between private forest land owners and the U.S. Forest Service to regularly maintain cost-share roads. Maintenance efforts should include goals to add riparian vegetation, replace/improve culverts, restore hillslope stability, prevent new bank armoring and fill, and reduce existing armoring and fill over time. Private forest landowners should coordinate these commitments with their “Road Maintenance and Abandonment Plans” filed with the Washington State Department of Natural Resources.



Policy UG2:

Support forest management and harvest rotation programs that minimize impacts on salmonid habitat while maintaining viable silviculture. Encourage forest landowners to meet (and/or exceed) the requirements of the Forest & Fish Agreement, Habitat Conservation Plans, and other agreements that require protection of salmon habitat.



Policy UG3 Discussion:

BNSF Railway owns and operates railroad tracks that are constricting the Green River in the Upper Green River Subwatershed. WRIA 9 should follow the example of the Puget Sound Nearshore Ecosystem Restoration Project, which developed a Salmon Recovery Funding Board proposal for WRIA 10 in coordination with BNSF Railway.



Policy UG3:

Initiate discussions with the BNSF Railway to identify mutual benefits for railroad operations and salmon habitat.

***FIGURE 7-1: Recommended Upper Green River
Subwatershed Projects***



Program U-1:

Develop a Strategy to Protect and Restore Habitat in the Upper Green River and its Tributaries

Conduct a planning effort to develop a long term, comprehensive approach to protecting and restoring ecosystem processes in the Upper Green River Subwatershed, in particular for river miles 88 through 67. While protecting habitat and habitat-forming processes in this river reach should be considered, the primary goal would be ecosystem process restoration (including for land that is acquired). The purpose is to provide suitable spawning and rearing habitat over time for salmonids that are given access to the Upper Green River Subwatershed (project UG-4).

Identify specific restoration actions on specific sites that would provide incremental, long-term progress toward restoring ecological processes to benefit salmonids consistent with conservation hypotheses and habitat management strategies (see list at the end of this program description). The strategy should incorporate the latest science with information about willing landowners, economic considerations, and overall feasibility and effectiveness evaluations to identify the best locations for habitat projects. The planning effort should complement other plans and programs that are in place in the Upper Green River Subwatershed and therefore must involve Tacoma Public Utilities, U.S. Army Corps of Engineers, U.S. Forest Service, private forestland companies, and King County.

During the development phase of this Habitat Plan, field checks were performed to verify where recommended habitat management strategies could be employed. These areas were given the highest ranking by the Science Panel for their potential value in protecting functioning habitat and/or restoring habitat-forming processes that would benefit salmonids.

One project for restoring channel migration and one for off-channel habitat creation should be chosen as model projects. With monitoring and adaptive management, the following projects could become more cost-effective over time.

LINKAGES

🔗 Conservation Hypotheses Addressed

- *Allowing natural disturbance type flows in unconstrained river channels (All-4)*
- *Preventing new bank/shoreline armoring and fill and removing existing armoring (All-6)*
- *Protecting, restoring, and enhancing habitat along the mainstem and major tributaries (Up-2)*

🔗 Habitat Management Strategies

- *Restore lateral channel migration to create new off-channel habitat*
- *Restore lateral channel migration in areas of the Upper Green where the channel is unnaturally confined and habitat-forming processes are not functioning*

The priority areas for restoring/facilitating channel migration are:

- River miles 88.3 to 77.9 (both banks);
- River miles 77.9 to 76.2 (right bank); and
- River miles 73.5 to 72 (right bank).

The priority area for creating/restoring off-channel habitat is:

- River miles 84.1 to 67.75



Project UG-1:

Revegetation of Sunday Creek 2.75 Miles Up from RM 84.1 (Both Banks)



Sunday Creek showing lack of shade-providing vegetation. July 2003 photo.

LINKAGES

🔗 Conservation Hypotheses Addressed

- *Protecting water quality (All-1)*
- *Protecting and improving riparian vegetation (All-2)*
- *Protecting, restoring, and enhancing habitat along the mainstem and major tributaries (Up-2)*

🔗 Habitat Management Strategies

- *Restore water quality (temperature)*
- *Rehabilitate riparian areas by establishing suitable native vegetation along banks of the mainstem and tributaries*
- *Substitute loss of slow water areas by creating new off-channel habitats and/or placement of large woody debris along banklines*
- *Substitute ecological processes with habitat features*

Project Description

Replant a 2.8-mile stretch along Sunday Creek with small riparian-type shrubs and plants. The planting zone would be 100 feet wide on both sides of the channel. Plants will need to be selected for their small size in order to avoid interference with Bonneville Power Administration power lines. Add more complexity to instream habitat by installing large woody debris (one piece for every two bank widths).

The project site begins near the location where the Bonneville Power Administration power lines cross Sunday Creek, 2.75 miles upstream of the Sunday Creek confluence with the Green River at river mile 84.1. Sunday Creek is located approximately 2.5 miles upstream of the old townsite of Lester. This project would require close coordination with the Bonneville Power Administration.

This is a Green/Duwamish Ecosystem Restoration Project.

Opportunities and Constraints

- Bonneville Power Administration requires that the project use only small plants because they will not interfere with power line operations.
- Sunday Creek will continue to have high temperature problems until an adequate level of riparian vegetation is established.



Project UG-2:
Instream Habitat Improvement Between RM 82 and 73

Project Description

Improve instream channel salmonid habitat between river miles 82 and 73. This project would include placing meander, bar apex, and barb log jams, installing large woody debris, and reconnecting/improving side channels. This area was verified through scientific field checks as a high priority area for improving natural channel morphology to benefit salmonids.

Opportunities and Constraints

- The City of Tacoma will implement this “Additional Water Storage Project” in coordination with the U.S. Army Corps of Engineers.

LINKAGES

🔗 Conservation Hypotheses Addressed

- *Protecting and improving riparian vegetation (All-2)*
- *Protecting, restoring, and enhancing habitat along the mainstem and major tributaries (Up-2)*

🔗 Habitat Management Strategies

- *Substitute ecological process with habitat features (e.g., install large woody debris)*



Project UG-3:
Culvert Replacements in Gale and Boundary Creeks near RM 67



Gale Creek from the culvert crossing. August 1999 photo.

LINKAGES

Conservation Hypotheses Addressed

- *Improving tributary access (All-3)*
- *Protecting, restoring, and enhancing habitat along the mainstem and major tributaries (Up-2)*

Habitat Management Strategies

- *Restore fish passage to tributaries*
- *Substitute habitat features to create pools and collect sediment*

Project Description

Implement the Gale Creek and Boundary Creek culvert replacement projects together to access three miles of spawning and rearing habitat for Chinook and coho salmon, steelhead trout, and possibly bull trout. The mouth of Gale Creek is located near river mile 67. Boundary Creek joins Gale Creek about one mile upstream from the Howard Hanson reservoir. This habitat is accessible from the reservoir. The projects include gravel supplementation to provide suitable spawning material and large woody debris placement in order to create resting pools and trap gravel.

This is a Green/Duwamish Ecosystem Restoration Project.

Opportunities and Constraints

- The City of Tacoma has committed to implementing the Boundary Creek culvert replacement.
- The projects are in the engineering and design stage and are expected to be implemented in 2005.



Project UG-4: *Fish Passage To and From the Upper Green River Subwatershed*

Project Description

To increase spatial structure and genetic diversity of the Green River Chinook population, this action reintroduces Chinook salmon above Howard Hanson Dam through a trap-and-haul system, and provides a facility for safe downstream passage of juvenile salmon. The City of Tacoma completed the upstream fish passage facilities at its Headworks Dam in 2004. The U.S. Army Corps of Engineers is nearing completion of a downstream juvenile fish passage facility at Howard Hanson Dam. Both facilities are anticipated to be operating in tandem within a couple of years, and successful reintroduction is anticipated within the first 10 years of the Habitat Plan.

In the future, possible policy discussions may include:

- 1) Introducing a spring Chinook population into the Upper Green River Subwatershed;
- 2) Isolating the hatchery stock from the Upper Green Chinook population to create a self-sustaining wild Chinook population; and
- 3) Introducing adult Chinook salmon above the Headworks Dam after filtration of Tacoma's water supply.

Opportunities and Constraints

- Under its 50-year Habitat Conservation Plan, Tacoma Public Utilities is committed to operating the upstream fish bypass collection facility and will transport salmonids above Howard Hanson Dam. The U.S. Army Corps of Engineers will operate its downstream fish passage facility at Howard Hanson Dam as part of the "Additional Water Storage Project."
- NOAA Fisheries gave Tacoma Public Utilities a preliminary recommendation in June 2004 to pass upstream all natural and hatchery origin Chinook, coho, sockeye, pink, and chum salmon; cutthroat trout; and natural-origin steelhead. The co-managers will make the final decision on which fish species to transport above Howard Hanson Dam in 2006.



Upstream fish collection facility under construction at Tacoma Headworks. July 2004 photo.

LINKAGES

🔗 Conservation Hypotheses Addressed

- Establishing/restoring Chinook upstream and downstream salmon access past Howard Hanson Dam (Up-1)

🔗 Habitat Management Strategies

- Substitute fish passage for adults and juveniles



Project UG-5:

Restore/Rehabilitate Habitat Through Forest Logging Road Improvements



The Upper Green River Subwatershed has nearly 1,000 miles of logging roads, some of which would be decommissioned. August 2004 photo.

LINKAGES

Conservation Hypotheses Addressed

- Protecting and improving riparian vegetation (All-2)
- Improving tributary access (All-3)
- Protecting, restoring, and enhancing habitat along the mainstem and major tributaries (Up-2)
- Protecting and restoring natural sediment recruitment process (Up-4)

Habitat Management Strategies

- Restore riparian vegetation and forest roads
- Restore hillslope hydrology and stability
- Restore hillslope processes by removing failing/high risk logging roads
- Rehabilitate forest logging roads

Project Description

Support implementation of the U.S. Forest Service/ Washington State Department of Ecology agreement on road maintenance and abandonment. Many hillside roads in the Upper Green River Subwatershed have met or exceeded their life span, lack adequate drainage, and have a high risk of failure in flood conditions. Consequently, the roads would need to be replaced or removed before their failure negatively impacts the mainstem river or stream habitat.

Potential actions would be to restore hillslope processes by removing failing/high-risk logging roads, recontouring and revegetating slopes, restoring natural drainage, and replacing culverts. Potential sponsors are the owners of the roads, namely the timber companies, the U.S. Forest Service, and the Washington State Department of Natural Resources.

Opportunities and Constraints

- The U.S. Forest Service has a Memorandum of Agreement with the Department of Ecology for roads maintenance and abandonment plans, which is in its seventh year of a 15-year process. Fish passage is the first priority followed by decommissioning roads.
- The U.S. Forest Service has already decommissioned eight miles of roads that scored “High” in their risk assessment study. Some funding may be leveraged through the Salmon Recovery Funding Board, as was done in Pierce County. Timber companies in the area (e.g., Plum Creek Timber) may also provide funding towards cost-share roads.
- This project is constrained by joint-ownership in a checkerboard pattern (158 of the 975 miles of roads) and limited funding, so implementation would likely require greater coordination than other types of projects.