

The Green/Duwamish Ecosystem Restoration Study

About the Watershed

The Green/Duwamish watershed comprises 480 square miles of land in western Washington that feeds the Green and Duwamish rivers. It is one of the most productive watersheds in the West. Beginning at its headwaters, it includes the largest farming area remaining in the Seattle region and more than 100 square miles of commercial forest land. The valley floor is home to five growing cities with a combined population of more than 350,000. At its mouth, the estuary is the industrial heart of Seattle and supports one of the largest container ports on the West Coast. Elliott Bay at the mouth of the river is a thriving harbor and the focal point for Seattle's downtown.

What is surprising is that the Green/Duwamish watershed is equally productive as a natural area. Tens of thousands of salmon and trout convene in Elliott Bay and migrate up the river every year to spawn and rear, using miles of good habitat on the mainstem and tributaries. Lakes and wetlands along the river host major populations of migratory and resident birds and other wildlife. Bear, elk, eagles and cougar roam the Cascade foothills and mountain peaks in the headwaters.

What other city in the United States can boast a major salmon-bearing river at its doorstep? While many once could, the salmon and other natural wonders of the Hudson of New York, the Charles of Boston, and

the Potomac of Washington have disappeared as these cities have grown. Today, Seattle and the Green/Duwamish watershed are unique.

The Green/Duwamish could easily go the way of other urban watersheds. Some habitats that are essential to the viability of salmon, including intertidal habitats in the estuary and floodplain habitats along the mainstem, are in critically short supply. Other salmon

habitats, especially along lower river tributaries, are threatened by the rapid growth of valley cities. As with many other Pacific Coast watersheds, the survival of salmon in the Green/Duwamish is no sure thing. Can Seattle and the Green/Duwamish watershed coexist into the future?

In 1995, the US Congress authorized a study to ensure that the Green/Duwamish ecosystem is protected and restored. The Green/Duwamish Ecosystem Restoration Study establishes a strategy to protect and

restore the critical habitat that is needed to keep salmon and other fish and wildlife in the watershed. Led by the US Army Corps of Engineers and King County, the study has engaged a large group of local, state, federal, and tribal agencies and private organizations in data collection, analysis, and development of study findings and recommendations. These findings and recommendations are summarized inside.



Findings of the Ecosystem Restoration Study

The study began with a scientific assessment of historic and current conditions in the watershed to determine restoration needs and priorities. A list of potential restoration projects was then compiled, with many proposals submitted by other agencies, organizations, and Tribes in the watershed. Each project was then evaluated using environmental and economic criteria. The findings of the study are as follows:

1. The resources of the Green/Duwamish watershed are important to the Seattle metropolitan region, the Pacific Northwest, and the Nation as a whole. The watershed is exceptional in a number of ways, particularly in the diversity of salmon and other species, the stable populations of species that are threatened elsewhere in the Pacific Northwest, and the presence of intact habitats in an urban watershed. Given these characteristics, protection of the Green/Duwamish watershed is of regional and national significance.

2. Maintaining salmon runs and other resources will require protection and restoration of key habitat areas. In order for salmon and other fish and wildlife species to thrive, habitat must be available to support all their needs and life stages. Intact habitat areas must be protected. In the many cases in the watershed where habitats are no longer as productive as they need to be in order to sustain salmon and other species, essential habitat areas must be restored.



3. Wherever possible, riverine and watershed processes that form and maintain good habitat should be restored. The form and function of habitat are the result of major physical processes such as the volume and timing of flood events and the transport of sediment. Important habitat-forming processes in the Green/Duwamish watershed have been interrupted through actions such as the operation of Howard Hanson Dam, and certain habitats have become less suitable for salmon and other species. Restoring essential river processes will have more widespread benefits to the ecosystem than simply rebuilding habitats.

4. Initial restoration projects should be concentrated in critical areas of the watershed. Certain areas of the watershed are particularly important to the health of the ecosystem. In the Green/Duwamish watershed, they are (1) the estuary, a vital and threatened link in upstream and downstream salmon migration, (2) the middle mainstem, an area that has the greatest concentration of intact habitats and river processes, and (3) selected tributaries that are vital to salmon spawning and rearing.

5. Protection and restoration of habitat should begin at once. While salmon populations remain viable in the watershed, habitat is still being lost along the tributaries and in the headwaters. If this trend continues, the survival of stocks will be threatened. Aggressive action to protect and restore habitat is needed now in order to avoid the rapid population declines in salmon and other species experienced in other Pacific Northwest watersheds.

Study Recommendations

Based on the findings of the study and extensive consultation with other agencies, organizations, and Tribes, a restoration strategy for the Green/Duwamish watershed has been devised. The strategy includes work on the following seven initiatives.

1. Critical rearing and feeding habitats should be reestablished at key sites in the Duwamish estuary. Riparian and streambank conditions between restoration sites should be restored where opportunities arise. Six estuarine restoration sites are proposed for acquisition and reconstruction in the study.

2. Urban tributaries of the Duwamish and lower Green River that have high potential as productive salmonid habitat should be restored. Other tributaries should be improved as local funding allows. Seven restoration projects on urban tributaries are proposed for construction in the study.

3. Fish passage and habitat values along the leveed portion of the lower Green River (between Auburn and Tukwila) should be improved consistent with flood protection goals in this reach. A program to revegetate and reconfigure levees and add woody debris in this reach is recommended in the study.

4. Productive tributaries such as Soos Creek, Newaukum Creek, and Mill Creek should be protected through acquisition and land use regulations, and disturbed habitats along these tributaries should be restored for salmon spawning and rearing and other fish and wildlife



use. Seven projects on these tributaries are recommended in the study.

5. Channel diversity along the middle Green River should be restored through reestablishment of side channel and floodplain habitats. Eleven side channel and floodplain reconstruction projects are proposed in the study.

6. The two mainstem dams on the upper Green River should be modified in design and operation to allow upstream and downstream migration of salmon and to enhance downstream habitat conditions. The study recommends continuing negotiation with dam operators on passage facilities and dam operations.

7. Habitat conditions in the upper Green River watershed should be improved by restoring unused road corridors and protecting and restoring stream buffers. Continuing consultation with private and federal timber managers is recommended in the study.



Next Steps

Many of the projects recommended in the study are simple to achieve, including acquisition projects and capital improvements with uncomplicated designs. Work on these projects should proceed at once using a combination of federal, local, and private funding sources.

Other projects and major programmatic changes require additional work before they are ready to implement. This will entail detailed environmental and engineering analyses for larger mainstem capital improvements or protracted negotiations for major programmatic changes such as modifications to dam operations. These initiatives should be pursued by continuing federal and local cooperation in the Ecosystem Restoration Study.

Restoring the productivity of this unique ecosystem can't be done cheaply and can't be done overnight, but it can be done. With concerted action now, we can ensure that the sight of salmon migrating in the shadow of downtown Seattle, a unique experience, can be enjoyed by our children and grandchildren.

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