

CHAPTER 11 RECOMMENDATIONS

The purpose of this chapter is to provide a list of recommendations to the North Santiam River Watershed Council regarding the kinds of actions that should be considered as part of the overall effort to assess, improve, protect, and restore watershed health within the Middle and Lower reaches of the North Santiam River watershed. This list is based on data compiled and evaluated as part of the watershed assessment process, presented in Chapters 1 through 8, and summarized in Chapter 9.

The list of recommendations that follows is intended to highlight the most important types of actions needed within the watershed, and the general types of locations where the identified actions should be carried out. It is not intended, however, to provide a blueprint for action items, in part because recommendations are not prioritized, specific locations for actions are not identified, ground-truthing of the feasibility of action item success has not been conducted, and the relative costs and benefits of recommended actions have not been considered. Such issues should be addressed as part of the process of constructing the Action Plan for the watershed, as described briefly below.

The purpose of an Action Plan is to identify specific actions that will help to protect, maintain, and restore watershed function and the health of aquatic and riparian resources. The Action Plan should be based on the mission of the North Santiam River Watershed Council. An appropriate format for this plan would be that of the recently completed Williams Creek Watershed Action Plan (Church 2000). Implementation of this plan will be voluntary, and, if it is to succeed, will be based on cooperative efforts among multiple stakeholders in the watershed, including private landowners; federal, state, and local government agencies; environmental groups; students; and local citizens. The plan will provide a framework and strategy for collaborative efforts. It will illustrate ways in which interested parties can become involved and take positive steps to improve the quality of life within the watershed.

We believe that there should be two primary goals to the Action Plan for the North Santiam River watershed:

- Goal 1 - Evaluate the condition of the watershed, based on information summarized and reported in the Watershed Assessment(s), and on information obtained through on-the-ground evaluation of site conditions and suitability for restoration or protection efforts.

Goal 2 - Develop a Watershed Health Strategy to protect, maintain, and restore watershed functioning and watershed resources.

Primary objectives of the Action Plan might include the following:

1. Evaluate habitat condition (aquatic and riparian), fish distribution, water quality, sediment sources, water use, and hydrology of the watershed and its various subwatersheds in order to develop an understanding of the conditions that affect watershed health
2. Protect intact habitat critical for salmonid recovery
3. Promote cooperation among landowners, government agencies, and local citizens
4. Encourage public participation in restoration efforts and land stewardship
5. Increase awareness and understanding of watershed processes and watershed health.

The Action Plan should be developed by, or with the direct involvement of, the Watershed Council. A major part of the overall effort will be to conduct ground-truthing of specific locations for implementation of particular protection, enhancement, and restoration actions. The Watershed Assessment identifies many of the resources or functions in need of protection or improvement and describes the general location where such actions might be needed, based on available information; the Action Plan should identify the specific locations where the recommended actions should occur, prioritize their importance, and evaluate their feasibility and relative costs and benefits.

The Watershed Health Strategy should be designed to effectively improve the overall health of the North Santiam River Watershed. To achieve this goal, individual projects will be planned to improve watershed conditions which will in some cases be linked to the recovery of salmon, steelhead, and trout. The objective is not only to restore native fish in the watershed, but also to improve overall watershed health, which is reflected in the success of these indicator species.

Successful implementation of the projects identified for the Watershed Health Strategy will connect a range of critical stream habitats needed for the successful spawning and rearing of native fish. Floodplain habitats interact with headwater tributaries of the North Santiam River to create a unique aquatic system ideal for supporting the early life stages of salmonids. However, current and historical limitations in fish passage and habitat quality have greatly reduced the

productivity of this system. For it to again support healthy populations of fish, projects must be designed to secure a well-distributed network of essential habitats.

The Pacific Rivers Council (1996) recommends designing a strategy for fish habitat restoration that takes into account five habitat types: *focal*, *adjunct*, *nodal*, *critical contributing*, and *grubstake* habitats. These terms can be used to compare habitats based on their spatial distribution and importance to native fish. The arrangement of these habitats should be considered when determining where and what types of projects should to be implemented.

Focal habitats are high-quality refuges that foster conditions ideal for the spawning and rearing of salmonids. *Adjunct habitats* are directly adjacent to focal habitats, but they have undergone human or natural disturbances and do not presently support viable fish populations. For example, habitat upstream from a ‘core’ salmonid habitat zone could be limited by poor fish passage and/or low channel complexity. A *nodal habitat* is a biological hot spot spatially separated from focal or adjunct habitats. This might include small tributary streams or pockets of higher quality habitat. These nodal habitats are often a result of wider riparian areas, active side-channels, the presence of large woody debris, and the absence of human disturbances. *Critical contributing areas* do not directly provide habitat for fish, but they are important sources of high-quality water for downstream habitats. Non-fish-bearing tributaries in the watershed can be considered critical contributing areas. These headwater regions contribute to the health of focal, nodal, and adjunct habitats described above. *Grubstake habitats* are heavily disturbed areas of the watershed that were once extremely important to fish productivity. This type of habitat might be difficult to restore due to financial and/or engineering limitations. For example, restoration might be highly problematic due to the close proximity of businesses or residential homes.

These habitat types are useful when determining where certain projects should be implemented. Although we might have a general understanding of their distribution throughout the watershed, we are not able to classify all sites by this system. This is primarily because of our limited knowledge of watershed conditions, especially on private lands. As our understanding improves, we will have a better grasp on how to connect these critical habitats for fish.

In the end, a successful watershed Action Plan must include all aspects of land management and public participation by incorporating protection, restoration, outreach, and monitoring efforts into one comprehensive strategy. To determine the success of this strategy, streams throughout the watershed must be monitored to provide current information about habitat and water quality

conditions. Continuous monitoring of these watershed resources will increase understanding of how land-use practices and natural limiting factors affect habitat and water quality conditions over time. Adequate monitoring is crucial for making wise land management decisions. It is an important tool in evaluating the impacts of those decisions on critical habitats in the watershed. Also, in order to determine the effectiveness of projects developed from the Action Plan, a well-designed monitoring strategy is essential.

The kinds of action items and data gaps that should be addressed by the Action Plan include the following:

General

- Prioritize restoration and watershed management activities in conjunction with development of an Action Plan, based on information in this assessment, other assessment work conducted in the watershed, and appropriate ground-truthing and feasibility evaluation. (Action Item)
- Prioritize for protection, restoration, and enhancement actions, high-quality areas within the study area that have known salmonid use for both spawning and rearing. Focus on areas with sufficient water quality for salmonids (low temperature, low turbidity) and areas with good stream channel characteristics (responsive channel habitat type, good geomorphologic conditions). (Action Item)
- Maintain relationships and contacts among the watershed council; counties; BLM; Forest Service; Oregon Departments of Forestry, Fish and Wildlife, and Environmental Quality; city governments; and private timber owners to keep up-to-date on data collection, further assessment, and restoration activities in the watershed. Periodically update assessment data sets accordingly. (Action Item)

Data

- Use a standardized base map. As a part of this assessment, a series of 1:24,000 base map layers were developed. We recommend that these layers be used as a base map and additional data be maintained at a scale of 1:24,000 or larger (i.e. 1:12,000). All of these layers will relate directly to the USGS 7.5 minute quadrangles which can be used to develop additional data layers and find locations in the field. (Action Item)
- Georeference all field data at a scale of 1:24,000 or better. This can be accomplished by using GPS to record latitude and longitude or by marking the location on the USGS quadrangle maps. (Action Item)

- Maintain data in an accessible location and format. Most data should be maintained in a GIS format and updated annually. Some coverages will be updated periodically by the agency that created the coverage (i.e. salmonid distribution data from ODFW). These data sets should be kept current in the database. (Action Item)
- Collect additional data in priority areas. Information provided in this document allows the user to select strategic locations for data collection based on features such as channel habitat type, known salmonid distribution, and water quality conditions. (Data Gap)
- Evaluate the GIS data layers. Several of the data sets used to develop this assessment need to be evaluated and compared to on-the-ground conditions before restoration actions are taken or final conclusions are made about ecosystem processes. Layers that need further evaluation or updating include:

Wetlands

National Wetlands Inventory (NWI) data were not available digitally for the entire area and so were used only in the areas of digital coverage. Additional wetland data were derived from the Oregon Natural Heritage Program (ONHP) at a finer scale. As additional wetlands data become more readily available in digital format, this coverage should be updated. Wetlands categories should be field verified before restoration actions occur. (Data Gap)

Roads

The roads coverage is a key coverage used to evaluate potential sediment sources and changes in watershed hydrology associated with road construction. However, most roads in this watershed are private, and data on road type and condition are generally unavailable. The data that are available may not accurately represent on-the-ground conditions in this watershed. (Data Gap)

Channel Habitat Types

Channel habitat types were determined using GIS. Limited field verification of these data suggest that the data accurately represent actual on-the-ground conditions (through visual comparison). However, the channel habitat type should be further verified in the field before they are used as a basis for determining where restoration actions should occur. (Data Gap)

Riparian Vegetation and Shade

Riparian conditions need to be further evaluated before restoration actions occur. A visual comparison of field checks to the aerial photo interpretations found the data to be fairly consistent. After preliminary selection of sites for riparian restoration, the stream reaches identified should be field checked for actual on-the-ground conditions. (Data Gap)

- Refine the land use layer. Continue to develop the land use layer to reflect changes in land use. (Data Gap)

Fisheries

- Work with ODFW to identify focal, adjunct, and nodal habitat areas for sensitive salmonid species. These data will be critical in developing watershed enhancement strategies. (Action Item)
- Identify and survey areas currently used by salmonids. Collect stream survey data according to ODFW protocols. These data will help identify habitat limitations and areas that may provide good habitat but are currently blocked by a barrier. (Data Gap)

Aquatic Habitats

- Field verify the channel habitat type GIS data layer. Some field observations have already been made and visually compared to the layers. (Action Item)
- Field verify the riparian GIS data layers. Some data have already been collected and visually compared to the layers. (Action Item)
- Areas of good habitat should be identified and protected. This should include an analysis of the watershed upstream from identified good habitat areas to locate potential problems that could result in future degradation to high-quality habitat. (Data Gap)
- Where feasible, habitat should be improved through the creation of off-channel winter refugia and introduction of LWD. Efforts should focus first on locations where the target fish species are known to be present and other habitat conditions are favorable. (Action Item)
- Long-term monitoring in the watershed is needed to evaluate changes in habitat and system productivity for juvenile salmonids through time. One approach might be to select representative reaches in upper, mid, and lower sections of the major subwatersheds as monitoring sites. Parameters to monitor would need to be carefully selected to provide the most information with the least expenditure of time and money. (Data Gap)
- Prioritize stream reaches for restoration of riparian vegetation. Start in areas currently used by salmonids and lacking in LWD recruitment potential, good shade conditions, or in-stream LWD. (Action Item)
- Plant riparian conifers and native species in areas lacking LWD recruitment potential. Start in areas of known salmonid use, and use the riparian vegetation map provided with this assessment and ODFW stream surveys to identify candidate reaches. Before any reaches are targeted for planting, they should be field verified for suitability and actual conditions. Vegetation planting should use native species and mimic comparable undisturbed sites. (Action Item)

- Develop a riparian fencing strategy to maintain riparian vegetation. (Action Item)
- Complete a culvert survey of all culverts that have not been evaluated for fish passage. Data should be maintained in a GIS. The road/stream crossing coverage is a good place to start. The culvert survey should begin in priority subwatersheds at the mouth of each of the tributary streams. Establish priorities for culvert replacement. (Data Gap)
- Replace priority culverts identified in the culvert survey. (Action Item)
- Install fish passages at known fish passage barriers that are caused by human influences. (Action Item)
- Prioritize for restoration, creation, or maintenance, palustrine wetlands that are connected to streams and provide back water rearing areas for salmonids. Start in areas with known salmonid rearing and spawning habitat. (Action Item)
- Identify and protect high-quality floodplain vegetative communities. (Data Gap)
- Restore floodplain vegetation in priority lowland restoration areas. (Action Item)
- Identify locations of channel modifications and disturbances, especially along the mainstem river. (Data Gap)
- Identify and map the locations of dikes along the mainstem river. (Data Gap)
- Evaluate the risks and benefits of removing existing riprap along the river bank to increase floodplain infiltration and improve wetland habitat connectedness. (Action Item)

Hydrology and Water Use

- Update and refine the roads layer. Keep in contact with federal, state, and county land managers and private land owners as the roads layer is updated to evaluate its accuracy. (Data Gap)
- Develop an outreach program to encourage water conservation. Educate the public about dewatering effects and how water conservation will help salmonids in the watersheds. (Action Item)
- Identify water rights that are not currently in use and that may be available for in-stream water rights through leasing or conversion. (Data Gap)

Sediment

- Identify roads that have not been surveyed for current conditions and fill these data gaps. Work with BLM and ODF to develop appropriate road survey methodologies. (Data Gap)
- Map road failures in areas where data are lacking. Coordinate with watershed stakeholders that are currently collecting road data such as BLM and private timber companies. Develop a strategy to fill in the data gaps. (Data Gap)
- Map culvert locations and conditions in conjunction with the culvert survey conducted for fish passage barriers. Check with ODF, ODFW, BLM and local foresters for the best methodologies and data to collect. (Data Gap)
- Map debris flows and landslides. Begin in the areas most susceptible to landslide activity. (Data Gap)
- Where possible, conduct road restoration activities such as road reconstruction, decommissioning, and obliteration. (Action Item)
- Replace undersized culverts that are at risk of washing out. Prioritize these culverts from the culvert surveys. (Action Item)

Water Quality

- Continue water quality monitoring efforts for fecal coliform bacteria, total suspended solids, nutrients, and organic contaminants. (Data Gap)
- Develop a systematic water quality monitoring program for areas with high priority for restoration activity. Focus the water quality monitoring on constituents that are important for the specific area being restored. Use the water quality data to evaluate restoration project success and refine the restoration plans. (Data Gap)
- Develop or expand the continuous temperature monitoring network with monitors at strategically located points such as the mouths of tributary streams, locations of known spawning beds, at the interface between major land use types, or downstream of activities with the potential to influence water temperature. (Data Gap)
- Begin to develop the capacity within the watershed council to conduct high quality, long term water quality monitoring to document the success of restoration activities. (Data Gap)
- Locate and map potential sources of nitrogen, phosphorus, and bacteria in the watershed. (Data Gap)

- Conduct water quality monitoring activities according to established guidelines such as those published by the Oregon Plan for Salmon and Watersheds. (Data Gap)
- Cooperate with DEQ and other agencies to share data and expertise. Coordinate the council's monitoring activities with those of the agencies, including DEQ's efforts to develop Total Maximum Daily Loads for water quality limited stream segments. (Action Item)
- Educate the public about the historic function of the river and its floodplains. Most people are not aware of the "way things were" before settlement in the Willamette Valley. If the public understood the reasons why the floodplains are so fertile and how floods formerly shaped the landscape, floodplain management measures might become more acceptable. (Action Item)