

Luckiamute/Ash Creek Study

10 RECOMMENDATIONS

10.1 Working toward an Action Plan

This watershed assessment sets the stage for prioritizing and planning restoration and monitoring activities in the Luckiamute / Ash Creek watersheds.

Using existing data, we have characterized the natural resources of the watershed and identified ecological connections between important watershed components. The first step in developing an action plan is to decide what role data will play in managing watershed resources.

In this assessment we have seen that, in some cases, our understanding of study area features do not mesh with key data sets. This is the case with the importance of large wood in streams and perspectives on log jams, with the importance of oak savannas and data sets depicting pre-settlement vegetation. Often, our perceptions are based on incomplete or anecdotal information. We recommend using objective, quantitative methods (*i.e.*, a scientific approach) to assess resources and measure change.

10.2 A Strategy for Data and GIS

We recommend that the Luckiamute Watershed Council make the decision to adopt a data-driven assessment and monitoring strategy. We recommend that the GIS built as part of this assessment take a central role in action planning. This can be accomplished by following these steps: (1) before

undertaking any restoration or monitoring action, the watershed council should query the GIS to determine what is known about the area for which actions are planned; (2) field work or monitoring should be conducted so that data collected are added into the GIS; and (3) all data from all actions should be entered into the GIS in a timely fashion so that future actions can benefit from what has accomplished. This will insure that the data housed within the GIS becomes an integral part of the action planning process.

We also recommend that council members take the time to familiarize themselves with GIS and the data contained therein.

The Watershed Council should also develop standard data guidelines. These guidelines should be incorporated into future contracts and data gathering activities. For example, we recommend that all data be collect at a spatial scale of 1:24,000 or better. We recommend that global positioning systems (GPS) be used whenever possible to record the locations of features and observations. We also recommend that data be collected using standardized collection methodologies (or that methodologies be fully documented) and kept with collected data.

This assessment has identified key data gaps. To fill those data gaps, we recommend collecting data to answer specific questions, which often includes developing an experimental design, rather than simply collection numbers in the field. For example, water quality can



Luckiamute/Ash Creek Study

be assessed upstream and downstream of a particular land use or discharge pipe. Measurements could be made at predetermined times. Analysis of the data would then tell whether the land use or discharge affected water quality. In contrast, sending volunteers out into the watershed to collect pH, dissolved oxygen concentration and temperature (for example) at irregular intervals and widely spaced locations will not lead to a better understanding of watershed processes or effectiveness of restoration actions.

The next step is to plan specific actions in specific places in the watershed and to determine how effective the Council's actions are at achieving their goals. We recommend establishing general goals to guide action planning. We also recommend using the GIS to ask specific questions about specific places in the watershed, selecting sites where observations will be made, collecting the data, entering the data into the GIS, and then using the GIS draw conclusions.

Finally, we recommend that the Watershed Council learn more about the various initiatives in the state to develop spatial models, *e.g.*, temperature models, habitat suitability models, water quality models, and water quantity. We recommend that data be collected to help these efforts. Recognize that the data developed by the Watershed Council are valuable. We recommend that the LWC coordinator be contacted before any of the data are distributed from this assessment (this will insure that restricted data sets are not re-distributed). We also recommend that data users sign a data use agreement so

that the LWC is credited with data generation.

10.3 Filling Key Data Gaps

We recommend that the LWC develop a more accurate roads layer from USGS topographic maps and other sources. The first step would be to contact parties that may have more complete roads layers (*e.g.*, private timber companies, county governments). These data could then be used to develop detailed coverages for specific areas. We recommend that data layers contain data of uniform spatial scale produced using similar methods.

We recommend detailed ownership information (*e.g.*, tax lots) be incorporated into the project GIS. Since most of the watershed is privately owned, it is reasonable to assume that restoration and monitoring activities will occur on private lands with willing land owners. Detailed ownership data would help to identify restoration and monitoring sites.

The following sections identify specific actions that are recommended to the Council. We recommend that the council prioritize this according to their goals and objectives. Lists in each of the following sections are in decreasing order of importance.

Suggested Analyses / Recommendations from Section 6

We recommend that first order streams be evaluated for shade and for the potential to deliver large wood to the stream networks. Areas that may be important to stream recruitment of



Luckiamute/Ash Creek Study

wood should be identified. This can be accomplished using the DOQs or through field surveys.

We recommend that LWC inventory streams. Areas where channels have been modified or are eroding should be mapped. This can be accomplished through a standardized field survey procedure. We recommend that the LWC map areas where stream banks are eroding as part of its future monitoring program (see Table 35). Photographs should be taken and locations recorded using a USGS topographic map or a GPS, and entered into the project GIS. We recommend that existing log jams be mapped. This can be accomplished using digital orthoquads or through field surveys. For field surveys, land owners can be contacted and stream walked to record log jams and other stream channel elements (*i.e.*, riprap, boat launches, bridge supports, *etc.*). Comment fields from Aquatic Habitat Inventory data can be queried for observations of AHI field crews.

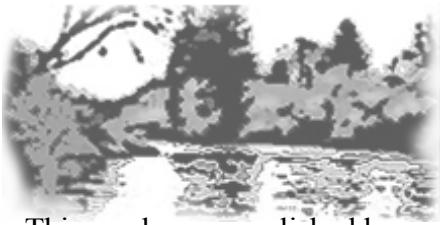
Establish a water quality monitoring program. Decide what variables are to be measured, the frequency of the observations and the locations to be monitored (using GIS) to answer specific questions. To start, we recommend that water quality locations be established on 303(d) stream reaches. As previously mentioned, consider establishing paired monitoring locations upstream and downstream of suspected problem areas (*e.g.*, land use, discharge pipes) or within areas draining sub-basins representing particular land uses. Stream

temperature is important in the study area. We recommend that LWC use the available water temperature data at the stream reach and basin planning scale to prioritize project sites. It is difficult to use temperature data alone. Consider developing a water temperature model. We recommend that LWC check on ODEQ's work in developing temperature models in the region.

Consider adding stream gauging stations, weather stations and rainfall gages to the monitoring program to improve knowledge of water availability.

Evaluate areas that impact peak flows and sediment delivery to streams. In this assessment, we identified areas where roads could potentially contribute to peak flows and sediment loads. We recommend that the areas identified in Tables 32, 33, and 34 be evaluated for mechanisms to keep water and sediments from entering the stream networks. This can be accomplished by increasing watershed water storage through the use of vegetated buffer strips or detention ponds.

We have also identified areas adjacent to streams lack vegetation. We recommend that floodplain areas be evaluated for wetland restoration and riparian planting areas. Preference could be given to those areas occurring on hydric soils. In any case, one of the most widespread problems in the study area is the lack of connection between floodplains and the stream network.



Luckiamute/Ash Creek Study

This can be accomplished by undertaking actions that decrease water velocities in the stream channels (increasing channel roughness) and minimizing the amplitude of peak flows. Floodplain restoration of wetlands, mentioned above, would also tend to reconnect floodplains. In addition, land cover could also be managed to increase watershed water storage by decreasing the amount of impervious cover and fostering mature vegetation. We also recommend that 7th Field HUCs be evaluated for debris flow hazard risk when planning for large wood source areas and in-stream restoration projects. Land cover can also be evaluated on those areas prone to flow to evaluate potential for large wood recruitment to the stream network.

We recommend that reservoirs be inventoried. This can be accomplished using that lat/longs provided in this report. In any case, field observation or use of DOQs could be used to verify location, measure size, and evaluate the potential for water quality problems. Many larger reservoirs can be sources of water of poor quality (*i.e.*, low oxygen concentration, nutrient enriched, and sites of harmful algae). These sites may be targeted for water quality monitoring. These reservoirs should be checked to see if they have dams present that could block fish passage.

A springs layer should be developed. All spring sites provided in this report need to be verified through field visits (in cooperation with willing land

owners) and that the condition of the springs be recorded. Ownership of springs should also be recorded.

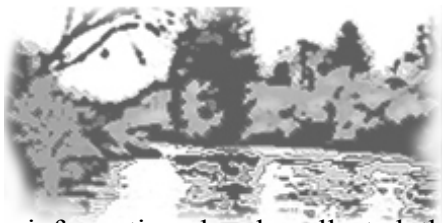
We recommend that the Watermaster be contacted before POD data are used for detailed planning purposes. The Watermaster should also be contacted before the well withdrawal data are used for planning purposes: the data need to be carefully reviewed.

We recommend that the EPA web site be checked again in the future and discharge permits be carefully monitored. In addition, the location of discharge pipes into receiving waterways should be verified and photographed. Consider situation water quality monitoring stations upstream and downstream of selected discharge points.

We recommend that local watershed groups work towards increasing awareness of nonpoint pollution sources, and take action to reduce these pollution sources. Examples of actions that can reduce pollutants entering streams from surface water runoff include riparian fencing, riparian plantings, grazing management and pasture rotation, and education for responsible pesticide use.

We recommend that LWC keep abreast of and participate in the TMDL process. Information collected in the Luckiamute watershed is already being used in TMDL development.

We recommend the development of a GIS-based hydrologic model. A tool can be developed, which builds on



Luckiamute/Ash Creek Study

information already collected, that will link land use and water quality.

Should the LWC action planning involve the long-term protection of water rights, we recommend that they contact the Oregon Water Trust (www.owt.org) for more information on their programs.

10.4 Recommendations from Section 7

We recommend that LWC ground truth the riparian vegetation layer created in this assessment. The GIS layer can be adjusted accordingly.

The Watershed Council identified oak savannas as a priority community type for management and inventory. We provided maps to be ground checked to the watershed council as part of this assessment. We recommend that the locations on the maps be visited and observations recorded and that oak forests be separated from 'true' oak savannas. These observations should be entered into GIS. Observations can then be used to refine current locations of oak savannas.

It was not the intention of this analysis to select individual sites for restoration or monitoring. However, much of the data necessary to prioritize sites is contained in the GIS delivered as part of this assessment. We recommend that when it comes time to prioritize sites, the floodplain, riparian, soils, and wildlife WSR grids be used. The DOQs can also be used to evaluate and map future monitoring and restoration sites. Since the DOQ photographs are already

georeferenced, new information can be entered into the LWC GIS by locating sites on the DOQs.

We recommend that the Polk Co. plant species check list be compared to noxious weed lists and a master list of weeds present in Polk Co. be generated. Once identified, information on the location of weedy species observations can then be tracked using the LWC GIS and a suitable management plan be developed.

10.5 Recommendations from Section 8

Several surrogate or stand-in data sets were generated as part of this assessment because better data sets were not available. We highly recommend that DEM-derived data sets be field checked or that the analyses be re-run if better data sets become available. We recommend that, to the extent possible, the DEM-derived stream gradient, confinement, can channel typing be field checked. We also recommend that these data be used to prioritize monitoring and restoration locations. For example, using GIS all low gradient unconfined streams could be identified. These areas could then be surveyed for spawning gravel or identified for riparian planting projects.

We recommend that LWC acquire and review all existing culvert data. If these data continue to be unavailable, we recommend that LWC undertake a culvert survey. LWC could locate and map culverts on main roads or use a simple GIS model to predict where culverts are likely to occur.



Luckiamute/Ash Creek Study

Although there are no ‘official’ core salmonid population areas recognized in the Luckiamute / Ash Creek study area, we recommend that the LWC compile a list of hotspots from local biologists and persons familiar with the area. These areas can be entered into the GIS and be used to prioritize monitoring and restoration sites.

10.6 Recommended Analyses and Mapping Exercises

The list below represents data that would have been useful in completing this assessment, if they were available. Future questions asked by the Council may include some of these exercises.

- Map active floodplains and wetland areas.
 - Collect data from landowners on flood frequency, areas of inundation, alternate stream channels and backwater wetlands.
 - Map areas of dynamic (frequently changing) stream channels.
 - Map locations where streams are entrenched.
 - Map locations of exposed bedrock along streams.
 - Map locations of algal blooms, indicators of nutrient enrichment and low dissolved oxygen concentration.
- Use the results of this report to prioritize areas in which AHI surveys need to be conducted or updated. To improve spatial accuracy of AHI surveys, measure habitat unit lengths with hip chains from landmarks that are visible on the DOQ photographs or the USGS topographic base maps. Use GPS if possible. Calibrate observers to maximize spatial accuracy. Ensure that data are quickly processed and incorporated into the MCWC GIS at an appropriate spatial scale.
 - Map the locations of exotic plants.
 - Map the locations of beaver dams. Review the AHI data for locations of beaver dams and beaver activity (in the AHI comment columns). Consider beaver dam locations when planning riparian plantings, especially conifers.
 - Work with ODFW and others to develop reliable estimates of the populations and distribution (including fish limit maps) for species of concern, such as salmon, lamprey, and mussels. Volunteers can be used to expand agency surveys provided that established protocols are followed. The lack of data on the distribution and abundance of aquatic organisms is a major impediment to developing a successful watershed enhancement strategy.
 - Design data collection strategies that include biological sampling. For example, water quality



Luckiamute/Ash Creek Study

monitoring data should include sampling for benthic macroinvertebrates, which can be good indicators of water quality and environmental change.

➤ Map physical and behavioral barriers to fish passage. Culvert data should be collected from county, state and private timber groups. Information describing the diameter, drop of outfall, pool below, gradient, road condition, and ditch conditions should be organized for each culvert. Consider following ODFW and ODF culvert survey guidelines if new surveys are to be conducted. When developing a water quality monitoring plan, consider stream reaches where high water temperature and low dissolved oxygen concentrations may act as a fish barrier.

➤ Map areas where there are buildings in the riparian zone and determine if monitoring is warranted at that location; educate landowner about water quality.

➤ Verify mapped points of water diversions.

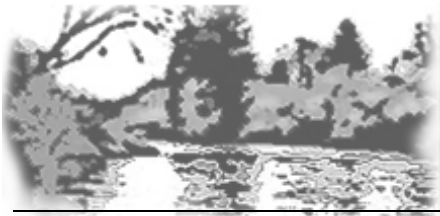
➤ Map (or verify) spring and well locations.

➤ Document areas of ground water shortages and water quality problems from well logs.

➤ Map water table level. Subsurface water flow entering streams may help to maintain cool

water temperatures necessary for good salmonid habitat.

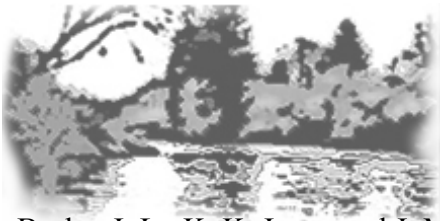
➤ Map locations of potential water contamination sources, *i.e.*, underground storage tanks and agricultural chemical storage areas.



Luckiamute/Ash Creek Study

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Luckiamute/Ash Creek Study

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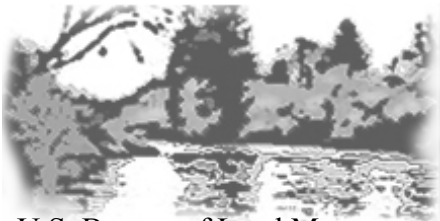
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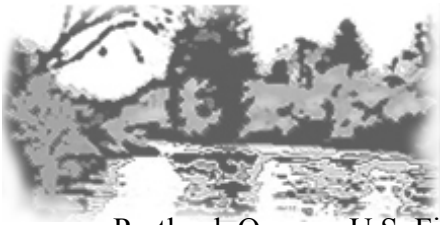
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Luckiamute/Ash Creek Study

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