Lower Coast Fork Willamette River
Oregon
Watershed Assessment

Chapter 4 Channel Habitat Types

4.1 Introduction

Identifying channel habitat types (CHT) was a primary task in the assessment process. Knowing the distribution and location of CHT in the watershed will allow the Council to better understand stream channel responses to land use activities and help identify areas with the best potential for stream and riparian restoration projects. A channel habitat type (CHT) is defined by three factors; stream gradient, stream size and channel confinement. Stream gradients tend to be highest near headwaters and lowest along valley floors where the land is flatter. Stream size depends on the amount of stream flow, which generally corresponds to the amount of land draining into the stream at a given point. Channel confinement is the degree to which a stream can move within its floodplain. Stream segments that run through steep sided valleys or canyons are more confined since the stream's ability to flood out of its banks and carve a new channel is restricted. When the valley is wider a stream has more opportunity to flood out of its banks and carve new channels across the floodplain. An exception is when streams in broad valleys have been channelized to prevent them from flooding or meandering. In this case a stream segment is confined by human modification as opposed to natural features of the landscape. **Table 4-1** describes and map figure 22 displays the CHT that have been identified in this watershed.

Table 4-1 Channel Habitat Types

Code	Channel Habitat Type	Gradient	Channel Confinement	Stream Size	Sensitivity
FP1	Low gradient large floodplain	<1%	Unconfined	Large	High
FP2	Low gradient medium floodplain	<2%	Unconfined	Medium to Large	High
FP3	Low gradient small floodplain	<2%	Unconfined	Small to Medium	High
AF	Alluvial Fan	1-5%	Variable	Small to Medium	High
LM	Low Gradient Moderately Confined	<2%	Moderately Confined	Variable	High
MM	Moderate Gradient Moderately Confined	2-4%	Moderately Confined	Variable	High
MC	Moderate Gradient Confined	2-4%	Confined	Variable	Medium
MV	Moderately Steep Narrow Valley	3-10%	Confined	Small to Medium	Medium
SV	Steep Narrow Valley	8-16%	Confined	Small	Low

VH	Very Steep Headwater	>16%	Confined	Small	Low

There are two reasons for identifying and mapping CHT. First, CHT allow us to identify sensitive channel segments that may warrant special attention and protection. A highly sensitive channel is more responsive to changes in peak flows, removal or addition of in-stream wood, stream bank modifications and inputs of sediment. The channel may respond to these changes by altering its pattern, location, width, depth and sediment deposition (Watershed Professionals Network 1999). Natural processes and/or land use activities can cause these changes. For example, land use that creates hard or non-vegetated surfaces can lead to more overland runoff, which creates higher stream flows during storm events and may result in stream bed scouring. The placement of rip-rap to stabilize stream banks can change erosion patterns downstream. Human activities that add sediment to the stream can damage stream habitat by filling in pools and spawning gravel and making the channel shallower, which causes the stream to heat up faster in the summertime.

Secondly, identifying CHT enable us to identify how different types of channels may respond to restoration efforts. Often, channels with medium to high sensitivity will show the most response to restoration. It should be noted however, that this method of predicting restoration response has not been tested in the LCFW watershed and field surveys and assessments by local professionals are necessary before determining if a site is appropriate for restoration.

4.2 Methods

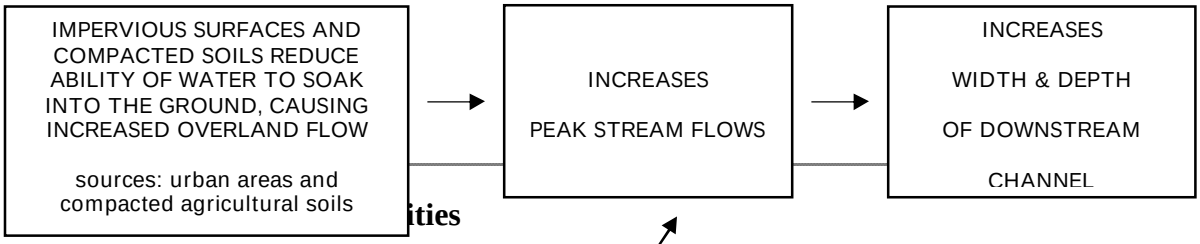
All stream segments that were present on our 1:24,000 USGS topographic base-map were classified with a CHT. Stream segments that were not present at this scale were not classified. The first step in classifying CHT was to divide each stream into segments according to stream gradient and size. Contour lines on the base map were used to determine gradients and the Oregon Department of Forestry classifications were used to determine stream size. The second step in determining CHT was to classify confinement for each segment. An initial determination was made based on valley steepness and channel sinuosity. Field checking enabled us to determine how accurate our map classifications of confinement were.

In general, classifications based on the map agreed well with our field classifications, especially in steep to moderately steep parts of the watershed. However, along the bottom of broad valleys it was more difficult to determine stream confinement. This is because agricultural and urban developments have modified many of these channels in order to prevent streams from meandering or coming out of their banks. Confinement of the larger streams is obvious since banks have been reinforced by levees and rip-rap. However, some of the smaller streams, especially in agricultural areas, may flood during the winter, which means they are not completely confined within their banks and thus have opportunity to meander. Due to time constraints and private property rights it was not possible to field check every stream segment in these areas for evidence of flooding.

4.3 Results

The Channel Habitat Type and Stream Restoration Sensitivity maps for the LCFW watershed (map figures 22 & 23) shows the distribution of channels with low, moderate, and high sensitivity. Note the relationship between topography and channel sensitivity: where streams are coming out of the mountains through steep, narrow valleys the sensitivity is low; in the low, broad valleys where streams have more opportunity to meander and flood the sensitivity is medium or high. The distribution of medium and high sensitivity channels is important to consider in relation to land use. The areas with the most sensitive channels correspond with areas primarily used for agriculture, rural residents and cities. The following diagram, table 4-2, illustrates how land use activities in these areas can impact sensitive channels.

Table 4-2 Impacts of Land Use Activities on Stream Channel Habitat



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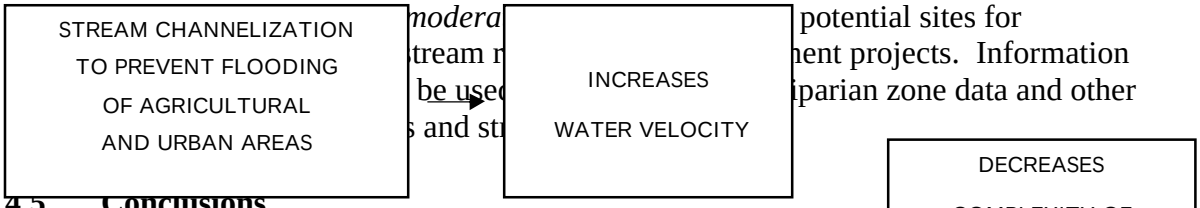
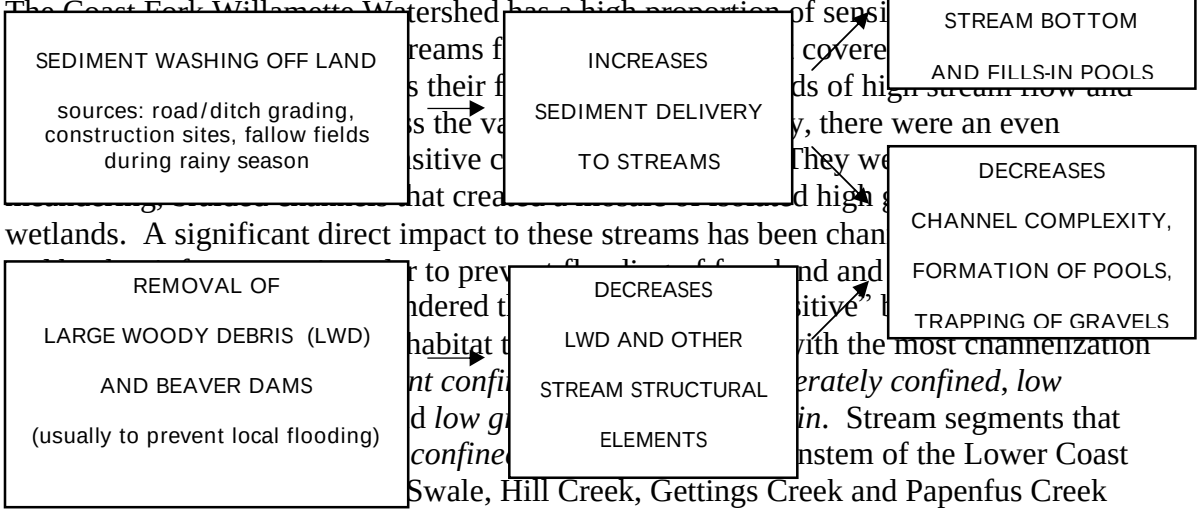
Stream segments identified as *low gradient small floodplain*, *low gradient moderately* *modera* potential sites for stream r ment projects. Information be use iparian zone data and other s and st



4.5 Conclusions

The Coast Fork Willamette Watershed has a high proportion of sensi reams f covere s their f ds of high stream flow and s the va y, there were an even sitive c They we hat creat d high g wetlands. A significant direct impact to these streams has been chan r to prev nd and ndered t itive" h habitat t ith the most channelization *nt confi erately confined*, *low* d *low g in*. Stream segments that *confine* nstem of the Lower Coast Swale, Hill Creek, Gettings Creek and Papenfus Creek which were *low gradient medium or large flood plain* before they were channelized.



Despite the loss or alteration of many streams there still is opportunity to restore or protect sensitive channels. Channels that have become less sensitive due to human

alteration may still have high potential for restoration because they still have the underlying valley and stream size that determined their sensitivity historically. Stream segments that are also candidates for riparian or wetland restoration are a good focus for council efforts since restoration would meet multiple objectives and have a higher probability of success. However, because the land along the bottom of the valley is developed and highly valued for farming, finding landowners interested in actively restoring channels will be a significant challenge.

Below is a list of land management practices and restoration activities that council members may wish to consider for protecting riparian habitat and sensitive channels:

- Protect riparian zones from livestock grazing.
- Protect riparian zones from residential and urban development
- Replant riparian zones with native grasses, shrubs and/or trees, particularly in areas that show signs of instability, and in all areas that have a high potential for success
- Reintroduce flooding along some stream segments
- Where possible, allow streams to meander
- Avoid creating impervious surfaces
- Minimize human caused sediment from washing into streams
- Do not remove large woody debris from stream banks or channels