

FINAL DRAFT

January 5th, 2000

WATERSHED COUNCIL RIPARIAN COMMITTEE Prioritization of Stream Restoration Projects, Tualatin Watershed

Goal: To create a scientifically supportable and defensible stream reach ranking system to prioritize stream restoration projects in the Tualatin River watershed. The criteria used for a ranking system must be obtainable, measurable, and meaningful.

Purpose: This document is a tool to be used during the ranking procedure. Definitions, assumptions, and directions for the stream reach prioritization matrix need to be fully understood to produce repeatable and objective data.

DEFINITIONS

GENERAL DEFINITIONS

Stream Restoration – Recovery of streams and associated riparian areas to a more naturally functioning self-sustaining system, hydrologically, morphologically, and biologically. Various techniques used to replicate the hydrological, morphological, and ecological features that have been lost in a stream due to urbanization, farming, or other disturbances.

Stream Reach – A section of a stream with similar characteristics including geomorphology, gradient, valley form, valley width, and flow.

Riparian Zone – The natural and potential area on each side of a stream as determined by plant species and hydrology.

In-stream Zone – The stream area incorporating the stream banks to ordinary high water, substrate, debris, and other objects in a stream

Stream Corridor – The longitudinal pathway that includes the stream channel, riparian zone, and floodplain of a stream. This narrow and long ecological landscape serves many functions for wildlife movement.

Habitat – The area or environment in which a plant or animal lives or grows, described by physical, chemical, and biotic characteristics. Typically, habitat describes the local area of an environment.

Diversity – The abundance of different animal or plant species or habitat types in a given location.

Morphology – The physical structure and pattern of a stream created by natural processes: hydrological, physical, and geological. Dynamic equilibrium between these forces determines the stability of a stream system. Erosion and sediment deposition are two of the major contributors to stream morphology.

Reference Site – A healthy self-sustaining stream system that can be used as a model for other stream restoration projects. A reference site can help set a goal, provide a blueprint for stream restoration techniques, and help managers to evaluate the success of a project.

Salmonid Migration – Travel patterns to and from the ocean for anadromous salmonids. Anadromous salmonids require certain stream conditions for moving to the ocean for their adult stage as well as traveling back to natal headwaters for spawning: no fish barriers, sufficient flow and water depth, and water quality.

CRITERIA DEFINITIONS

Anadromous Fish – Fish that are spawned and reared in freshwater, migrate to the ocean for the adult stage, and then later return to freshwater for spawning (Chinook, Coho, and Steelhead).

Salmonid Spawning – The release and fertilization of eggs, which begins the new life cycle of the fish. Salmonid spawning requires properly sized substrates and cool, well oxygenated water

Salmonid Rearing – The early developmental stages of anadromous salmonids. Rearing salmonids require specific habitat types during their early life stages. These habitat requirements vary seasonally and among species. In general, habitat requirements include pools with cover, riffle areas, and good spatial heterogeneity.

Resident Fish – Fish that are spawned, reared, and developed in freshwater and do not migrate to the ocean for the adult stage. All stages of the life cycle for these fish are in freshwater (Cutthroat trout).

303(d) List – Section 303(d) of the 1972 Federal Clean Water Act requires that the Department of Environmental Quality must develop a list of all waters in the state Oregon that do not meet water quality standards, exceed narrative standards, evidence of beneficial use impairment, or indicate a declining trend in water quality such that it would exceed a standard prior to the next listing. The parameters listed in the 303(d) list are: aquatic weeds and algae, bacteria, biological criteria, chlorophyll-a, dissolved oxygen, habitat modification, flow modification, nutrients, pH, temperature, sedimentation, total dissolved gas, toxins, and turbidity.

Temperature – Water temperature is an important parameter for salmonids. Spawning, rearing, and migration are all affected by high water temperatures. The preferred water temperature of 50-55 °F is ideal for salmonid habitat. Even though spawning is most susceptible to high water temperatures, the rearing habitat will be the focus due to the warmer time of year when rearing is occurring. Spawning typically occurs during the cooler winter months when water temperature is not a major factor. Water temperatures during the summer months (rearing season) and 303(d) listings will determine the criteria value.

Accelerated Erosion – Severe detachment of soil particles that result in an excessive quantity of suspended load and sediment deposition. Accelerated erosion is caused by direct human impacts such as channelization, in-stream removal of bed material, deforestation and vegetation removal in riparian zone, and soil exposure from overgrazing and agricultural practices. Symptoms of accelerated erosion may include turbid waters, extreme total suspended solids concentrations, deep exposed stream banks, extreme bank scouring, entrenchment, and sediment deposition.

Riparian Quality – The quality of the riparian zone is dependent on width, canopy cover over the body of water, naturally functioning plant community, density, spatial heterogeneity, connectivity to other ecosystems, and overall productivity.

Potential Anadromous Fish – A stream reach that has potential anadromous fish use if a human-made barrier is removed or altered to allow fish passage.

Wildlife Corridor – Wildlife Corridor – A linear habitat whose primary function is to connect two or more significant habitat areas. Corridors provide the following benefits: a) allow animals to travel, migrate and meet mates; b) facilitate dispersal of native plants; c) decrease the risk of wildlife in-breeding; c) allow wildlife to escape pollution and other environmental stresses; d) allow wildlife to re-colonize areas from which they have been eliminated. For the purposes of the Riparian Restoration Matrix, a “significant habitat” is:

- Any upland area devoid of significant human activity with contiguous predominantly native woody vegetation with mean length greater than 1320 feet and mean width greater than 1320 feet , or
- Any contiguous wetland area devoid of significant human activity with mean length greater than 660 feet and mean width greater than 660 feet.

A “corridor” is defined here as any strip of predominantly native woody vegetation or native wetland vegetation that:

- Connects two or more significant habitats that are less than 2 miles apart, and
- Is at least 35 feet wide, and
- Is devoid of significant human activity, busy roads, railroads or other human structures that would significantly reduce animal migration.

Corridors must *connect* two or more significant habitats. A reach of a stream that is *part* of one large habitat is not a corridor and would receive 0 points for this criterion.

ADDITIONAL CRITERIA INFORMATION

Predominant Land-use – Document the dominant land-use around the stream site: agricultural (Ag), urban (Ur), or forested (Fo).

High Visibility – Document whether or not the stream reach is an important political site where there is a high public attention for the restoration, either yes or no.

Fish Barriers – Document if there are impassible fish barriers downstream from restoration site, either yes or no.

Stream Classification – Use Dave Rosgen’s or other stream classification systems to identify stream type. The stream classifications Systems look at stream channel, entrenchment, width/depth ratio, sinuosity, slope, channel material, etc...

Metadata – Document all of the sources of data for each criteria for each stream reach. Include name of source, date of the document, location or department of data source, and any other helpful information.

IMPORTANT ASSUMPTIONS

1. Anadromous Fish Locations– for the purpose of this stream reach prioritization matrix, it is assumed that most tributaries and stream reaches in the Tualatin River watershed downstream of natural barriers historically supported populations of anadromous fish. Historical, potential, current, and confirmed fish existence are factors in the matrix.
2. Fish Habitat Rating – the three primary habitat functions that a stream provides for anadromous fish are spawning, rearing, and migration (see definitions). For the purpose of this stream reach prioritization matrix, it is assumed that spawning habitat is the most important habitat function to be restored followed by rearing and migratory habitat respectively.
3. Restoration Target Species – all fish species in a stream reach will benefit from stream restoration projects. However, the stream reach prioritization matrix places more of an emphasis on anadromous species utilization (primarily steelhead trout and Chinook salmon) than resident species. However, cutthroat trout utilization is included in the stream reach prioritization matrix, restoration process, and goals.
4. Criteria for Matrix – Measurable physical parameters and social statistics will be separate in the ranking process. Physical criteria are rated individually then summed and normalized to generate a quantitative ranking system while social/political parameters document verbal qualitative comments for future references and general information purposes.

5. 303 (d) Listings – Just because a stream reach is not on the list, it will not be assumed that the stream is fully functional. It is important not to assume positive stream conditions due to lack of documentation.
 6. Overall Rating of Streams – the higher the overall rating, the higher priority for stream restoration.
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