Long Tom Watershed Council
Methods for 10-year Action Plan
March 15, 2010

Introduction

This document is intended to accompany the LTWC 10 year Action Plan. Components of the Long Tom Watershed Council's 10 Year Action Plan include:

- GIS layers with data tables created by Jim Reed, PhD, LTWC staff, Ed Alverson
- Conceptual model created in conjuction with Robert at BEF and LTWC Technical Team
- Matrix of Strategies and Ecological Uplift created by LTWC Staff and Technical Team
- Vision created by LTWC staff and Steering Committee
- Tables created by LTWC staff to summarize calculations from GIS analysis
- Yearly work plans in agreement with Meyer Memorial Trust and BEF.

This document provides further information in support of the GIS layers and maps primarily. The 10 year Action Plan is a dynamic document, and the confidence of the estimates are indicated after each section below. LTWC aims to complete all estimates with a confidence level 4 or higher (out of 5 possible) by end 2012.

Barrier Removal or Replacement Projects

Methodology

275 culverts were surveyed for their fish passage status by the LTWC in 2009. A protocol designed by the Bureau of Land Management Salem District was used to rate each crossing as either "Red," "Green," or "Grey". "Red" means that the culvert was impassable to juvenile salmonids at the time of the survey, "green" means that the culvert was passable to juvenile salmonids at the time of the survey, and "grey" means that the culvert needs to be analyzed using FishXing, software produced by the USFS to model streamflow at culverts to determine their fish passability. To prioritize the barriers, LTWC staff met with Becky Flitcroft (USFS Pacific Northwest Research Station Fisheries Biologist) to prioritize drainages within the Long Tom Watershed to enhance fish passage at barrier culverts. The following criteria were used to make this determination:

- **Relative water quality** - Utilizing the Council's water quality monitoring data, drainages were selected for fish passage enhancement that had relatively low summer water temperatures and comparatively high macroinvertebrate community scores. Usually, these two parameters mirrored each other. For more information

about the water quality monitoring data see the Council's report entitled *Stream Health and Water Quality in the Long Tom Watershed, 1999-2006*.

- **Relative density of fish passage barrier culverts** - Drainages were selected that have comparatively few fish passage barrier culverts with the goal of creating relatively large areas of barrier-free stream networks as quickly and economically as possible.
- **Amount of habitat upstream** – Once the above parameters were used to select the target drainages and their 43 barriers (35 in model subwatersheds and the rest in *Upper Long Tom and Elk Creek*), the relative amount of habitat upstream of each of the barriers was used to sort the barriers into two tiers. This parameter was used to split barrier culverts within the priority drainages into 2 tiers. "Tier 1" barriers have relatively large amounts of habitat upstream of them while "Tier 2" barriers have less upstream cutthroat trout habitat.

Opportunity/Landscape Need

Of the 275 surveyed culverts, at least 208 were barriers (Note that 26 culverts were "grey" according to the field survey, most of these will likely be determined to be passage barriers). Since it is not financially feasible to enhance fish passage at 208+ locations it was necessary to prioritize enhancing passage at these barriers, based on relative water quality, **r**elative density of fish passage barrier culverts, and amount of habitat upstream.

10 Year Action Plan

LTWC anticipates being able to remove or replace 35 culverts (including 1 dam) during 2010-2019, at a rate of 3-4 per year. There are 20 Tier 1 barriers (19 culverts + 1 dam) and 15 Tier 2 barriers. *Note: 33 barriers were submitted with the action plan. Confidence in 10 year priority: 4, pending refinement and review of the mapping process to make sure it captured all the field information correctly.*

Riparian Revegetation Projects

Methodology

The riparian re-vegetation layers were created by the Long Tom Watershed Council to provide approximate estimates of riparian condition in the Coyote (including Spencer), Bear and Ferguson sub-watersheds. The riparian assessment was done using aerial photographs taken in summer 2005 by Surdex Corporation, half-meter resolution. The assessment was based on **stream shade**, **width of riparian vegetation**, and **dominant vegetation type**. Each section of stream, 200' or greater, was given a value based on the dominant characteristics. Dominant vegetation Classes were O =open, such as pasture or prairie, B=brush, D = deciduous (>70%), C = Conifer (>70%), M = mixed conifer and

deciduous forest (30-70% made up of either tree type). A total of 302 miles were categorized; which is virtually all the area in the three subwatersheds excluding some very small headwater (1st order) streams that all had significant riparian zones and were fully shaded. Field verification was conducted at several locations in each sub-watershed to calibrate the aerial photography interpretation. Riparian width was recorded as a total width including both sides of the stream and crossing over the stream corridor. Categories were >50 feet on each side (total width 100'), 25-50, and <25'. A total of 299 miles were measured on the aerial photography. The combination of the lower categories was 170 miles and correlated well with the shading mileage such that the shading is the parameter chosen for mapping. Width and shade combined for both sides of the stream were assigned a summary quality value. Those values were grouped into 3 classes: poor (values 3-6), mediocre (values 7-10), good (values 11-12).

- **Poor** indicates less than 40% cumulative shade (both sides of creek) and a cumulative riparian width of 50' or less.
- **Mediocre** indicates 40% - 74% cumulative shade and cumulative riparian width of 51'-100'.
- **Good** indicates 75% or greater cumulative shade and over 100' of riparian width.

Revegetation acreage estimates were determined by subtracting the average riparian width measurement for a reach from the desired 100' (50' on each side) and multiplying by the length of the reach. For the 10 year plan number, acreage was calucluated using a constant 75' width multiplied by the mileage because it is more important that the reveg occur within the reaches in the priority area than choosing 30 miles of reaches specifically at this point (which would yield a more accurate reveg need).

To focus the need, priority areas were decided upon by filtering for:

- **lower elevation geographic area with higher stream flow**
- **large parcels, and contiguous swaths**
- **higher landowner interest** ("interested" and "maybe").

The first two filters above are a generally recommended approach by Stuart Rounds, USGS. Then the areas were further separated into two tiers.

- **Tier 1** – Bear Creek, Ferguson Creek and mainstem areas of Coyote Creek subwatersheds
- **Tier 2** - Spencer Creek subwatershed (in Coyote Creek)

Opportunity/Landscape Need

182 stream miles (inclusive of both sides of the stream) or 1,693 acres need revegetation across the Ferguson, Bear and Coyote Creek (including Spencer Creek) subwatersheds. This mileage represents the combination of 107 miles or 1,178 acres in the poor category

(0-40% shade) as well as 75 miles or 515 acres in the mediocre category (40-74% shade). In Tier 1 only, 1,360 acres need revegetation with 930 acres in the poor category and 430 acres mediocre.

Confidence in data: 4 in terms of whether or not an area needs restoration as the air photo resolution was high but taken in 2005. Confidence level of 3 in terms of exact mileage and acreage. Ground verification will be performed during project siting.

Priority Area for 10 year Action Plan, and Final Action Plan number

LTWC anticipates being able to revegetate 30 stream miles during 2010-2019, at a rate of 3 miles/year. This translates roughly to 273 acres, figuring an average of 75' riparian width needing vegetation. This would be accomplished primarily in Tier 1 areas.

Confidence in 10-year priority: 4. To some extent we are artificially reducing the priority area to get down to a feasible amount for 10-year implementation. We may reconsider this over the first few years.

Fencing Projects

Methodology

After reseraching alternatives to produce this layer, and not being able to secure FSA or NRCS data to determine if livestock information could be gained, aerial photography (summer 2005 by Surdex Corporation, half-meter resolution) was used to identify areas where cattle might be present. Analysis covered all streams until they were bordered on both sides by F1 zoned land (primary forestry). Classes were assigned based on the apparent land usage of the land bordering the riparian corridor: Pasture, prairie and crops, F = forested (this included cut over areas). D = developed land (such as housing, or parking lots). Notes regarding livestock presence were made in the GIS however no definitive identification of livestock presence was able to be made in a consistent manner from the aerial photography. Mileage numbers represent the total linear miles of pasture alongside streams (1 mile of stream running through pasture on both sides would be 2 fencing miles). These estimates present an *upper bound* for fencing potential. Total miles were analyzed by priority areas, riparian quality, and landowner interest.

Opportunity/Landscape Need

There are approximately 285-305 possible "fencing miles" (not stream miles) where streams need increased protection from livestock across the Ferguson, Bear and Coyote Creek subwatersheds. The vast majority of these miles, approximately 90%, have pasture, prairie or crops on both sides. This data is an upper bound and needs refining with a livestock layer.

Confidence in landscape need: 2. A livestock layer, either built through outreach or generated by ouwindshield survey, would be helpful. Probable variance in the results will be a reduction in fencing need by 30-60%. Further refinement should focus on the 10-year Plan numbers and geographic areas. Note that the outreach for revegetation will contribute related livestock and fencing need data.

10 Year Action Plan

LTWC anticipates being able to install 50 fencing miles during 2010-2019, at a rate of 5 miles/year. Priority area is the same as riparian shading. There may be some variation for certain project sites, but for the most part in the Long Tom River basin both revegetation and fencing action are typical for a site lacking an adequate riparian area as livestock are a typical factor.

Confidence in 10 year priority: 4, pending confirmation and possible refinement.

Oak Woodland, Prairie/Savannah, and Wetland Habitat Projects

Methodology

In this analysis, performed in January 2010, larger tracts of oak, prairie, and wetland habitats were identified for potential restoration based on data provided by The Nature Conservancy (TNC). Acreage was calculated based on detailed vegetation mapping by local ecologist Ed Alverson (TNC), and is refined from the generalized mapping in the Willamette Synthesis Project. This refinement enabled the addition of habitats known locally. Habitat targets are blocks of at least 40acres, preferrably contiguous or within a few parcels of a habitat block. This patch size (i.e. 40 acres or more) is assumed to be sufficient to ensure viability of a variety of prairie/savanna dependent species. The same rationale applies to oak woodland and wet prairie. The LTWC Action Plan includes a spreadsheet defining Ecological Uplift. In this category the data is fairly refined due to the extensive work of the Wetlands Partnership (which includes the LTWC). This Conservation Action Plan (CAP) process provided the status estimates. During the Willamette Synthesis Project in 2009, Jonathon Soll of the TNC remarked during a presentation that somewhere over 30% of the conservation need began to be significant in a positive manner for the survival of the target species. Priority parcels were chosen with the following filters:

1) **Location** in Coyote Creek due to the greater extent of overall habitat available and the number of partners focusing on that area (increasing the potential for contiguous habitat and long term protection)
2) **Size**
3) Estimated **landowner interest** level

Opportunity/Landscape Need

In Coyote Creek, 3,156 acres of oak and 11,214 acres of prairie, savannah or wetland habitat need some restoration action. Habitat in Ferguson and Bear subwatersheds has not been mapped thoroughly and may add another 20-30% to the total acreage need of these three habitat types, with most in the wetland category. This total need would be from 17,200 – 18,600 acres. Below is the estimated status level if a certain percentage of the total needed acreage is restored (this data is from the CAP work):

- Poor 0-25% of the potential acres <4,300 acres
- Fair 26-50% of the potential acres 4,300 – 9,300 acres
- Good 51-75% of the potential acres 9,301 – 13,950 acres
- Very Good >75% of the potential acres >13,950 acres

Confidence in data: 4. This data has been refined and mapped by a person with over 10 years field experience in the area, although site visits will always improve the knowledge. It would be helpful to describe wetland projects (e.g. instream and adjacent) in a separate category due to level of hydrologic connection.

10 Year Action Plan

LTWC anticipates being able to enhance or restore 600 acres during 2010-2019, at a rate of 60 acres/year. This could range up to 100 acres/year however this project type can be complex and goals are best not overstated. Of that 600 acres, 400 would be oak and prairie/savannah and 200 would be wetlands and floodplain. This division is based on the relative amount of habitat available by type and LTWC experience that implementing wetland projects is less compatible with the local land uses in those areas. Note that other entities are significant in the restoration work on these habitats locally - the City of Eugene, USFWS, TNC, McKenzie River Trust and occasionally the BLM.
Confidence in 10 year priority: 4, pending evaluation of confirmation and possible refinement.

Landowner Interest

Methodology

Multiple sources were utilized to estimate and code landowner interest for over 3,000 parcels in the three subwatersheds, for which a database of 556 landowners represents all ownership. Sources of information included the council's database (over 1,000 individuals), the macroinvertebrate survey database, the culvet survey database, the Coyote Creek outreach project, and personal knowledge. Level of landowner interest was estimated individually for each landowner by council staff. Estimated interest is mapped

along with each main project type to provide an overview of where it overlaps with prioritized areas, and could be considered as a basis for prioritization.

Code	Description
0/9 /-1 =	The landowners is not interested in restoration
1 =	Do not know the level of interest the landowner has in restoration
2 =	The landowner may be interested in restoration based on meeting attendance, survey permission, personal knowledge
3 =	The landowner is interested in restoration, based on personal knowledge, or has a project in some stage with the Council or a partner or similar type organization

10 Year Action Plan

There are 556 landowners in the 3 subwatersheds. 182 landowners have been contacted and are interested. 35 are not interested. 115 are "maybe" interested, and 224 remain uncontacted.

Confidence in data: 3. Although general confidence is high, especially due to the extent of specific knowledge held by the council and its partners from direct contact and outreach during various projects over the past 12 years, this is a qualitative measure with a high degree of variability. Refinement will include comparing scores, using Steering Committee and alumni contacts, and further direct outreach to landowners. Data could be refined by indicating likely willingness based on survey/monitoring contact and persmission versus estimated interest in project or stewardship action.

Instream Habitat/Geomorphic Projects

Opportunity/Landscape Need

To be determined.

Confidence: 1. Need to determined - large wood projects, channel remeander and bank stability (reduction in high levels of man-made erosion) projects. Bear and Feruson Cereks have wood surveys completed by ODFW in the 1990s; these may be helpful in determining wood project potentials.

10 Year Action Plan

The Council has described its objectives in the LTWC Action Plan matrix, Strategy Effectiveness, which includesinstalling large wood and boulders in priority reaches and restoring priority sections of streams to their original channel, or reconnecting them for improved hydrologic function.

Wetland or Floodplain Enhancement Projects

Wetland projects are included with oak and prairie above.

Invasives Control

Opportunity/Landscape Need

To be determined. The need is significant and no inventory has been conducted. The Council has not approached invasives as a primary project type. Invasives control is a phase I project or accompanies other objectives at a project site.
Confidence: 1. Not finished yet. Need to identify approximately 10 "key" species that are early invaders, help to inventory them as field work is conducted on a regular basis, and control them at project sites.

10 Year Action Plan

The Council has described its objectives in the LTWC Action Plan matrix, Strategy Effectiveness, which includes eradication of all invasive shrubs on Council projects, control of invasive herbaceous plants on all Council wetland projects and where possible on upland projects, reducing spread of EDRR species, reducing spread of bull frong and warm water game fish.

Potential Flow Restoration

Opportunity/Landscape Need

To be determined.
Confidence: 1. Not finished yet. The minimum instream flows established by ODFW for the Long Tom River basin, including some for the model sub-watershed areas, are from 1963 and would need to be re-established. When Fern Ridge Dam was being repaired the Council worked with Oregon Water Trust to secure temporary instream flow rights. The amount of permanent flow restoration needs are not known.

10 Year Action Plan

The Council has described its objective in the LTWC Action Plan matrix, Strategy Effectiveness, which is to increase summe streamflow at the mouth of Bear, Ferguson and Coyote Creeks by 2030.