Skagit County Geographic Information Systems
Skagit Watershed Ag/RRc-NRL
Riparian Mapping Project Summary

Introduction

Skagit County's Salmon Policy Resolution (R20070499) directs the county's Geographic Information Systems department to undertake a significant mapping project of riparian areas on agricultural and natural resource lands within the Skagit River watershed. Some 770 miles of watercourse are included. The study area does not include areas outside Skagit County's jurisdiction (cities and towns), diking and drainage districts covered by the Drainage and Fish Initiative and the Tidegate and Fish Initiative agreements, and type 5 streams.

Background

Many counties protect streams using mandatory buffers—strips of land bordering the stream where development or farming is not allowed. Because buffers can impose a heavy burden on agriculture, Skagit County does not require buffers on ongoing-agricultural lands.

Project Goal

The project's goal was to measure the amount of existing vegetated riparian area and compare it to the amount of potential vegetated riparian area if buffers were required along the watercourses. The project essentially attempted to answer the question, "How much riparian area is already protected?"

Methodology

The project used high-resolution bird's eye aerial photography that allowed easy identification of vegetation type and accurate identification of even narrow buffers less than 30-feet. For still more precision, project staff used LIDAR imagery that measured vegetation height. With both types of imagery at their disposal, GIS staff examined each watercourse and its surrounding area by hand for accurate ground cover assessment.

Step 1—Hydro Data Correction

The first step in the project was to compare existing county GIS data on stream locations to 2007 aerial photography. Where the existing hydrological data was significantly misaligned, the project team corrected it. Where a stream appeared to be misclassified according to DNR's five-level stream types, the project team reclassified it for the purposes of this project.

Step 2—Identify Riparian Areas

For each stream, the project team used 2007 aerial photography to manually categorize the types of ground cover within 200-feet of each stream. Roads, structures, and classes of vegetation were be identified and mapped. Map designations distinguished between young plants, mixed mature forests, deciduous forests, and other vegetation, and ground cover classifications such as roads and structures.

Step 3—Identify Existing Protected Areas

Using other GIS databases, the project team identified existing areas of protected riparian area. Possible classifications included parks, USFS land, conservation easements, and CREP-rental lands.

Step 4—Analysis

Finally, the project team used the mapped areas to calculate total riparian area acreage, total area in buffers, and total area in protected buffer areas.
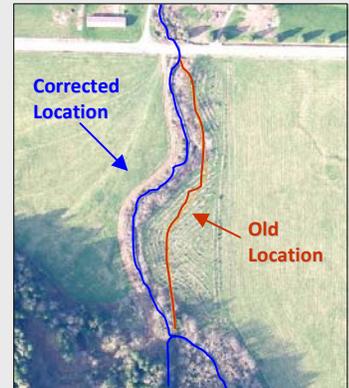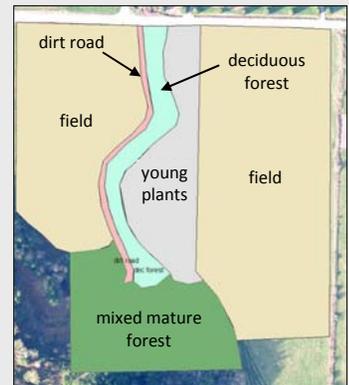
Expected Use of Results

Beyond its applications for the Ruckelshaus Center process, Skagit County intends to use the results of this project to evaluate the severity of the riparian protection situation, and to prioritize and focus efforts to enhance riparian areas.

For more information on the Riparian Mapping Project, please visit www.skagitcounty.net/salmonstrategy

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Study Conclusions

This study provides an accurate land use analysis of areas surrounding watercourses that flow through Agricultural and Rural Resource zones.
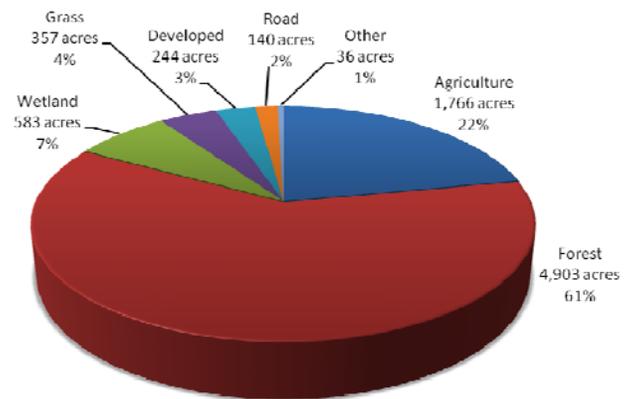
For the purpose of our report, we evaluated our compiled information based on the most commonly-posed questions collected throughout past buffer discussions. It is possible, however, to use this data for many other purposes not addressed in this study such as establishing a baseline for comparing change over time.

We classified land uses out to 300 feet from the streams, but we used standard buffer distances (50, 100, and 200 feet depending on stream type) for most of the analysis in this project. Of the 8,031 acres of standard buffer area analyzed, we classified the following land uses: 22% agriculture, 5% developed land or road covered, and 73% forest, wetland, or natural grass. Agricultural activity varied by region ranging from 13% in the Sauk region to 35% in the Nookachamps.
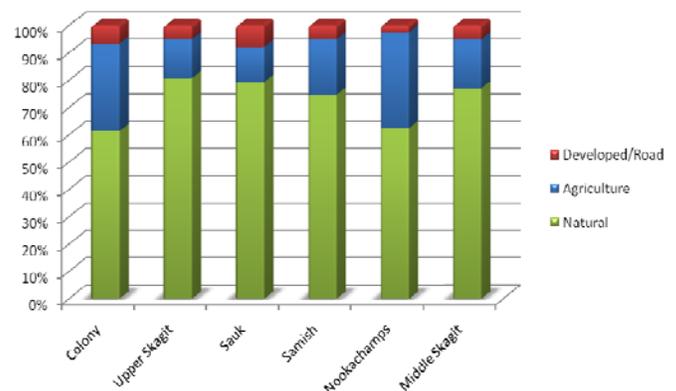
One purpose of this study was to determine how many acres of riparian agricultural land would be eligible for habitat protection. For agricultural use areas within standard buffer areas (1,766 acres), we concluded that there are 42 acres of protected land, 75 acres of public land, and 64 acres of land with no functions or values. Together, these three categories, which would not qualify for habitat acquisition programs, constitute 10% of the agricultural land studied within the standard buffer area. Of the remaining agricultural area, 90% is potentially restorable.

We also compared our land use data with other compiled satellite data sets. These other studies used an automated processing of land cover and have a course resolution of only 30 meters, which detects only large-scale patterns. In addition, these other methods classified land cover, which is slightly different from land use. During this analysis, we found that the high-resolution photography detected many clues and cover types that the 30-meter data set did not detect. In comparison with our study, both course resolution studies over-estimated agricultural land use—NLCD by 123% and RTI by 289%.
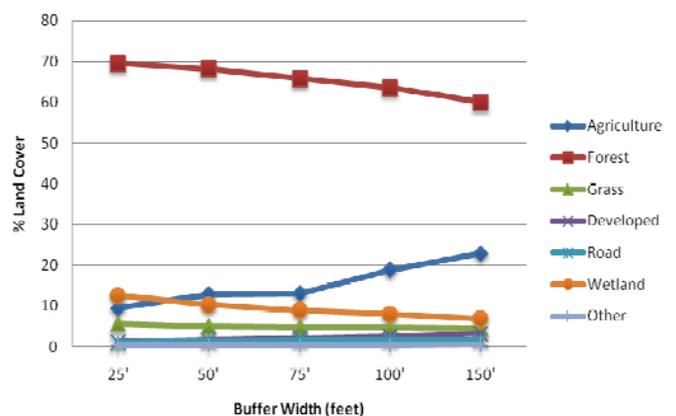
While it may be cost-prohibitive in other regions to perform a detailed analysis such as this study, care should be taken when using coarse imagery for land use calculations. The role of unmanaged areas such as fallow fields are probably beneficial to riparian health, yet may likely classify as agriculture in coarse scale imagery. This is only one study so the coarse estimates may vary from one county to another; however, some attempts to reconcile errors should be made before drawing conclusions based on the provided results.

Summary of land use designations within standard buffer widths of streams

Land use in three general categories shown as percentages within each sub region

Percent of buffer in each land use classification for varying buffer widths