

Palmer Soil & Water Conservation District
 1700 E. Bogard Rd. Ste 203A Wasilla, Alaska 99654
 Phone: (907) 357-1440

Date: September 30th, 2015
Partner: Palmer Soil and Water Conservation District
Agreement Number: F14AC01072
Reporting Period: 8/29/14 – 9/30/15 Final Report
Project Title: Riparian Impact Evaluation of Priority Streams in the Matanuska-Susitna Borough

Palmer Soil and Water Conservation District (PSWCD) have completed compiling two datasets of geomorphic and riparian habitat information for the highest priority waterbodies in the Matanuska Susitna Basin. 35 of highest priority water bodies were selected based on biological value and vulnerability from human development by experts within the Mat Su Salmon Partnership (Table 1). These datasets will be available to be used by other professionals to assist with future salmon habitat restoration and conservation projects. The datasets were created by compiling the known existing USFWS, PSWCD and Wasilla SWCD GPS-captured field data from the last 10 years as well as with updated orthometric-photo evaluated data using the most current (2011-12) LiDAR and imagery data provided by the Matanuska Susitna Borough.

Central Portion of Mat-Su Watersheds	Susitna Drainage Watersheds	Eastern portion of Mat-Su Watersheds
Big Lake	Cache Creek	Wasilla Creek
Blodgett Lake	Goose Creek	Jim Creek
Cottonwood Creek	Lake Creek	Jim Lake
Fish Creek	Larson Lake	Matanuska River Clearwater Side Channels
Goose Creek	Montana Creek	McRoberts Creek
Herkimer Lake	Queer Creek	Mud Lake
Horseshoe Lake	Rabideaux Creek	Swan Lake
Little Meadow Creek	Sawyer (Buddy) Creek	Swift Creek
Little Susitna River	Sheep Creek	
Lucile Creek	Sunshine Creek	
Meadow Creek	Susitna River Channel, Sloughs, & Clearwater Side Channels	
	Trapper Creek	
	Twister Creek	
	Whiskers Creek	
	Wiggle Creek	
	Willow Creek	

Table 1. List of 35 highest priority water bodies in the Matanuska Susitna basin.

Geomorphic Dataset

The geomorphic dataset includes all 35 prioritized waterbodies. A little more than 1,690 miles of stream centerlines/lake edges are included in this database. Of those 1,690 about 50 miles were field collected with a GPS unit. The remaining miles were created using heads-up digitizing with the latest high-accuracy imagery and LiDAR data available. The majority of the

database falls into the high resolution area collected by the Mat-Su Borough in 2011-12. A few of the streams (Lake Creek, Cache Creek, Sheep Creek and the upper reaches of the Susitna River) fall outside of this boundary and the SDMI Best Data Layer was used (Figure 1).

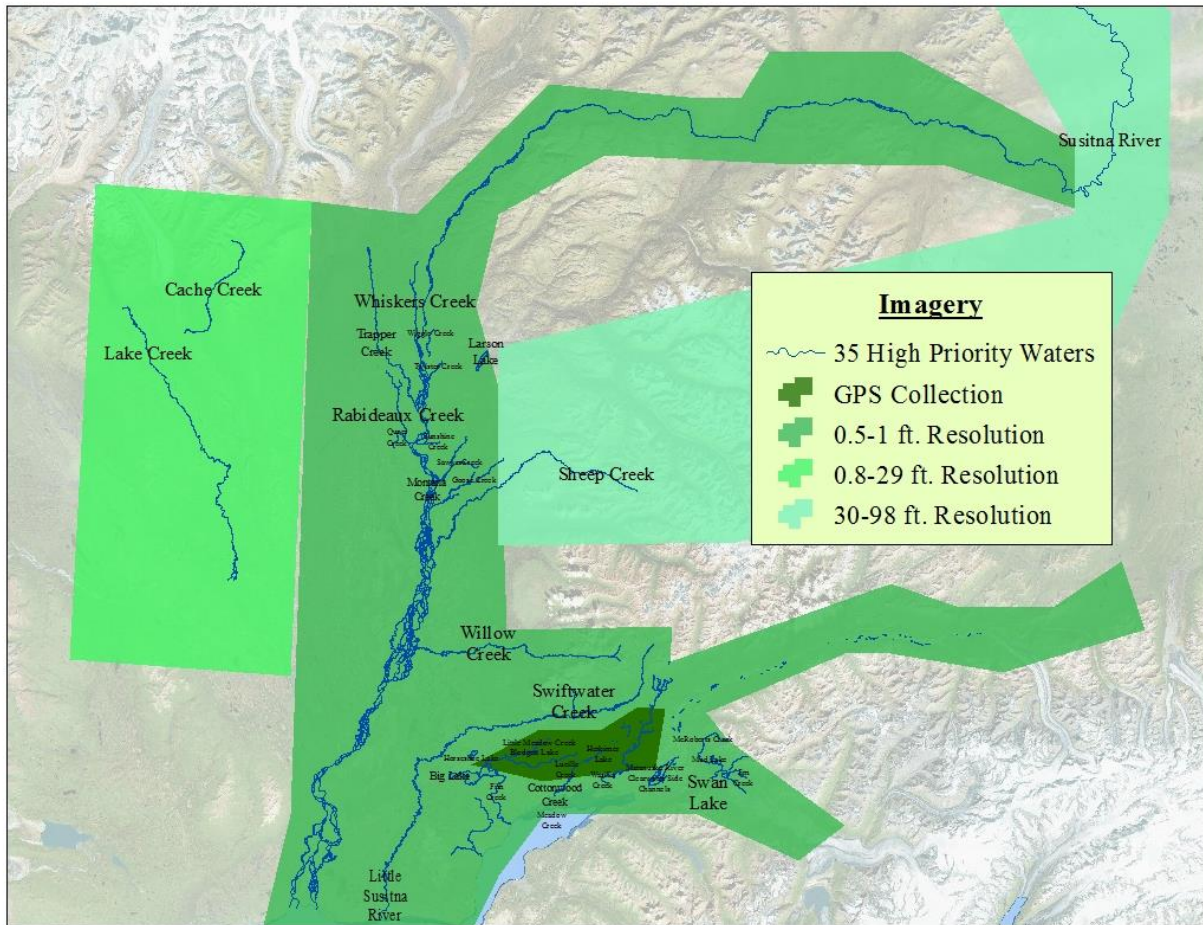


Figure 1. Resolution of imagery used to create the database of high priority water bodies.

The geomorphic data was heads-up digitized at a scale of about 1:600. When imagery was insufficient to clearly show the centerline or edge of a waterbody, the bare earth Digital Elevation Models were used as supplemental imagery (figure 2).



Figure 2. Example of using imagery (left) and bare earth DEM (right) for heads up digitizing

Restoration Opportunity Dataset

The restoration opportunity dataset is compiled of line data along areas that have the potential for riparian impact and therefore for potential future restoration. A lot of these opportunities will be valuable for future regulation purposes, so we can contact landowners who may be in violation of future stream-buffer laws. A significant amount of opportunities are included in the “other” category, which includes anything from structures in or on the stream, dams, ATV crossings, access points, garbage, or anything that didn’t fall into the main categories (table 2). There were 188 instances of ATV crossings, 48 powerlines and 52 road crossings all included in the “other” category.

Restoration Opportunities by Type		
Restoration Type	Number of Occurrences	Total Length
Bare Dirt	126	9,960.99
Dock (Permanent)	702	17,808.58
Extended Dock	30	1,575.24
Lawn to Shore	146	9,683.66
Lawn Within 5' of Shore	132	18,956.12
Other	489	46,516.28
Paved Boat Launch	56	4,141.84
RCG	12	345.83
Rock, Riprap	126	14,039.71

Table 2. Riparian impacts by type

A separate report will be created with all of the restoration opportunities identified overlaid with the parcel information and given to the project officer.

Field Verification

Palmer SWCD selected over 13 separate sites to visit for field verification during the summer of 2015 (figure 3). These sites were selected based on accessibility, restoration type and feasibility of potential restoration.

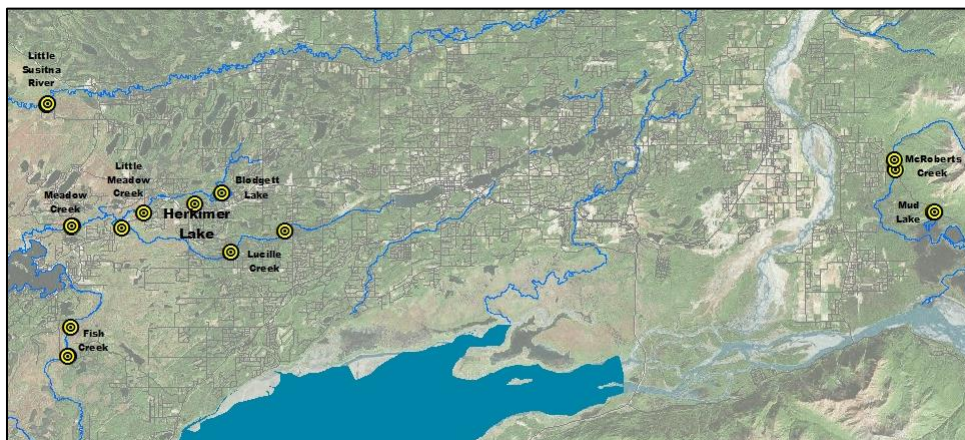


Figure 3. Field locations selected to for field verification during the summer of 2015

Blodgett and Herkimer Lakes were great areas to survey, because they are easily accessible and we were able to survey the entire lakes in just a few days. Blodgett lake had 32 opportunities identified using photo interpretation and there were found to be a total of 43 after field visits (figure 4). Some of the differences in restoration types, quantities and locations may have been because of lack of visibility from trees, new structures built since the date of the imagery, lack of clarity in the imagery (hard to identify bare dirt vs. lawn, etc.), and human error (I may have excluded docks that looked very small on the imagery, but took pictures of everything during the site visits).

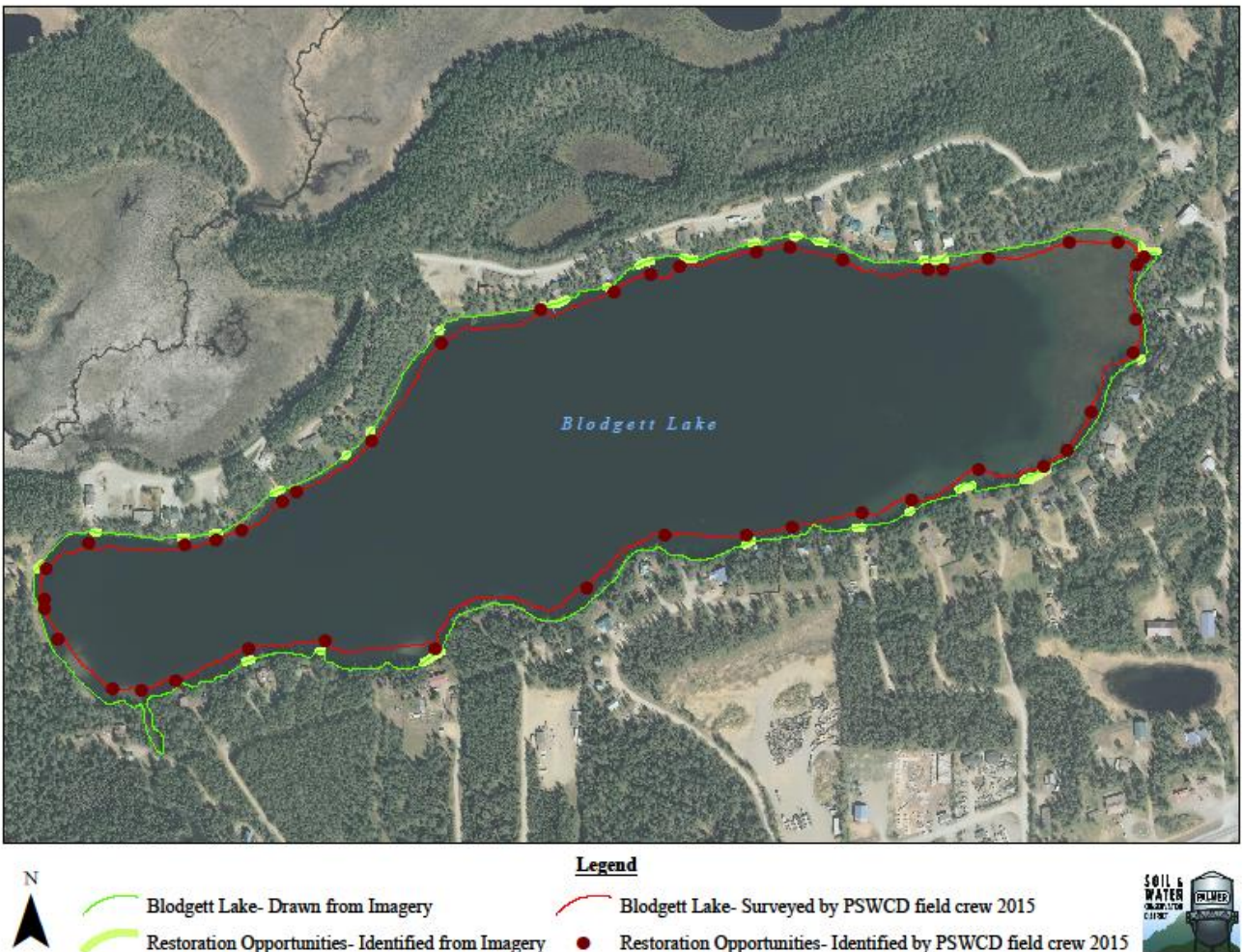


Figure 4. Blodgett lake field verification

The other field visits included sites on Herkimer Lake, Lucille Creek, Little Susitna River, Fish Creek, Meadow Creek and Little Meadow Creek. A few of the locations selected turned out to be inaccessible because of private property, but most of the site visits confirmed what we saw on the aerial imagery (figure 5). There were no sites that we looked at that showed a dramatic variance from what we were able to see on the imagery, however there are clearly more opportunities out there than what we are able to see on the imagery alone. The imagery has given us a huge starting point on creating a baseline for riparian impact and we can begin to focus our efforts on restoration.



Figure 5. Lawn selected for field verification- image on left is from aerial imagery, photo on right is the photo of same lawn.

Reed Canary Grass

During the summer of 2015 PSWCD staff has resurveyed Cottonwood Creek starting from approximately 1 mile above the highest known Reed Canary Grass infestation down to where Cottonwood creek meets the hay flats. All of the RCG was recorded with a GPS unit and mapped in GIS. The survey provided a strong baseline data for the current extent of the RCG on Cottonwood Creek (Figure 6). Fortunately, the RCG has not spread downstream farther than the previous known extent, which leads me to believe that the seed head clipping from the 2014 field season was successful at mitigating the spread. In June and again in August of 2015 PSWCD's field technician spent time in the field clipping seed heads on the infestations in an effort to continue to impede future seed distribution of RCG.

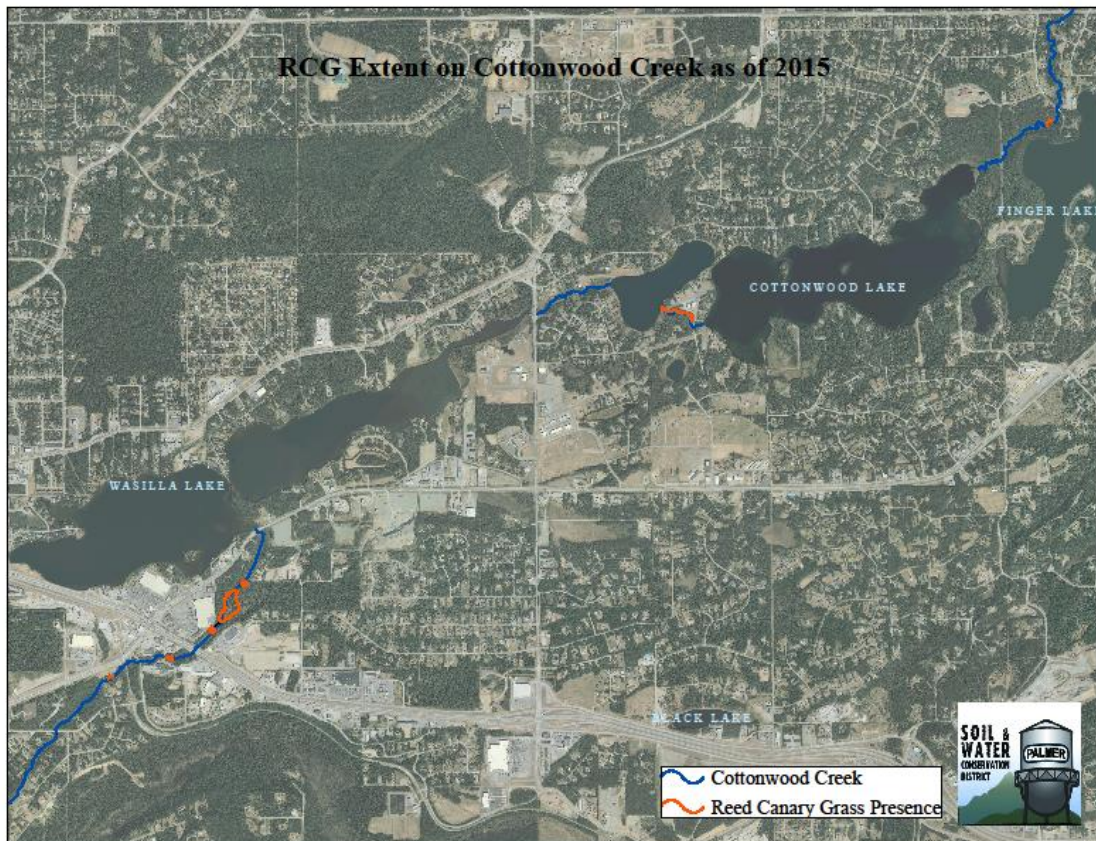


Figure 6. Reed Canary Grass extent on Cottonwood Creek



2015 Reed Canary Grass control/mitigation- before (left) and after clipping (right)



PSWCD field crew surveying Cottonwood Creek for Reed Canary Grass in 2015

With the help of the US Fish & Wildlife Service, PSWCD was able to secure funding to create a part-time position for the coordination of the Mat-Su Cooperative Weed Management Area. This person will help to continue monitor/control efforts of Reed Canary Grass on Cottonwood Creek and will hopefully pursue support, permits and funding for eventual eradication of RCG on Cottonwood Creek.

35 High Priority Waters in the Matanuska-Susitna Borough



Tags

Mat-Su Streams, Matanuska Susitna Streams, High Priority Water Bodies, Mat-Su Salmon Habitat Partnership Strategic Action Plan, Restoration, Geomorphic, Riparian Impacts

Summary

This dataset comprises the most current (2015) geomorphic attributes of the 35 highest priority water bodies in the Matanuska Susitna Borough as well as possible restoration opportunities along these high priority waters. Mapped water bodies include: Big Lake, Blodgett Lake, Cache Creek, Fish Creek, Goose Creek, Goose Lake, Herkimer Lake, Horseshoe Lake, Jim Creek, Jim Lake, Lake Creek, Larson Lake, Little Meadow Creek, Little Susitna River, Lucille Creek, Matanuska River (clearwater side channels), McRoberts Creek, Meadow Creek, Montana Creek, Mud Lake, Queer Creek, Rabideaux Creek, Sawyer Creek, Sheep Creek, Sunshine Creek, Susitna River, Swan Lake, Swift Creek, Trapper Creek, Twister Creek, Wasilla Creek, Whiskers Creek, Wiggle Creek and Willow Creek.

Description

The Matanuska-Susitna Borough's (MSB) large land base contains a dense network of fish-bearing waters. The riparian habitat along them has been impacted over time but there is no quantification of how much or where the riparian area has been denuded or impacted in other ways. The Mat-Su Salmon Partnership has identified 35 high priority streams and lakes in the MSB that are high-value rearing, spawning, or overwintering salmon habitat and are most at risk for impact from human development. Several of the priority MSB water bodies were recently ground mapped and assessed for riparian impacts. This map compiles those efforts to develop a comprehensive database showing impacted vs. non-impacted riparian area along area streams and provide basic descriptive statistics that can be used to track performance measures of partners through the Mat-Su Salmon Habitat Partnership Strategic Action Plan. Objective 2.3 of this strategic plan is to restore 5% of all impacted riparian habitat in priority streams by 2018. Palmer Soil and Water Conservation District (PSWCD) has provided GIS mapping support to evaluate impacts to riparian habitat, as well as on-the-ground verification of stream location and riparian habitat information to generate the first riparian map in the MSB. The riparian area of these prioritized water bodies has been evaluated using ortho-rectified aerial imagery from 2011 (provided by the Mat-Su Borough) at a 1:600 scale and on-the-ground surveys by PSWCD and other partners. These prioritized waterbodies were last updated in August of 2015.

Credits

Palmer Soil and Water Conservation District, US Fish and Wildlife Service, Wasilla Soil and Water Conservation District, Matanuska Susitna Borough, Mat-Su Salmon Habitat Partnership

Use limitations

The majority of this data was created using heads-up digitizing with high resolution (.5-1 foot) aerial imagery and LiDAR data collected in 2011-2012 by the Mat-Su borough. Waterbodies field verified and collected using GPS are denoted in the "Data Integration Type" field of the dataset.

Lake Creek, Cache Creek and the upper reaches of Sheep Creek and the Susitna River are all located out of the realm of the Mat-Su Imagery project and the lower resolution SDMI Best Data Layer was used in its place.

Extent

West	-151.47	East	-146.82
North	63.20	South	61.19

[Metadata for the 35 highest priority water datasets](#)