Alaska's Sweet Clover Infestation Problem - Analysis & Recommendation

Chase Hand and Maggie Dunleavy

Correspondence Study School 10th Grade

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Introduction

Sweet Clover is a biennial plant that can reach 2-5 feet in height and it is considered an invasive weed in Alaska. It was originally brought to North America as forage crops, since then it has spread to Alaska and thrives near roadways, around rivers, and newly cleared areas. Sweet Clover has formed large, nonspecific stands along rivers in Southeast, South Central, and Interior Alaska. The weed degrades natural grassland communities by over topping and shading native species.

It also has great potential to reproduce and spread rapidly. Each plant produces 350,000 seeds that can remain viable in the soil for up to 81 years. Large seed banks are common, and it can self pollinate as well as outcross. Seeds are easily dispersed by water and vehicle tires. These factors make river and stream crossings along with road banks a prominent place for seeds to take hold.

The primary concern to Alaska is the potential damage Sweet Clover can cause to river systems. ***The non-invasive plants*** found along Alaska's riverbanks have a woody root system with numerous root hairs. This type of root system helps hold the soil, which slows down the rate of riverbank erosion . Sweet Clover has a tap root which does not hold the soil and therefore the rate of riverbank erosion is higher. Also, Sweet Clover alters the fixed nitrogen in the soil which makes it unfit for some plants to populate. Therefore, besides causing the rate of riverbank erosion to increase, Sweet Clover pushes out native plant species thereby affecting the local ecosystem and those species that depend upon it. Our goal was to determine which category of river is the most susceptible to Sweet Clover infestation and where government agencies should focus their remediation work.

Materials and Methods

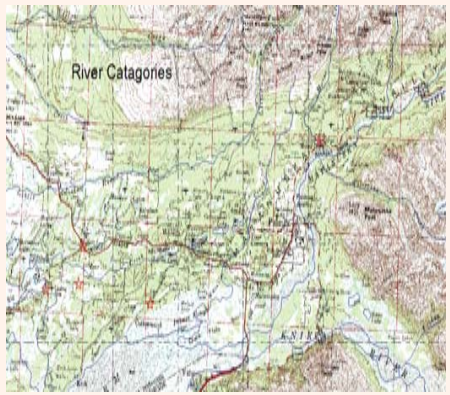
The materials used in our project were a Garmin eTrex Legend GPS, a road map of the Matanuska-Susitna Valley, a Pentax Optio digital camera, and a Dell laptop computer with ArcGis software.

We used information obtained from the Palmer Soil and Water Conservation District to help locate potential sites that we could visit, along with a classification system developed by the United States Geological Survey that helped us categorize the rivers and streams we visited. At each site we took a GPS waypoint, along with digital pictures of the area. Notes were written in a field notebook indicating the intensity of Sweet Clover infestation.

Our GPS data was downloaded onto the Dell computer, and ArcGis software was used to identify locations on topographic maps of the area.

Results

Our results indicated:
•Sweet clover is present at the majority of all the bridges over bodies of water.
•It is present in the riverbed of all the melt water streams that we documented
•It was not present in the riverbed of any of the black water streams
•It was not present in the clear water streams with one exception.



Pink= In the riverbed
Green= High intensity
Yellow= Low intensity
Red= Not present

Road sign= Clear water
Star= Black water
Cross= Melt water

USGS – Three general classes of water discharging into Mat-Su Valley

Clear water rivers
i.e. Moose Creek
Low sediment load
Originate from gw discharge zones;
Typically smaller tributaries

Black water dominated rivers
i.e. Deshka River
Low sediment load
Drain permafrost and peat-dominated wetlands

Melt Water dominated rivers
i.e. Matanuska River
High sediment load
Drain ice and snow fields, alpine glaciers

Conclusions

•We found that Sweet Clover is predominately found in unconsolidated sediments along roadways and in melt water river beds.

•We found that Sweet Clover was not present in black water and clear water stream beds.

•The intensity of Sweet Clover infestation varies with the amount of the vehicle traffic along roadways.

Recommendation

•The major focus of control work should be on roadways that have intense concentrations of Sweet Clover, which experience heavy amounts of vehicle traffic, and cross tributaries to melt water rivers.

•Roadways which cross clear water streams that do not drain into melt water rivers, and have intense concentrations of Sweet Clover should be second in priority.

•Roadways crossing black water streams that are not tributaries to melt water rivers should be lowest in priority.

Literature cited

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