Russian olive and Salt cedar Waterway Project

Final Report

Prepared for:
Colorado Water Board Conservation
Water Plan Grant

December 4, 2019

Montezuma County Noxious Weed Department
Grant Amount: $25,598
Prepared by: Bonnie Loving

Introduction:

This project was designed to control phreatophytes in an effort to conserve water and promote healthy ecosystems. Montezuma County Noxious Weed Department (MCNWD) hired a two-person crew to do cut stump treatments on Salt cedars and Russian olives within Montezuma County, per request of individual landowners and land managers. Even though these two species are designated as List B noxious weed species we do not enforce management, it is by request only.

Background:

MCNWD has mapped 482 miles of waterways and an additional 3,421 acres of pasture and wetlands infested with Russian olives. Giving us a grand total of 6,098 acres of infested land. Salt cedar is in our project scope as well, however we have not mapped the Salt cedar, but we estimate it is infesting at least 100 miles of waterways or 600 acres of land within Montezuma County.

We used data from published research studies to calculate our water loss from Russian olives and Salt cedars and it came out to be 4,800-acre feet or 1,564,086,849.6 gallons/year in Montezuma County. Southwest Colorado has been in extreme drought for a few years now, and water is one of our top scarce resources. The heart of our county is in agriculture, if we continue to lose water, people will start losing their farms and way of life. It therefore is our duty to do whatever we can to conserve what little water we have.

Studies have proven other negative aspects of Russian olives such as increased Nitrogen levels in the water, decreasing water quality and increasing algae. There have also been studies that found increases in Carp populations where Russian olives have taken over, which is a problem because Carp are non-native fish that push out our native fish populations. There have also been studies that show an increase in mosquito populations in Russian olive thickets versus native trees.

Other negative impacts Russian olives have is the debris they put into irrigation ditches and water. This increases the chances of clogging ditches and losing water from it flooding out at the clog site. This also attributes to higher ditch maintenance costs.

From the inventory results and recorded impacts of these phreatophytes from published studies, we concluded action needed to be taken. However, we had to understand why landowners and land managers were currently not actively managing these species before we could move forward with developing a plan. MCNWD narrowed it down to a few explanations.

One explanation relates to the history of Salt cedar and Russian olives. Salt cedar was brought to the United States in the early 1800's. As early as the 1820s Saltcedar was advertised in U.S. horticultural catalogues, and by 1856 it was sold and promoted in California nurseries. In the early 1900s, Saltcedar was widely planted in the Southwestern United States for windbreaks and protection from streambank erosion, being promoted by both government and private land agencies.

Russian olive has a similar story, it was brought into the United States in the early 1900s, it was cultivated in several Western States. Russian olive has widely been promoted for being planted in

windbreaks and horticultural settings, often with the encouragement of state and Federal subsidies.

So you have both phreatophyte species being introduced to the United States and promoted to landowners to plant by the U.S. government. The Colorado Noxious Weed Act was established in 1990, recognizing the severe impacts that these non-native species are having on our native ecosystems. Salt cedar and Russian olives were put on the B-List designating them to be controlled and suppressed on all lands within Colorado.

A lot of landowners and land managers in this area remember when the U.S. government was promoting everyone to plant these, and now you have the U.S. government telling the landowners and land managers they need to manage them in a manner to get rid of them over time. The U.S. government has cost them a lot of money by promoting planting phreatophytes, which have now taken over their waterways and properties, costing them money from reduced forage for livestock, or maintaining ditches from the debris of these phreatophytes. The water loss also costs them money. So at this point they are not willing to do what the government asks of them, they are the ones that created the problem, therefore they should clean it up.

Second, there is such an extensive problem with these species today. They are well established on most waterways and wetlands. At this point in the game managing them would be very expensive. Stemming off of this, there are not enough contractors in this area to put a dent in the populations because they are busy managing other noxious weed species. The contractors would also prefer to manage forbs rather than shrubs and trees with 4" thorns.

Doing cut stump treatments on these species is very labor intensive. You have to be able to carry a chain saw and drag wood around. Half of our landowners physically would probably not be able to do this work because of age or injuries. Then you have the younger landowners who have to work three jobs in order to pay bills, they wouldn't have the time to do the work themselves. Reasons like these are assumed to be the explanation of why the problem has gotten so bad, and why MCNWD needed to come up with a plan that would be feasible for landowners.

Method:

MCNWD hired a seasonal two-person crew that would work 40-hour weeks from May 1, 2019 to November 31, 2019. The crew was trained as spraying technicians in order to safely and effectively treat Russian olives and Salt cedars with herbicides to kill root systems and hopefully prevent the species from sprouting. The crew was also trained for chainsaw safety. Luckily the two gentleman who were hired already had extensive experience with chainsaws.

The crew is doing cut stump treatments on all shrubs/trees with a root collar diameter (RCD) greater than one inch. This work entails either using snippers or a chainsaw to cut the shrub/tree down, and within five minutes of cutting the stem, they would apply a mixture of Garlon 4, Impel, and Rodeo to the stump with a paintbrush or with a backpack sprayer. Shrubs/trees smaller than 1" RCD are foliar sprayed with the same herbicides with a backpack sprayer.

Areas down McElmo Canyon we ended up renting an excavator and a mulcher attachment to more effectively treat thicket areas of Salt cedar. Because the equipment was more effective than chainsaws in these situations we applied for funds to purchase an attachment head for an excavator to help save rental costs. We were granted the funds through the Water Supply Reserve Fund Grant. We will be purchasing an attachment in spring of 2020.

Each day the crew documents how many trees were treated divided into different RCD sizes and by species (please refer to appendix A for how this chart is set up). By recording this data we can then use those numbers to calculate the water savings. It was determined that calculating water saved per acre was less accurate than keeping track of individual trees treated relative to their RCD size. The golden rule is landscape trees need 10 gallons per inch in diameter each week to be healthy. These phreatophytes work differently because they grow in riparian areas and are known to transpire higher rates of water than native trees. There are not studies that give us a direct number of how many gallons each diameter class of these two species takes up per week. Using an educated guess, on the reserved side, we are estimating these trees are taking up 20 gallons per inch in diameter each week, so twice of that of which an ornamental tree would take up.

Once the trees are cut and treated the crew then piles the slash into slash piles on the properties to be burned or hauled off by the landowner / land manager. Larger tree stems are cut into sections intended for the landowner / land manager to utilize as firewood. Trees are not felled into waterways, in some cases equipment such as side by sides or tractors were used to pull the tree away from the waterway as it was being felled.

Another procedure that the crew is tasked with is to take before and after photos on each treatment property. Unfortunately, the crews photography skills are low and we did not obtain very good before and after photos. Some areas that had a lot of before and after photos were pretty decent, however we really need to wait for the landowners to burn the piles before we can get good representation of an after picture.

Outreach:

From the map data MCNWD has identified Russian olive and/or Salt cedar on about 700 private properties. We grouped different areas as ‘stages’, that way we can notify stage 1 about the project initially and then move down to the list to stage 7. Please refer to appendix B for the letter that was sent out to the properties.

Empire Electric also graciously put a quarter page of information in Colorado Country Life Magazine to help get the word out about our project (please refer to appendix C).

Results:

The crew has treated Russian olives and Salt cedars on a total of 30 properties and some areas of county roadsides. Waterways that were treated include: private ditches off Lone Pine Canal, private ditches off Upper Arickaree, private ditches south of Trail Canyon, Ritter Draw, McElmo Creek, a drainage

off Upper Arickaree and Hermana Canal, drainage off of Rocky Ford Ditch, drainage off Yellow Jacket Canyon, some irrigated pastures off pipelines, Mancos River, private ditch off of Towaoc / Highline Canal, Mud Springs, and Simon Draw.

To sum up this project the crew has treated 8,175 Russian olives and 4,975 Salt cedars. We kept track of the diameter range of each tree treated from >2", 2-4", and <4". We then calculated the amount of water each diameter class of tree used in a 39-week period. Total water savings from treating these 13,150 treated trees comes to be 38,693,750 gallons of water, or 118.7 acre feet. We don't think acreage of treated trees is as important as individual trees treated, however the gross acreage of treated trees comes to be about 150. The goal was 200 acres, however some properties we treated had high density of trees, so acreage isn't the important take home note, individual trees treated is, including diameter class.

A map of treated areas can be found in Appendix D, and photos of the project from 2019 can be found in Appendix E.

Conclusion:

Overall the project was very successful, we had very little down time due to an experienced crew and eager landowners. One of the hurtles was finding a more efficient management technique for treating thickets of Salt cedar. We ended up renting the excavator and attachment, which ended up costing $8,100 for one month. In reality the cost was worth it because for every six hours of chainsaw work in areas like this the equipment could handle that section in one hour. So it saved 5 hours of labor. There are many properties on our schedule for 2020 that this equipment will save us time, therefore we will purchase the attachment head to save us about $4,000/month. That will leave us with the excavator rental charge of $4,000 a month.

We hope to keep our original crew for the 2020 season, therefore as an incentive of them returning we will have a return bonus, as well as a $.50/hour raise. Also, to try to shorten their time off without income, we applied for Habitat Partnership Protection funds from Parks and Wildlife to help cover their salary for April of 2020. MCNWD was not able to get purchase orders through grants until mid-April, delaying the crew's start date. Now that we have secured funds for April we are able to start them April 1st, 2020.

Actual Expense Budget:

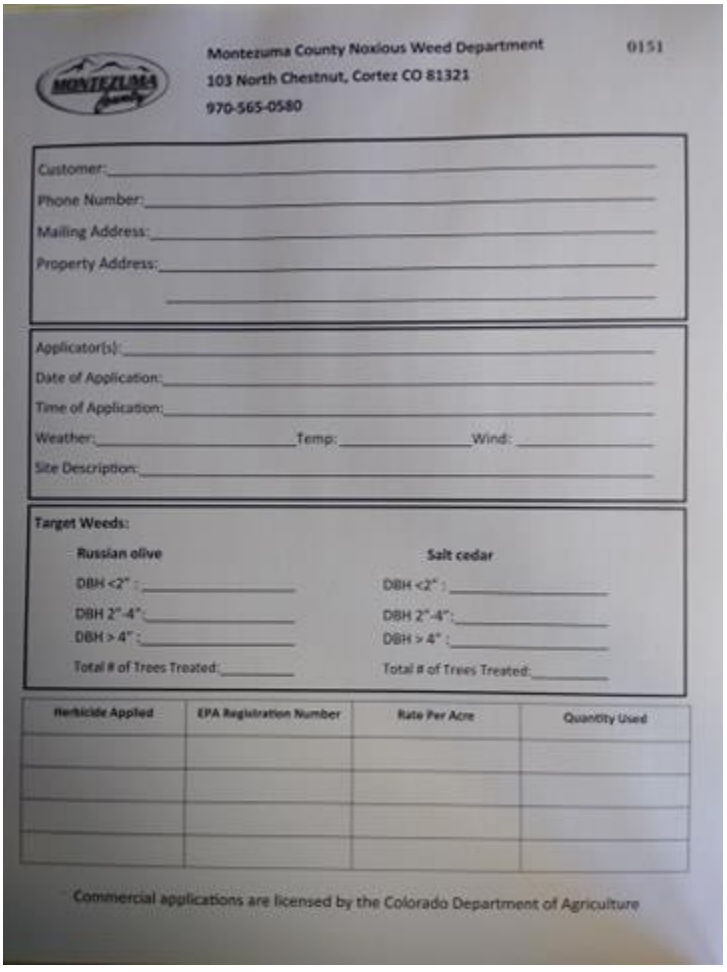
Year	2019
3-Person Crew Salary	$ 47,397.16
Cost of Herbicide	$ 3,958.50
Fuel	$ 1,761.75
Fleet	$ 403.99
Excavator Rental	$ 8,150.00
Chainsaw / PPE / Misc	$ 2,783.18
Phone	$ 724.64
Admin Time (300 Hours)	$ 9,000.00

	Total Cost	$ 74,179.22

Funding:

Funding Party	Awarded Amount
Colorado Department of Agriculture	$22,500
Colorado Water Plan Grant	$25,598
Southwestern Water Conservation District	$7,100
Landowners	$10,500
Montezuma County Noxious Weed Department Admin (300 hours)	$9,000
Total:	**$74,698**

Appendix A: Field Documentation



Montezuma County Noxious Weed Department 0151
103 North Chestnut, Cortez CO 81321
970-565-0580

Customer:
Phone Number:
Mailing Address:
Property Address:

Applicator(s):
Date of Application:
Time of Application:
Weather: Temp: Wind:
Site Description:

Target Weeds:

Russian olive
DBH <2" :
DBH 2"-4":
DBH > 4" :
Total # of Trees Treated:

Salt cedar
DBH <2" :
DBH 2"-4":
DBH > 4" :
Total # of Trees Treated:

Herbicide Applied	EPA Registration Number	Rate Per Acre	Quantity Used

Commercial applications are licensed by the Colorado Department of Agriculture

Appendix B: Letter to landowners with known populations of phreatophytes.

Montezuma County Weed Program
103 North Chestnut
Cortez, CO 81321
(970) 565-0580

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Dear Landowner,

We are writing you today to inform you of an exciting service we will be offering private landowners during 2019. We will have a two-person crew available for hire at a very low cost of $20/hour for managing Russian olives and/or Salt cedar along waterways or within wetland areas. Currently the going rate for this type of work is $85/hour for one person not including cost of herbicide. This $20/hour will include labor for both crewmembers and will include herbicide cost.

Why do we need to manage Russian olives and Salt cedars?

Both species are on the Colorado Noxious Weed Act List B designating them for control and suppression on all lands within Colorado. These species have been proven injurious natural habitats or ecosystems. Both of these species take up a considerable amount of water, which in this extended drought lessens the amount of water we have available. In Montezuma County we have mapped over 6,000 acres of Russian olives and have estimated their uptake of water being 4,800-acre feet of water per year, which comes out to be 1,564,086,849.6 gallons of water per year. This is not including water loss from Russian olive debris clogging up irrigation systems, which leads to flooding equating to more water loss. We have not mapped Salt cedars yet, so we do not accurately know what their extent is.

Aside from water loss, Russian olives have been attributed to an increase in nitrogen levels in water. Nitrogen accumulates in Russian olive foliage, and then the foliage falls into the water resulting in an increased nitrogen level, which decreases water quality and increases algae. Studies have also shown that Russian olive thickets increase the amount of mosquitos.

Salt cedars are known to be salt pumps; they pump salt from deep into the ground where it then overtime becomes deposited onto the soil surface. The high salt levels reduce ability of most natives to grow in that area.

How will the crew be managing these species?

The crew will do cut stump treatments on trees with a Diameter at Breast Height (DBH) of 2" or larger. Trees with DBH of less than 2 inches will be foliar sprayed with herbicide via a backpack sprayer or atv sprayer. There are many different situations that could occur during treatment areas, each will be dealt with on a case by case basis, in the most reasonable and safest manner available.

Trees will not be felled into ditches or the water. Some trees overhanging the water will have to be dealt with by both crew members in an effort to pull the tree onto the short as it is being felled. Safety is always addressed prior to each job as well as during technician training. Safety is also evaluated on case by case basis.

Slash will be dealt with as per landowner request. It can be piled for the landowner to burn during the upcoming winter; larger logs can be cut for firewood and stacked in treatment area. We do not want to waste too much time cleaning up, but we will try to work with the landowners requests.

Crews will fill out all necessary documentation for each job as well as map treated areas, including photo points.

Why is Montezuma County offering this service?

Montezuma County is doing everything they can to conserve water, which is a main driver of this project. The second main driver is the understanding how expensive Russian olive and Salt cedar management can be, as well as how many of us do not have the time or ability to do the work ourselves.

Through two grants, one through the Colorado Department of Agriculture and the other through Southwestern Water Conservation District, we are able to make this crew affordable. A big thank you to these organizations for making this program possible.

What is required of the landowner?

The landowner will be required to sign a contract prior to work being done. The contract goes over the job details that were explained in the previous section. The contract will include types of herbicide that will be used for the cut stump treatment and the foliar application. If the property owner allows the crew to use an atv sprayer, if there are dense stands of young trees, there is a section for the landowner to sign allowing the crew to do so. The crew will be very respectful with the atv and will follow specific requirements the landowner sets for use of an atv on their property.

The contract also states that the landowner and Montezuma County Noxious Weed Program will work with each other in the future if any monitoring or photo points should be taken again. Before and after pictures are highly recommended, so re-visiting those photo points would be a good idea.

How to proceed if you are interested in hiring the crew?

Contact Montezuma County Noxious Weed Department for more information, 970-565-0580. Prior to treatments, a staff member will meet with you at your property to go over specifics.

Bonnie Loving
Montezuma County Noxious Weed Program Director
bloving@co.montezuma.co.us
970-565-0580

Appendix C: Advertisement in Colorado Country Life Magazine, promoted by Empire Electric.

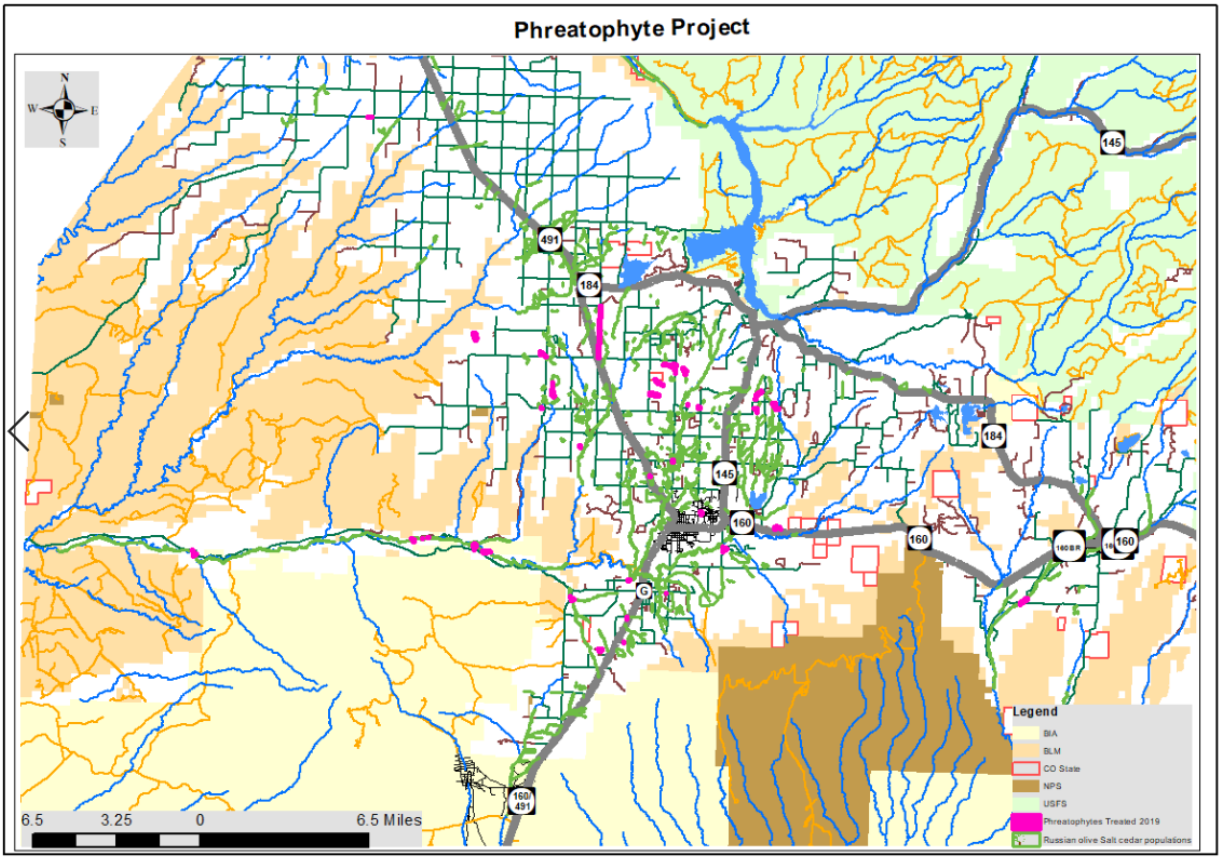
NEED HELP MANAGING RUSSIAN OLIVES OR SALT CEDARS (TAMARISK)?

Montezuma County Noxious Weed Department (MCNWD) has a crew available for private landowners for the treatment of Russian olives and Salt cedars. Both species are non native to the United States and have proven to be damaging to our ecosystems. Please contact MCNWD for more information about this crew.

Since May 1st the crew has treated 4,524 Russian olives and 212 Salt cedars, resulting in a water savings of 12,510,810 gallons.

Montezuma County Noxious Weed Department
103 North Chestnut, Cortez CO
970-565-0580
bloving@co.montezuma.co.us

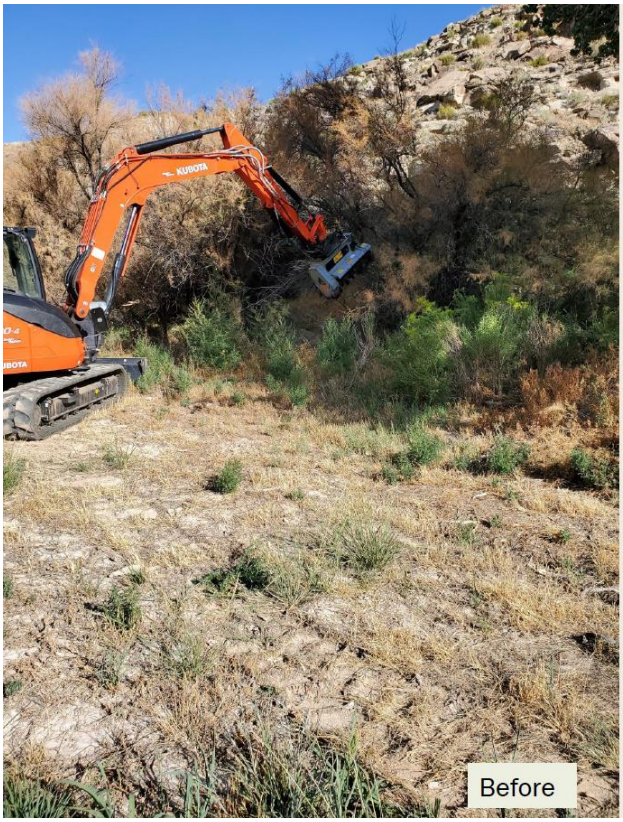
Appendix D: Map of 2019 treatments.



Appendix E: Photos of treatments in 2019.


Before


After


KUBOTA
Before


After


Before


After


Before


After


Before


After


Before
After


Before
After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Before
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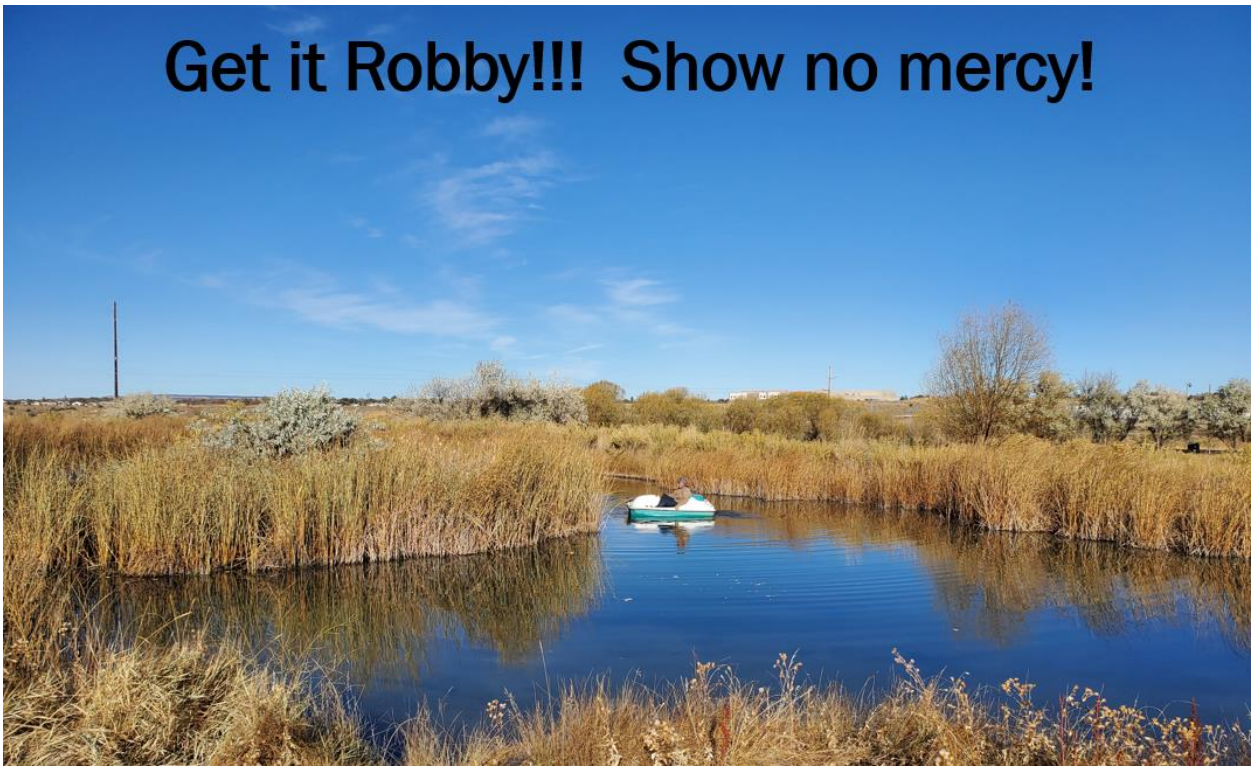
Get it Robby!!! Show no mercy!


Before
After


Before
After