

## **Final Report**

**Project Title: Muddy River Weed Management 2016**

**Project Number: 2015-NPS-1520B**

**Deliverable: D22**

### **Executive Summary:**

Clark County, NV and the National Park Service Lake Mead Exotic Plant Management Team (LAKE EPMT) entered into a three year partnership agreement beginning in November 2015 to inventory non-native vegetation and conduct weed control treatments on the Clark County Desert Conservation Program (DCP) Muddy River Properties.

The main goal of this project is to support vegetation management and maintenance activities along the Muddy River for enhancement of native riparian species of concern within the Multiple Species Habitat Conservation Plan. Weed surveys and project activities were conducted on nine DCP properties (Reserve Units A, B, C, D, E, F, G, H and I). The location and extent of infestations were recorded with GPS units, and treatments of exotic plant species were completed on a prioritized basis and also included targeted species listed in the agreement. In addition, revegetation with native species was also conducted in Units A, B and D to enhance habitat and suppress weeds from establishing.

Project Deliverables and Milestones were due and reported on a quarterly, bi-annual and annual basis during the three year project. A lot of valuable information has been exchanged and vegetation management work has been accomplished on the ground to meet current site objectives. Since this project has been initiated, similar weed management and restoration activities have been simultaneously occurring by other adjacent land managers within the corridor. This collaborative effort will help ensure long term vegetation management success not only within the Clark County Muddy River Properties but throughout the river corridor.

This work was supported by the Clark County Desert Conservation Program and funded by Section 10, as project #2015-NPS-1520B, to further implement or develop the Clark County Multiple Species Habitat Conservation Plan.

### **Introduction:**

The purpose of this project is to conduct inventories of non-native vegetation and weed treatment on the Clark County Desert Conservation Program (DCP) Muddy River Properties. There are 9 separate parcels of property totaling 118 acres along the river in the upper portions of the Moapa Valley, NV. These properties were acquired by Clark County due to their value

and/or potential value to meet actions addressed in the Multiple Species Habitat Conservation Plan.

The goal of this project is to support vegetation management and maintenance activities along the Muddy River for enhancement of native riparian species of concern of the Multiple Species Habitat Conservation Plan.

Non-native invasive plants and other weeds are commonly known to degrade ecological habitats, alter potential desirable native plant community recovery, reduce overall potential for wildlife diversity and increase wildfire potential including fire frequency and intensity. Some weeds are categorized by the State of Nevada as noxious, which land owners are required by law to control. Weed management is a vital component of not only being a good land steward and neighbor within a community but is a critical step toward restoring lands for maximizing native species habitats.

### **Methods and Materials:**

Plant surveys and treatments were accomplished by systematically covering the area on foot by using a grid type pattern to ensure thorough coverage.

Non-native plant surveys were conducted twice a year on foot during the winter and spring/summer time periods for three consecutive years (2016, 2017 and 2018). Twice-a-year surveys during these time periods were designed to detect a variety of species that may emerge during weather patterns related to these seasons. Non-native annual and perennial plant species were documented during surveys and geospatially recorded using hand held global positioning system (GPS units) devices including computer tablets and mobile phones. All plant inventories and treatments were recorded with GPS using standards according to the North American Invasive Species Management Association (NAISMA.org). Project related photographs were taken using digital cameras, and cameras within phones and tablets.

Weed treatments primarily consisted of two methods including mechanical and chemical. Mechanical methods included hand pulling or hoeing with a hand tool for small isolated annual weed populations encountered. The majority of weeds were treated using spot foliar herbicide method applied with back pack sprayers equipped with adjustable nozzles.

### **Results:**

For project results please refer to the following tables, data summaries and maps.



## Lake Mead Inter-Regional Exotic Plant

### Management Team Treatments

Partner: Clark County

Location: Muddy River (2015-2018)

Treatment Methods: Foliar Spot

Herbicide Concentrate: 0.1 gal Habitat

0.7 gal Roundup Pro Concentrate

0.5 gal Weedmaster

0.895 gal Weedar 64

Herbicide Mixture Rate: Mix #1: 0.5% Habitat, 0.5% Roundup Pro Concentrate

Mix #2: 3% Roundup Pro Concentrate, 1% Weedmaster

Mix #3: 1% Weedar 64

Mix #4: 1% Weedmaster, 1% Roundup Pro Concentrate

Herbicide Total Mix: 15.95 total gal

Mix #1: 2 gal

Mix #2: 2 gal

Mix #3: 8.95 gal

Mix #4: 3 gal

## Accomplishments

Species	Total Surveyed Acres	Net Infested Acres	Gross Infested Acres Treated	Net Treated Acres
<i>Acroptilon repens</i>	NA	0.000023	0.000772	0.000023
<i>Atriplex semibaccata</i>	NA	0.011488	0.267105	0.011488
<i>Bassia hyssopifolia</i>				
<i>Centaurea melitensis</i>	NA	0.229095	13.74	0.229095
<i>Chorispota tenella</i>				
<i>Convolvulus arvensis</i>	NA	0.005646	0.050204	0.005646
<i>Erodium cicutarium</i>				
<i>Malcolmia africana</i>	NA	0.017466	0.582205	0.017466
<i>Malva neglecta</i>				
<i>Salsola kali</i>	NA	0.066023	2.05865	0.066023
<i>Sorghum halepense</i>	NA	0.006681	0.017185	0.006681
<i>Salsola tragus</i>				
<i>Sisymbrium irio</i>				
<i>Tamarix ramosissima</i>				
<i>Tribulus terrestris</i>				

These definitions are based on NAISMA standards please visit [www.naisma.org](http://www.naisma.org) for more information. These definitions can also be found on the back of this report. For Questions please contact Curt Deuser at [curt\\_deuser@nps.gov](mailto:curt_deuser@nps.gov) (702) 293 - 8979

# Acreage Definitions

## **Surveyed Area**

Any area covered during the course of weed management / control activities. An area may be considered “surveyed” regardless of the presence / absence of target weed species. Surveyed area is obtained by GPSing the perimeter, GPSing perimeter points or digitized on screen using landform references.

## **Gross Infested Area**

The gross infested area is defined as the general perimeter of the infestation. Gross infested areas contain the target species and the spaces between populations or individuals. A gross infested area is calculated by adding up the total acreage of all mapped weed infestations, without taking into account percent cover.

## **Net Infested Area**

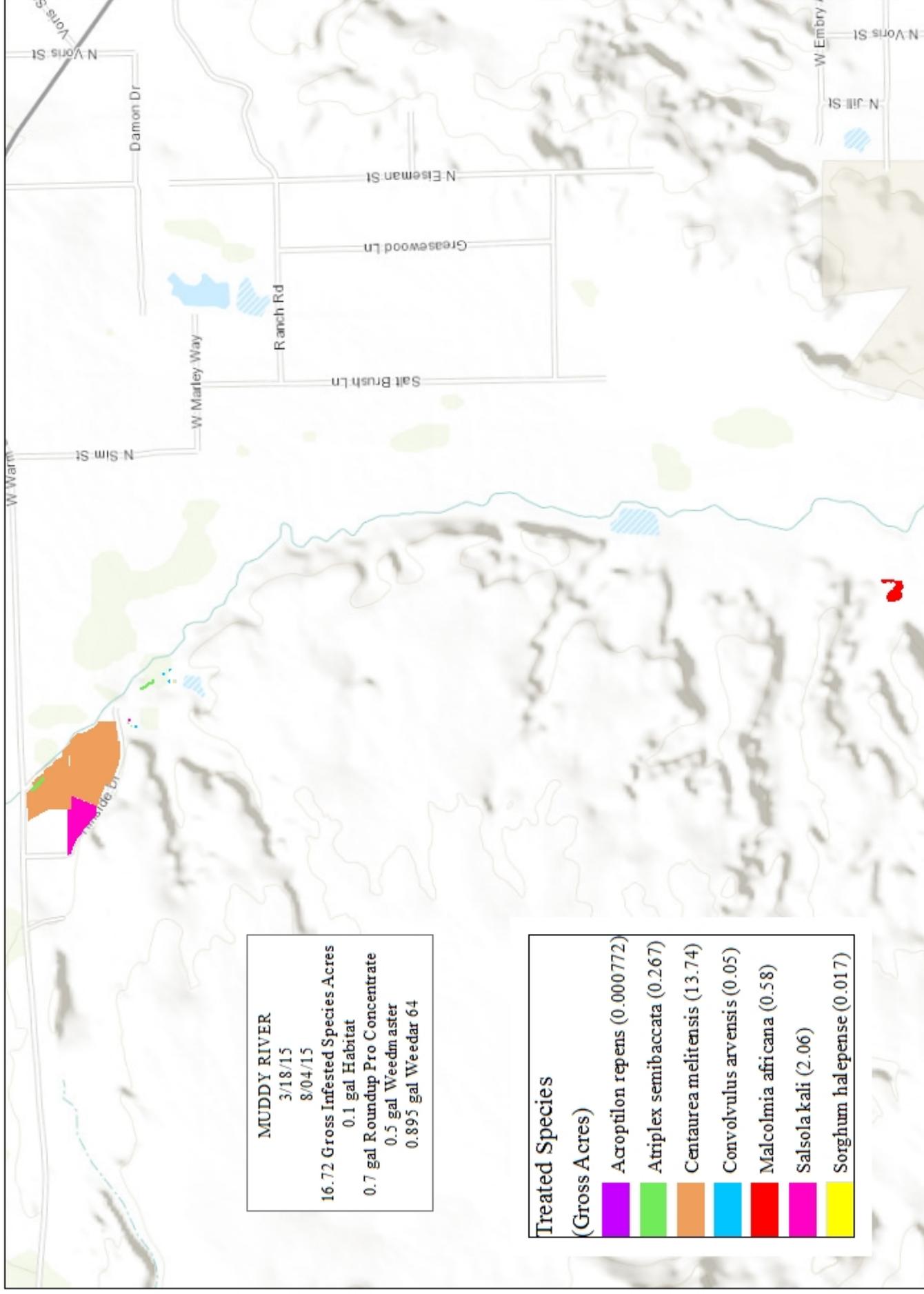
Actual area occupied by weed species within the gross infested area, which does not contain the spaces between individuals and populations. The total infest area (with the gross infested area) may be comprised of multiple infested areas, described by polygons, buffered points, buffered lines, or be calculated as the result of a stem count in which each individual is assigned a coverage multiplier.

## **Net Treated Area**

Treated area is either the infested area or subset of an infested area which has received treatment action. Treatment area is calculated using the same standards as infested area.

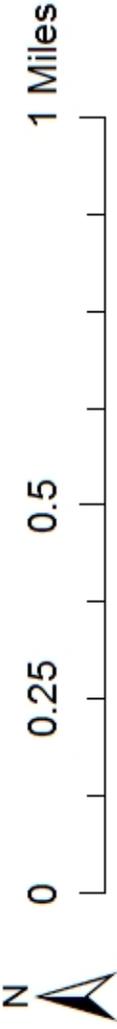
\* All of these terms apply to single species measurements. When there is more than one weed species in an area, the above measurements need to be applied to each species (population) individually.

# Muddy River Clark County 2015 EPMT Treatments



<b>MUDDY RIVER</b>
3/18/15
8/04/15
16.72 Gross Infested Species Acres
0.1 gal Habitat
0.7 gal Roundup Pro Concentrate
0.5 gal Weedm aster
0.895 gal Weedar 64

Treated Species (Gross Acres)
Acroptilon repens (0.000772)
Atriplex semibaccata (0.267)
Centaurea melitensis (13.74)
Convolvulus arvensis (0.05)
Malcolmia africana (0.58)
Salsola kali (2.06)
Sorghum halapense (0.017)





## Lake Mead Inter-Regional Exotic Plant

### Management Team Treatments

**Partner:** Clark County

**Location:** Muddy River (2015-2018)

**Treatment Methods:** Foliar Spot

**Herbicide Concentrate:** 0.1 gal Garlon 4 Ultra

48 floz Killzall II, 48 floz Weedestroy AM40

1.55 gal Roundup Pro Concentrate, 1.55 gal Weedar 64

33 floz Weedmaster, 0.33 gal Roundup Pro Concentrate

**Herbicide Mixture Rate:** Mix #1: 20% Garlon 4 Ultra

Mix #2: 2 floz/gal Killzall II, 2 floz/gal Weedestroy AM40

Mix #3: 1% Roundup Pro Concentrate, 1% Weedar 64

Mix #4: 1 floz/gal Weedmaster, 1% Roundup Pro Concentrate

**Herbicide Total Mix:** Mix #1: 0.5 gal

Mix #2: 24 gal

Mix #3: 155.4 gal

Mix #4: 33 gal

## Accomplishments

Species	Total Surveyed Acres	Net Infested Acres	Gross Infested Acres Treated	Net Treated Acres
<i>Acroptilon repens</i>				
<i>Atriplex semibaccata</i>	NA	0.06998	7.066735	0.06998
<i>Bassia hyssopifolia</i>	NA	0.015204	3.040882	0.015204
<i>Centaurea melitensis</i>	NA	0.079109	12.50311	0.079109
<i>Chorispota tenella</i>	NA	0.044389	8.846885	0.044389
<i>Convolvulus arvensis</i>	NA	0.057948	15.562603	0.057948
<i>Erodium cicutarium</i>	NA	0.03851	7.701943	0.03851
<i>Malcolmia africana</i>	NA	0.06847	4.14212	0.06847
<i>Malva neglecta</i>	NA	0.122134	5.640433	0.122134
<i>Salsola kali</i>	NA	1.509202	25.771395	1.509202
<i>Sorghum halepense</i>	NA	0.022938	0.026986	0.022938
<i>Salsola tragus</i>	NA	0.112563	3.752091	0.112563
<i>Sisymbrium irio</i>	NA	0.270301	15.078408	0.270301
<i>Tamarix ramosissima</i>	NA	0.01371	0.024716	0.01371
<i>Tribulus terrestris</i>	NA	0.033971	6.794205	0.033971

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## Surveyed Area

Any area covered during the course of weed management / control activities. An area may be considered “surveyed” regardless of the presence / absence of target weed species. Surveyed area is obtained by GPSing the perimeter, GPSing perimeter points or digitized on screen using landform references.

## Gross Infested Area

The gross infested area is defined as the general perimeter of the infestation. Gross infested areas contain the target species and the spaces between populations or individuals. A gross infested area is calculated by adding up the total acreage of all mapped weed infestations, without taking into account percent cover.

## Net Infested Area

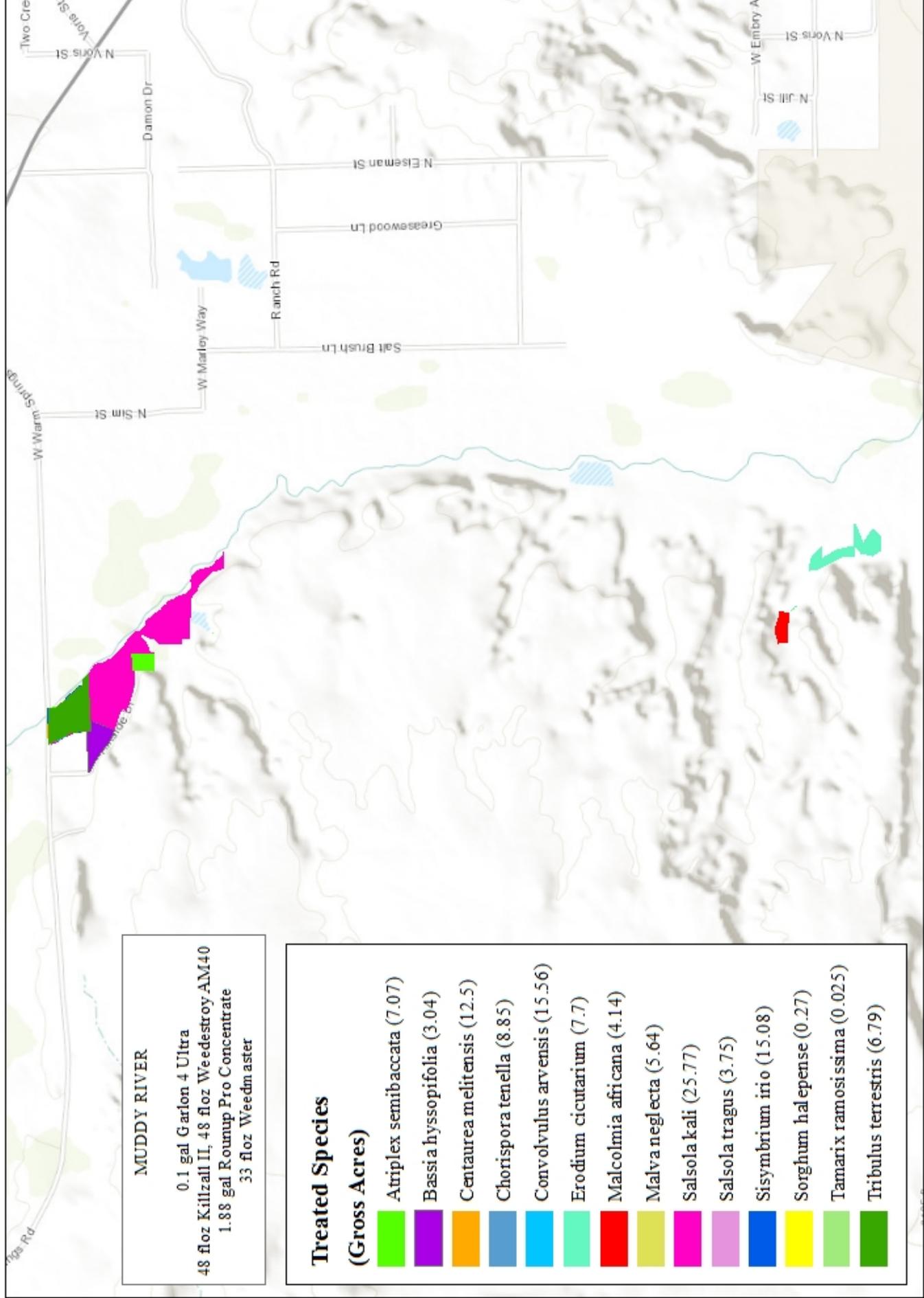
Actual area occupied by weed species within the gross infested area, which does not contain the spaces between individuals and populations. The total infest area (with the gross infested area) may be comprised of multiple infested areas, described by polygons, buffered points, buffered lines, or be calculated as the result of a stem count in which each individual is assigned a coverage multiplier.

## Net Treated Area

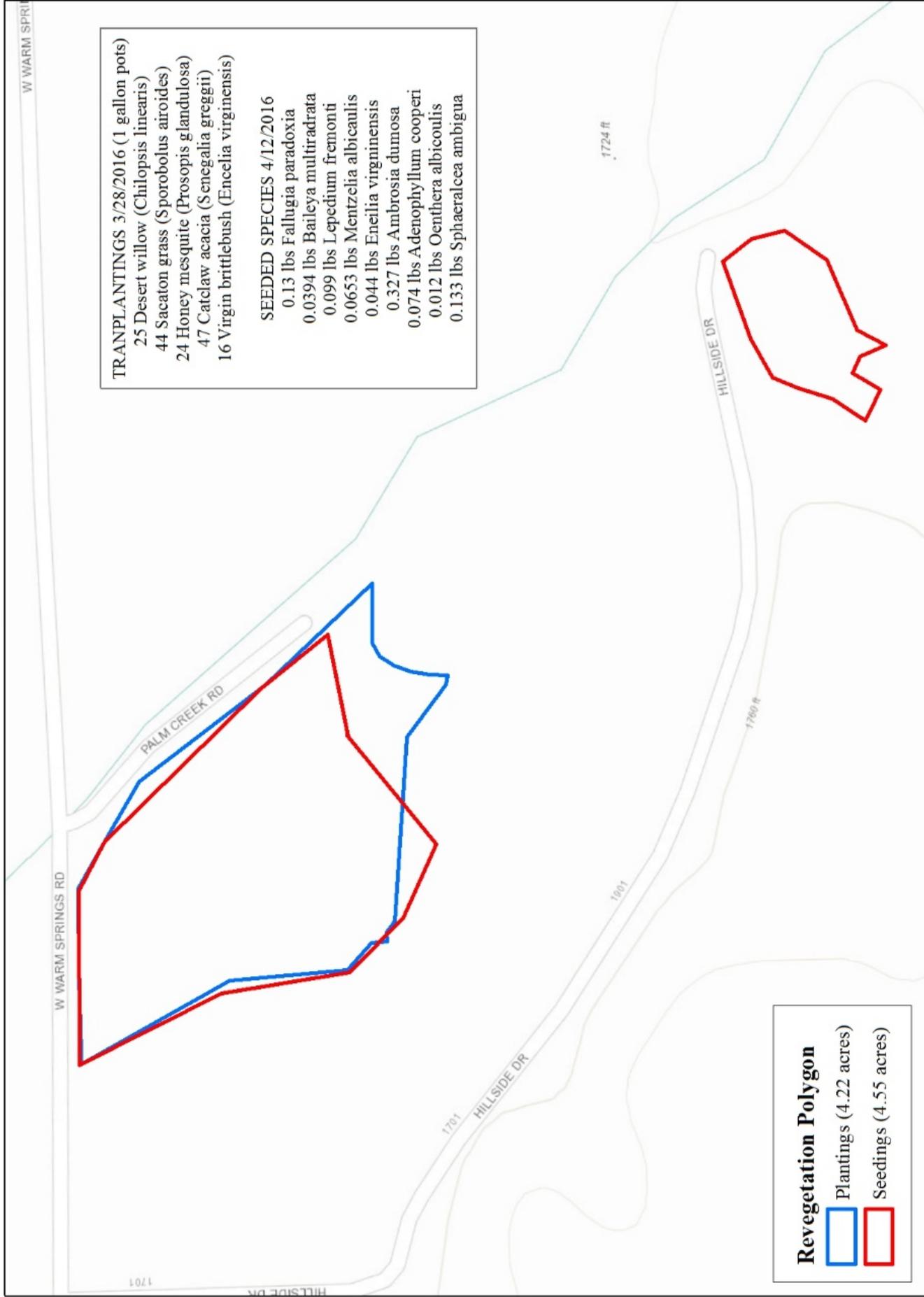
Treated area is either the infested area or subset of an infested area which has received treatment action. Treatment area is calculated using the same standards as infested area.

\* All of these terms apply to single species measurements. When there is more than one weed species in an area, the above measurements need to be applied to each species (population) individually.

# Muddy River Clark County 2016 EPMT Treatments



# Muddy River Clark County 2016 EPMT Revegetation





# Lake Mead Inter-Regional Exotic Plant Management Team Treatments

**Partner:** Clark County

**Location:** Muddy River (2015-2018)

**Treatment Methods:** Foliar Spot

**Herbicide Concentrate:** 0.4 gal Garlon 4 Ultra

0.6875 gal Roundup Pro Concentrate

0.416 gal Weedar 64

0.875 floz Transline

0.105 gal Weedestroy AM40

0.22125 gal Weedmaster

0.012 gal Milestone

**Herbicide Mixture Rate:** Mix #1: 20% Garlon 4 Ultra

Mix #2: 1% Roundup Pro Concentrate, 1% Weedar 64

Mix #3: 1% Roundup Pro Concentrate, 1% Weedmaster

Mix #4: 1.5 floz/gal Weedar 64, 0.5 floz/gal Transline

Mix #5: 1% Weedestroy AM40, 1% Roundup Pro Concentrate

Mix #6: 1% Weedmaster, 1% Roundup Pro Concentrate

Mix #7: 1% Weedmaster, 0.2% Milestone

Mix #8: 1 floz/gal Weedmaster, 1.28 floz/gal Roundup Pro Concentrate

**Mix #9: 1 floz/gal Weedmaster, 1% Roundup Pro Concentrate**

**Herbicide Total Mix:**

**Mix #1: 2 gal**

**Mix #2: 33.5 gal**

**Mix #3: 6 gal**

**Mix #4: 1.75 gal**

**Mix #5: 10.5 gal**

**Mix #6: 6.75 gal**

**Mix #7: 6 gal**

**Mix #8: 6 gal**

**Mix # 9: 6 gal**

## Accomplishments

Species	Total Surveyed Acres	Net Infested Acres	Gross Infested Acres Treated	Net Treated Acres
<i>Acroptilon repens</i>				
<i>Atriplex semibaccata</i>	NA	0.00431	0.020884	0.00431
<i>Bassia hyssopifolia</i>				
<i>Centaurea melitensis</i>				
<i>Chorispora tenella</i>				
<i>Convolvulus arvensis</i>	NA	0.175236	1.052839	0.175236
<i>Erodium cicutarium</i>				
<i>Malcolmia africana</i>				
<i>Malva neglecta</i>				
<i>Salsola kali</i>	NA	0.218762	23.571137	0.218762
<i>Salsola</i>	NA	0.13835	0.922332	0.13835
<i>Sorghum halepense</i>				
<i>Salsola tragus</i>				
<i>Sisymbrium irio</i>	NA	0.340874	1.270602	0.340874
<i>Sisymbrium irio</i>				
<i>Tribulus terrestris</i>				
<i>Tamarix ramosissima</i>		0.111083	0.177733	0.11083

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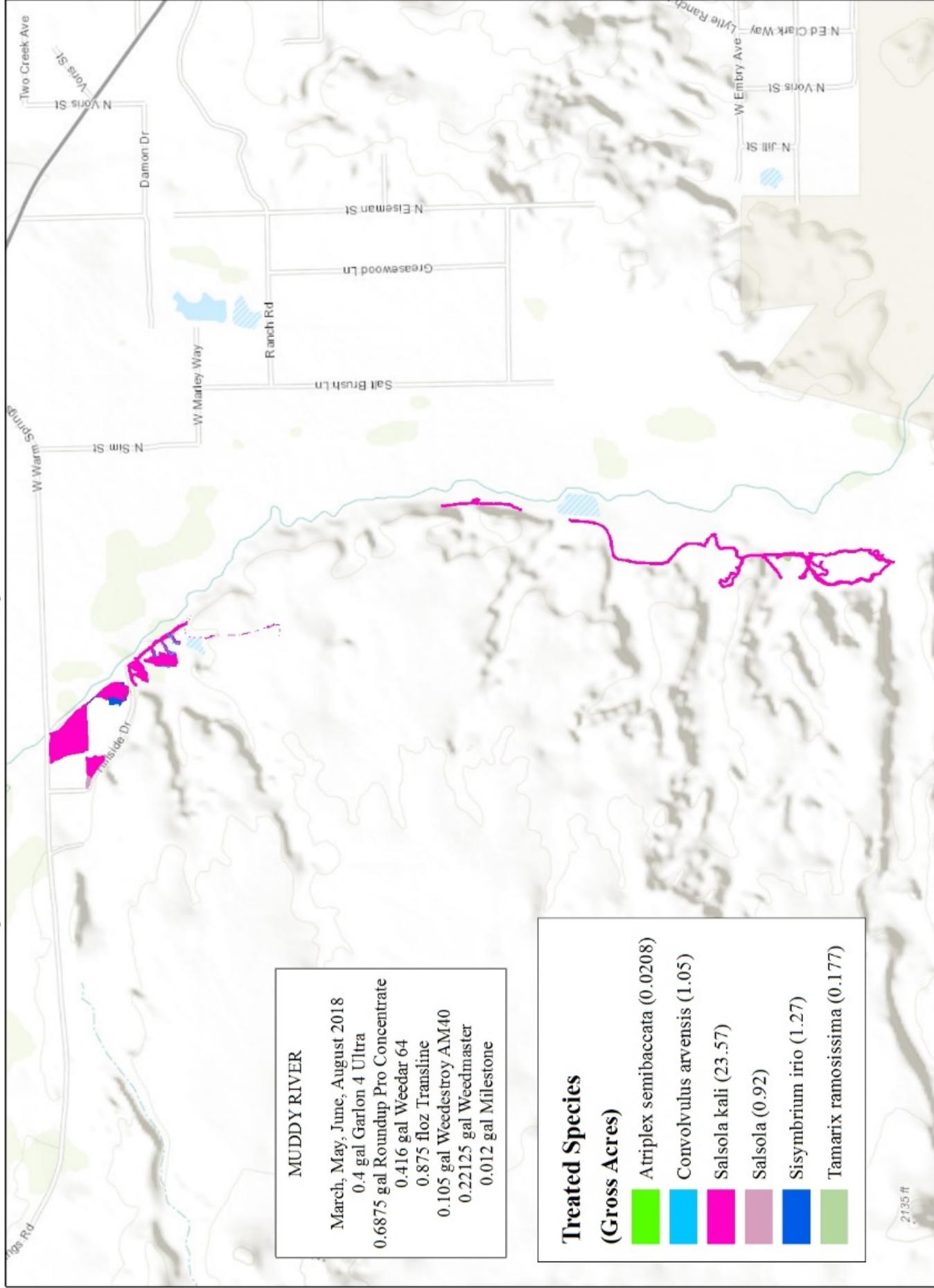
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## Net Treated Area

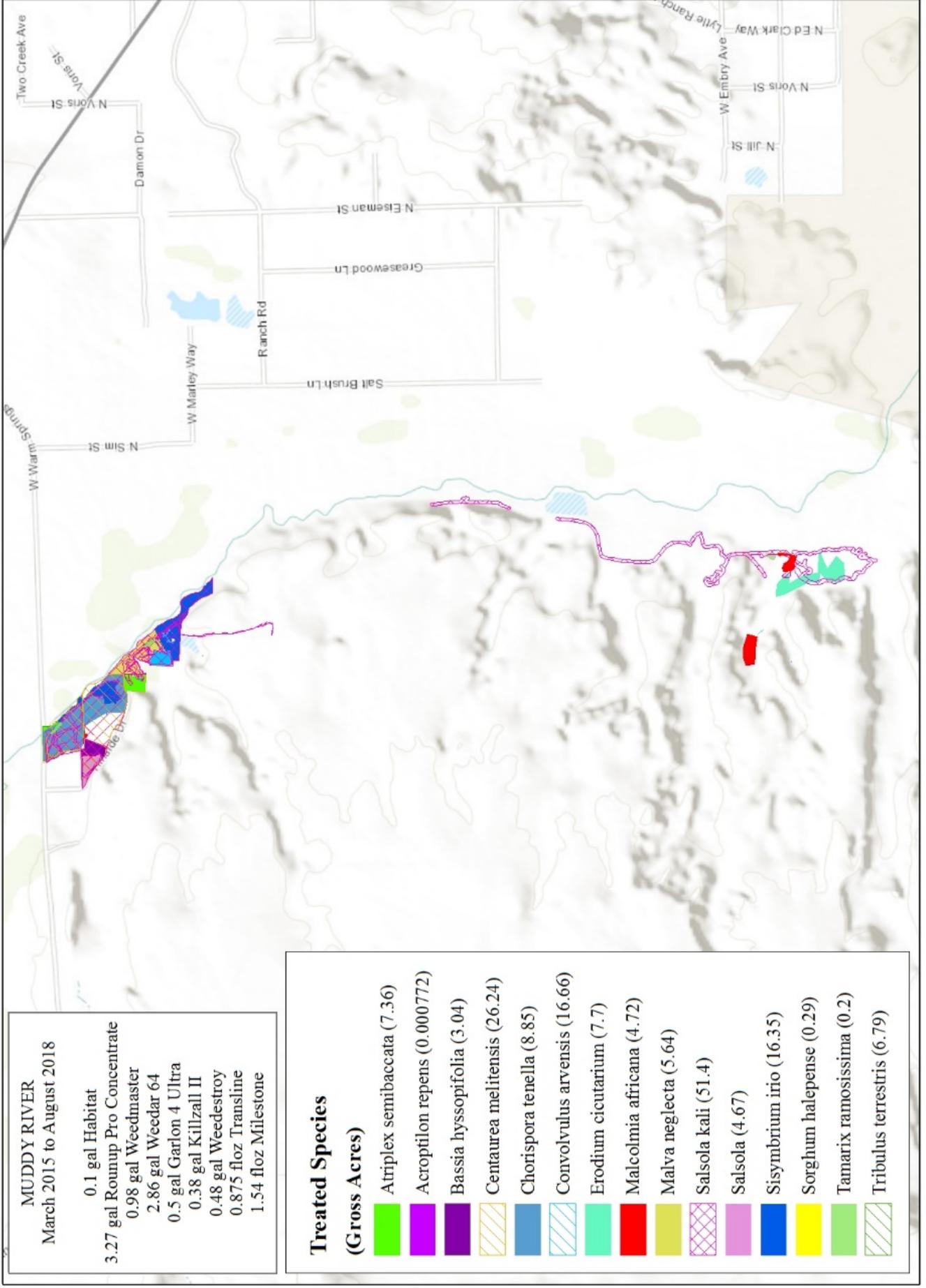
Treated area is either the infested area or subset of an infested area which has received treatment action. Treatment area is calculated using the same standards as infested area.

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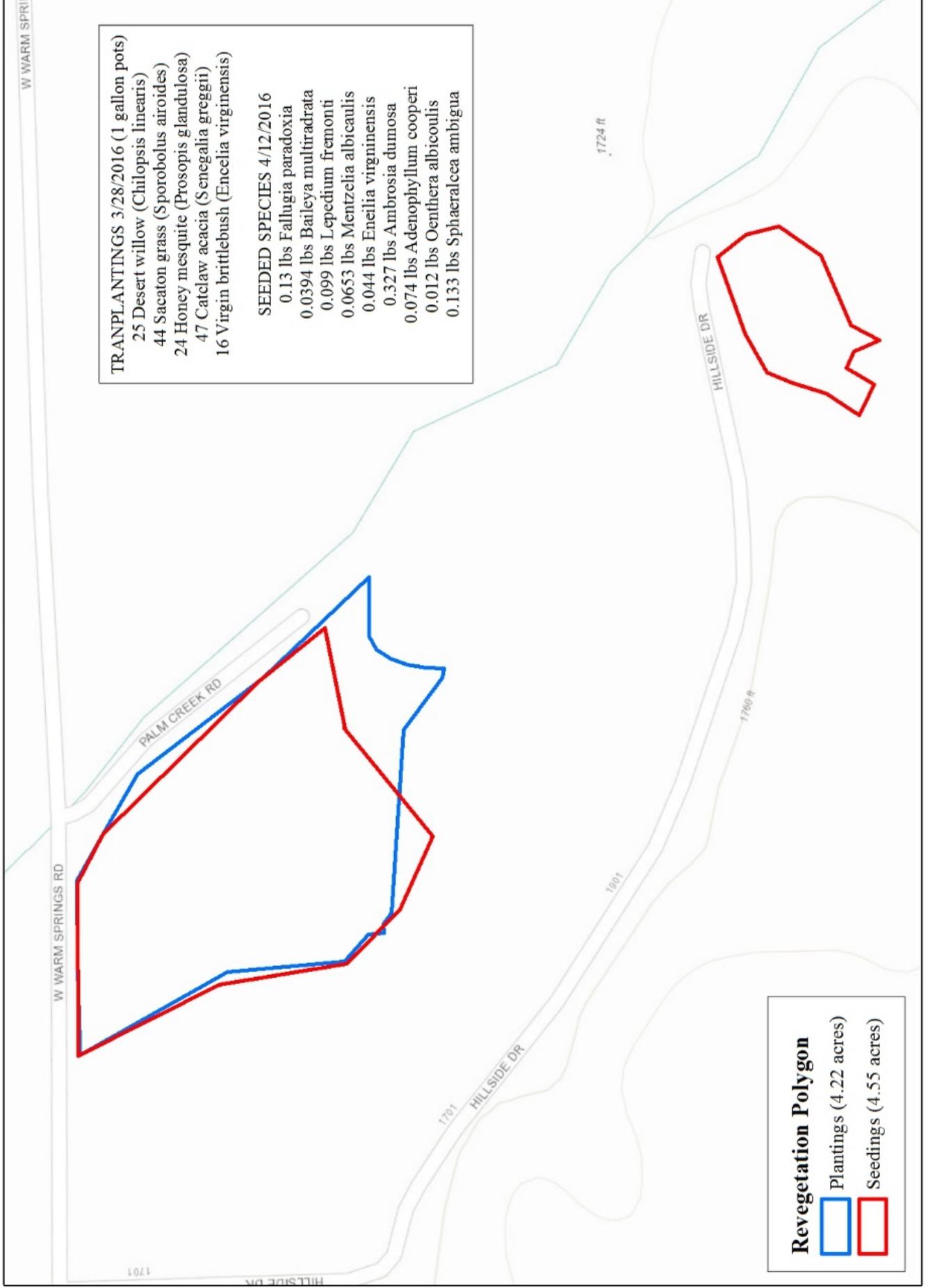
# Muddy River Clark County 2018 EPMT Treatments



# Muddy River Clark County EPMT Treatments 2015-2018



# Muddy River Clark County 2016 EPMT Revegetation



### **Evaluation and Discussion of Results:**

London rocket, Malta Starthistle, Puncture Vine and Russian thistle continue to be a nuisance in units A,B,C, & E, but these populations have been dramatically reduced due to depletion of the seed bank from persistent control actions. There has also been a dramatic recovery of desirable native plants from natural recovery and our transplanting and seeding of native species in April of 2016. This native species establishment has also attributed to the reduction of weeds by competition with desirable perennial plant cover increasing. Excellent survival of the 156 native trees and shrubs has occurred with minimal supplemental watering due to the expertise of the EPMT's planting techniques, watering and maintenance activities on site. Many of these trees have grown over six feet tall and are beginning to provide habitat for bird and other wildlife species. In Unit F, a substantial amount of tamarisk was controlled using the cut stump method in the winter of 2017/18. This tamarisk control should be continued in Unit F in future projects since it is very feasible to achieve eradication and there are many native mesquite trees on site. Some native plant revegetation could also occur after the tamarisk is removed.

In the spring of 2016 we conducted native revegetation and seeding within Units A, B and seeding within Unit D. We transplanted native trees using deep hole planting of long stem nursery grown stock provided by the National Park Service Native Plant Nursery at Lake Mead National Recreation Area. All plant material was originally collected from the southern Nevada area. This long stem deep planting method was developed by the USDA NRCS Plant Materials Center in Los Lunas, New Mexico and described by David R. Dreesen and Gregory A. Fenchel in a 2014 Rangelands publication produced by the Society for Range Management. 156 one gallon container trees and shrubs were planted on March 28, 2016. Refer to table for a list of species planted. The purpose of the revegetation was to provide a desirable plant community to reduce and eventually out-compete the amount of weeds on site. However recent funding has been obtained to conduct a larger restoration project including large scale earth moving and re-contouring of the floodplain in the near future, unfortunately all of the transplanted trees from 2016 will be destroyed from these earth moving activities. However the end result should be the creation of a more hydric vegetation community capable of supporting an excellent riparian habitat that is more intact with the floodplain.

The glyphosate treatments of Australian saltbush were effective in Unit A and B. However there has been new recruitment of this species from the seed bank, continued treatments will occur. It should be noted that significant rain events occurred in April 2016 (record precip for the month in Las Vegas) and at least one of these rain events caused sheet flow in Unit A. The good thing is that it help water our transplants in Unit A and made for moist soil during the seeding project, however significant weed production occurred in Units A, D and E has a result

of these rain events. It should be noted that a massive production of puncture vine established in Unit A in April forming "carpets" of puncture vine seedlings throughout most of Unit A. This was the most amount of puncture vine ever observed in any of the units during the previous 4 years. However we responded quickly and prevented all of this from fruiting and going to seed which would have resulted in a very nasty field thorny seeds. Lots of Russian thistle has been treated this spring has well which also would have resulted in impenetrable thickets in Units A, D and E. Most of the native transplants have survived and look healthy and are growing out of their tree shelters. We have also observed many desirable native shrubs establishing in Units A and D. Species include salt bush, white bursage and others, we believe some of this is from our seeding and also from natural volunteer establishment. There is a significant amount of narrow leaf mallow establishing in Unit A. I believe that Unit A is finally healing itself and putting itself on a trajectory of long term more sustainable plant community of native shrubs and trees that is more resistant to weed dominance. However this unit will still take much vigilance in weed control due to its historic disturbance regime and massive seed bank of a variety of weeds.

The uplands in Units E, F, G and I and the adjacent surrounding upland areas during the winter and spring months can have an abundance of the winter annual weed African mustard (*Malcolmia africana*) (beyond control feasibility) during optimum conditions. Its presence and abundance will likely continue to vary according to weather conditions and is believed to be closely associated with fall precipitation to stimulate germination, followed by subsequent winter precipitation to determine survival and productivity (bio-mass).

The lowland/riparian areas of Units F and H have large tamarisk (*Tamarix ramosissima* or *species*) stands but also have a lot of mesquite trees and other desirable species. Although a ditch cuts through Unit G, it does contain a relatively intact native plant community and very few non-native species present.

Weed treatments were effective at greatly reducing the amount of high priority state Noxious weed species presence throughout the properties such as Russian knapweed (*Acroptilon repens*), malta starthistle (*Centaurea melitensis*), puncture vine (*Tribulus terrestris*) and Johnson grass (*Sorghum halepense*) in addition to persistent high priority nuisance species that can inhibit long term site restoration such as fivehook bassia (*Bassia hyssopifolia*), Australian saltbush (*Atriplex semibaccata*) and field bindweed (*Convolvulus arvensis*).

It is important to note that it is most effective to control weeds early before they become well established and develop seed banks making it difficult for long term control. This approach is referred to in weed management as early detection rapid response. There are four examples of detection and control that were found and controlled by treatment during this project within the Muddy River Reserve Units: Sahara mustard (*Brassica tournefortii*), this is a state listed Noxious weed that is a widespread common problem in Clark County although it has not established on the property. Blue Mustard (*Chorispora tenella*), this weed is not widespread in

Clark County natural areas. Chaste tree (*Vitex angustus-castus*) is a common ornamental in the County that is just starting to spread into natural areas and is on the Clark County Invasive Weed Species Watch List developed by the Nevada Department of Agriculture. And Forage Kochia (*Kochia prostrata*), which is common in the Moapa Valley area but not well established on the Muddy River Reserve Properties.

### **Conclusions and Recommendations:**

Continuation of this project is important to maintain successes and to keep the sites free from Noxious weeds and other high priority weed species that alter site restoration potential or any other nuisance species determined to be controlled by the County Project Manager. The Bureau of Land Management (BLM) has continued tamarisk control and other weed species control followed by active revegetation along the streambanks and floodplain since 2014 within the old Perkins parcel. Nearly all of the Clark County Muddy River Properties are immediately adjacent or surround this BLM project area. Russian knapweed within the County properties has been virtually eradicated and also controlled to maintenance levels on adjacent BLM lands which are also being treated through an agreement with our team. This way weeds will have less potential to move across boundaries since adjacent properties have the same weed control objectives.

Tamarisk impacts to riparian ecosystems are well known and include increased fire risk, displaced native vegetation, decreased habitat for some species, and consumption of water resources. There are currently large mature stands of tamarisk in Reserve Units F and H. The tamarisk leaf beetle, (*Diorhabda* spp) has been established on this portion of the Muddy River. Widespread defoliation of tamarisk trees in this drainage was observed in early August of 2011, however all of the tamarisk appeared to re-foliate in September 2011 and through the fall. Periodic beetle caused defoliations has occurred in the summers of 2012 through 2018 with variable amounts of defoliation and presence of the beetle. (SNWA staff from the Warm Springs Natural Area stated that defoliation did not occur in 2014). If the beetle persists in the area it is likely that eventual suppression of the tamarisk will occur over the next several years, however long term effects of the beetle are still largely unknown. If beetles are effective at controlling tamarisk then active revegetation with Ash trees, mesquite trees, quailbush and sacatone grass may be desirable to provide diverse plant community replacement. Other tamarisk control alternatives within the Muddy River Units include ground crews using the cut stump method or the foliar herbicide application method, or tree extraction with heavy equipment. Either triclopyr or imazapyr based herbicides could be used with these methods. We can discuss advantages and disadvantages of each of these methods in the future.

Special consideration should be given to the southernmost Reserve Units, F, G, H and I. These lower areas have seen fewer disturbances than the upper sections in recent years and

therefore consist of a mature native shrub community dominated by *Suaeda torreyana* (sea-blite) and *Atriplex lentiformis* (quailbush), and include both screwbean and honey mesquites. There is a ditch in Reserve Units G and H that is altering hydrologic surface flow, re-contouring of this ground disturbance feature could be considered in order to restore the hydrologic processes. *Sporobolus airoides* (alkali sacatone grass) is present in both Reserve Units G and H and is a valuable native grass often used for habitat restoration in riparian areas in the desert Southwest due to the ability to thrive in salt rich soils and as forage for wildlife (Johnson, 2000). Alkali sacatone is highly drought tolerant yet often found near marshes and where ground water is not deeper than three feet from the surface. Alkali sacatone is present in Reserve Unit H and G in a few isolated pockets yet remnants of a much larger distribution is visible as stubble underneath much of the shrub layer in much of the central portion of the Unit H.

Another species of interest is *Distichlis spicata* (saltgrass), which was found in only one location in Reserve Unit F. Saltgrass is another salt tolerant grass species that can be used for habitat restoration in disturbed areas for erosion control. Salt grass has stolons and is capable forming dense ground cover which can impede weeds making it ideal for the proposed use of stream bank erosion control along the Muddy River in Reserve Units A and B.

The dense populations of *Malcomia africana* (African mustard) in the uplands and western half of Unit F were left untreated due to lack of feasibility for control. Feasibility for complete control of this winter annual species will be difficult due to the extent of the population in the surrounding areas outside of the reserve. Typically this plant should be prioritized for control in isolated areas, restoration sites or where it competes with rare plants.

#### Recommendations for Units A, B and C:

These units are heavily disturbed from past land management activities and there are ornamental non-native Pine trees, Southern Oak trees (both non-invasive) and Palm trees remaining on site from a previous tree farm including irrigation pipes and furrows. Native quail bush is establishing in the southwest portions of these units which is a desirable species adapted to the site and will likely continue to expand into the more barren areas over time. However in 2014 some fire breaks were bulldozed in these units under direction from the County site manager. Future weed and vegetation control will need to be implemented if the County wants to maintain these fuel breaks. In 2015, we treated these areas as Russian thistle began to invade the fuel breaks since weeds like Russian thistle will only increase the fire potential. I would not recommend bulldozing fuel breaks in the future since this creates ground disturbance and more weeds and does not allow the site to recover. Not sure why the fire breaks were constructed in the first place since all the units are surrounded by roads which already form functional fuel breaks.

Restoration alternatives could include ornamental tree removal and re-contouring the site with excavation equipment and revegetation with supplemental irrigation once a desired site objective has been determined. Another much less costly alternative may be to seed or plug the site with native Sacatone grass and/or Salt grass species and other salt tolerant shrub species that may establish with minimal short term supplemental watering requirements. These species would increase plant cover, reduce bare ground, and greatly reduce the amount of weeds on the site from year to year. The minimal alternative would be to continue weed control on an annual basis and allow the site to slowly recover naturally with desirable plant species over time.

In Unit F, a substantial amount of tamarisk was controlled using the cut stump method in the winter of 2017/18. This tamarisk control should be continued in Unit F in future projects since it is very feasible to achieve eradication and there are many native mesquite trees on site. Some native plant revegetation could also occur after the tamarisk is removed.

The County should be prepared to conduct major weed control for the first 3 years after construction while desirable vegetation is establishing. Ground disturbance from earth moving activities is notorious for producing massive amounts of annual weeds in the following years so aggressive weed control is recommended to prevent weed seed bank development.

**Supporting Project Report Photos:**



Photo: From left to right: *Centaurea melitensis*, *Malcolmia africana*, and *Lactuca serriola*



Exotic Chaste Tree, *Vitex agnus*, found and treated in Unit C.



Virgin Brittle Bush (*Encelia virginensis*) shrub transplant in Unit A



Honey Mesquite (*Prosopis glandulosa*) transplant one month after planting in Unit A



Puncture Vine and Russian thistle treated in Unit A



Watering transplants in Unit A



Treating weeds in Unit A



Exotic Australian Saltbush (*Atriplex semibaccata*) in Unit E.



Honey Mesquite approximately two years after transplanting in Unit A.



Honey Mesquite tree approximately 2 years after transplanting in Unit A.



Tamarisk control in Unit F.



Mixing native seed in Unit A.



Spreading native seed mix in Unit A.



Spreading native seed mix in Unit D/E.

FOREST SERVICE  
BILL FOR COLLECTION

Doc. Date : 04/29/2016		PAGE: 1						
ENCLOSE A COPY OF THIS BILL WITH YOUR CHECK OR MONEY ORDER. DO NOT SEND CASH. PLEASE INCLUDE BILL NO. AND CUSTOMER NUMBER ON YOUR CHECK OR ON YOUR ONLINE BILL PAYMENT. MAKE CHECK PAYABLE TO: FOREST SERVICE	MAIL PAYMENT TO: US Forest Service C/O Citibank P.O. Box 301550 Los Angeles CA 90030-1550 Or pay online at <a href="http://www.fs.fed.us/billpay">www.fs.fed.us/billpay</a>							
TO: LAKE MEAD NATIONAL RECREATION AREA 601 NEVADA HWY BOULDER CITY NV 89006 US	PAYER INDICATE AMOUNT ENCLOSED: <hr/> NET AMOUNT DUE :           \$           351.00 <hr/> DUE DATE:                   05/29/16 <hr/> FMMI BILL NUMBER :       1002235993 <hr/> CUSTOMER NUMBER :       3306843							
REFERENCE CONTRACT/PERMIT/AGREEMENT NUMBER : NPNV_Order2015	DESCRIPTION : NPNV_Order2015							
REMARKS : RE: BPPS-BDFA-0601-000000001875 NOTE : PLEASE SEND ALL CORRESPONDENCE, INQUIRIES, AND CHANGE OF ADDRESS TO : DESCHUTES NF 63095 DESCHUTES MARKET RD BEND OR 97701 US	<hr/> PRINCIPAL :                 \$           351.00 <hr/> INTEREST :                 \$           0.00 <hr/> ADMINISTRATIVE COST :   \$           0.00 <hr/> PENALTY :                 \$           0.00 <hr/> AMOUNT DUE :             \$           351.00 <hr/> AMOUNT CREDITED :       \$           0.00 <hr/> NET AMOUNT DUE :       \$           351.00							
FAILURE TO MAKE PAYMENTS BY THE DUE DATE WILL RESULT IN THE ASSESSMENT OF LATE PAYMENT CHARGES (INTEREST, ADMINISTRATIVE COST, AND/OR PENALTY CHARGES) IN ACCORDANCE WITH YOUR CONTRACT, PERMIT, OR THE DEBT COLLECTION ACT OF 1982, AS AMENDED. POSTMARKS ARE NOT HONORED. LATE FEES DO NOT APPLY FOR BILLINGS IN ADVANCE OF RECEIPT OF GOODS OR SERVICES.								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">LINE</th> <th style="text-align: left; padding: 2px;">LINE INFORMATION</th> <th style="text-align: right; padding: 2px;">AMOUNT</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">000001</td> <td style="padding: 2px;">NPNV_Order2015</td> <td style="text-align: right; padding: 2px;">\$           351.00</td> </tr> </tbody> </table>	LINE	LINE INFORMATION	AMOUNT	000001	NPNV_Order2015	\$           351.00		
LINE	LINE INFORMATION	AMOUNT						
000001	NPNV_Order2015	\$           351.00						



## SEED ORDER Form for Bend Seed Extractory

**Seed Order #:**  
(For BSE use only)

Please submit completed forms to:  
Kayla Herriman at kherriman@fs.fed.us or Sarah Garvin at sarahegarvin@fs.fed.us

Date Ordered: 2/24/2015 Date Needed to Receiver: **ASAP**

ID Short Code	Source Code	Pounds to Ship	Receiver	Comments
SOS-NV040-208	ADCO2-SOS-NV040-208-LINCOLN-14	0.074#	Please send all seed to : Curt Deuser Lake Mead National Recreation Area 601 NV Way Boulder City, NV 89005 702-293-8979 <a href="mailto:curt_deuser@nps.gov">curt_deuser@nps.gov</a>	Please send the
SOS-NV040-193	AMDU2-SOS-NV040-193-LINCOLN-14	0.327#		entire remainder of
SOS-NV040-65	AMDU2-SOS-NV040-65-10	0.791#		seed for each
SOS-NV052-381	BAMU-SOS-NV052-381-LINCOLN-12	0.025#		accession
SOS-NV040-202	BAMU-SOS-NV040-202-LINCOLN-14	0.0144#		
SOS-NV040-192	ENVI-SOS-NV040-192-LINCOLN-14	0.18#		
SOS-NV040-198	ENVI-SOS-NV040-198-LINCOLN-14	0.044#		
SOS-NV040-108	FAPA-SOS-NV040-108-10	0.082#		
SOS-NV052A-003	FAPA-SOS-NV052A-003-CLARK-12	0.048#		
SOS-NV040-197	LEFR2-SOS-NV040-197-LINCOLN-14	0.099#		
SOS-NV052-550	LYAN-SOS-NV052-550-CLARK-15	0.1391#		
SOS-NV052-543	LYAN-SOS-NV052-543-NYE-15	0.1335#		
SOS-NV040-196	MEAL6-SOS-NV040-196-LINCOLN-14	0.0653#		
SOS-NV052-324	OEDEA-SOS-NV052-324-CLARK-12	0.002#		
SOS-NV052-356	OEDE2-SOS-NV052-356-CLARK-12	0.01#		
SOS-NV040-201	SPAM2-SOS-NV040-201-LINCOLN-14	0.047#		
SOS-NV040-64	SPAM2-SOS-NV040-64-10	0.086#		

If you have questions, please contact:  
Kayla Herriman at 541.383.5481 or kherriman@fs.fed.us  
Sarah Garvin at 541.383.5646 or sarahegarvin@fs.fed.us

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Report prepared by the Lake Mead Exotic Plant Management Team (LAKE EPMT). Project reporting and data management production by Rachel Skoza, LAKE EPMT. Report analysis and recommendations prepared by Curt Deuser. Thanks to the field work completed by many individuals from the LAKE EPMT. Also thanks to James Holland for plant identification and verification.

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[http://agri.nv.gov/Plant/Noxious\\_Weeds/Noxious\\_Weed\\_List/](http://agri.nv.gov/Plant/Noxious_Weeds/Noxious_Weed_List/)

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