



**TOWN OF CARBONDALE
511 COLORADO AVENUE
CARBONDALE, CO 81623**

Board of Trustees Agenda Memorandum

Item No: Attachment:

Meeting Date: February 22 , 2022

TITLE: 2022 Town of Carbondale Integrated Weed Management Plan

SUBMITTING: Parks & Recreation Department

ATTACHMENTS: Parks Department Yearly Timeline
Weed Management Plan Spreadsheets and Integrated Weed Management Log
Weed Control Maps and photos of test sites
Absinth Wormwood Information and State Map

PURPOSE:

Resolution # 13 Series of 2019 adopted the Town of Carbondale Integrated Weed Management Plan (CIWMP). The management techniques prioritized in this plan include prevention, cultural, mechanical, biological strategies and as a last resort, chemicals. This plan includes consult with area Natural Land Management Specialists to exhaust all strategies named above before resorting to chemical control. Before using any chemical on town managed land in Carbondale, it is necessary to get approval from the Board of Trustees, because Carbondale pursues an herbicide and pesticide free policy whenever possible.

On an annual basis an assessment, well in advance of the growing season, will take place of the weed mitigation methods used per park and on other Town owned lands. The effectiveness assessment will utilize data compiled on the Parks Department & Public Works Department Weed Management Plan spreadsheets, which detail the methods, techniques, timing, and effectiveness of the efforts of weed management presently being used. These documents also provide data on species of non-desirable plants not responding to the non-chemical treatment efforts.

If necessary, at this time a plan for the following growing season will be presented to the Environmental Board and to the Weed Advisory Board (Board of Trustees) for the use of an approved chemical treatment for the eradication of the weed in question, which will be identified by type, location, size of infestation, methods of chemical use, details of chemical used and the use regimen per location.

Anytime chemicals are recommended for weed management to the Weed Advisory Board, the E-Board will have first reviewed the "Logs and Archive" of integral strategies pursued by staff, including the report from the Natural Land Management specialists to confirm that integral (chemical-free) management techniques have been exhausted, or are not realistic with budget limitations and staff availability. Town staff will consult with a Natural Land Management Specialist to determine the most beneficial and effective chemical management technique.

BACKGROUND:

The State of Colorado Noxious Weed Act (C.R.S. 35-5.5) was signed into law in 1990 and amended in 1996. Now known as the Colorado Noxious Weed Act (Act), it states that noxious weeds pose a threat to the natural resource of Colorado. The Act also directs that the governing body of each municipality shall adopt a Noxious Weed Management Plan for all lands within the municipality. The Mayor and Board of Trustees shall provide for the administration of the Noxious Weed Management Plan authorized by the Act. In October of 2015, the Board of Trustees appointed a Citizens Weed Advisory Task Force to develop a noxious weed management plan. This citizen group produced a base plan that saw numerous revisions and was adopted in 2019. The *Integrated Weed Management Plan* that we are now using is the product of continuing refinement of the document by the Citizens Task Force, the Public Works Department, the Parks & Recreation Department, the E-board and the Parks & Recreation Commission.

DISCUSSION:

Reviewing the park specific management plans from 2019-2021, many of the techniques for weed eradication will remain the same and chemical free as we have seen progress in the success of these efforts. In addition, the steam machine equipment was purchased and used successfully for certain weed eradication efforts in 2020-21. The site-specific plans did expose some problem areas that are not responding well to our existing techniques. The following locations are problem areas that we are closely monitoring. These locations are not presently recommended for any chemical weed treatment.

- *Baseball field infields-* A perennial rhizomes bind weed *Field Bindweed* (C-list) and other weeds were manually removed in the fall of 2019 to a depth of 6" on Triangle, Bill Hanks and Tiny Nightingale infields. The steam machine was also used on Tiny Nightingale field to see if a deeper root steam technique would work. Monitoring the infields last spring during the growing period it appeared that these previous methods did not have a beneficial effect on these well-established weeds on any of these infields. Taproots of the bindweed can be 2-10 feet deep, seed can remain viable for 50+ years and shallow tillage only increases the number of plants. This rendered the steam machine an ineffective tool to deal with this weed. Since the fields were not being used and the daily field prep was not being conducted due to covid, the bind weed took over the infields. We used our "bolt drag" to try and pull the weeds in the infields and then hand-picked the remnants, but this weed is established in the soil and we are not getting ahead of it with these techniques. Other weeds identified in the infields are *Purslane*, *Prostate Knotweed*, *Common Mallow*, *Prostate Pigweed*, *Khakiweed*.
 - **2022-** The *Alpha Natural Proprietary Product* showed promise on the bind weed in our experimental plot at the North Face Bike Park on the established rhizomes in 2021. We will test this natural product out on the infields this spring prior to use and then cap with additional infield soil. This will take place on the Bill Hanks and RVR Baseball diamonds.
 - **2022-** We will experiment on the Tiny Nightingale Field with a vinegar and/or salt based product to check the efficacy of those products and also to compare this field with Bill Hanks and RVR as a secondary efficacy test of the Alpha Natural product.
 - **2022-** Colorado Department of Agriculture Request-A-Bug service involves collection and distribution of biocontrols (insects or pathogens) to suppress noxious weeds and insect pests. Biocontrols can be requested by government

agencies in Colorado. “Biological control for field bindweed includes a microscopic mite, *Aceria malherbae*. The mites infest the newest growth of the plant by forming a leaf gall. The gall is basically a small nursery housing the developing culture of mites. This initially reduces flowering and stunts the growth of the stems. Mites overwinter on the root buds and emerge again with spring growth. The activity of the mites can kill the bindweed.”¹ This technique is not appropriate for these locations due the constant disturbances in the infield .

- *Gateway RV Park*-Due to the gravel dirt sites we have *Burr Buttercup* and *Scotch Thistle* and *Canada Thistle* (B-list). Efforts in the past have included Avenger, a natural burn down product, manual extraction, weed burning, and the steam machine.
 - **2022**-Prior to being open to the public and at first growth we will increase our efforts to eradicate the weeds established in the gravel camp sites. We will continue to use avenger, a natural burn down herbicide, manual extraction and/or weed burning techniques, and continue to test the effectiveness of the steam machine weed control methods when available. We used the steamer multiple times on the *Burr Buttercup* before and during flowering , prior to the bur seeds developing. There is no known biological control of this weed.
 - **2022**-Other weeds that are present on site include *Scotch Thistle & Canada Thistle* (B-List) Our manual extraction efforts, before the plants go to seed, has been slowly diminishing the infestation and their annual regrowth.
- *North Bridge Riverfront Park* an infiltration of *Wild Parsnip* has established itself along the south side of the public access trail on the property. This is sometimes miss-identified as *Poison Hemlock*, a B-list weed. The Wild Parsnip is a native plant, but the leaves and stems can cause burns and blisters on the skin after touching, so due to the location our only option is to manually eradicate this plant with proper PPE. This did not take place in 2021 and the plant colony has grown and is now prominent along the ditch in this area and seems to be propagating up the ditch towards another ditch intersection, which will have the ability to spread the seed even faster throughout Town.
 - **2022**-Manual Extraction-potentially with temp workers.

Our largest and most difficult weed management challenge is at the 33 acre Nature Park. Coming in a close second is the weed management challenge at our 2 acres of irrigated dirt at the North Face Bike Park. The roundabout parks and bulb out gardens and Highway 133 corridor each have unique weed issues also. The following parklands are recommended for chemical weed control subject to the Integrated Weed Management Plan guidelines for 2022.

- *Nature Park*- Last year we identified some patches of *Common Burdock* (C-list) and *Hounds Tongue* (B -list). There is also *Canada Thistle* (B-list) and *Plumeless Thistle* (B-list). We burned the park in the spring and organized another Friends of the Nature Park volunteer clean-up effort for some manual weed extraction. We fenced off two experimental test plot area where we identified the common burdock and the two thistles to the north and north west of the cabin and on a south east portion of the park that had disturbed soil (please see map). We cut the area in thirds and sprayed one section with *Avenger*, a burn down contact non-selective herbicide, one

section with *Tenacity*, a selective systemic herbicide, and a third section with *Alpha Naturals* organic product. This was conducted in a post emergent situation on established weeds for a one-time application trial to test the three techniques. Then we returned at two and then four weeks to assess the efficacy of the products.

Although the techniques revealed quite different initial weed responses the long-term effect on the problem areas appeared to have no effect. There is enough of an embedded seed bed in the soil that our efforts did not produce a diminishing noxious weed infestation. The shady moist conditions around the cabin site would need a concerted effort and a revisit on a bi-weekly basis to see any progress here regardless of the product used. The meadow site, with the disturbed soil, and an abundance of Canada Thistle, displayed the same non-conclusive results at the 4 week mark.

Avenger: This produce seemed to work the best at the two week mark due to the burn down and non-selective nature of the product, but it left more opportunity for the Canada Thistle to come back because it had a detrimental effect on the native grasses. It did not affect the seed bed in the ground and would need to be reapplied every two weeks

Tenacity: Did not display worthiness for a chemical based herbicide and the selective nature was not specific enough for the three species of weeds we were experimenting on.

Alpha Natural Proprietary Product: We did not see any results different from the *Tenacity* test plots. A small reduction in the heights of the weeds but not a significant reduction in the number of weeds, and not the visually obvious weed damage provided by the *Avenger* product.

- **2022 -Nature Park**-We will continue manual weed extraction around the cabin and the solar panels and burn what we can in the spring in this location.. We will look at the possibility of using goats in the fenced in solar array, which has experienced overgrowth of Canada Thistle and Scotch Thistle. If the goats are not possible this year we would like to use a spot spray application of *Opensight* herbicide in the fenced in and locked solar array portion of the park.
 - **Biological Control**- We will continue to monitor the rust fungus (*Puccinia Punctiformis*) that is working on the Canada Thistle in the eastern portion of open space of the park. Unfortunately we cannot get any more product at this time. The Colorado Department of Agriculture website mentioned the following. “*Puccinia punctiformis* is unavailable at this time due to regulatory reclassification.”²
- Last year, at the *North Face Bike Park* we proposed a spot spray application to attempt to eradicate weeds on the Colorado Noxious Weed B list, *Common Tansy*, *Hoary Cress* (White Top) and *Canada Thistle*. *Common Tansy* is a List B that requires elimination by 2022. We have been weed whacking and hand pulling the *Canada Thistle* and are keeping it from expanding, but mowing is not effective on the *Tansy* and *Hoary Cress* and may cause the plant to develop perennial characteristics. Both weeds have not responded favorably to our existing techniques for weed mitigation and have established themselves in specific areas adjacent to the riding surfaces in the bike park. In 2021 we continued with our techniques of weed whacking growth

and we re-established the pea gravel on top of the weed barrier on the non-rideable surfaces within the park.

- **2022**-Burn the park in the spring.
- **2022**-Weed whack once a month during growing season.
- **2022**-The Parks Department is requesting the use of a spot application on the B-list noxious weed *Common Tansy*, *Hoary Cress* and *Canada Thistle* of the herbicide *Opensight* with a non-ionic surfactant and to apply it when the plant is bolting to the bud growth stage. We will conduct this in an experimental fenced in area of the park, so no public access is possible. We would like to continue to test the efficacy of a few other herbicide products at the same time. One product is called *Eco Might Pro*, and bills itself as a non-toxic product because it has a very small % of chemical herbicide. According to the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA") and an independent study done by the Environmental Protection Agency, the *EcoMIGHT* products falsely claim to be exempt from FIFRA under Section 25(b), 7 U.S.C. § 136w(b) specifically the Minimum Risk Pesticides criteria at 40 CFR Part 152.25(f).³ We also plan to test an organic product certified for organic use that is a 20% vinegar weed killer called *Green Gobler*, that is naturally derived from corn.

➤ **Roundabout Gardens** The Public Works Department used a combination of weed steaming and a spot spray application of *Tenacity Herbicide* in the roundabout garden areas in 2021. Michael Callas, our Town Arborist, would like to continue this technique in the roundabout because there is no public access through that area and it would allow him to get a better handle on the bindweed and thistle. Mike takes pesticide applicator classes yearly and is an industry professionals trained to provide safe distribution of chemicals.

- **2022**-Mike would like to use a product called *Open Sight* for the List A and B noxious weeds in the Roundabout Gardens and by using it in conjunction with the steamer he thinks he will be able to make some headway. It would be a spot spray application targeted at specific noxious weeds.

➤ **Roadside Areas along the Highway 133 corridor** This is the non-turf areas to the North of the Roundabout on the east and west side of Highway 133. In 2020, the State of Colorado asked the Town of Carbondale to work on the eradication of *Absinthe Wormwood* within Town limits. The County weed manager and the State of Colorado Department of Agriculture are pushing for us to eradicate all of the *Absinthe Wormwood* in town in 2022. They feel that this is an obtainable goal given the weed has not completely taken over, and where found exists in small clusters that would not be hard to eradicate. (See state map of the location of the infestation in the attachments).

- Mike Callas is requesting the use of *Opensight* in limited doses in areas not generally accessible to the public with a spot spray technique to eradicate *Absinthe Wormwood*. The use of this product would only occur in roadside areas, that are outside of our turf parks. Although these roadside areas are considered public open spaces they do not experience close interaction with the public. *Opensight* is an effective chemical for treating List A and B weeds on the State

noxious weed list. For the past 5 years we have been working on mechanical and organic chemical eradication with little success on this weed. We feel a systemic herbicide is needed to complete our goal of eradication of this B-list weed. There is no biological control for *Absinthe* at this time.

Town staff would follow the public notification rules stated in the CIWMP regards to use of herbicides on Town owned land :

Notification of Herbicide Use

1. *Public Registry- town staff will establish a program for the registration of all pesticide sensitive (interested) residents so they may be informed, at minimum, within a 48 hour window before the application of an airborne herbicide.*
2. *On-site Posted Notification- Any town staff that uses any herbicides should comply with the following on-site notification procedure: Signs should be posted at all usual public and employee points of entry to the treated area and pursuant to State or Federal law, regulation and by product label instructions. Signs should be posted two (2) days in advance of application and remain in place for the re-entry interval as determined by the product label or regulation. Signs should contain the name and active ingredient of the herbicide product, the target plant, the actual date of application, the re-entry interval as determined by the product label or regulation, and the name and contact number for the town department responsible for the application. Signs should be of a standardized design that are easily recognizable to the public and workers.*
3. *Posted Notification on Town of Carbondale website of herbicide application on town property.*

RECOMMENDATION:

The noxious weed management method selected should be the least environmentally damaging, yet practical and reasonable in achieving the desired results. In making these decisions all factors including budget implications, materials costs, training and availability of labor need to be considered. The challenge for the Parks & Recreation and Public Works Department is the total square acreage of parklands and gardens in the Town right of ways that require ongoing maintenance. The goal is to develop the most feasible and time efficient means of noxious weed control.

It is the County's and the Town of Carbondale's philosophy to minimize the use of herbicides and impacts to desirable vegetation. However, for some species of noxious weeds, herbicide application is the most efficient and effective method of control. It is extremely important to treat small infestation of certain weeds (List A and B species mandated to be eradicated) as soon as possible. To ensure that small infestations of noxious weeds are controlled or eradicated effectively, it is extremely important to take immediate action on certain weed patches.

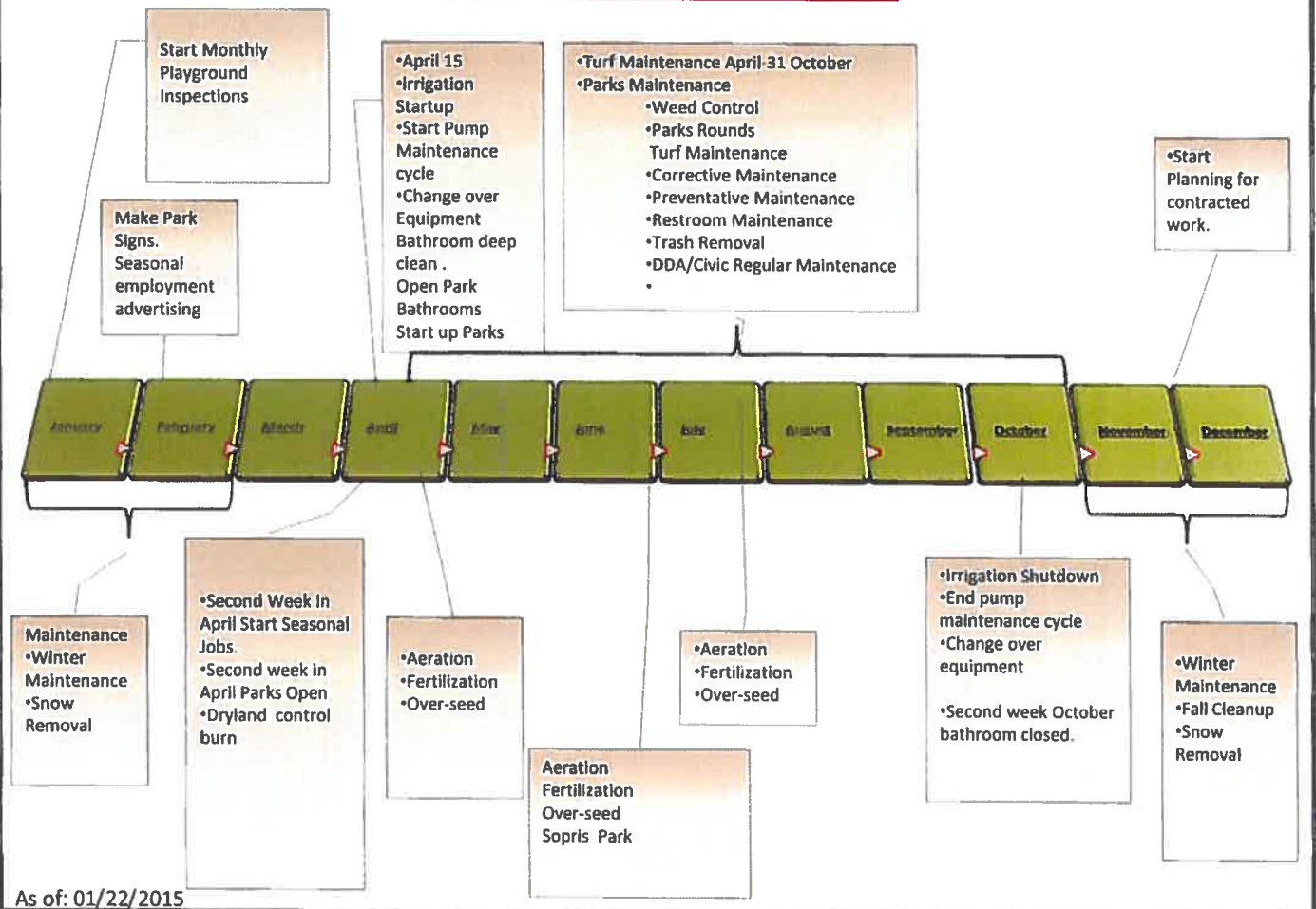
Parks & Recreation Department staff is seeking approval from the Parks & Recreation Commission, the E-Board and the Board of Trustees to use a spot spray application of a chemical based herbicides to eradicate the Type A and Type B Colorado Noxious Weed species from the Town owned land mentioned above. This recommendation would be presented to the Trustees for the final decision. The CIWMP states:

In this manner Town staff, whom have been trained in the application of the herbicide, receive permission from the Board of Trustees acting as the Weed Advisory Board, to use an approved herbicide for the eradication of a noxious weed on Town lands. This plan uses the expertise of land managers for a long-term strategy that has the goal of long-term eradication and/or control of noxious weeds without uncontrolled proliferation. Any permission obtained to use herbicides from the board of Trustees must follow the label instructions. Any use of a herbicide inconsistent with the label's directions is illegal.

Prepared By: Eric Brendlinger, Parks & Recreation Director

- 1) <https://ag.colorado.gov/conservation/biocontrol/request-a-bug>
- 2) <https://ag.colorado.gov/conservation/biocontrol/canada-thistle>
- 3) <https://www.epa.gov/minimum-risk-pesticides/minimum-risk-pesticide-definition-and-product-confirmation>

Parks Department Yearly Timeline



As of: 01/22/2015

2022

TOC Turf Parks

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Soil & Turf Evaluation	Normal	In Progress	Spring	2022	50%	Soil samples from Sopris Park and Hendricks Dog Park to be sent in for analysis. Potential to send in other samples from turf parks if we see issues.
Aeration	Normal	scheduled	Spring	2022	80%	parks contain clover and dandelions, good turf root systems parks have less.
Fertilization	Normal	scheduled	Spring	2022	80%	parks contain clover and dandelions, good turf root systems parks have less.
Over Seed	Normal	scheduled	Spring & Fall	2022	80%	parks contain clover and dandelions, good turf root systems parks have less.
Applying soil conditioners or organics	Normal	Not Started	Fall	2022	0%	Depending upon the results of soil samples. Potential additives to our Aeration, fertilization and overseed techniques.
Top Dressing	Low	completed	Summer	2019	100%	Summer 2019 Hendricks & Miners Soccer Fields Top Dress product could have used more sand to enhance leveling.
Mowing regimen	High	In Progress	Seasonal	April 15 - Oct 15	100%	Height of Mowers 2.5" , 1 x time per week.
Watering Regimen	High	In Progress	Seasonal	April 15-Oct 15	100%	
Avenger Spot Spray Burn Down natural, non-chemical herbicide	Low	Not Started	Spring	2022	0%	# of Gallons of avenger (6 to 1 ration with water) is more effective on broad leaf weeds and cannot be used on turf fields because it is non-selective.
Steam Machine Weed Burn	High	Experimental Phase	Spring, Summer	2022	0%	Town now owns a machine so we will experiment with it in weed problem areas. Turf parks are not high priority for this machine.
Seek consultation with Natural Land Manager Specialists for next step	High	Not Started	Spring	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.
Spot spray Use of chemical based Herbicide	Low	Not Started	Spring	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.

These are Sopris Park, North Face Park, Historical Park, Thompson Park, Bonnie Fisher Park, Hendricks Soccer field, Holland strip, Hendricks Strip, Miners Park, Colorado Meadows, and Gianinetti Park. New park to this inventory is the Ramey-Harvey Park and the 4th street Plaza Park..

Spring aeration with tine about 4" depth. (Feb. to Mar.)
 Spring fertilization after irrigation is on. (Apr. to May.)
 Parks that have heavy usage (Sopris & Hendricks) will
 Aerate in the end of July. If necessary apply fertilizer.
 Seed Mixture for Turf Parks : COOP Roaring Fork Lawn Mix

TOC Roundabout Gardens and Roadside Open Space (non-turf areas)

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Burning	Low	Not Started	Spring	2022	0%	Burn can not happen along the roadside or in garden areas.
Manual Extraction	Medium	conducted annually	Spring & Summer	2022	40%	Lacking staff to conduct as much as needed. Will continue in 2022.
Goat pasture	Low	not started	Spring & Summer	2022	0%	Cost could be prohibitive, unless we own our own goats or trade out for camping at Rodeo grounds. Goats will eat many of our desirable plants and are not recommended along 133.
Over Seed	Medium	conducted annually	Spring & Fall	2022	30%	Desireable active grass and wildflowers help to choke out the weeds
Mowing regimen	Low	Not Started	Seasonal	2022	0%	Weed wacking to scalp weeds prior to seeding. In 2022, we are looking to trim/mow along the edges of the path to assist with controlling the yellow sweet clover and keep it from laying over the path.
Steam Machine burn down	High	Conducted weekly, bi-weekly	Spring & Summer	2022	50%	We have a steam machine and it gets used 35 of hours per week on average. We have used it with success, however it is tough to get to all of our 92 gardens with it.
Watering Regimen	High	scheduled April - Oct Ditch season	Seasonal	2022	50%	The Highway 133 corridor irrigation has seen damage due to development and cars driving over heads. When functional helps with desirable plants.
Avenger Spot Spray Burn Down natural, non-chemical herbicide	Low	not started	Spring/ Summer	2022	0%	We have used avenger with little success. It does burn down the undesirable weeds, however they return with vigor 1-2 weeks later.
Seek consultation with Natural Land Manager Specialists for next step	Low	Experimented	Spring	2022	0%	We tested the Alpha Natural product on the roundabout gardens last year without a noticable affect on the noxious weeds.
Spot spray Use of chemical based Herbicide	High	Requesitng use	Spring	2022	0%	Requesting use to eradicate Absinthe Worwood and control Canada Thistle, both B-list noxious weeds.

2022

TOC Promenade Park

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Burning	Low	Not Started	Spring	2022	0%	Due to proximity to residential properties this would not be prudent for this park.
Manual Extraction	Low	Scheduled	Spring/ Summer	2022	50%	In progress :crusher fine areas and the pathways. Ascendigo Vocational program, UPS workers, staff
Fertilization	Low	Not Started	Spring	2022	0%	
Over Seed	Low	Not Started	Spring & Fall	2022	0%	
Applying soil conditioners or organics	Low	Not Started	Spring	2022	0%	
Mowing regimen	High	scheduled	Seasonal	2022	80%	Height of Mowers, 1 time every 2 to 3 weeks. Weed whack growth where mowers can't reach.
Watering Regimen	High	scheduled	Seasonal	2022	50%	Good growth of natives but also of weeds.
Avenger Spot Spray Burn Down natural, non-chemical herbicide	High	scheduled	Spring/ Summer	2022	50%	# of Gallons of avenger 4 (6 to 1 ration with water) used on pathways and picnic pavilion only. Requires re-application and not effective on bind weeds without large leaf surface areas.
Steam Machine Weed Burn	High	scheduled	Spring/ Summer	2022	50%	Purchase of steam machine in 2020 allowed experimentation on crusher fine paths and picnic shade areas for the summer of 2021. Effective with avenger and but needed additional treatment. Once a month for bind weed
Seek consultation with Natural Land Manager Specialists for next step	Low	Not Started	Spring	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.
Spot spray Use of chemical based Herbicide	Low	Not Started	Spring	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.

2022

TOC Nuche Park

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Burning	Low	Not Started	Spring	2022	0%	
Manual Extraction	Low	Not Started	Spring	2022	40%	Partnered with RFOV with school groups to manually extract B list noxious weeds present. Will continue in 2022.
Goat pasture	Medium	pursue this technique	Spring & Summer	2022	0%	Cost could be prohibitive, unless we own our own goats or trade out for camping at Rodeo grounds
Fertilization	Low	Not Started	Spring	2022	0%	
Over Seed	High	pursue this technique	Spring & Fall	2022	0%	When the noxious weeds are manually extracted the bare and disturbed ground needs to be reseeded.
Applying soil conditioners or organics	Low	Not Started	Spring	2022	0%	
Mowing regimen	Low	Not Started	Seasonal	2022	0%	Height of Mowers, x times per week. Weed wacking to scalp weeds prior to seeding.
Steam Machine burn down	Low	experimental	Spring & Summer	2022	0%	Potential technique that could be used now that we own a machine. Lacking staff to conduct.
Watering Regimen	High	scheduled April - Oct Ditch season	Seasonal	2022	50%	RVR controlled irrigation system was not functioning in early 2020, planted trees have died, with irrigation fixed we planted trees and could expand this with native cover crops in the future. RVR mows 1 to 2 x per season
Avenger Spot Spray Burn Down natural, non-chemical herbicide	Low	not started	Spring/ Summer	2022	0%	# of Gallons of avenger (6 to 1 ration with water) Have not tried this in this park, but the potential for this to work is high due to small infestations of weeds.
Seek consultation with Natural Land Manager Specialists for next step	High	Need to schedule	Spring	2022	0%	Fenced in parking lot now functioning. Assessment of what type of weed problem we have and how to control them can take place in 2022.
Spot spray Use of chemical based Herbicide	Low	Not Started	Spring	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.

2022

TOC Gateway RV Park

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Camp hosts to spray with avenger and burn as they see fit	Normal	done as needed	camping season	2022	25%	Camp hosts are supplied with avenger and a weed burner to take care of small spots as they come up. Helped with the sharp burs from the Puncturevine infestation c-List
Steam Technique	Normal	scheduled	early spring	2022	25%	Tried the new weed steamer on the ground cover in the camping spots when they first flower. Needs multiple treatments
Hand extraction	Normal	scheduled	Spring	2022	25%	Unable to use temp workers due to covid 20-21. Staff hand pull plus one Friday with seasonal parks crew.
Spot Burn gravel camping and parking sites	High	experimental	Spring, April	2022	0%	Conduct in springtime prior to opening.
Cut down flowering thistle	High	Scheduled	Spring, Summer	As needed 2022	75%	Cut down and removed all thistles that had flowered but not seeded yet. Working on Scotch Thistle and Canadian Thistle. Are diminishing with this technique but not eradicated.
B List Colorado Noxious Weed - Scotch Thistles & Canadian Thistles	High	Scheduled	Spring & Summer	2022	50%	Thistles are a tri annual plant propagating by seed. If we can keep the thistles from going to seed then we will slow down the infestation. It takes many years but works as long as we keep on top of it. After a thistle flowers it will usually not put out another flower so mitigation has to be done after the thistle has flowered.
Biological	Normal	ordered	Spring & Fall	2022		There are two biological controls available for control of Puncturevine; <i>Microgaster lareynii</i> , a seed feeding weevil, and <i>Microgaster lypriformis</i> , a stem boring weevil. Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916
Seek consultation with Natural Land Manager Specialists for next step	high	Need to schedule	camping season	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.
Spot spray Use of chemical based Herbicide	Normal	needs BOT approval	Spring, before park opens	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.

2022

Baseball Infields

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Infield drag with the 5&1 twice a month	Normal	Completed	all season	2022	50%	Drag with the grader, pulling all annuals. Manually remove all weeds and throw away.
Hand pull and dig bindweed and grass	Normal	Completed	Late fall	2022	0%	Unable to use Two temp workers in 2020-21. Staff dug up root systems of the bindweed and grass. Since fields were not being used bindweed infestation grew.
Spot Burn with handheld weed burners	Normal	scheduled	spring/summer	2022	20%	Pre-season when plants are flowering prior to going to seed. Continue this in 2021.
Carpet weed steam the entire infield to kill all seeds	low	not scheduled	early spring	2022	0%	This will be experimental with steam machine if the machine is available and staff is available. Not available in 21
Manual Weed Pull with students as a public lands stewardship work project	Normal	on schedule	mid summer	2022	10%	Roaring Fork Outdoor Volunteers organize Summer Advantage Students from Crystal River Elementary One Day only and Bill Hanks only in 2021. Try to repeat
Seek consultation with Natural Land Manager Specialists for next step	High	scheduled	Spring	2022	0%	Contracting with Alpha Naturals for two applications of his proprietary organic weed spray for the bind weed.
Top dress with new infield material	High	Scheduled	Spring	2022		After the blanket 2nd spray of Alpha Naturals product, a grader drag and then a top dress will be tried in 2022.
Biological Control	low	not scheduled	Spring	2022		The bindweed gall mite, Aceria mahlerbae, has proven to be effective in reducing field bindweed infestations. This is an option for large infestations. Available from Colorado Department of Agriculture, 970-464-7916.
Spot spray Use of chemical based Herbicide	High	needs BOT approval	Spring/Fall	2021	0%	This step will be necessary when the previous methods of weed mitigation are not successful..

The bind weed is taking over and needs to be dealt with. Covid caused a re-growth of the weed due to lack of use of the field and lack of machine dragging. The root system grows horizontally about 6-10 inches below the surface sending off shoots of new plants. Just hand picking the foliage only makes the weed stronger and bigger. I want to see if digging the root systems will slow down the spread. We will try Alpha Naturals in 2022, and a infield material top dress. Biological control would not work here due to the disturbances with dragging and play. If the bind weed is unaffected from these new techniques, I will recommend spraying in either or both the late fall after summer use has

Public Works & Parks Department Integrated Weed Management Log

(To be filled out to document integrated weed management efforts in specific locations)

Specific Location:

Baseball Infields at the Bill Hanks , Triangle Park and Tiny Nightingale Fields. Carbondale, CO -We are requesting an application of an organic proprietary substance from Alpha Naturals on the infields at the Bill Hanks, Triangle Park and Tiny Nightingale Fields in the Spring at first growth of the following weeds. The following weeds have been identified in the infields, Field Bindweed (C-list)Purslane, Prostate Knotweed, Common Mallow (B-list), Prostate Pigweed, Khakiweed.

Natural Land Management Specialist Consultation

Name:

John Buerger Bee Safe Consulting LLC Alpha Naturals

Date:

Jan 18,2022

Contact Info: John Buerger <970john@gmail.com

Recommendation:

"After looking over your info, I can honestly say every one of your weed / vegetation problems can be managed with my mineral, carbon, microbe blended (Odorless Food Grade) spray on. Bindweed wildly up and cease to grow, starving out as well as Canada, Bull, and Scotch thistle plants. Kochia, Mallow, dandelion and plantain will wilt and slowly die. Grasses and shrubs will flourish. "

In 2021 John offered free test plots of small scale areas to show my diverse pesticide/herbicide free results. " I will do all applications and show that the solution is really food grade, but i will not divulge the formula because it is the result of 25 tears of testing. " We will contract with him to conduct two applications of his proprietary organic weed spray for the bind weed. After the blanket 2nd spray of Alpha Naturals product we will conduct a grader drag and then a top dress with new infield material.

Date	Method Employed (M-Mechanical, B-Biological, O-Other)	Description of Work	Number of Hours
Early Spring 2022	O-Spot Spray	John Buerger will conduct a test plot of his proprietary blend spray on of bind weed and other weeds in the infield dirt of the North Face baseball fields and at Triangle Park.	
Late Spring/Early Summer 2022	O- Spot Spray	We will experiment on the Tiny Nightingale Field with a vinegar and/or salt based product to check the efficacy of those products against the alpha Natural products.	

Public Works & Parks Department Integrated Weed Management Log

(To be filled out to document integrated weed management efforts in specific locations)

Specific Location:

Baseball Infields at the Bill Hanks , Triangle Park and Tiny Nightingale Fields. Carbondale, CO -We are requesting a consultation with natural land managers on how to control the weeds in the infields at the Bill Hanks, Triangle Park and Tiny Nightingale Fields in the Spring. The following weeds have been identified in the infields, Field Bindweed (C-list) Purslane, Prostate Knotweed, Common Mallow (B-list), Prostate Pigweed, Khakiweed. We are looking for a recommendation of an appropriate non-toxic methods to help us control these weeds

Natural Land Management Specialist Consultation

Name:

Mark Duff

Date:

Jan 18,2021

Contact Info: Contact Info: mark duff <dufrado@gmail.com>

Recommendation:

Till it up and smooth it out. Hit it hard with steam when the weeds come back up. Use a vinegar lemon juice mix first. A non toxic solution. Apply method to use when it is a really hot day and the plants are in their growing season. Then place a few inches of infield mix over the top. If we till it make sure you overtop so the exposed seed does not get sunlight.

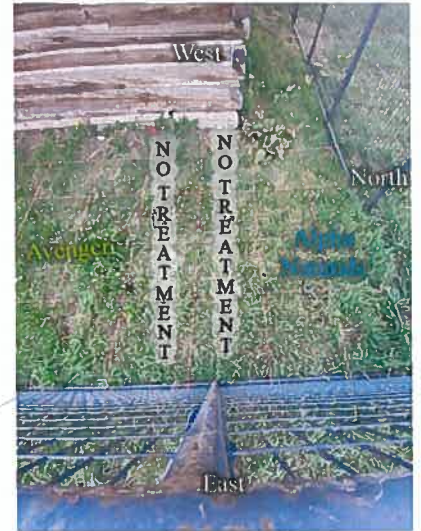
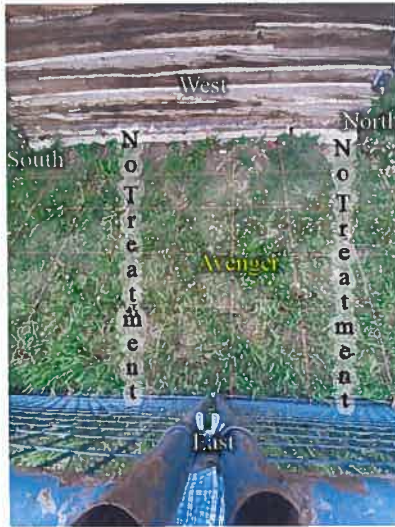
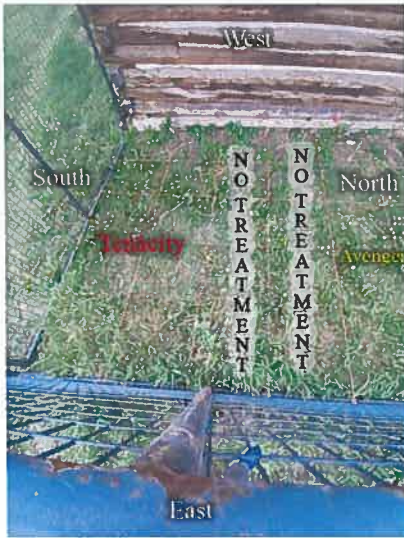
Date	Method Employed (M-Mechanical, B-Biological, O-Other)	Description of Work	Number of Hours
Early Spring 2022	O-Spot Spray	Parks & Recreation Staff, using appropriate PPE would conduct a spot spray for a blanket contact and residual control of bind weed and other weeds in the infield dirt of the baseball fields. Then a top dress after this effort with new infield dirt. This will be compared to the Alpha Naturals product on Bill Hanks and Triangle fields.	

TOC Nature Park

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Uplands and Wetlands Evaluation	Low	Completed	Spring	2015	0%	Conducted by Ryan Sparhawk in 2015
Burning	High	Scheduled	Spring	2022	80%	One burn in 2017. 2018-19 drought conditions and did not have trained manpower for burn. Conducted in Spring 2020 only 65% of park. Burned 80 % in 2021 spring.
Flood Irrigate	Low	Not Started	Summer	2022	0%	Last Flood Irrigation was 2016
Manual Extraction	Medium	started in 2020	Year round	2022	10%	Potential volunteer effort with schools or established "Friends of the Park" groups. Town staff does mitigation work on Canadian Thistle on adjacent hillside and has taken over maintenance of the Solar Array. 80% effective
Goat Pasture Technique	Low	pursue for solar array	Spring & Sum	2022	0%	Could be cost prohibitive on this parcel, unless we owned some goats. Could be used in Solar array due to existing fence and trade out for camping location at rodeo.
Fertilization	Low	Not Started	Spring	2022	0%	
Over Seed	High	Experimental	Spring & Fall	2022	0%	Tried Fall 2021 for a reestablishment of some native plants in areas of noxious weed infestations post treatment or after manual eradication.
Applying soil conditioners or organics	Low	Not Started	Spring	2022	0%	
Biologics : Introduced Rust Fungus	High	Started in 2015	Spring	4 year process	70%	Specific to the Canada Thistle, Colorado Department of Agriculture experiment on 1 patch, 148 stem in 2015 down to 44 stems in 2019. Insects are available, but provide limited control. Currently, collection and distribution methods for Canada thistle rust are being refined.
Mowing regimen	Low	Summer mowing season	Seasonal	2022	30%	Path to Archery Range. And around and inside Solar array fencing.
Watering Regimen	Low	Not Started	Seasonal	2022	0%	This was a suggestion from the 2015 Parks Recreation and Trails Master Plan. We only irrigate the trees and plants around the solar array on a schedule.
Avenger Spot Spray Burn Down natural, non-chemical herbicide	Low	Started for the test plots in 2021	Spring	2022	0%	Must re-apply every two weeks to be effective. Will try in solar array and around cabin in 2022. Weed whacked and manually pulled in these locations instead.
Seek consultation with Natural Land Manager Specialists for next step	High	Started for the test plots in 2021	Spring	2022	20%	This step will be necessary when the previous methods of weed mitigation are not successful. Consulting with a Natural Land Manager for the test plots.
Spot spray Use of chemical based Herbicide	Low	Started for the test plots in 2021	Spring	2021	20%	This step will be necessary when the previous methods of weed mitigation are not successful. Conducted a spot spray in the test plots to check efficacy against natural techniques.

Nature Park- The Friends of the Nature Park and the Roaring Fork Outdoor Volunteers joined forces in September 2021 to conduct a weed map of the property and to manual pull the known noxious weeds. We have identified some patches of *Common Burdock* (C-list) and *Hounds Tongue* (B-list). There is also *Canada Thistle* (B-list) and *Plumeless Thistle* (B-list). We burned the park in the spring 2021 and will try in 2022, and organize another Friends of the Nature Park volunteer clean-up effort. We fenced off 2 experimental test plot areas where we have identified the common burdock and the two thistles to the north and north west of the cabin and a disturbed portion of the meadow. We cut the area into test plots and sprayed them with *Avenger*, a burn down contact non-selective herbicide, some with *Tenacity*, a selective systemic herbicide, and some with a proprietary natural product developed by John Buerger, a Natural Land Specialist. This was conducted in a post emergent situation on established weeds for a one time application trial to test the three techniques. We then returned in two weeks and then in four weeks to assess the efficacy of the products. We will continue to monitor and will try to propagate the rust fungus that is working on the *Canada Thistle*.

Nature Park Cabin East Test Site (prior to treatment May 28, 2021)



Nature Park Cabin East Test Site (post first treatment June 14, 2021)



Nature Park Cabin East Test Site (July 8th 2021)



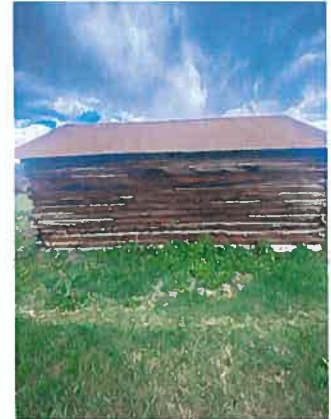
Nature Park Cabin Site North Plot (pre-test May 28th, 2021)



Nature Park Cabin Site North Plot (post-test June 2021)



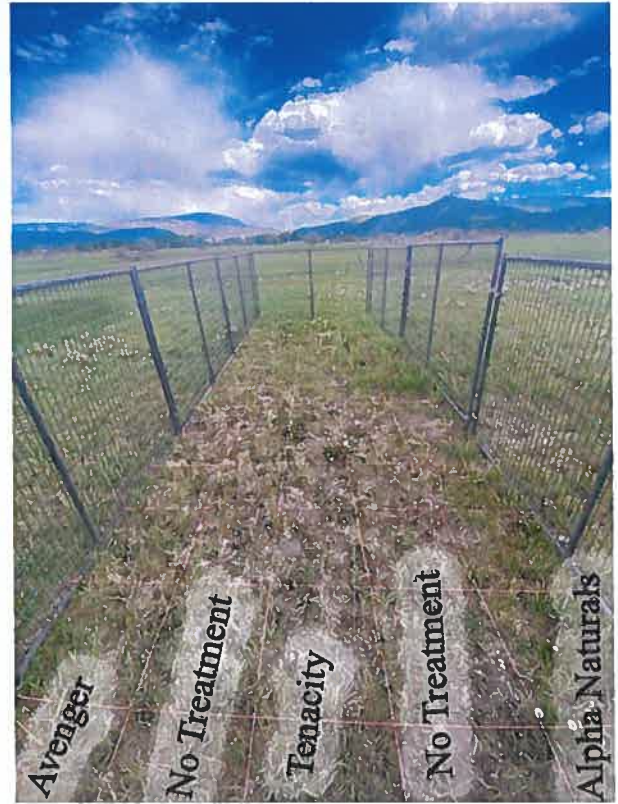
Nature Park Cabin Site South Plot (pre-test May 28th, 2021)



**Nature Park Cabin Site South Plot (post-test July 8, 20021)
Alpha Natural Product Only**



Nature Park Plot 2 (disturbed soil pre-test May 28 2021)



June 14, 2021

July 8th, 2021

September 15, 2021



Sept. 2021 surrounding view



North Face Bike Park

Weed Control Method	Priority	Status	Season	Date	% effective	Notes
Hydro Seed non-rideable berms and backsides of features	Low	Attempted	Spring	2015 post construction	10%	We had irrigation problems, so seed did not receive sufficient moisture to take. X2 Tried a manual scarify of soil and seed planting in 2016 also, but only mildly successful.
Soil Analysis	Normal	Completed	Fall	2016	20%	Had soil samples accessed by Colorado State 2016. Soil lacking in Phosphates. No soil additions budgeted.
Mulch	Low	Attempted	Winter	2017	10%	Used Christmas tree mulch 4" thick in low moist spots with out success. Fertilized weeds, held moisture.
Pea Gravel and Weed Barrier	Normal	scheduled	Spring & Fall	2016 & 2017 & 2021	75%	helped in between jump lines and pump track features, needs weeding every year by hand for newly established weeds in the pea gravel.
Burn perimeter	Normal	scheduled	Spring	2016 & 17, Not 2018, 19 or 20	25%	Was effective on the perimeter but did not help the berms and backsides of the features in the park. Will attempt in 2022 if staffing and weather allows.
Weed whack scalping with machines	High	scheduled	Spring, Summer	May, June, August 2022	50%	Manual scalping first of large weeds necessary. Labor intensive. Cut down the weeds that propagate via seed and removed all the cuttings. With Parks staff 2 to 3 times a year or 1 employee and 1 temp worker, two days
Manual Pull	High	scheduled	Spring, Summer	May, June, Aug 2022	75%	1 to 2 guys, 40 Hours for 1 week, \$1,000 Temp Budget not used due to covid. Not able to repeat multiple times due to budget
Manual Pull with volunteers	High	scheduled	Spring, Summer	May, June Aug 2022	25%	Not conducted due to covid in 2020. 1 to 3 x per year school groups or RFOV Youth Corps will manually pull one section of the park. 2 to 3 hours only. Ascendigo vocational 6 weeks, two people, one day a week. 2022
Steam Machine burn down	High	experimental	Spring & Summer	April, May, June Aug 2022	0%	Potential technique that could be tried this coming year because we own a machine. Lacked manpower in 2021
Avenger Spot Spray Burn Down natural, non-chemical herbicide	High	In Progress	Spring, Summer	June, July, August 2022	50%	# of Gallons of avenger 4 (one case) (6 to 1 ration with water) Need to re-apply every 2-3 weeks. Lacked the trained staff to stay with this schedule.
B List Colorado Noxious Weed List Canadian & Scotch Thistles	High	as needed	mid summer	2022 spring	40%	Cut down all thistles that were flowering and before the went seed. Removed all debris. 1 employee or two temp workers 1 day.
B List Colorado Noxious Weed Mitigation Required Common Ragwort	High	proposed	Spring, Summer	2022	60%	Hand pulled common ragwort when noticed. 1 employee in travels. Mandated to eradicate by 2022. Spot Spray recommended
B List Colorado Noxious Weed Hoary Cress (White Top) mitigation	High	proposed	Spring, Summer	2022	0%	White top will need to be spot sprayed before it gets out of control. If we catch it while it is small then eradication will be less spray then if we wait. Did not conduct in 2021
Seek consultation with Natural Land Manager Specialists for next step	High	scheduled	March / April	2022	0%	This step will be necessary when the previous methods of weed mitigation are not successful.
Spot spray Use of chemical based Herbicide	High A and B list weeds	proposed	Spring, Summer	2022	0%	This step will be necessary when the previous methods of weed mitigation have not been successful on A & B

At the North Face Bike Park we are proposing a spot spray application to attempt to eradicate weeds on the Colorado Noxious Weed B list, *Common Tansy*, *Hoary Cress* (White Top) and *Canada Thistle*. *Common tansy* is a List B that requires elimination by 2022. We have been weed whacking and hand pulling the *Canada Thistle* and are keeping it from expanding, but mowing is not effective on the *Tansy* and *Hoary Cress* and may cause the plant to develop perennial characteristics. Both weeds have not responded favorably to our existing techniques for weed mitigation and have established themselves in specific areas adjacent to the riding surfaces in the bike park. The plan for 2022 is to burn the park in the spring and to continue with weed whacking growth and re-establishing the pea gravel on top of the weed barrier on the non-rideable surfaces within the park. The Parks Department is requesting the use of a spot application on the B-list noxious weed *Common Tansy*, *Hoary Cress* and *Canada Thistle* of the herbicide *Escort XP* with a non-ionic surfactant and *Eco-Might* and to apply these when the plant is bolting to the bud growth stage. This will be in a fenced off experimental plot at the bike park.

North Face Bike Park Alpha Natural Test Plot
Pre application May 28th, 2021



North Face Bike Park Post application
June 23, 2021



Absinth wormwood

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Absinth is well branched and gets 3 feet tall and 2 feet across.
2. Silver-grey leaves and small yellow flowers.

Absinth wormwood Identification and Management



Identification and Impacts

Absinth wormwood (*Artemisia absinthium*) is native to Eurasia, the Middle East and North Africa. It was introduced to North America in the early 19th century to be cultivated for medicinal use. It was first reported outside cultivated gardens in 1841, along roadsides and waste grounds.

Absinth wormwood is a long-lived perennial that possesses a strong sage odor and bitter taste. Plants grow 2 to 4 feet in height and are prolific seed producers. It has a taproot that can reach 2 inches in diameter and shallow lateral fibrous root branches that can extend up to 6 feet long in all given directions. Plants are woody at the base and regrow from the soil level each spring. The stems are numerous and are covered with fine, gray hairs while the leaves are blue-olive green, alternate and highly divided. Flowers are small, yellowish and arranged in large, spike-like panicles. The seed viability is estimated to be 3 to 4 years and are easily scattered by wind, water, animals, and in hay. The seeds are less than 1/6 inch long, smooth, flattened and light gray.

Habitats for Absinth wormwood include disturbed sites, moist soils, and is also shade tolerant. It can occur in 5,000 to 7,000 feet elevation and is considered a weed in pastureland, cropland, and rangeland. Absinth wormwood is listed as poor palatability in horses, but good for sheep.

The key to effective control of Absinth wormwood is a combination of control methods. Compared to most perennials, it is fairly easy to control with chemicals in combination with mechanical control. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Absinth wormwood is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photo © Kelly Uhing, Colorado Department of Agriculture; and map above by Crystal Andrews, Colorado Department of Agriculture.

Artemisia absinthium L.

**CULTURAL**

Cultural controls are possible in theory, but are very time consuming and expensive. Complete removal of any seedlings or newly established plants by continual hand pulling is also possible.

**BIOLOGICAL**

There is no biological control available for Absinth wormwood. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Hand pull or dig when soil is moist. Make certain to pull all the roots, including short horizontal roots. Bag specimens carefully so as to not scatter seeds if removed during or after flowering. Multiple mowings prior to seed generation can cause stress and may provide a control option.

Integrated Weed Management:

Absinth Wormwood is easily controlled using a combination of methods such as chemical and mechanical.

Compared to most perennials, it is fairly easy to control.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	7 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply late spring into summer though the flowering growth stage.
Aminopyralid* + Metsulfuron (Opensight)	3.3 oz. product/acre	Apply late spring into summer though the flowering growth stage.
Aminopyralid* + 2,4-D (Forefront HL)	2 pints product/acre	Apply late spring into summer though the flowering growth stage.
Clopyralid (Transline)	0.66 pint/acre	Apply late spring into summer though the flowering growth stage. Provides greater selectivity when applying near trees and shrubs.
Picloram* + 2,4-D (Tordon/Picloram 22K - Restricted use pesticide)	1 pint product/acre + 1 qt./acre 2,4-D	Apply late spring into summer though the flowering growth stage. DO NOT use near trees, desirable shrubs, water, or high water table.
*Product not permitted for use in the San Luis Valley.		
Additional herbicide recommendations for other species can be found at: goo.gl/TvWnv9		

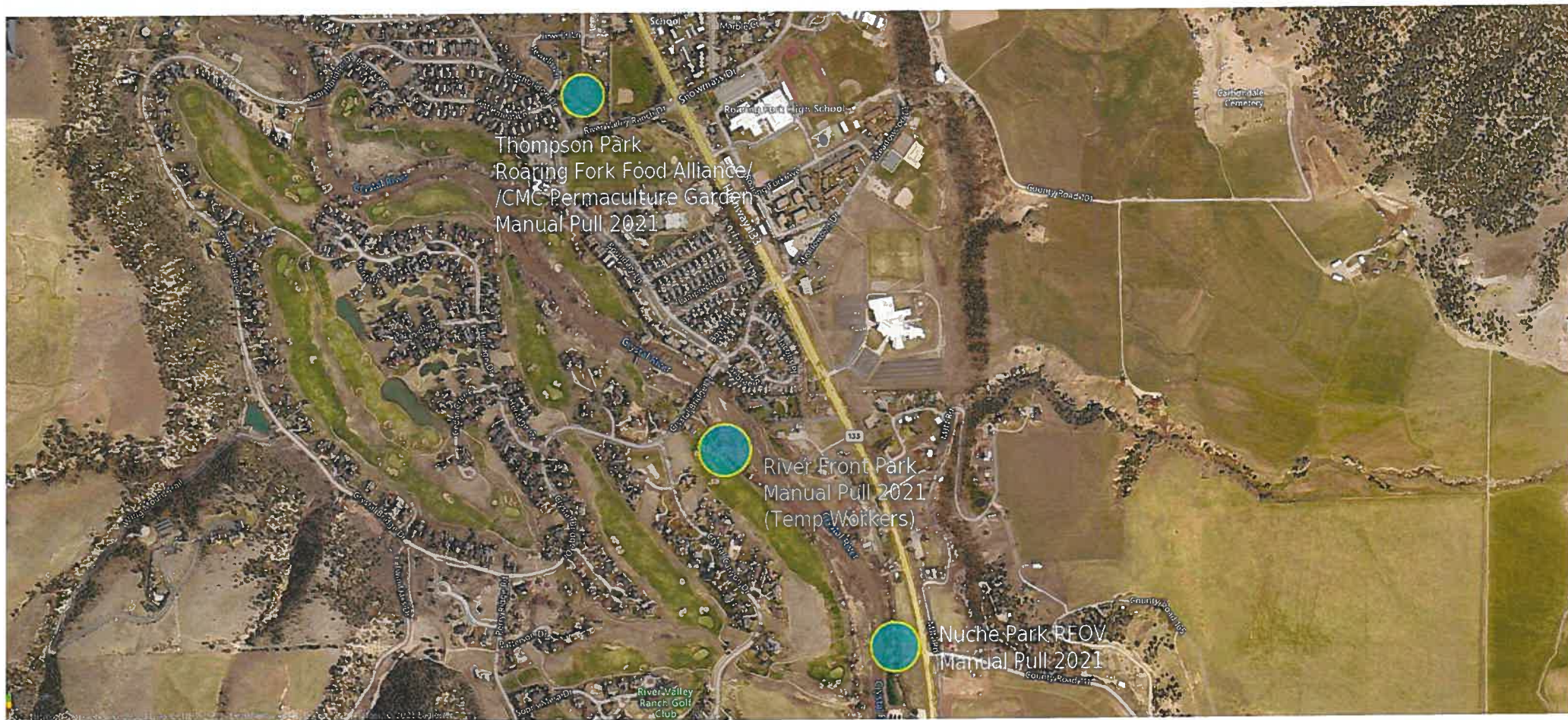
Top to bottom photos, © Chris Evans, River to River CWMA, Bugwood.org; Mary Ellen (Mel) Harte, Bugwood.org; and Richard Old, XID Services, Inc., Bugwood.org.

Absinth wormwood

Colorado
State
University



Town Park Manual Pull efforts for Absinth Wormwood, Burdock & Houndstongue 2021



04/16/2021 - 05/26/2021

Weed Map Riverfront Park North Bridge Drive 2021



Weed Map Riverfront Park North Bridge Drive 2022

