Golden's Community Invasive Plant Program

Annual Report 2020





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ABSTRACT

Wildsight Golden's 2020 Community Invasive Plant Program (CIPP) aimed to decrease invasive plant infestations while increasing public awareness about the environmental, social and economic impacts invasive plants bring to communities. This report outlines the actions and results achieved by the program in 2020. The CIPP works in partnership with the Town of Golden and the Columbia Shuswap Invasive Species Society (CSISS), towards reducing invasive plant populations within the Town of Golden through public outreach, as well as a variety of non-toxic mechanical treatment methods. A total of 115 bags of invasive plants were removed during the 2020 CIPP, bringing the program's total (since its establishment in 2010), to 2,267 bags. Specific areas within the Town of Golden were designated as high priority for mechanical removals based on invasive plants present, the ecological importance of the area, and the volume of human traffic/use. Prior to plant removals, priority sites were surveyed using the Invasive Alien Plant Program (IAPP) survey forms and methodology. Public outreach continued to be an important element of the CIPP. Due to COVID-19, the 2020 CIPP public outreach was adjusted towards an online format that produced outreach videos and weekly "Weedy Recipes" highlighting invasive plants found in Golden, including how to identify and manage them. An opportunity for residents of Golden to send in photos of plants to be identified was also successful in identifying several invasive species found on private property. Another vital portion of public outreach continues to be the annual Community Weed Pull Event. Although the CIPP has continued to be successful at removing or managing invasive plant populations within the Town of Golden, improvements to the program should continue, including a longer work term for the coordinator, as well as exploring reclamation of sites with native plants.

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ACKNOWLEDGEMENTS

Wildsight Golden's Community Invasive Plant Program (CIPP) would like to acknowledge the traditional unceded territory of the Ktunaxa and Secwepemc Nations and the home to the Metis Nation Columbia River Society on which the 2020 CIPP was conducted. The CIPP would like to extend sincere gratitude to the organizations and volunteers that help and support the continued success of the program, and for without the CIPP would not exist. A huge thank you goes out to the Town of Golden and their staff for financially supporting the CIPP, for picking up bags of invasive plants to be brought to the local CSRD Landfill, and for providing any and all tools when requested. The CIPP also would like to acknowledge and give thanks to the Columbia Shuswap Invasive Species Society (CSSIS) for their support in the program by providing assistance and invasive plant knowledge for the duration of the program. Thank you as well to Rachel Darvill, who established the CIPP in 2010 and for her continued guidance and direction which has been key in keeping the program running both efficiently and consistently; and for her work on editing this document. Lastly, Wildsight Golden would like to thank each of the hardworking volunteers who attended the CIPP's Community Weed Pull Event, as well as all private landowners within Golden who shared concerns and were supportive in taking action towards the eradication of invasive plants on or around their properties.

1. INTRODUCTION

With recent and numerous reports bringing attention to the alarming rate of unprecedented loss of biodiversity, now more than ever, invasive plants and their management are a call for concern (UN Report, 2019). Second to habitat loss, invasive species are the second largest cause of biodiversity decline globally (Environment Canada, 2004). Invasive plants are described as non-native plants that have been brought into our ecosystems and do not have natural pathogens or predators to keep their populations in check (Polster, 2009). Since invasive plants are prolific seed producers, they are able to reproduce and grow rapidly and abundantly consequently allowing them to take over and destroy local ecosystems. Water quality, wildlife, wildfires, soil productivity and pH levels can also be negatively affected by the spread of invasive plants (Environment Canada, 2004; ISCBC, 2014). Invasive plants also can negatively affect communities economically. A decade ago, the provincial government reported spending \$65 million dollars to rectify damage caused by invasive plants (Frid et al., 2009). Programs created at the community level such as Wildsight Golden's Community Invasive Plant Program (CIPP) are essential for managing the detrimental impacts invasive plants incur through promoting various treatment methods of removal and public education.

2. PROGRAM OVERVIEW

Since 2010, Wildsight Golden's CIPP has been operating seasonally with the aim of decreasing invasive plant populations while increasing public awareness within the Town of Golden (Harper, 2018). The CIPP recognizes its success is owed to strong partnerships with the Town of Golden and CSISS, including their valuable contribution of resources and knowledge. In 2020, Wildsight Golden employed one individual to take on the position of Invasive Plant program coordinator (Tesia Hackett) from May 19th to August 12th for 30 hours per week (360 hours total). The coordinator returned to this position having completed the role of CIPP project coordinator in 2019. The coordinator was responsible for day-to-day operations of the program that included invasive plant inventories in priority areas, using the IAPP survey forms and methodology, mechanical removal of invasive plants at priority sites, attempts at restoration in these sites, planning and executing Golden's Annual Community Weed Pull, as well as online public outreach. A total of 151 bags of invasive plants were removed from the Town of Golden

during the 2020 CIPP, bringing the grand total of bags removed through the program to 2,267 (see Appendix A).

2.1 CIPP 2020 and COVID-19

Having a returning coordinator for the CIPP was useful in ensuring the 2020 CIPP could begin the contract without delay. The coordinator was able to build upon training from the previous year that included visiting high-priority sites, invasive plant identification and IAPP training. A large portion of the CIPP is conducted solely by the coordinator who is in the field performing removals of invasive plants and inputting data into IAPP, and thus they were not affected by COVID-19. The portion of the program that was affected by COVID-19 was the public outreach aspect. Due to early physical distancing guidelines many past public outreach opportunities were cancelled and unavailable for the CIPP 2020, e.g., Farmer's Markets, tourism events. This was mitigated by using an online outreach approach throughout the program as well as conducting the Annual Community Weed Pull event exercising cautions and guidelines set out by the Province of BC.

3.INVASIVE PLANT MANAGEMENT

3.1 Priority sites

Throughout the Town of Golden, widespread populations of numerous invasive plant species have been observed and documented. To effectively manage removals, specific sites deemed as high priority were established during previous years of the CIPP. An area's priority was assessed utilizing the CSISS high-priority Golden Invasive Plant Management Area (IPMA) list, consideration of an area's ecological value, along with assessing high areas of public use. These sites were shown to the program coordinator by Rachel Darvill on May 21st in 2019 (Hackett, 2019). The 2020 CIPP focused on a total of 15 sites within the Town of Golden and they were all mechanically treated (see Appendix B).

While attending to the high-priority sites, the 2020 CIPP coordinator found that the area from Little Mittens Animal Rescue Association facility to the Old Mill site (south of Fisher Road along the Columbia River) should be noted as an important nesting area for birds and precautions should be exercised during removal of invasive plants in the area. On two separate occasions the coordinator had discovered well concealed song sparrow nests while mechanically removing burdock. In North America, the most

numerous entanglements reported in plants are of birds in burdock (Underwood et al., 2013). Continuous successful removal and monitoring of burdock is recommended.



Figure 1. Two separate bird's nests discovered while removing burdock near Little Mittens Animal Rescue Association facility.

3.2 Priority species infestations

The priority invasive plant species removed in 2020 included (but were not limited to) Common Tansy (*Tanacetum vulgare*), Cypress Spurge (*Euphorbia cyparissias*), Diffuse Knapweed (*Centuarea diffusa*), Leafy Spurge (*Eurphorbia esula*) and Spotted Knapweed (*Centaurea biebersteinni*). Additional species removed were: Bull Thistle (*Cirsium vulgare*), Canada Thistle (*Cirsium arvense*), Common Burdock (*Arctium Spp.*) Common Comfrey (*Symphytum officionale*), Chicory (*Chicorium intybus*), Creeping Bellflower (*Campanula rapunculoides*), Dame's Rocket (*Hesperis matronalis*), Dalmatian Toadflax (*Linaria dalmatica*), Glandular Baby's Breath (*Gysophila scorzonerifolia*), Hound's-Tongue (*Cynoglossum officionale*), Orange Hawkweed (*Pilosella aurantiaca*), Oxeye Daisy (*Leucanthemum vulgare*), Wormwood (*Artemesia absinthium*) and Yellow Toadflax (*Linaria vulgaris*). Due to time constraints of

the program, at sites where multiple plant species were found, only the higher-priority species were removed.

3.2.1 Leafy Spurge

The first and only observation and recording of Leafy Spurge in Golden was in 2017 on the west bank of the Kicking Horse River and this infestation was mechanically removed by the CIPP (Cobb, 2017). During the 2018 CIPP, the small infestation had re-established itself to approximately the same size as recorded in 2017 and was again removed by hand (Harper, 2018). It was found to become re-established in 2019, but in an area smaller than previously recorded (0.0002 Ha). This high-priority plant had its GPS location recorded and was removed in 2019 by careful digging to ensure minimal reestablishment (Hackett, 2019). During the 2020 CIPP, Leafy Spurge was once again observed to have re-established at the same size (0.0002Ha) as 2019 at the recorded location and was treated by cutting down and bagging the flowering part of the plant and applying a natural herbicide (see appendix C) in an alternative effort of management. This is a high priority species that must be re-visited annually.

3.2.2 Himalayan Balsam

As recommended in 2019, monitoring for Himalayan Balsam was conducted at Edelweiss Slough and behind the Golden Secondary School because this plant was found at those two locations in 2017 (Cobb, 2017). This invasive plant species was not observed at either location in 2018, 2019 nor 2020. This suggests that mechanical treatment of Himalayan Balsam by the CIPP in past years has been successful. However, continued monitoring is still recommended given it remains a high-priority species in the Golden IPMA Priority Species List.

3.3 Invasive plants species for future CIPP removal

Yellow hawkweed (*Hieracium pratense*) is a low-priority invasive plant species and was observed and recorded in several high-priority sites in Golden. Along the Rotary Trail by Alexander Park, this plant has been observed to be aggressively spreading. It has also been observed and recorded in several sites along the Kicking Horse River. Bluebur (*Lappula squarrosa*) has been observed in nearly all of the high-priority sites, including the route of the Community Weed Pull along the Kicking Horse River. Not listed in the IPMA or found in the IAPP database, Bluebur is currently not listed as an invasive plant to be

removed for the CIPP. Because these plants have been found to be spreading rapidly, the 2020 CIPP coordinator recommends both yellow hawkweed and bluebur to be considered for future CIPP removal.

3.4 Invasive plant surveys and mechanical treatment methods

A fundamental aspect to the CIPP was conducting cursory invasive plant surveys prior to removal using the Invasive Alien Plant Program (IAPP) survey forms. Data recorded included species found, the area, density and distribution in which it was found at the site. This information collected in the field was then re-recorded into the IAPP database under the previous CIPP username/BCEID Wildsight 2019. Sites previously surveyed were already assigned a site ID and could be found using the IAPP database and map display. The CIPP 2020 program coordinator was able to visit 21 sites, survey and perform mechanical removals at those sites. For areas that were mechanically treated, the invasive plants were removed either through hand pulling, digging, or pruning, were then double bagged in heavy duty garbage bags, and were picked up by the Town of Golden after notification as to where the bags could be picked up for disposal at the Columbia Shuswap Regional District (CSRD) landfill.

3.5 Removal strategies

The CIPP employs mechanical treatments to manage invasive plant species. Although most respond well to mechanical removal, many species, such as Common Tansy and Common Burdock are able to re-grow quickly if the roots are not completely removed (ISCBC, 2014) Understanding how to effectively deal with invasive plant species is critical to success (Polster, 2007). During the 2020 CIPP, the coordinator took an approach to mechanical removal by studying the physiology of plant energy dynamics. Physiology of plant energy dynamics helped the 2020 coordinator plan a removal strategy to decide which species to remove according to their growth/energy cycles (Polster, 2007). Choosing a removal strategy in 2020 that focused on plant energy physiology, several priority sites were revisited throughout the 2020 CIPP and additional removals were completed where needed. Monitoring allowed the coordinator to determine which invasive plants should be removed and at which time during the program to allow for minimal regrowth.

3.5.1 Common Burdock

Common Burdock will regrow if the second-year plant stalk is cut down before producing seed heads (Hackett 2019). Common Burdock can be managed by cutting the seed heads off the plant after the flowers have turned purple. This is a signal that the plant has spent its energy towards reproduction and will not regrow if cut down at this time. At the beginning of the 2020 CIPP, the coordinator determined to first focus on removal and bagging of burdock that had turned to seed the previous year, digging out as much first and second year root as possible and afterwards reseeding the area with grass seed. Choosing to focus on removing burdock at the beginning of the contract was also decided due to a wet spring. Digging up burdock roots was easier after and during rainy periods, which were frequent in the spring. In the final weeks of the program, the coordinator revisited the sites where burdock was removed in the spring. These sites had been monitored throughout the program for any bolting stalks that were producing flowering parts. Once the bolting burdock had produced flowers that had turned purple, the coordinator cut down the flowering parts of the plant and bagged them. This ensured the plant's flowering parts would not mature into seed heads nor re-grow. Since burdock only spreads by seed, the leaves and stalks were cut down and left to decompose. Incorporating these removal strategies allowed for the coordinator to optimize removals in the 12 weeks of the program.

3.5.2 Common Tansy

The coordinator also chose to remove Common Tansy through extensive digging where infestations were in high density, as thorough removal of roots was required. Near 14th and 13th Street South along the Rotary Trail, there are two dense infestations of Common Tansy where the coordinator dug under the roots and removed as many root fragments as possible to ensure minimal regrowth. The area was also re-seeded with grass and monitored several times throughout the program. In other areas with smaller infestations of Common Tansy, such as the area behind King Crescent mobile park, the coordinator opted to allow for the plants to grow into their flowering stage and then dead-head the plants by cutting them down at the base of the stem. This ensured that the plant would not go to seed or continue to spread, although continual removal of Tansy in this area is required.

3.5.3 Orange Hawkweed

Orange Hawkweed is an invasive plant that spreads aggressively by seed and by creeping stolons that can spread vegetatively by mowing and will reproduce if just a fraction of the rhizome is left to reestablish. In an attempt to control Orange Hawkweed, the coordinator produced a natural herbicide using concentrated vinegar (20%), citrus peels and dish soap. Citrus peels have a natural terpene, D-

Limonene and can be extracted with vinegar. During the first week of the program, the coordinator infused one gallon of concentrated vinegar with citrus peels for two weeks. The infused liquid was then strained and 2 tbsp of dish soap was added, creating a natural herbicide. On June 12th, 2020 this natural herbicide was applied to rosette and flowering Orange Hawkweed in a test patch with successful results. Close monitoring showed that within days of application, the plant had browned, wilted and did not reestablish. Continued monitoring of test patches of Orange Hawkweed were also performed twice weekly while the plant was observed in its flowering stage. In conjunction with head-heading and careful digging, the application of this natural herbicide should be considered for non-toxic removal of Orange Hawkweed.



Figure 2: Left: Citrus peels infusing in concentrated vinegar (20%) to produce a natural herbicide. Right: Before and after photos of herbicide being applied to Orange Hawkweed test patches.

3.5.4 Additional species

By focusing on removal of Burdock and Common Tansy at the beginning of the program, this allowed for Spotted and Diffuse Knapweed to develop into their bolting/budding stage which made for easier identification and hand-pulling.

The coordinator also monitored additional high-priority sites at this time to note the development stages of different invasive plants. For example, when Orange Hawkweed was first observed to be in flower along the Kicking Horse River, the coordinator then focused on removals and public outreach material on Orange Hawkweed. This also allowed for the Spotted and Diffuse Knapweed from 9th Street North (towards the pedestrian bridge) to develop and allow for the bio-agents previously released in that area to continue to feed on the roots of the plants. In this area, Knapweed was cut at the base to allow for the bioagents to reproduce. Also, by focusing on removal of Burdock and Common Tansy at the beginning of the program, this allowed for Spotted and Diffuse Knapweed to develop into their bolting/budding stage which made for easier identification and hand-pulling. With Canada Thistle, if hand-pulled this may split the root and produce more shoots. Cutting or mowing is best applied after the plant has produced buds (ISCBC 2019).

3.6 Restoration attempts

At certain sites where removal of plant species required extensive digging or disturbing the soil, measures of small-scale restoration were implemented. For instance, areas where first year burdock roots and Common Tansy were dug up were re-seeded with grass seed. This was to discourage the disturbed area from being targeted by other invasive plants that prefer disturbed soil. Along the Kicking Horse River, re-seeding of native ground cover, Yellow Mountain avens (*Dryas drummondii*), occurred. The program coordinator distributed seeds saved from previous years and participants in the Community Weed Pull helped to spread seeds along the Kicking Horse River where invasive plants had been removed.

3.7 Biological agents

Two biological agents were monitored during the CIPP. The first species observed was the root-crown weevil, *Cyphocleonus achates*. This bio-control agent resides in the taproot of Diffuse and Spotted

Knapweed species, which eats the plant. The root-crown weevil was found in Knapweed species along Kicking Horse Drive. Spotted and Diffuse Knapweeds located in this area were cut down to the base of the plant to encourage stable root-crown weevil populations, as they live in the plant's roots. The second site visited was at Alexander Park where the Dalmatian Toadflax stem boring-weevil, *Mecinus janthinformis*, was observed within a dense Dalmatian Toadflax population.



Figure 3: Left: Root-Crown Weevil (Cyphocleonus achates) inside Spotted Knapweed (Centaurea biebersteinii) found in Golden July 15, 2020. Right: Dalmatian Toadflax Stem-Boring Weevil (Mecinus janthinformis) found on Dalmatian Toadflax (Linaria dalmatica) in Alexander Park, Golden August 4, 2020.

4. PUBLIC OUTREACH

4.1 Online outreach

Public outreach is a fundamental aspect to the Community Invasive Plant Program. Due to physical distancing measures set in place at the start date of the program, public outreach opportunities usually attended by the CIPP were affected. For example, the Golden Farmer's Market could offer only limited space to approved vendors and events such as the Golden 24-hour bike race were cancelled. A public outreach booth was not set up for the 2020 CIPP. To mitigate the affected public outreach portion of the program, the 2020 coordinator took an approach to include more online outreach material.

A weekly online outreach series, "Weedy Wednesday Recipes" was created (see Appendix D). This series was posted on the Wildsight Golden Facebook page and provided a recipe on how to prepare several of the edible invasive plant species found in Golden and included a write-up describing the plant, how to identify it and manage it. An online video outreach series was also created, which was posted on the Wildsight Golden Facebook page every Saturday for a month. Several high-priority invasive plant species found in Golden were chosen, and the coordinator recorded outreach videos describing the identifying features of the plant, where it can be found, what makes it invasive and how to manage the plant. The videos were posted on social media platforms.

In addition to the weekly outreach series, two "What's In My Backyard?" posters were created that were shared on social media in an effort to reach out to residents of Town of Golden to identify invasive plants growing on their property and how to manage them (see Appendix E). One poster was meant to build on the free invasive plant survey for residents offered by the CIPP. For those wishing to still have plants identified without a physical visit to their property, a second poster with the opportunity for residents to send in photos of plants to be identified was developed. The coordinator respon ded to five individuals and identified several invasive plant species of concern and sent information to the land owners on how to manage them.

4.2 Private landowner outreach

The neighborhood of Riverglen Drive has been observed to have aggressive infestation of Orange Hawkweed established. Orange Hawkweed has also been recorded along the Rotary Trail adjacent to

Riverglen Drive. The coordinator also observed infestations to be spreading throughout the neighborhood nearby. Orange Hawkweed was observed to be in its flowering stage mid-June. Before any outreach was performed, Orange Hawkweed was mechanically removed along the Rotary Trail. During these removals, 5 residents and 4 visitors stopped to inquire about why the plant was being removed and what it was. This was a great opportunity to educate people who were not aware of how aggressive Orange Hawkweed spreads and its effects on native vegetation displacement. On June 17th, the coordinator dropped off 15 informational packages to the residents of Riverglen Drive and to three houses on 5th Street South. This package included information on large Orange Hawkweed infestations, a letter from the CIPP, a BC Invasive Species Council TIPS sheet on Orange Hawkweed, as well as a recipe for the natural herbicide (described previously) that was used with positive results. A concerned resident from the neighborhood contacted the coordinator to ask more about the application of the herbicide. Another resident asked for the coordinator to come look at an infestation on a private landowner's property and how to manage a large-scale infestation.

A second series of landowner outreach was conducted again in Riverglen Drive. While conducting invasive plant removals along the Rotary Trail adjacent to Riverglen drive, it was observed that although fencing clearly marked Town of Golden property, signs of landscaping and maintenance by private landowners on Town of Golden property were evident. Invasive plants species such as Dame's Rocket (Hesperis matronalis), Creeping Bluebell (Campanula rapunculoides), Orange Hawkweed (Hieracium aurantiacum), Common Burdock (Arctium spp), Cypress Spurge (Euphorbia cyparissias), Glandular Baby's Breath (Gypsophila scorzonerifolia), Spotted Knapweed (Centaurea biebersteinii) and Common Comfrey (Symphytum officinale) as well as ornamental plants Mountain Bluet (Centaurea montana), Bachelor's Buttons (Centaurea cyanus) and Thunder and Lightning Scabious (Knautia macedonica) were found spreading and escaping on Town of Golden property that is being used by private landowners. On Tuesday July 14th, letters provided by the Town of Golden were dropped off to private landowners with property adjacent to the Rotary Trail explaining the removal of invasive plants in the area. Although these infestations are found on Town of Golden property, it is recommended to continue to work with private landowners to bring awareness of the different invasive species found near their property line, how to manage them, and find a way to work together in decreasing the spread of these plants.

4.3 Outreach with Metis Nation Columbia River Society

During the 2020 CIPP the coordinator strived to find alternative ways to manage invasive plants while keeping the amount of invasive plant material that had to be bagged and taken to the dump as minimal as possible. Many of the invasive plants removed in the program have been introduced to North America because they had been used culinary and medically historically. To encourage alternative management of invasive plants, the coordinator met with a volunteer of the Metis Nation Columbia River Society to remove Common Comfrey from behind Golden Secondary School. The roots and leaves were harvested and the remaining vegetation was left as a soil amendment where the plants had been dug up. The roots and leaves that were harvested will be used in an upcoming workshop to teach the Metis Community how to make a topical healing balm from the plant.



Figure 4: A volunteer from Metis Nation Columbia River Society harvesting comfrey roots and leaves for medicine.

4.4 Get Wild Kids Camp

The CIPP program coordinator met with Wildsight Golden's Get Wild Kids Camp on two occasions during the 2020 CIPP. Locations, dates and times were organized with the camp's program coordinator. This was a great and fun opportunity to teach young kids in Golden about invasive and native plants as well as about some priority invasive plant species, and also about why they should care about the removal of

these plants. Each session lasted approximately two hours and included several invasive plant themed games in between educational discussions about invasive plants to keep the children engaged. Due to weather and high temperature, the coordinator made the decision to forgo a weed pull activity. Rather, native plant seed bombs with native plant seeds collected by the coordinator were made by the camp kids in the shade.



Figure 5: Get Wild camp kids making native plant "seed bombs"

4.5 Signage

To encourage residents learning more about invasive plants specific to the area, the coordinator created two posters to be erected (see Appendix G). One poster was created to be placed along the Rotary Trail near Riverglen Drive that included identifying photos of Orange Hawkweed, Spotted Knapweed, Cypress Spurge, Creeping Bluebell, Dame's Rocket and Glandular Baby's Breath. The second poster was created specific to the area behind King Crescent mobile park and includes identifying photos of Common Tansy, Mullein, Creeping Bluebell, Spotted Knapweed, Common Comfrey and Great Burdock. Included in these posters was a brief explanation of invasive plants, the CIPP and how to report invasive plants.

4.6 Media

Social media was used throughout the 2020 CIPP to post online outreach material including the "Weedy Wednesday Recipes", online outreach videos as well as the "What's in My Backyard?" landowner outreach post. These were posted on Wildsight Golden's Facebook page. Promotion for the "13th

Annual Community Weed Pull Event" poster as well as the "What's in My Backyard?" outreach posts were shared through Wildsight Golden's Facebook account to the "Golden Community" group.

Three press releases were submitted to the Golden Star for publishing during the 2020 CIPP (see Appendix H). An initial press release outlining the start-up of the 2020 CIPP as well as a second write-up to advertise the "13th Annual Weed Pull Event" were published in the Golden Star. A third and final press release outlining the success of the 2020 CIPP was also submitted for publishing.

5. COMMUNITY WEED PULL

On Saturday, June 27th the coordinator organized and facilitated Golden's 13th Annual Community Weed Pull Event. The event included a brief introduction to the CIPP, invasive plants that were to be targeted, and best management practices for the invasive plants were shared during the weed pull. The Town of Golden provided bags and tools used and picked up the bagged invasive plant material that was taken to the landfill for disposal. 17 volunteers attended the Weed Pull and a total of 18 bags of invasive plant material were removed from along the Kicking Horse River at this event.



Figure 6: Volunteers removing invasive plants during the Community Weed Pull Event

Following COVID-19 guidelines, each participant sanitized their hands and any tools shared with hand sanitizer donated by the Metis Nation Columbia River Society.

In past years, the Weed Pull Event has provided a free lunch for all volunteers. To navigate through COVID-19 concerns, the coordinator reached out to Dan Bracko from Columbia River Catering Co. to inquire about providing volunteers with a meal prepared and served from his food truck. Upon further discussions about the food menu to be served, the idea of implementing edible invasive plants into the menu was explored and eventually executed. This lunch option allowed for proper physical distancing and was a great success. The free edible invasive lunch was promoted on advertising for the Weed Pull and over 21 people had emailed and expressed interest in the Weed Pull. Prior to the Weed Pull Event, the coordinator gathered and prepared edible invasive species that were then featured in the lunch menu for all volunteers. These invasive species were Burdock root, Western Goat's Beard greens,

Dame's Rocket leaves and flower, Sow Thistle greens and Oxeye Daisy leaves. A lunch was also provided to the Town of Golden employee that Saturday who was responsible for pick-up of the bagged invasive plants from the Weed Pull.



Figure 7: Volunteers enjoying the lunch featuring edible invasive provided by Columbia River Catering Co.

6. FUTURE RECOMMENDATIONS

6.1 Work Term and Hours

The 2020 CIPP work term was extended by one week to expand the program to 12 weeks. Having the program continue until mid-August allowed for the coordinator to plan effective plant removals. As mentioned in this report, burdock will re-grow if cut-down before the plant bolts and produces flowers. Allowing for a longer work term for 2020 allowed the coordinator to remove burdock flowers and cut down the bolting stalks observed to begin late-July. This approach allowed for the coordinator to focus on removal of invasive plants specific to the time where the energy of the plant allowed for effective cutting or removal with minimal re-growth. It is recommended to expand the high-priority sites to include more removal of burdock - especially burdock that is over taking the alley ways in the Town of Golden. Also, having the CIPP extend to mid-late August would allow for more effective burdock removal.

6.2 Reclamation using native plants

Invasive plants can establish quickly on disturbed sites (ISCBC, 2019). To counter the disturbance caused by the mechanical removal of invasive plants, the coordinator recommends consideration of implementing reclamation of sites by planting native plants specific to the area. During the 2020 CIPP, the coordinator reached out to both Prairie Moon Nursery and Tipi Mountain Native Plants to discuss the possibility of workshops to educate residents of Town of Golden the benefits of planting native plants, and how to properly collect and save native plant seeds for reclamation. Due to COVID-19 restrictions and a high business demand, neither nursery was available to discuss this opportunity further.

6.3 Continued public outreach

It is highly recommended to continue using the "What's in My Backyard?" online outreach posts on social media. During the 2020 CIPP the coordinator responded to five residents of Golden with various "mystery" plants to be identified. Using this approach, the coordinator was able to help residents identify several invasive plants of concern including, Hounds-tongue (*Cynoglossum offinicinale*), Bull Thistle (*Cirsium vulgare*), Canada Thistle (*Cirsium arvense*) and Burdock (*Arctium spp.*).

Although not possible during the 2020 CIPP, continued presence at local events and the Golden's Farmers Market is a fundamental aspect of public outreach and if possible, for the 2021 CIPP should be continued.

6.4 Encouraging management of invasive plants on private property

Alleyways and private property lines shared with Town of Golden property remain an area that could be considered for better management of invasive plants. Although admittedly a difficult task to be implemented, a creative incentive-based solution could be explored. For example, the possibility of a Town-wide contest including "Before" and "After" photos of private residents' yards with invasive plants and of management of them could be something worth exploring.

6.5 Collaboration opportunities

Another opportunity to explore would be collaboration with the Youth Volunteer Program funded by the Invasive Species Council of BC. This program works with youth aged 15 to 30 to gain volunteer experience and take action improving habitats and communities. Possible ideas that could be explored would be targeting areas in the community that would benefit from extra hands removing invasive plants. Additionally, youth could be encouraged to volunteer time to help residents of Golden with removal of invasive plants due to physical concerns (e.g. people in wheelchairs, seniors). Youth could also be involved in future public outreach opportunities such as the Farmer's Market or events.

Continued collaboration with the Metis Nation Columbia River Society could include checking in with members to ask if any invasive plant material to be removed during future CIPP could be used by members for future plant medicine projects. It is also recommended to check in with Local Food's Matter to inquire about opportunities to have a presence at local "Seed Swaps" to ensure invasive plants or ornamental plants prone to escaping cultivation are discouraged. The Invasive Species Council of BC has a "Plant Me Instead" outreach program that identifies common invasive species to BC and native plant alternatives to cultivate that would be beneficial in sharing with this organization.

6.6 Alternative Community Weed Pull Route

Prior to the Weed Pull Event being conducted, an invasive plant survey of the route was conducted and the coordinator found limited populations of Spotted Knapweed along the route. This would suggest that past Weed Pull Events have been successful in managing Spotted Knapweed along the route and also suggests an alternative Weed Pull route could be explored for the future. Moving the weed pull route to include the Rotary Trail from the Pedestrian Bridge to the CP Bridge/Confluence Park is worth considering.

7. CONCLUSION

Wildsight Golden's Community Invasive Plant Program has proven to be effective in reducing invasive plant populations within the Town of Golden since its establishment in 2010. Public outreach has been a large contribution to its success through the Annual Community Weed Pull Event, online outreach, private land visits, and print media. This has subsequently expanded the number of people locally

interested in the fight against invasive plants. Increasing the work term of the CIPP allowed the program to grow and become even more successful and productive. Continued partnerships with the Town of Golden and the Columbia Shuswap Invasive Species Society are also very important to the CIPP. Ongoing communication with both of these partner groups benefited all involved the CIPP. Overall, the CIPP continues to be effective for keeping invasive plant populations as manageable as possible within the Town of Golden, with public outreach becoming increasingly more important as is the idea of further reclamation/restoration efforts using native plants

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Appendix A. 2020 CIPP Invasive plant removal locations and number of bags pulled

Location	Plant Species	# of bags
Rotary Trail 13stS and 14stS	Common Tansy, Burdock, Dame's Rocket, Yellow Toadflax, Canada Thistle, Bull Thistle	
Weed Pull Route	Spotted Knapweed, Oxeye Daisy, Western Goat's Beard, Canada Thistle	19
Little Mittens to Old Mill	Burdock, Common Tansy, Canada Thistle, Yellow Toadflax	18
Hounds-tongue, spotted knapweed, diffuse knapweed, Canada thistle, Mullein		16
CP Bridge to 9stN	Spotted Knapweed, Burdock,	15
Riverglen Dr/Rotary Trail Orange Hawkweed, Cypress Spurge, Creeping Bluebell, Mullein, Spotted Knapweed, Dame's Rocket		12
Alexander Park	Burdock, Spotted Knapweed, Western Goat's Beard, Wormwood,	
Behind King Crescent	Common Tansy, Spotted Knapweed, Common Comfrey, Creeping Bluebell, Burdock	9
14 ^{ave} S and Selkirk Hill	Common Comfrey, Spotted Knapweed, Diffuse Knapweed	7
Spotted Knapweed, Diffuse Knapweed, Mullein		5
Ski Hill Bridge to CP Bridge	Spotted Knapweed, Diffuse Knapweed	5
Rotary Trail/Flat Area past Riverglen Dr Orange Hawkweed, Spotted Knapweed, Mullein		5
Rip-Rap to CP Bridge	Spotted Knapweed, Mullein	3
CP Bridge to Rotary Trail	Spotted Knapweed, Leafy Spurge, Mullein	2
Edelweiss	Chicory, Canada Thistle	1
Golden Secondary School	Common Comfrey	1
Rotary Trail/Dojo	Burdock, Canada Thistle	1

Appendix B. Priority Sites and Invasive Plants Found

ite# Location		Invasive Plants Found	lotes
1	Alexander Park	Wormwood, Burdock, Knapweed, Western Goat's Beard, Canada Thistle, Dalmatian Toadflax, Sulphur Cinquefoil	Bio-agent on Dalmatian Toadflax - good to have signage in summer
2	Rotary Trail 14th St. S to 6th Ave	Common Tansy, Dame's Rocket, Burdock, Yellow Toadflax, Canada Thistle, Bull Thistle	Possible "No Dumping Sign" or Tansy Removal Sign
3	Behind High School	Himalayan Balsam, Burdock	No Him. Balsam Found
4	Edelweiss	Himalayan Balsam , Dalmatian Toadflax, Common Tansy,	None recorded 2019
5	Rotary Trail - 11th St. S by Well #3	Comfrey (by Well #3), Knapweed along trail	No Dumping Sign needed
6	Walking Trail behind King Crescent	Comfrey, Common Tansy, Knapweed, Mullein, Yellow Toadflax	No Dumping Sign needed - follow up with CSISS about property with tansy infestation
7	Rotary Trail - CP Bridge to Riverglen Dr.	Spotted and Diffuse Knapweed, Orange Hawkweed, Leafy Spurge, Burdock, Mullein, Oxeye Daisy	Remove Knapweed. Carefully remove leafy spurge (record GPS + IAPP)
8	CP Bridge to Confluence	Spotted and Diffuse Knapweed, Oxeye Daisy, Western Goat's Beard	Remove Knapweed
9	Fischer Rd to Airport	Spotted and Diffuse Knapweed	Remove
10	Little Mittens/Old Mill	Burdock, Common Tansy, Canada Thistle	Cut-down and remove seeds
11	Kicking Horse Dr. 9th Street N to CP Bridge	Spotted and Diffuse Knapweed , Oxeye Daisy, Mullein, Burdock, Western Goat's Beard	*Bio-agent - leave roots for weevil
12	KH Dr. CP Bridge to Ski Hill Bridge	Spotted and Diffuse Knapweed, Oxeye Daisy, Western Goat's Beard	Remove
13	Rotary Trail beside Dojo and DayCare	Burdock	Remove
14	Riverglen Dr.	Orange Hawkweed	Land-owner Outreach
15	Private Property Riverglen Dr/Rotary Trail	Cypress Spurge, Glandular Baby's Breath, Comfrey and others	Remove Cypress Spurge

Golden's Community Invasive Plant Program

Natural Orange Hawkweed Herbicide

This is an easy recipe you can make at home to combat Orange Hawkweed infestations on your property.

This natural herbicide was made by infusing orange peels in concentrated vin egar cleaner, adding some dish soap and applying directly to the orange hawkweed. This recipe takes two weeks to complete. If you are interested in making and applying this herbicide but orange hawkweed has already flowered on your property, while you are waiting for the herbicide to be ready to apply, cut off the flower heads and dispose of them, double bagged, to the landfill. For any questions or comments, please email Tesia at: wildsightweedprogram@gmail.com

Ingredients:

- 2.5L 10% Concentrated vinegar cleaner (Allen's Double Strength Cleaning Vinegar available at grocery store)
- 10-15 Citrus peels (orange, lemon, lime, grapefruit citrus peels contain the naturally occurring terpene compound D-Limonene that is extracted by the vinegar) **or** use 1 oz D-Limonene, if available.
- 1/4C Dish Soap

Directions:

Soak citrus peels in vinegar solution for up to 2 weeks. Skip this step if you have access to D-Limonene.

After two weeks of infusing orange peels in vinegar, strain out peels and with gloves, pour vinegar into a spray bottle. Add dish soap to solution. The dish soap will help the herbicide "stick" to the orange hawkweed.

Spray on orange hawkweed and use care as the vinegar will also kill any other plants it comes into direct contact with. Keep out of reach of children and use gloves to avoid any skin irritation the vinegar solution may cause.



Appendix D. Weedy Wednesday Recipes.



plants tiny hairs that may irritate the throat.



Appendix E. What's In My Backyard?



COMMUNITY INVASIVE PLANT PROGRAM

WHAT'S IN MY BACKYARD?

Free invasive plant photo identification to residents of the Town of Golden

Send in a photo of a plant you would like to be identified and we will let you know if it is an invasive plant and how to manage it's spread!

To help accurately identify your mystery plant, take several photos that include any branches, stems and any flowering parts. Send in your photos to:

wildsightweedprogram@gmail.com





COMMUNITY INVASIVE PLANT PROGRAM

WHAT'S IN MY BACKYARD?

Free invasive plant identification to residents of Golden

The Community Invasive Plant
Program offers free visits to your
property to help identify any invasive
plants and go over safe, non-toxic
ways to manage them.

If you are interested in having plants on your property identified, please contact program coordinator Tesia at:

wildsightweedprogram@gmail.com



Appendix F. Invasive Plant Posters















INVASIVE PLANTS LEARN TO RECOGNIZE AND BE PLANT WISE

Invasive plant species pose serious threats to our native ecosystems. They have no natural predators or disease to control them making them extremely aggressive in their non-native environments. Invasive plants can have widespread negative economic, recreational and environmental impacts.

Since 2010 Wildsight Golden and the Town of Golden have been working in partnership to control invasive plants through early detection, removal and monitoring programs. Golden's Community Invasive Plant Program continues to be effective in removing invasive plants in an effort to maintain and restore Golden's natural plant ecology.

For more information on this program, visit wildsight.ca/invasivespecies. To report an invasive plant call 1-888-WEEDSBC or use the "Report-a-Weed" application either online or through your mobile device.

Thank you for your help







Appendix G. Photos of invasive plant removals



Before (left) and After (bottom right) photos of Common Tansy removal adjacent to Rotary Trail near 13stS and 14thS. Photo of Common Tansy root removed (top right).



Before (right) and after (left) photos of Burdock removal off a walking trail near $9^{\text{ST}}N$.



Before (top) and After (bottom) photos of Common Tansy removal adjacent to Rotary Trail by 14^{st} S and 13^{st} S.



Before (top) and After (bottom) photos of Orange Hawkweed removal along Rotary Trail and Kicking Horse River.

Thursday, June 18, 2020 Page A5

Community weed pull set for June 27

By Claire Palmer

Wildsight Golden will host the 13th annual community weed pull along the Kicking Horse River on Saturday, June 27.

The event is a part of Wildsight Golden's Invasive Plant Program, a family friendly opportunity for the community to come together to learn more about invasive plants and their safe removal.

The project aims to improve and protect the biodiversity and natural ecology of Golden.

This year's weed pull will follow strict ment from Wildsight provided featuring COVID-19 health guidelines set out by physical distancing required for particialso be providing hand sanitizer as well the event.

According to a state-



Community members at last year's weed pull. (Wildsight Golden photos)

engaging.

Golden, the weed pull locally soruces edwill be an opportunity ible invasive plants the province, with to 'pull' together as a provided by Columcommunity during a bia River Catering of at least six feet tough time for many. Co. To receive lunch, Wildsight empha- pre-register and RSVP pants. Wildsight will sizes the need to dress no later than June 24, for the weather and emailing wildsightto bring water, as the weedprogram@gmail. as tools and bags for work will be physically com. The location for the weed pull will be Free lunch will be sent via email.