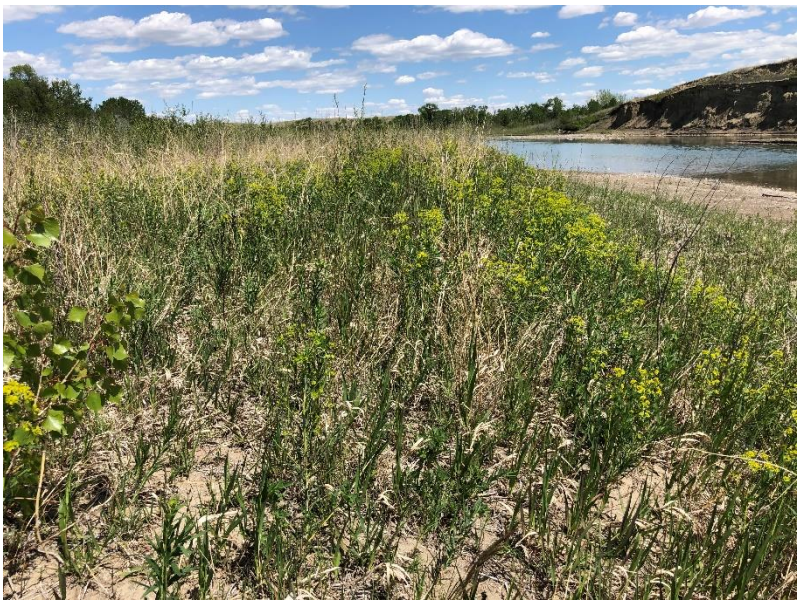
M.D. of Willow Creek No. 26

Five-Year Moon River Leafy Spurge Sheep Grazing Project 2020-2024

Calendar Year 2022 (October Update)



MD of Willow Creek

Background

Beginning May 9, 2020, 190 head of sheep were introduced to target graze Leafy Spurge (*Euphorbia esula*) on M.D. of Willow Creek owned lands along the Belly River in the subdivision of Moon River with a primary objective of reducing Leafy Spurge incidence via targeted grazing. Another 240 sheep were introduced to the project on June 10th bringing the total number of sheep to graze the target area in 2020 to 430 head. The sections of SE-13-09-24-W4, SW-13-09-24-W4, and NW-13-09-24-W4 were grazed totalling approximately 125 acres of the treated area.

As per the previously signed contract, agreements were maintained between the M.D. of Willow Creek and the Granum Hutterite Colony. During the second year of the program, Granum Colony subcontracted the grazing to Wade Gustman. On June 4, 2021, 164 sheep were brought to the area to target graze for the second year. Sheep brought in for the 2021 season were not previously exposed to the site. Throughout the summer additional sheep were dropped off in the project area as needed. Sections grazed in the year previous was maintained as the program area, although; specific sites for rotation differed according to herder ability and accessibility. The sheep were withdrawn from the area on September 20-21, 2021.

In May 2022, the crew from the M.D.'s Agricultural Service Board conducted spraying and mowing in the unoccupied horse paddocks. Absinthe Wormwood (*Artemisia absinthium*) and Leafy Spurge were targeted during this initial treatment, both with herbicide and mowing. On May 12, Agricultural Fieldman Carla Preachuk, Asst. Agricultural Fieldman/Environmental Technician Whitley Macaulay, Wade Gustman, and Andy Dormar met at the sheep grazing area down by the river to discuss plans for grazing during 2022. Upon inspection of the site, a consensus was met to withhold from grazing and control Leafy Spurge primarily with herbicide for 2022. Because of abnormally dry conditions in 2021 and spring 2022, Wade predicted that there would not be enough non-target vegetation to support the dietary requirements of the sheep and that the landscape would suffer negative impacts from grazing whilst in a state of stress from the weather. The group agreed that grazing would not be viable for the 2022 season and agreed to continue control with alternative measures and revisit the grazing potential in 2023.

Following the May 12, 2022, meeting with Andy, Wade, Carla and Whitley, the crew sprayed Downy Brome and Leafy Spurge within the large horse pastures behind the paddocks. Leafy Spurge was also targeted along the river and within all previously sheep-targeted areas. From May through to September, a total of eleven herbicide treatments were applied to the river banks, pastures and horse paddocks at Moon River. Leafy Spurge was the main target, but Absinthe Wormwood, Downy Brome (*Bromus tectorum*), Kochia (*Bassia scoparia*) and Canada Thistle (*Cirsium arvense*) were also targets of herbicide treatment.

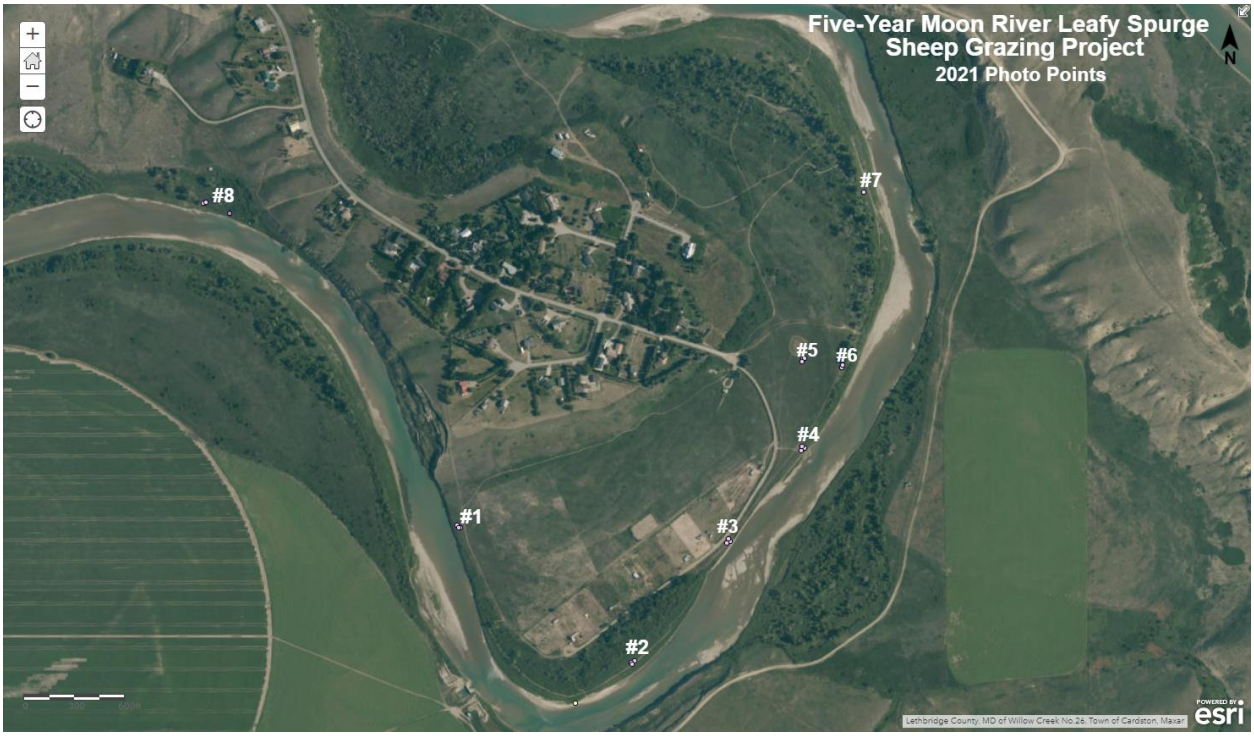


Figure 1. The above map represents the photo points collected throughout the first and second years of the project. Sheep have grazed at each of the points (excluding point #8 in 2021), however; specific areas grazed may change year to year depending on the herder preference, priority areas and accessibility.

Results to Date

Completion of the first year of the project showed some interesting results and presented areas for improvement. Although literary research suggests that targeted grazing with sheep for Leafy Spurge control can be successful, it is important to understand that results may not appear immediate and initially drastic. Leafy Spurge is a hardy long-lived perennial that produces primarily through extensive root systems but is also capable of producing up to 130,000 seeds per plant, as such control must be repetitive and consistent to produce results.

In the second year of the project, results showed that following an initial grazing treatment Leafy Spurge plants resprouted and produced flowering parts, allowing for the potential of seed reproduction. However, areas targeted more than once showed a lack of flowering parts and targeted plants appeared stressed and non-recovered. For the future success of the program, it is suggested that a multiple treatment targeted grazing approach be implemented where possible. Herbicide treatments were also utilized in the first year of the study. Some sites within the project area were sprayed with a selective herbicide in the fall following the removal of the sheep. Where possible an integrated pest management (IPM) approach of target grazing and herbicide application is desired.

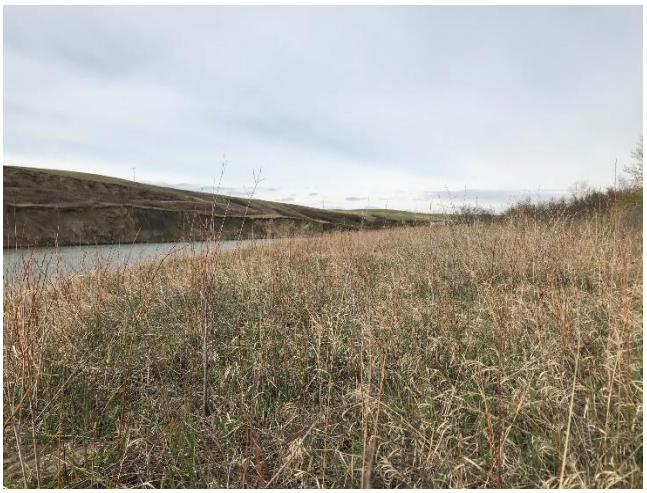


Image 1a. Photo point #2 May 2020 pre grazing.

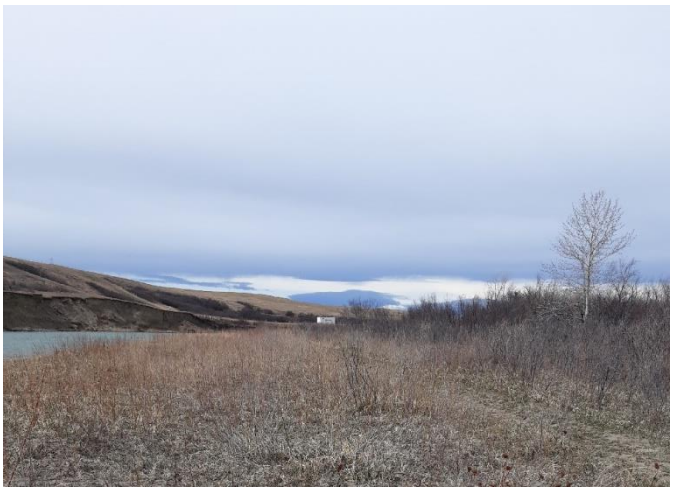


Image 2a. Photo point #2 April 2021 pre grazing.

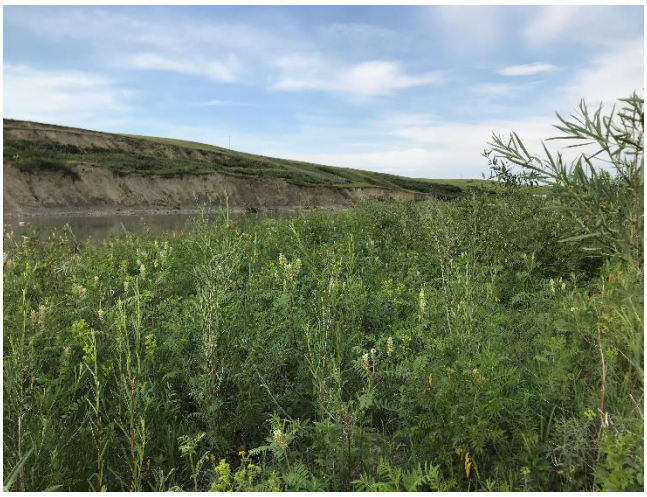


Image 1b. Photo point #2 August 2020 post grazing.

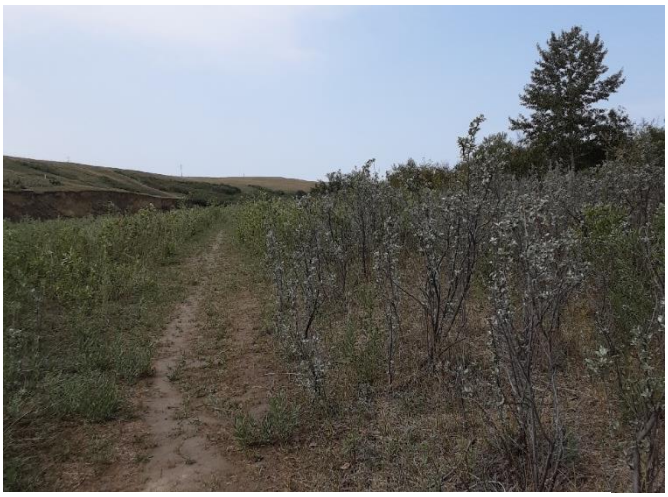


Image 2b. Photo point #2 August 2021 post grazing.

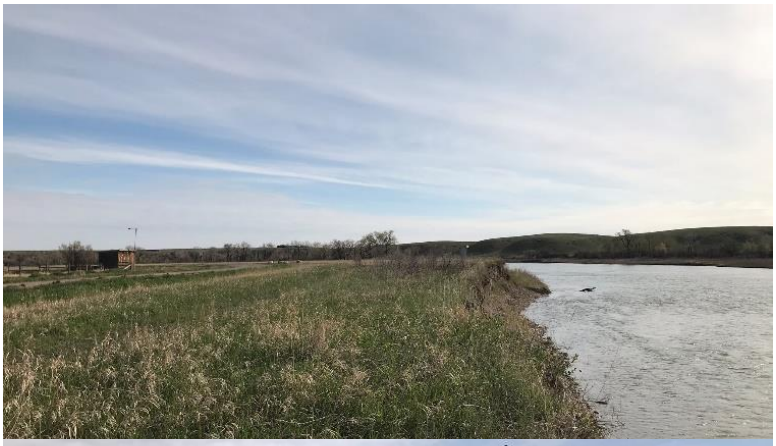


Image 3a. Photo point #3 May 2020 pre grazing.

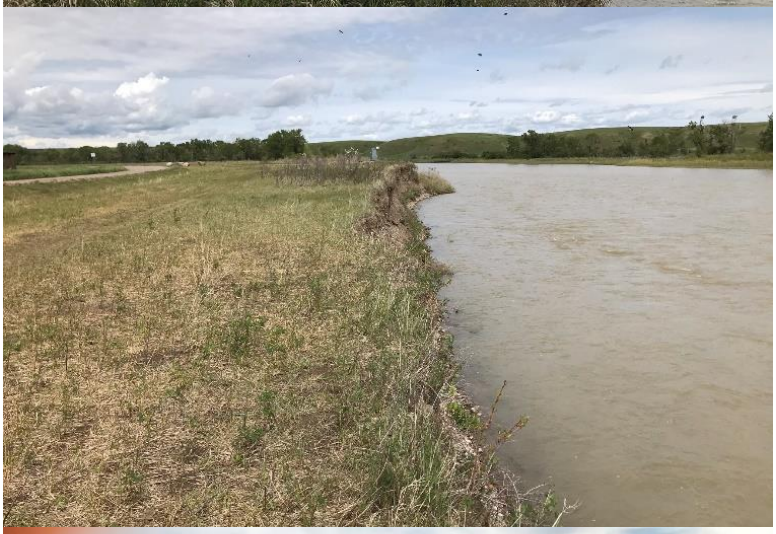


Image 3b. Photo point #3 June 2020 immediately after grazing.

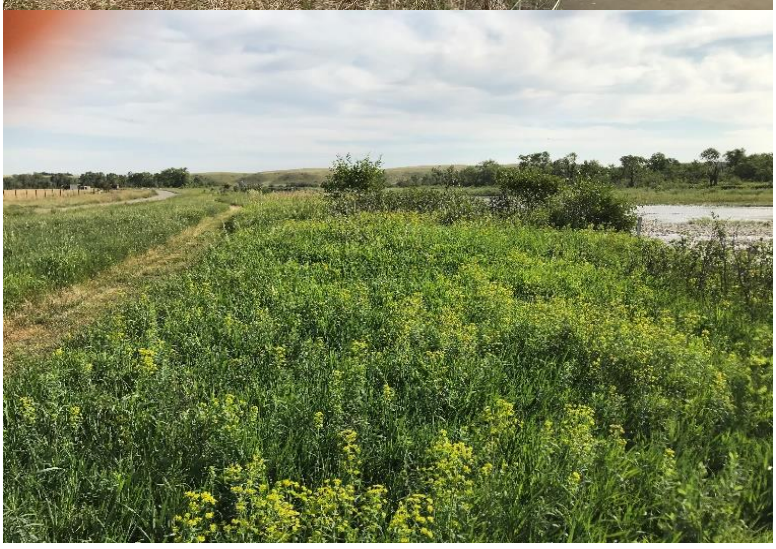


Image 3c. Photo point #3 August 2020 post grazing.

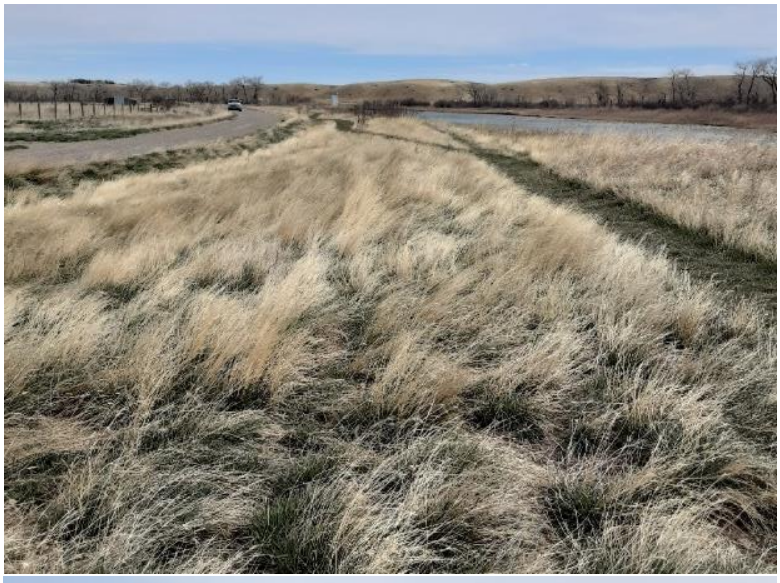


Image 4a. Photo point #3 May 2021 pre grazing.

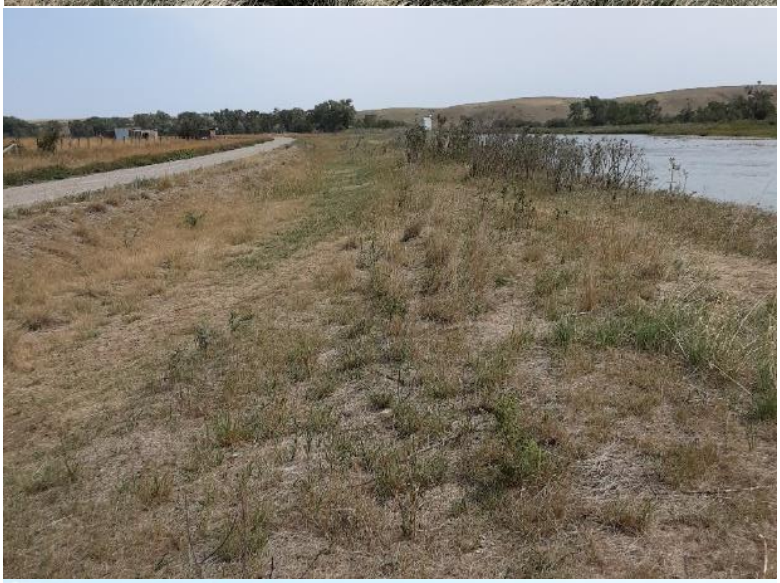


Image 4b. Photo point #3 August 2021 shortly after grazing.

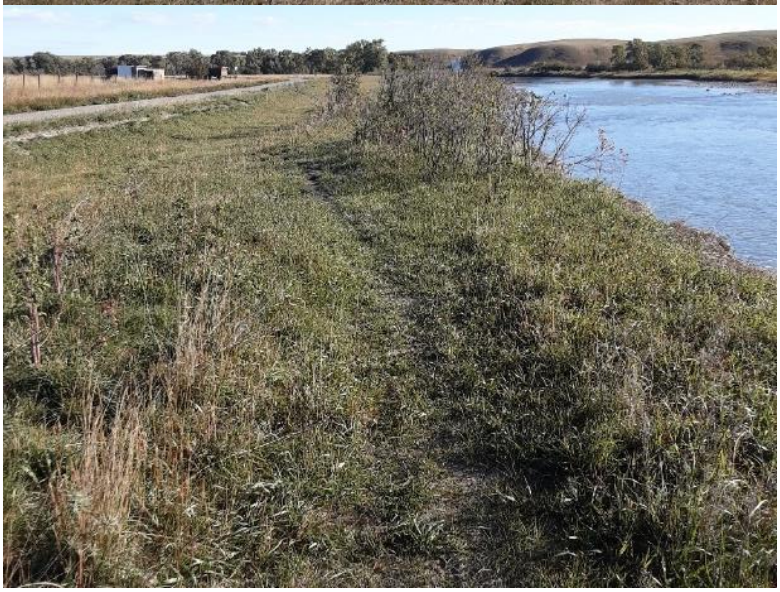
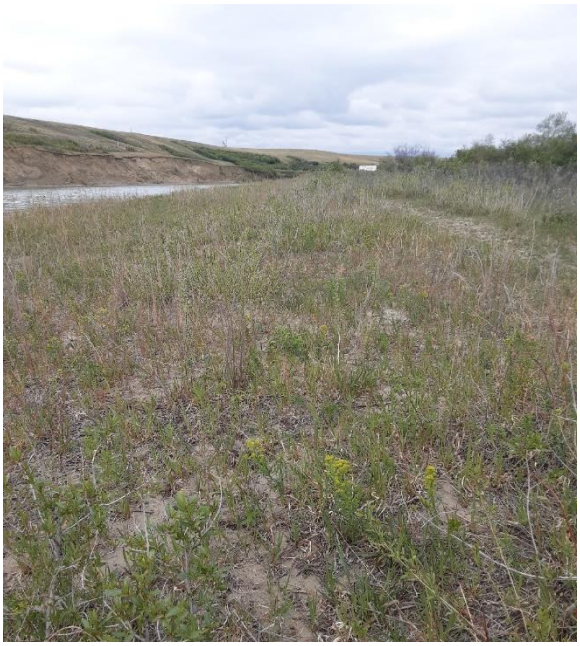


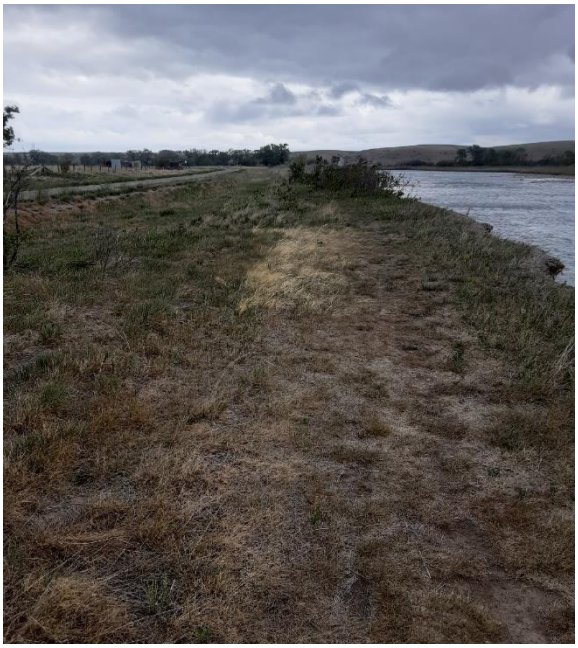
Image 4c. Photo point #3 September 2021 post grazing.

The images previous show the progression of two sites in the project area. Image series 1 shows Photo point #1 before and after it had been grazed in 2020. In comparison to image series 2, which shows the same photo point pre and post-grazing in 2021, there appears to be a significant difference in the amount of Leafy Spurge that reflowered post-grazing. 2021 showed a lower incidence of flowering plants following grazing treatment. In image series 3 and 4 we see a progression of site #3 in 2020 and 2021. Following grazing in 2021, there is a much more positive outcome than post-grazing in 2020. Image 3c shows a strong reflower of Leafy Spurge following grazing in 2020, while image 4c shows a lack of reflowered plants following grazing in 2021. Although some of this improvement can be attributed to sheep management and potential grazing repetition at the site, it is also important to acknowledge that these results may be due in part to environmental conditions, such as the drought experienced in 2021.

Following the withdrawal of the sheep, Wade Gustman expressed his satisfaction and happiness with the project stating that he believed the project to be proving effective and that continuation of the project will provide enhanced success. A conversation with Wade also revealed some amendments to be made for 2022. Wade specifically noted that grazing rotation should, and will in the future, start at one end of the project area and continue right through to the opposite end of the area rather than jumping from site to site. Fencing from the river right to the very back of the project location was also a suggestion that Wade made and will likely carry out in 2022. He stated that this approach will increase the aesthetic appeal of the area and not leave patches of non-grazed vegetation. Overall, Wade expressed satisfaction with the project and his eagerness to continue his participation.

Upon inspection of the project location in May 2022, results showed that Leafy Spurge had begun to sprout at the site in high abundance. Treatments with herbicide showed some success, but many environmental factors (ie. drought, wind, temperature) played a role in decreasing the effectiveness of the application.

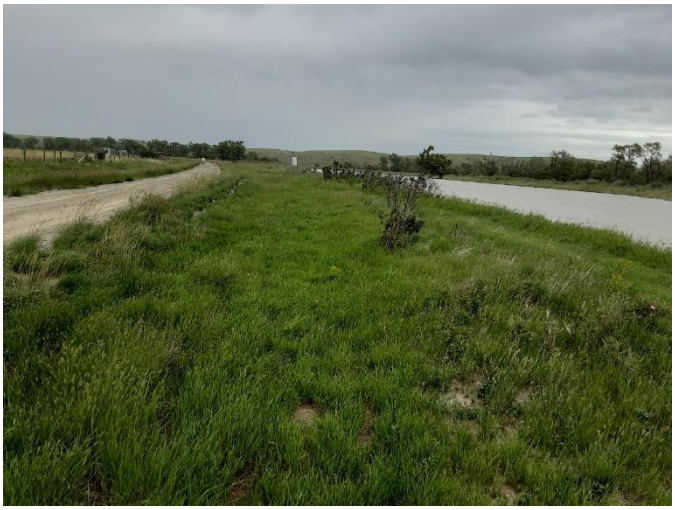


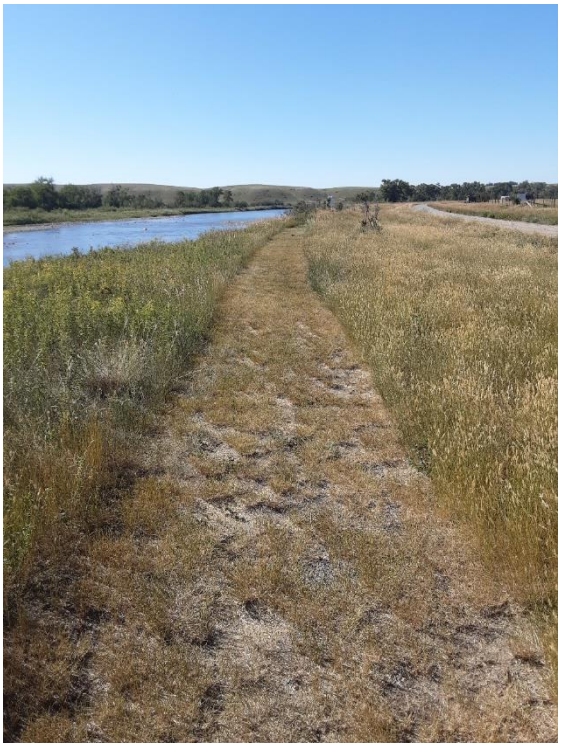


Images above show photo point #2 (left) and photo point #3 (right) on May 30, 2022 following treatment with herbicide. These photos can be deceiving as there are is a high abundance of juvenile plants at the sites that had not yet flowered at the time the photos were taken.

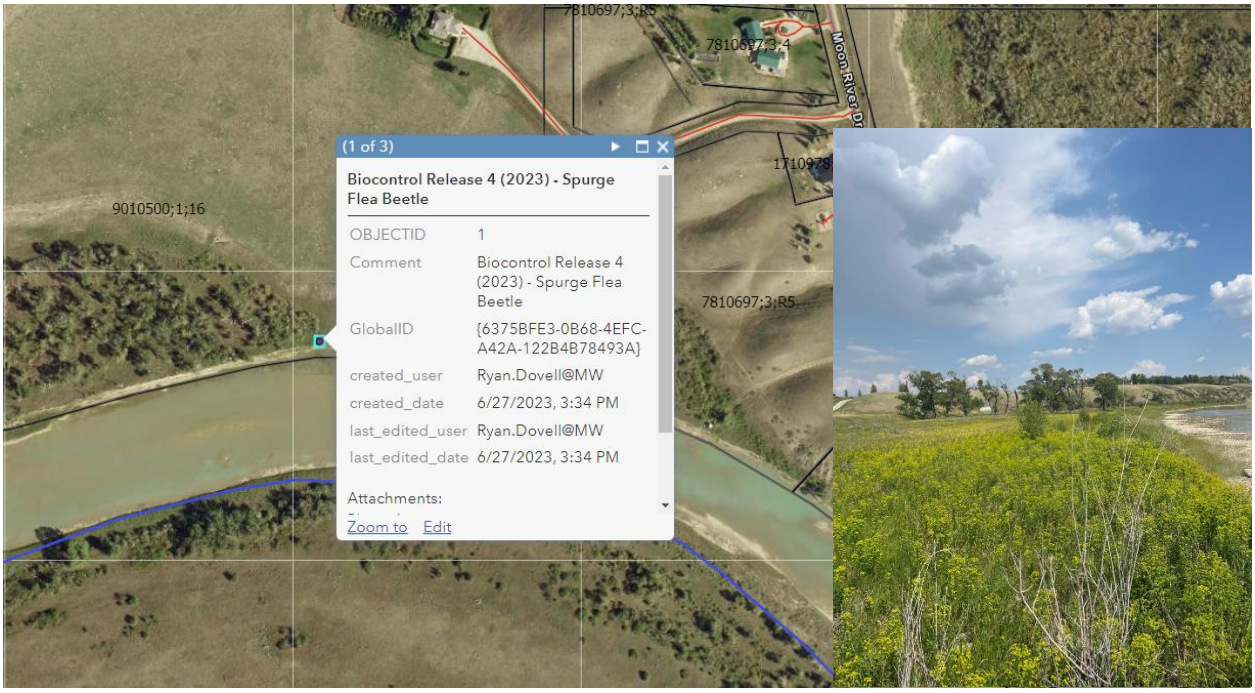
Throughout 2022, herbicide treatments were the primary control method used to minimize the spread of Leafy Spurge throughout the area. While other noxious and nuisance weeds were also targeted, the majority of the treatment was on Leafy Spurge. The abundance of Leafy Spurge during the entire season from April to September was comparable to the abundance in 2021, with the highest abundance being on the banks of the river. Some of these high abundance areas were unable to be treated with herbicide because high water levels within the river caused access issues. Again, weather conditions were a factor in 2022 with herbicide treatments. The month of June saw heavy rain followed by a hot August. This caused some treatments to be later in July, allowing plants to reach a more mature stage overall before treatment.

One good thing to note is that the increased moisture experienced in 2022, from the previous year, and the lack of pressure from the sheep grazing, allowed the desirable vegetation (grass, shrubs, forbs) to establish hardier stands and increase in abundance. This increase in desirable plant vigour may contribute positively to the success of Leafy Spurge control in the area for next year as juvenile Leafy Spurge plants will have a harder fight for resources.





The image above shows photo point #3 on June 24, 2022. The image to the right shows photo point #3 on August 8, 2022. In comparison to the images of photo point #3 from 2021, there is a visible increase in grass vegetation in 2022. Note that there is Leafy Spurge on both sides of the trail in the image to the right.



The above image shows the location of the biocontrol release of brown and black flea beetles at Moon River on June 27, 2023. The picture on the right side is looking back east at the residential area of Moon River, taken the day the biocontrols were released—showing a severe monoculture of Leafy Spurge.

Adjustments and Amendments to Date

Upon completion of the first year of the program, issues were recognized with regard to fencing. Residents of Moon River communicated their concerns through their Residents Association who then followed up with a letter requesting enhancements to the project that included assurance of proper electric fence installation, fence line mowing, and stronger communication. Following these requests, the M.D. of Willow Creek purchased a solar electric fencer that was successful at maintaining the containment of the sheep throughout the duration of the second year of the project as required.

One amendment suggested in the second year of the project is that a stronger continuous grazing technique is implemented and accompanied by IPM techniques. While one area is left to graze another, the Leafy Spurge is given time to recover and reflower. If another herd was able to move one or two rotations behind the next the plants may not have the time to recover and control may be more effective. However, it is understood that resources may be limited and a continuation of the current process will also be effective. An issue also arose during the second year of the project with the watering system in the horse pastures. A leak in the system rendered it unusable for most of the summer and therefore impeded the use of these pastures for grazing, however; this issue has been resolved and the area is fit to be utilized in 2022.

Besides the lack of sheep in 2022, there were no other amendments to report.

In 2023, no sheep were placed on the Leafy Spurge infestation. Wade Gustman was unable to provide his herd this year. Instead, herbicide applications using Navius FLEX @ 167 grams/hectare and a surfactant Gateway tank mix were completed on June 12th, and June 16th. A biocontrol was released at one location along the shore of Moon River this year as well. Brown and black flea beetles approved for use in Canada for control of Leafy Spurge were released on June 27th.

Looking Ahead

This project will continue over its five-year term into 2024. Upon inspection during the spring of 2024, a grazing prescription may be reintroduced to the project area. An integrated pest management approach will continue to be applied in future years of the project. Amendments and adjustments will continue to be made as they arise to ensure the sizeable success of the project over its future years of operation.