Wild Rice Restoration and Canada Goose Management in the St. Louis River Estuary – 2021 Goose Roundup Report

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PROJECT SUMMARY

The Wisconsin Department of Natural Resources (WDNR) conducted a Canada goose (*Branta canadensis*) roundup as part of on-going efforts to restore wild rice (*Zizania palustris*) in the St. Louis River Estuary. Once abundant throughout the estuary, wild rice has been reduced to a few remnant stands and areas where restoration efforts have been implemented. Research in the estuary has determined that Canada goose herbivory is the most significant impediment to successful establishment of self-sustaining wild rice beds. A variety of techniques have been used to reduce the impacts of geese that include hazing, egg addling, mylar flashing, swan decoys, and exclosures without a sufficient reduction in herbivory. Wildlife professionals from the WDNR and Animal and Plant Health Inspection Service (APHIS) implemented the goose roundup at strategic locations in the estuary in proximity to wild rice restoration sites. A total of 187 geese were removed over the course of the two-day roundup effort.

PROJECT BACKGROUND

Wild Rice Restoration Goals -- The restoration of wild rice (*Zizania palustris*) in the St. Louis River Estuary is of cultural and ecological significance. Restoration goals developed in the Wild Rice Restoration Implementation Plan for the St. Louis River Estuary ("Wild Rice Plan"; Minnesota Department of Natural Resources 2014) include the establishment of 275 acres of self-sustaining rice beds. This work was conducted with funding provided by the Great Lakes Restoration Initiative and administered by the U.S. Environmental Protection Agency. These efforts will contribute to the removal of beneficial use impairments for the St. Louis River Area of Concern (BUI 9 – Loss of Fish and Wildlife Habitat).

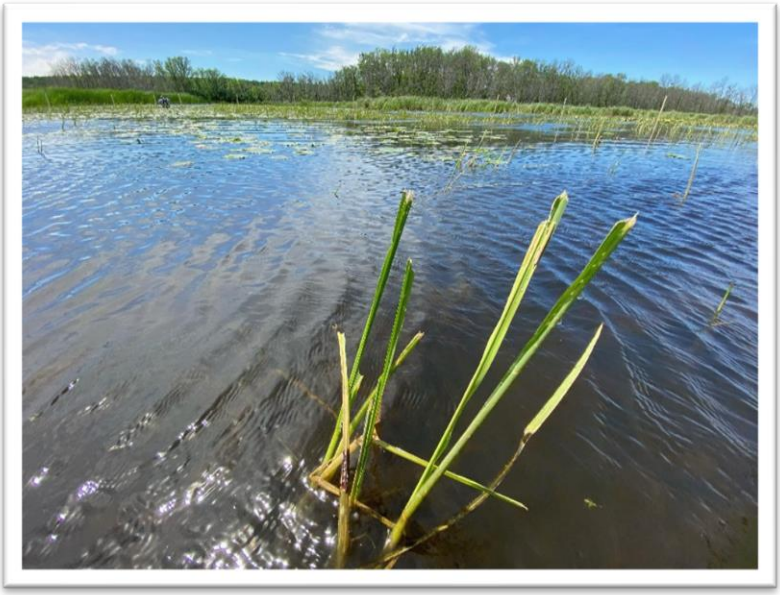

Figure 1. Sign of Canada goose herbivory on wild rice in the St. Louis River Estuary (Photo Credit: WDNR).

Canada Goose Herbivory -- Wild rice restoration efforts in the St. Louis River Estuary are hampered by Canada goose (*Branta canadensis*) herbivory (Figure 1). Monitoring data, camera traps and anecdotal observations have documented heavy browse by Canada geese during late spring and summer months when wild rice is in the floating leaf and early emergent stages of its life cycle (Schwartzkopf 1999; Figure 2). This important phase of the wild rice life cycle coincides with an abundance of molt migrant and resident nesting geese (and their offspring) occupying wild

rice sites in the estuary. Efficient foraging by geese inhibits wild rice flowering and seed head production.

A variety of techniques have been implemented to reduce the impacts of Canada goose herbivory (e.g., adapting restoration techniques, hazing, egg addling, mylar flashing, swan decoys, and goose exclosures). Despite these efforts, the impact of Canada goose herbivory has not been sufficiently reduced to allow for the establishment of self-sustaining wild rice beds.

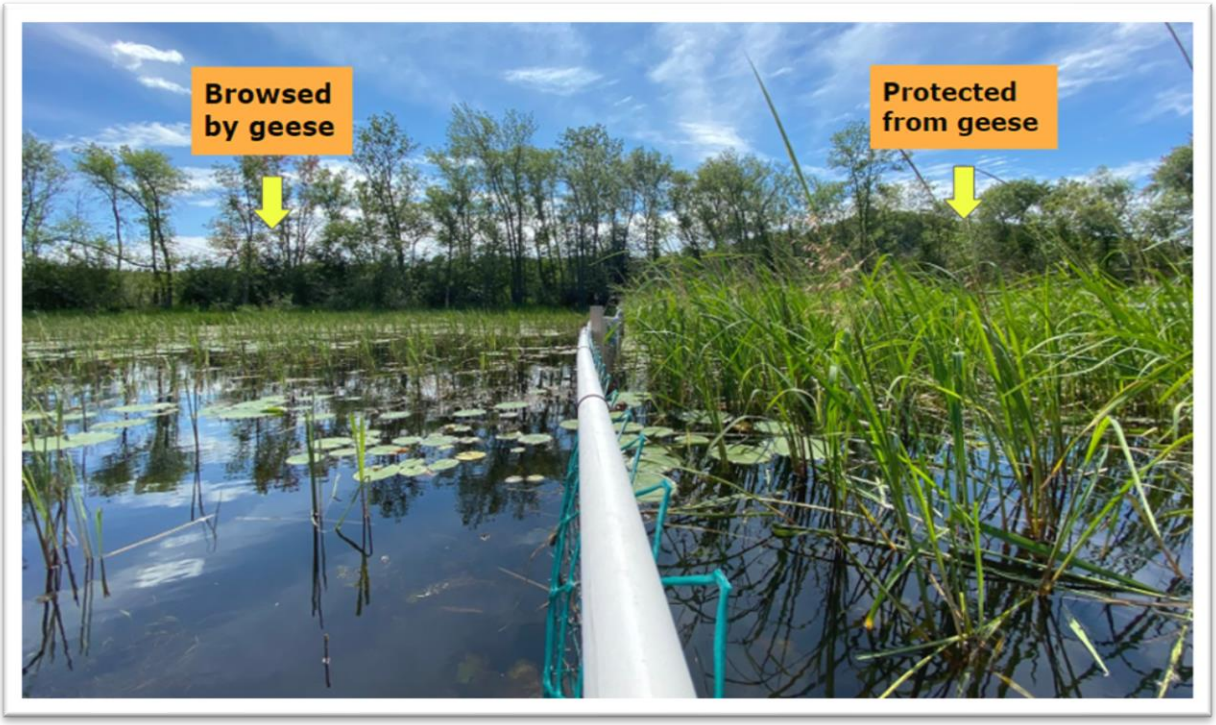

Figure 2. Canada goose exclosure experiments have identified goose herbivory as the primary impediment to wild rice restoration in the St. Louis River Estuary (Photo Credit: Lake Superior National Estuarine Research Reserve).

Canada Goose Roundup -- The WDNR, in partnership with the City of Superior and the Animal and Plant Health Inspection Service (APHIS) – Wildlife Services, coordinated a Canada goose roundup on the Wisconsin side of the St. Louis River in July 2021. Personnel from WDNR, APHIS – Wildlife Services, Minnesota Department of Natural Resources (MNDNR), 1854 Treaty Authority, Superior Police Department, and the Lake Superior National Estuarine Research Reserve (LSNERR) participated in the goose roundup effort at five locations within the estuary (Figures 3 - 6).

We deployed motorboats and kayaks to locate and herd geese towards designated capture sites where APHIS – Wildlife Services personnel captured and processed geese following standardized control methods. Geese were euthanized using carbon dioxide, a method of euthanasia approved by the American Veterinary Medical Association. All geese were donated to the Lake Superior Zoological Society in Duluth to be utilized as food for resident carnivores.

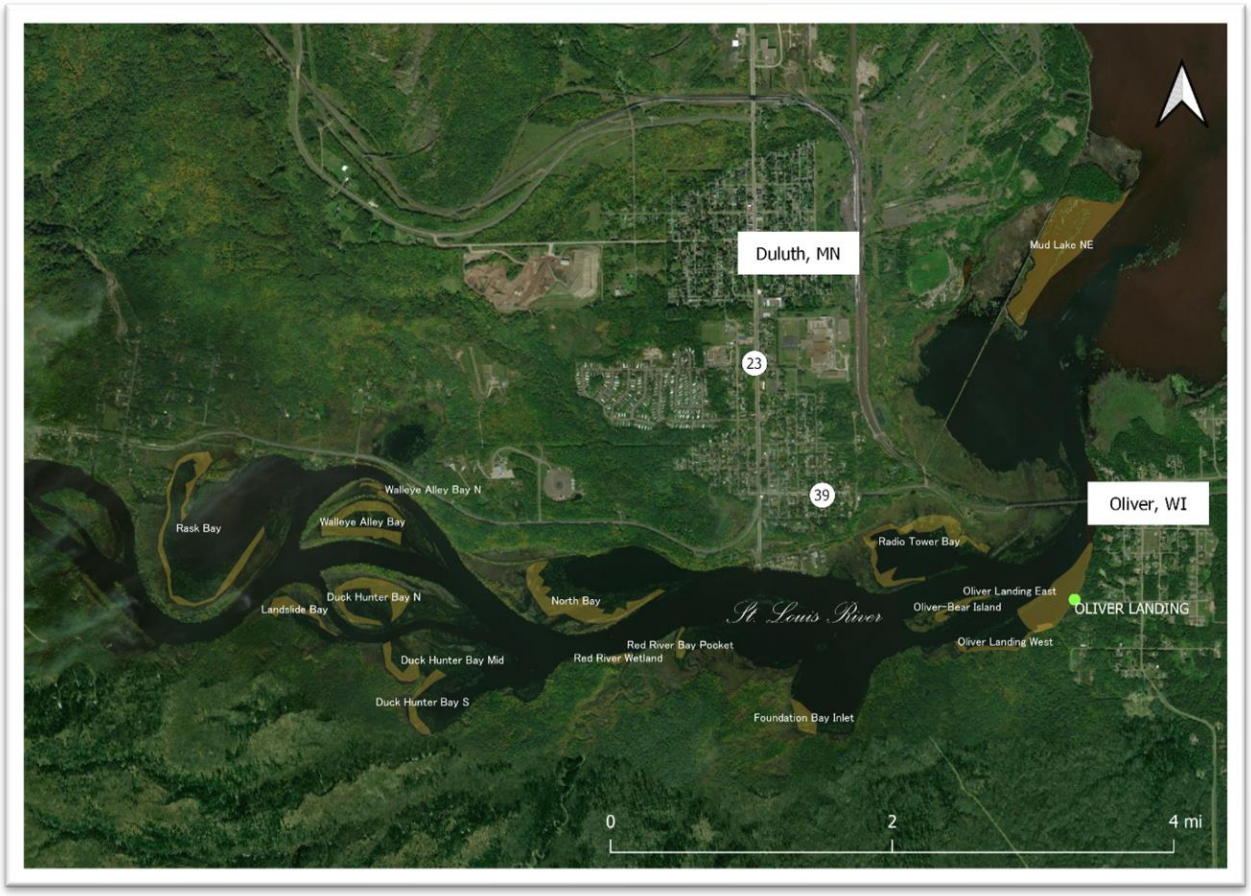

Figure 3. Wild rice restoration sites near the 2021 Canada goose roundup location at Oliver Landing.

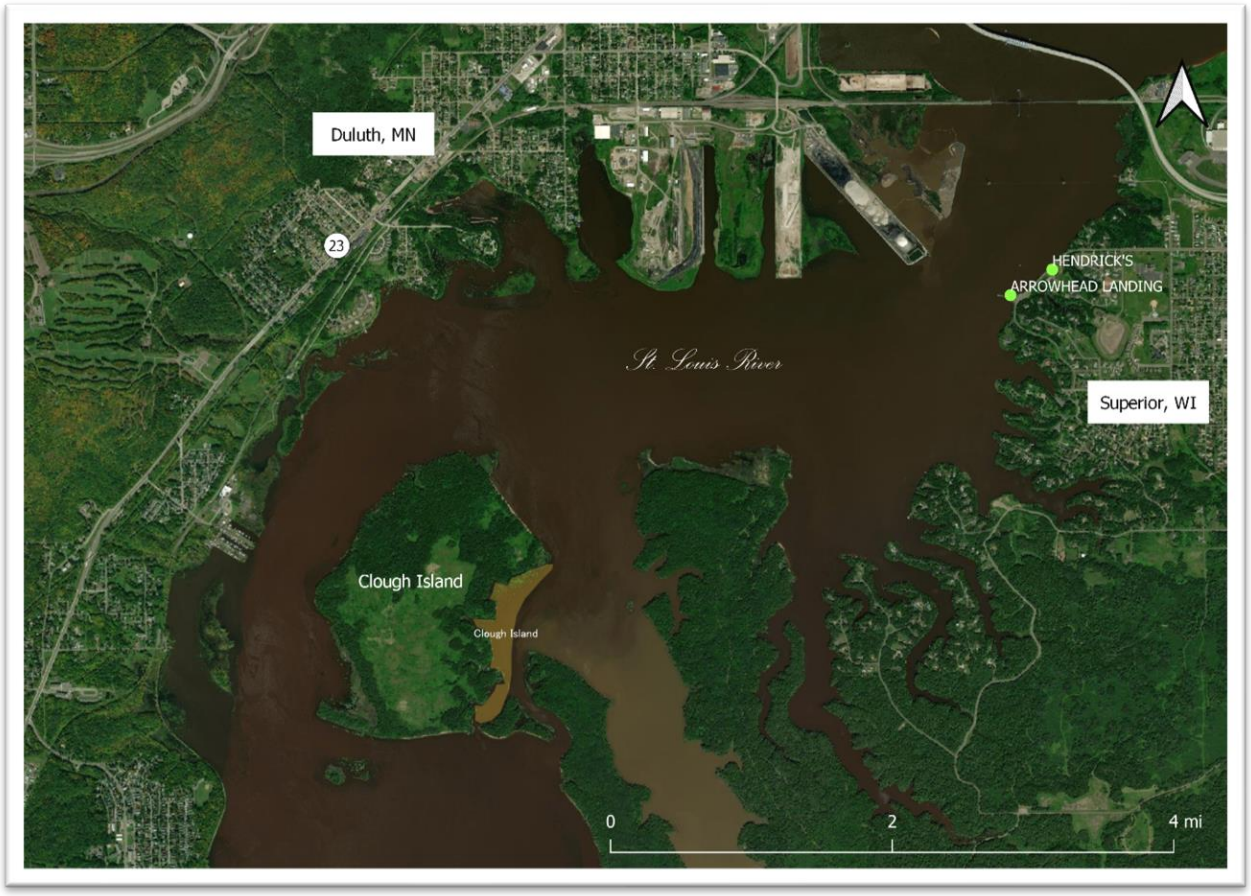

Figure 4. 2021 Canada goose roundup locations near the Clough Island wild rice restoration site.

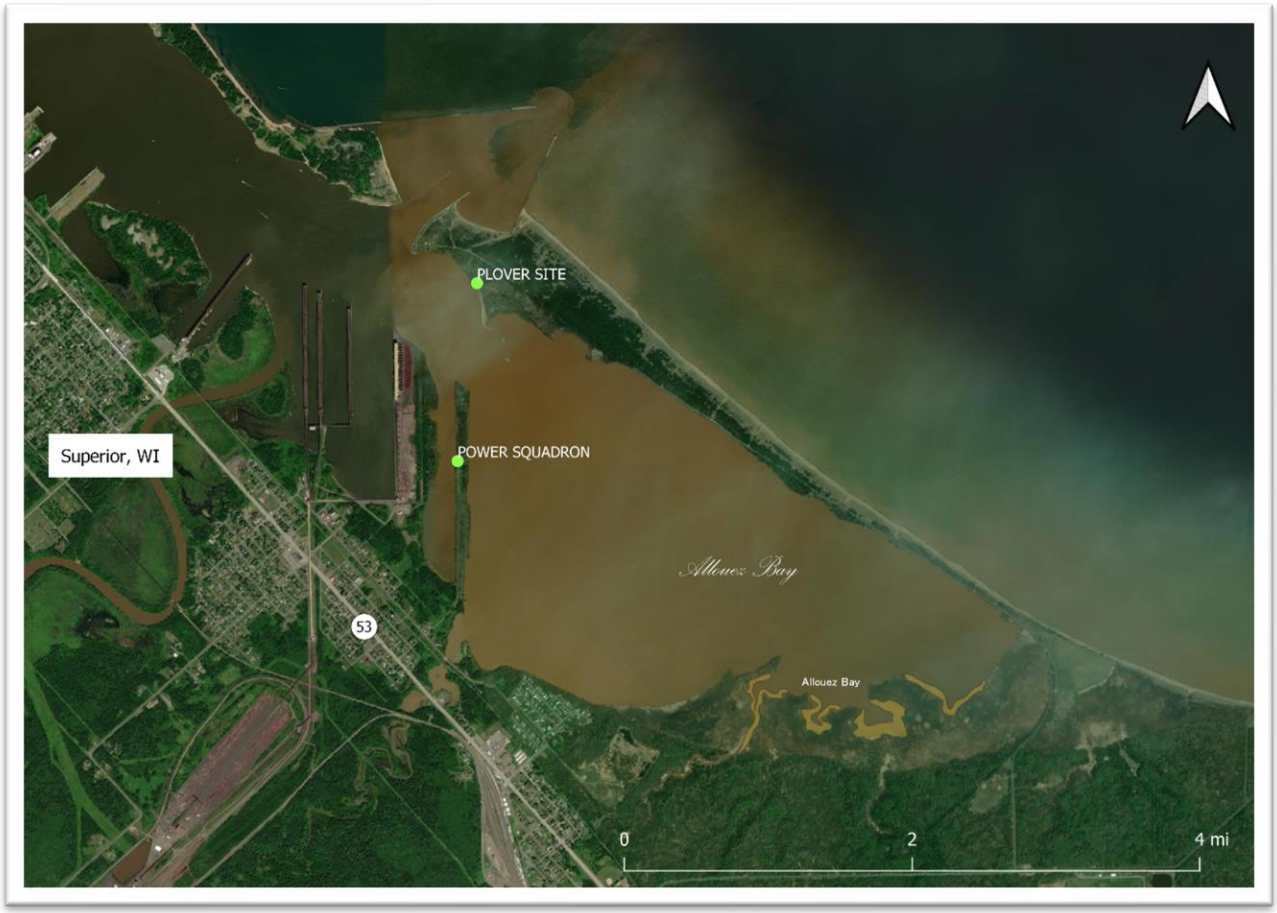

Figure 5. 2021 Canada goose roundup locations near the Allouez Bay wild rice restoration sites.

PROJECT OUTCOME

Canada Goose Roundup -- A total of 187 Canada geese were removed from the St. Louis River (Table 1). Captures in Allouez Bay (*n* = 98) comprised a significant proportion of geese that inhabit the wetland areas of the bay that are likely to browse planted rice. Upriver sites west of Oliver Landing proved to be more difficult in terms of locating and successfully herding geese to the capture location. Considerable effort was made to roundup geese from areas near Foundation Bay and Oliver-Bear Island sites.

Table 1. Canada goose capture results during the July 2021 roundup.

Date	Location	Site	Adult	Juvenile	Total
7/1/2021	Arrowhead	Arrowhead Landing & Hendrick's	8	14	22
7/1/2021	Allouez bay	Power Squadron	35	16	51
7/1/2021	Upriver	Oliver Landing	34	0	34
7/2/2021	Upriver	Oliver Landing	13	0	13
7/2/2021	Allouez Bay	Plover Site	15	32	47
7/2/2021	Upriver	Oliver Landing	20	0	20

Although we had some success at these "upriver" sites (*n* = 67), there is a substantial number of geese that evaded capture. We also captured geese (*n* = 22) from Arrowhead Landing and a nearby residential site (i.e., "Hendrick's"), a site that is approximately 2 miles (3.22 km) from the nearest wild rice restoration site on the eastern side of Clough Island (Figure 3).

CONCLUSIONS & NEXT STEPS

General Conclusions -- This first effort at rounding up Canada geese from the St. Louis River Estuary was a success. Personnel from multiple organizations came together to implement a direct management action that will benefit wild rice restoration. In addition, we verified that this type of management action can be done efficiently and effectively. The roundup was conducted discretely, was met with strong support from members of the public that were encountered and will likely improve the likelihood of successful wild rice seed production.

Quantifying the Impact of Removal -- We will not be able to quantify the impact of removing 187 geese on wild rice seed production until monitoring efforts are completed in the fall of 2021. We hope to observe monitoring locations with greater biomass, density and seed production. Similarly, we expect to see fewer monitoring locations with evidence of goose browse when the monitoring results are made available. Heavily browsed vegetation was observed prior to the roundup. It is likely that wild rice restoration sites in closer proximity to roundup location will experience a greater reduction in goose herbivory that sites which are more distant to roundup locations. We intend to examine monitoring data to evaluate this first year's impact.

Expanding to Minnesota -- Many of the prime round up locations in the upriver sections of the project area are located on the Minnesota side of the river. Future capture efforts will be more effective at reducing goose herbivory on upriver restoration sites when capture operations can be conducted in Minnesota as well as Wisconsin. The City of Duluth is currently exploring the development of a city-wide goose management plan that would allow the MNDNR to permit specific management actions to reduce impacts to wild rice and other resources. Until the MN plan is in place, round up efforts will take place exclusively on the Wisconsin side of the river.

Continued Management -- Effective goose management that benefits of wild rice restoration relies on cooperation among a diverse group of stakeholders each of whom plays an important role. Opportunities to educate the public on the cultural and ecological importance of wild rice will help garner continued support for goose management. Higher seeding rates (~200lbs/acre) combined with goose exclosures and annual round ups will go a long way towards achieving the wild rice restoration goals established in the "Wild Rice Plan" (MNDNR 2014). We anticipate that goose roundups will be implemented in subsequent years and that management triggers for Canada goose roundups will be incorporated into a future Wild Rice Plan revision. However, we believe that as restoration goals are met, Canada goose roundups in the St. Louis River Estuary will end. Continued monitoring will inform the effectiveness of these tools and the need for future action.

Research Opportunities -- There are a few key research questions that have been developed in the process of planning for, and carrying out, this initial round up effort.

1. How much time are geese spending in wild rice restoration sites compared to other locations in the estuary? Is the amount of time spent in a restoration site proportional to the amount of rice present?
2. How far will geese move within the estuary to access wild rice restoration sites? Do restoration sites near capture locations see a greater benefit than sites more distant (e.g., improved biomass seed production, higher density rice stems, etc.)?
3. Is there a wild rice density and/or patch size where rice beds become more resilient to goose herbivory? Can we establish a set of metrics that define a resilient stand of wild rice in the St. Louis River Estuary?

REFERENCES

Minnesota Department of Natural Resources. 2014. St. Louis River estuary wild rice restoration implementation plan. Division of Ecological and Water Resources. Duluth, Minnesota.

Schwarzkopf, L. 1999. St. Louis River – wild rice restoration project. Prepared for Richard Greenwood, Great Lakes National Program Office, U.S. EPA/Region V, Chicago, IL.