



Invasive Plant Management in Yukon – Charley Rivers National Preserve

2024 Summary Report





ON THE COVER

The IPMT crew and volunteers (from left to right: Anna O'Brien, Benjamin Wright, Josh Ward, Liam Irvin, Zoe Fornander, Adam Myers, Sam Schroeter, Jesi Lobato, and Sarah Lampley) lining up to survey the island near Rock of Ages.

Photography by NPS/Yoselyn Ayala

ON THIS PAGE

Top Left: The IPMT crew and volunteers manually removing *Melilotus albus* on Montauk Island. Top Right: SCA intern Liam Irvin holding a bag full of *Melilotus albus*. Lower Left: SCA intern Toby Fried scouting for native plants in Coal Creek. Lower Right: SCA intern Sam Vrablic collecting specimen vouchers of native plants.

Photography by NPS/staff

Invasive Plant Management for Yukon-Charley National Preserve

2024 Summary Report

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National Park Service

Yukon-Charley Rivers National Preserve

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Contents

	Page
Figures	iv
Tables	iv
Abstract	v
Acknowledgements	v
List of Terms	vi
Introduction	1
Methods	4
Invasive Plant Management.....	4
Seeds of Success	5
Other Projects	7
Results	10
Discussion	19
Literature Cited	21

Figures

	Page
Figure 1. Yukon-Charley Rivers National Preserve Boundary from park brochure.....	3
Figure 2. IPMT Crew surveying for invasive plants using a gridding method.	5
Figure 3. Invasive plant treatments made on the island near Rock of Ages 2024.	11
Figure 4. Invasive plant treatments made on Montauk Island 2024.	12
Figure 5. Invasive plant surveys conducted near Slaven's Roadhouse 2024.....	13
Figure 6. Invasive plant surveys conducted near Coal Creek Dredge 2024.....	14
Figure 7. Invasive plant surveys conducted near Coal Creek Camp and Airstrip 2024.....	15
Figure 8. Seeds of Success work done in Coal Creek 2024.....	17
Figure 9. Dragonfly larva collected in Coal Creek during August trip	18

Tables

	Page
Table 1: Invasive plants surveyed in YUCH 2024.....	10
Table 2: Native plant seeds scouted and collected for Seeds of Success in Coal Creek 2024.....	16

Abstract

This report describes the work performed by the Invasive Plant Management Team (IPMT) at the Yukon – Charley Rivers National Preserve (YUCH) in July and August of 2024. The two objectives for this field season were to treat for invasive plant species, specifically *Melilotus albus*, and to collect native plant seeds at Coal Creek, using the Seeds of Success Protocol, for future restoration projects. Other side projects completed included dragonfly and bee collections, and a maintenance project. Invasive plant surveys were conducted at Coal Creek and on two separate islands, an island near the Rock of Ages and Montauk Island. Treatments were only completed on the islands since seed collection was given priority at Coal Creek. Overall; 7.48 acres were surveyed for invasive plant species and treatments were made on 4.30 acres. For Seeds of Success the crew ended up obtaining 17 collections of 14 different plant species.

Acknowledgements

The Invasive Plant Management Team would like to thank Amy Larson and Ellen Lyons for being our points of contact and approving our work at YUCH. A thank you to Danielle Knap for proposing and advocating for the treatments of white sweet clover and facilitating surveys with past crews. We would also like to thank Chad Billock for facilitating the use of the boats, scheduling boat operators, and creating alternative maintenance projects for our crew. A huge thanks to our amazing boat operators, Mike McDougal and Mallie Hall, for safely boating us to all our destinations. Another huge thanks to Mike McDougal for talking to the SCA interns about why the work they are doing is important and why it matters, as well as thanking him for being the person to report the first infestation. Another huge thank you to Mallie Hall for giving everyone a tour of the historic dredge and sharing personal insight from his experience working there. A big thank you to Jason Duke, Melanie Flamme, Jared Hughey and James Cash for gathering invasive data in addition to their job responsibilities. A thank you to Lisa Dlugolecki with the US Fish and Wildlife Service, for working with us and sending her two technicians, Jesi Lobato and Sarah Lampley, to help with this invasive removal project. Also, a thank you to the BLM crew that did treatments near and around the boat ramp in the town of Eagle. Lastly, a thank you to Gavin DeMali, Realty Specialist at the Alaska Regional Office, for joining us for seed collection and volunteer Adam Myers for giving his time to remove invasive white sweet clover.

List of Terms

BLM	Bureau of Land Management
EDRR	Early Detection Rapid Response
GIS	Global Information Systems
GNSS	Global Navigation Satellite System
IPMT	Invasive Plant Management Team
I&M	Inventory and Monitoring Network
NPS	National Park Service
PMC	Alaska Plant Material Center
SCA	Student Conservation Association
SOS	Seeds of Success
USFWS	U.S. Fish and Wildlife Service
YUCH	Yukon-Charley Rivers National Preserve

Introduction

The Alaska Regional Invasive Plant Management Teams (IPMT) is one of 17 established IPMT in the country. Each IPMT serves multiple parks within a specific broad geographic region. They work to identify, develop, conduct, and evaluate invasive species removal projects and undertake appropriate native species restoration efforts. Due to the remote nature of many of the Alaska park units and the associated high cost of travel, the Alaska IPMT does not always have the funding to have a centralized crew that travels to each park in its region like a lot of the lower 48 crews. Historically the teams have worked cooperatively with partner parks to train existing park staff, partially fund seasonal employees, and fund/support in park internship positions.

IPMT Liaison Anna O'Brien received Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) project funding that allowed the IPMT to hire three term positions beginning in spring 2024. These new hires served as IPMT Crew Leads who managed three separate IPMT field crews for the 2024 field season. These three crews were the Early Detection and Rapid Response of Terrestrial Invasive Plants (Weeds) Crew, the Aquatic Invasive Plants (Elodea) Crew and the Seeds of Success (Seeds) Crew. Each Crew consisted of one crew lead and two Student Conservation Association (SCA) interns. These crews work collaboratively with the 16 National Park units in Alaska. The needs of each park determine the work schedule for the Alaska IPMT crews. While each of these crews have a specialty, they are all cross trained in the other crews' specialties and other niche needs to best serve the parks. All three crews went to Yukon – Charley Rivers National Preserve in 2024.

Yukon – Charley Rivers National Preserve (Figure 1) has fewer recreational visitors compared to other park units in Alaska. In 2023 YUCH had an estimated 1,011 visitors while Denali National Park and Preserve had 498,722 visitors that same year. The towns used to access this park are the towns of Circle and Eagle, Alaska, as well as an airstrip located near the historic mining camp of Coal Creek. Both towns have less than 100 year-round residents who rely heavily on a subsistence lifestyle. Due to the lower visitation by tourists and residents there is a correspondingly low abundance of invasive plants in YUCH, however there are a few invasive species infestations that have potential to cause widespread negative impacts on the local ecosystem. The largest number of recreational visits consist of visitors floating the Yukon River. Visitor's gear and clothing could potentially be spreading seeds from other locations that could inadvertently be transported down river, even from as far as Whitehorse, Canada. The Yukon also attracts many visitors in the winter during the Yukon Quest International Dog Sled Race between Fairbanks, Alaska, and Whitehorse, Canada. Public use cabins along the river serve as checkpoints during the race and there is concern that hay used for the sled dog's bedding could be a vector for new invasive plant introduction.

Invasive plant management began in YUCH in 2005 with a survey of the Coal Creek watershed. Between 2008 and 2011, invasive plant surveys were conducted on several public use cabins and along the Yukon River by IPMT staff, interns, and volunteers. In 2019 the first known *Melilotus albus* (white sweet clover) plant within the park was reported by a local resident. From 2020-2023 surveys for white sweet clover were conducted and treatments were done along the Yukon River corridor. For the 2024 field season, two IPMT

Crews, two U.S. Fish and Wildlife (USFWS) technicians and one volunteer treated for invasive plants on islands that had been observed with white sweet clover infestations in previous years. The infestations of white sweet clover are the largest known invasive infestations within the park and are located on islands that serve as important winter moose habitat.

White sweet clover can be toxic to wildlife, has a ranking of 81 in the Alaska Invasive Species Ranking system, and is a new infestation that can heavily change the ecosystem, so it is of high priority to control this infestation. The invasiveness ranking system includes at least 170 known invasive plants within the state and is based on a scale of 0 to 100; a plant ranked at 0 is not a threat to native ecosystems, while a plant ranked at 100 is a very high threat to native ecosystems. The invasiveness ranking system for invasive plants in Alaska is based on an initial climate screening and an evaluation of ecological impacts, biological characteristics and dispersal ability, ecological amplitude and distribution, and feasibility of control (Carson et al. 2008).

In addition to the crews doing white sweet clover work, the IPMT's seeds crew scouted and collected native plant seeds in the Coal Creek area. Coal Creek has had significant hydrologic alteration due to the extensive gold dredging that occurred in the lower six miles of the creek. The creek no longer flows in its original channel and the new creek channel is eroding the airstrip at Coal Creek. The airstrip is essential for the many scientific and historic preservation projects that take place at Coal Creek Camp. This disturbance has prompted a creek re-alignment and restoration project. The goal is that much of Coal Creek will be moved back into its original channel and restoration will be completed to restore the hydrologic function to the creek. Seed collection has been prioritized in this area to help with this restoration effort. Seed scouting began in 2023 and was continued for the 2024 field season.

While the IPMT's were at Coal Creek, two side projects were also done. The Inventory and Monitoring Network (I&M) requested that we collect dragonfly larva at Coal Creek. Dragonfly collections are identified to species and are also used to test the amount of mercury found in the waterways. Bees were also collected; bee collections are sent to the University of Alaska Anchorage (UAA) for identification and added to the Alaska Bee Atlas database. The Bee Atlas is collaborative program that collects data on bee biodiversity in the state of Alaska.

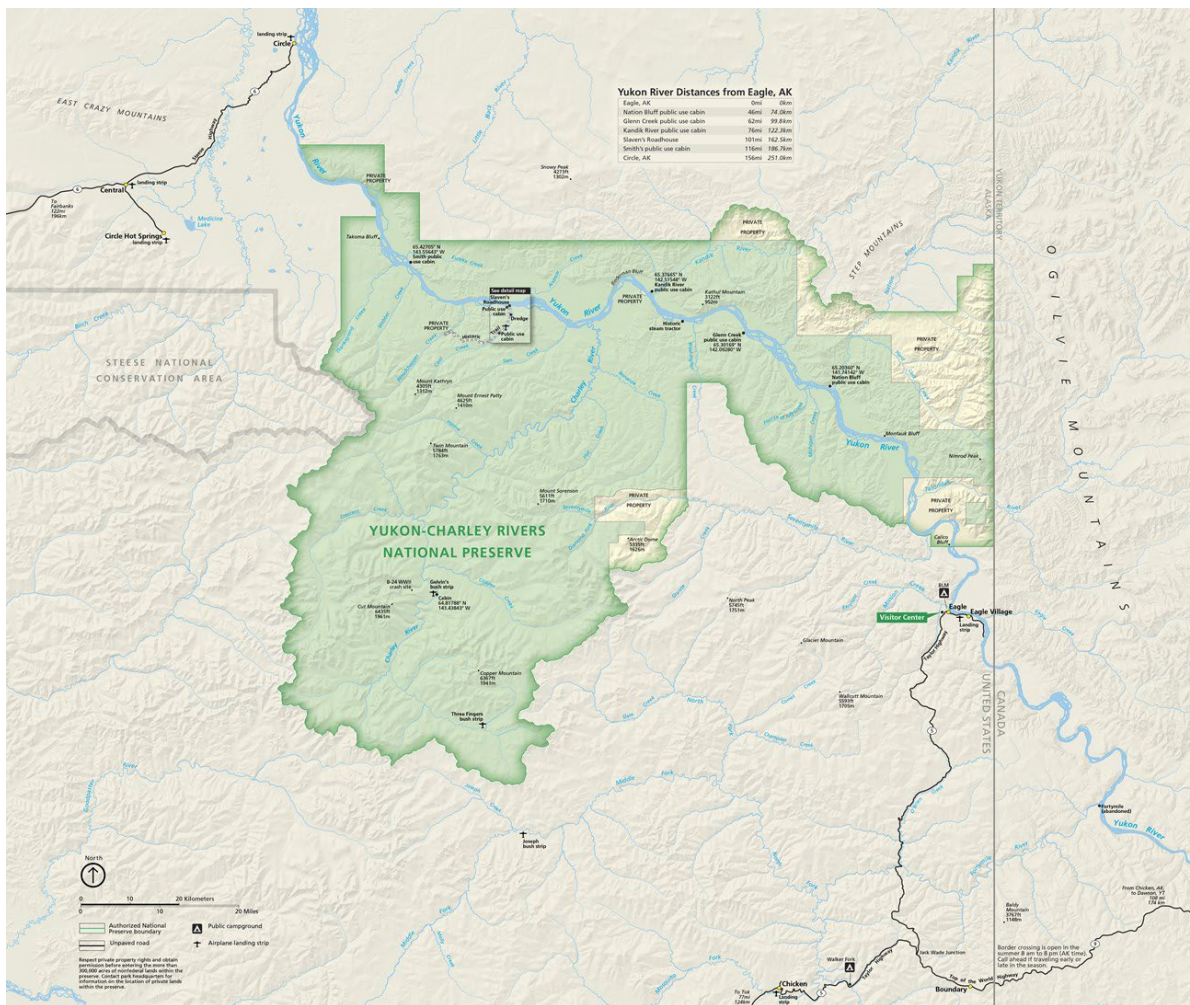


Figure 1. Yukon-Charley Rivers National Preserve Boundary from park brochure.

Methods

The 2024 IPMT field work that occurred in Yukon – Charley Rivers National Preserve was conducted during two work trips that took place on July 1st-July 8th and August 12th-August 19th. The field work conducted can be divided into three separate phases: Invasive Plant Management, Seeds of Success, and a Maintenance project. Locations were assigned by IPMT Liaison Anna O'Brien after coordination with the YUCH staff. During the first trip of the season the crew was separated into two separate groups, one stationed near Rock of Ages and the other at Slaven's Roadhouse at Coal Creek.

Methods for Invasive Plant data collection and processing followed the Alaska Invasive Plant Management Team 2024 Field Protocol (O'Brien 2024) and the Alaska Invasive Plant Management Team 2024 Office Protocol (O'Brien 2024) developed by the Alaska IPMT Program. These protocols outline methods for data collection in the field and processing data. We collected data using a Samsung Galaxy Tab Active 3 and Trimble's R1 GNSS receivers (to increase GPS accuracy). Spatial data and attribute data was collected using Esri's ArcGIS Field Maps.

Methods for Seeds of Success data collection and processing followed the Bureau of Land Management's (BLM) Technical Protocol for The Collection, Study, And Conservation of Seeds from Native Plant Species for Seeds of Success (BLM 2024). This protocol outlines methods for data collection in the field and processing data. We collected data using Samsung Galaxy Tab Active 3. Spatial data and attribute data was collected using Esri's ArcGIS Survey123.

Invasive Plant Management

Two islands were surveyed and treated for white sweet clover during the July 1st – July 8th work trip. The islands that were given priority were an unnamed island adjacent to our camping location (near Rock of Ages) and Montauk Island. Treatment locations were based on historical surveys and time availability. This group consisted of IPMT Liaison Anna O'Brien, IPMT Crew Leads Yoselyn Ayala and Benjamin Wright, SCA interns Zoe Fornander, Joshua Ward, Sam Schroeter, and Liam Irvin, USFWS Technicians Jesi Lobato and Sarah Lampley, and volunteer Adam Myers. This group surveyed for invasive plants on the islands using a gridding method (Figure 2). This involved walking in a line, with everyone standing about arm's length from one another, from one side of the island to the other. Each time the opposite side was reached the entire line would rotate on the last person of the line, the people at both ends of the line were tasked with making sure we did not overlap survey locations when turning. If any invasives were found in an individual's survey area as we walked the whole line would stop and wait until the plants were treated. All treatments were done manually via hand pulling. Mapping was done by two people carrying tablets. All plants that were found with flowers or seeds were thrown in a bag to be disposed of by YUCH Maintenance staff at a later date.

Invasive Plant Surveys were also conducted in the Coal Creek area during the July work trip. This work was done by IPMT Lead Dusty Reed and SCA interns Toby Fried and Sam Vrablic. Surveys were conducted by spot checking areas that receive high use at Slaven's Roadhouse, Coal Creek Camp, and the historic gold dredge. In zones that were suspected to have more invasives (mowed grass, near buildings, parking lots) small grid searches would be performed by the three crew members across this area. Anywhere that invasives were found would then prompt a more thorough survey of the surrounding area. The road between Slaven's Roadhouse and Coal Creek Camp was also surveyed while traveling between the two sites. Since no high priority invasives were found and all present species were well established across the Coal Creek

area, only surveys were conducted and no treatments were done. Because the surveys were only done as time allowed, after seed collection, surveys should not be considered exhaustive.



Figure 2. IPMT Crew surveying for invasive plants using a gridding method.

Seeds of Success

The Seeds of Success Protocol recommends that scouting and collection be done as two separate trips. The first trip would occur earlier in the growing season while flowers are blooming making plants easier to identify and the second trip would occur later in the growing season when seeds are viable. The seeds crew separated from the main group doing invasive work and focused on seed scouting at Coal Creek during the July trip. Sites that had been collected from or previously scouted as having viable native plant populations in 2023 were revisited. Additionally, areas that had openings in forest structure were visited to look for native plant populations that were sufficiently large to collect from. An effort was made to scout for potential seed populations of grasses, sedges, and forbs within a variety of habitat types from wetlands to upland meadows. This would provide a mix of possible seed material based on the needs of the reseeding projects in the future. Although the crew's main objective was scouting, they made collections for populations that had viable seed.

The second crew went to YUCH in August, when most of the plants scouted were predicted to be ready for collection. The second SOS trip was conducted by IPMT Liaison Anna O'Brien, SCA intern Sam Vrablic, and NPS employee Gavin DeMali. They prioritized collections from the previously scouted populations in July but also scouted and collected from any population that was the appropriate size and had viable seed. Due to a lack of supplies the crew was unable to make seed collections and herbarium voucher specimens their last day in the field. However, photos were taken of plants scouted to help with the verification of identification.



Gavin DeMali collecting native plant seeds in Coal Creek during August trip.



Dusty Reed scouting for native plant seeds in Coal Creek during the July trip.

Other Projects

During the July trip, the crew camping near Rock of Ages helped Mike McDougal with a Maintenance project. Since the maintenance crew had taken the time to transport such a large crew down the river, we helped them complete a project that was best performed by a large crew to try and show our appreciation for their support of our work. The project consisted of clearing overgrown vegetation around the Nation Cabin, a public use cabin. This consisted of using hand tools such as serrated weed cutters, loppers, and saws to cut overgrown vegetation. Cutdown vegetation was then thrown in the forest for it to decompose naturally.



IPMT crew clearing vegetation around the Nation public use cabin.



SCA intern Zoe Fornander standing in front of Nation cabin after the completion of maintenance project.

Dragonfly sampling followed the Dragonfly Mercury Project: Sampling Guide for the Collection of Dragonfly Larvae Samples from National Parks for Mercury Analysis (Nelson and Eagle-Smith 2024). The August crew collected dragonfly larva in a small swampy area near Slaven's Roadhouse. The crew also collected bees near Coal Creek Camp. Bee collections followed the methods outlined in the Alaska Bee Atlas: Bee Inventory and Monitoring plan for Alaska (Fulkerson et al. 2023).



Gavin DeMali collecting dragonfly larva during August trip

Results

During the 2024 field season invasive plant management was completed in three areas, Coal Creek, Montauk Island, and on an island near Rock of Ages. Overall, five invasive plant species were observed during this field season (Table 1). The IPMT Crew surveyed a total of 7.48 acres for invasive plants and treated 4.30 acres. Treatments were done on the island near Rock of Ages and Montauk Island. The group that did the treatments began with the island nearest to their campsite and were able to survey the entirety of it (Figure 3). The majority of invasive plants removed on the island were white sweet clover, but a singular *Melilotus officinalis* and a singular *Chenopodium album* were removed. Once that island was completed the group moved on to Montauk Island, this island was the next priority because a big infestation was discovered in 2020. Montauk Island, is larger, has denser vegetation, and a bigger infestation so we were unable to complete treatment (Figure 4). The only invasive species that was observed and subsequently treated on Montauk Island was white sweet clover.

Table 1. Invasive plants surveyed in YUCH 2024.

Species		AKNHP Ranking	Location		
Latin Name	Common Name		Island near Rock of Ages	Montauk Island	Coal Creek
<i>Bromus inermis</i>	smooth brome	62	-	-	H
<i>Capsella bursa-pastoris</i>	shepherd's purse	40	-	-	H
<i>Cerastium glomeratum</i>	sticky chickweed	36	-	-	H
<i>Chenopodium album</i>	lambsquarters	37	X	-	H
<i>Crepis tectorum</i>	narrowleaf hawksbeard	56	-	-	H
<i>Elymus repens</i>	quakgrass	59	-	-	H
<i>Hordeum jubatum</i> *	foxtail barley	63	-	-	XH
<i>Lepidium densiflorum</i>	common peppergrass	25	-	-	H
<i>Matricaria discoidea</i>	pineapple weed	32	-	-	H
<i>Melilotus albus</i>	white sweetclover	81	XH	XH	-
<i>Melilotus officinalis</i>	yellow sweetclover	69	X	-	-
<i>Plantago major</i> **	common plantain	44	H	H	H
<i>Poa annua</i>	annual bluegrass	46	-	-	H
<i>Polygonum aviculare</i>	prostrate knotweed	45	-	-	H
<i>Stellaria media</i>	common chickweed	42	-	-	H
<i>Taraxicum officinale</i>	Common dandelion	58	-	-	XH
<i>Vicia cracca</i>	bird vetch	73	-	-	H

Key: X=Currently Present, H=Historically Present (2005 – 2023)

**Hordeum jubatum* is believed to be native to eastern interior Alaska. However, it is considered a nuisance weed.

** *Plantago major* is under discussion over if it's native to YUCH or not. It is native to some parts of AK but not all, it was mapped, and hand pulled in 2022 and 2023 but not in 2024 due to Justin Fulkerson at UAA saying that he thought the YUCH river population looked like it was native.

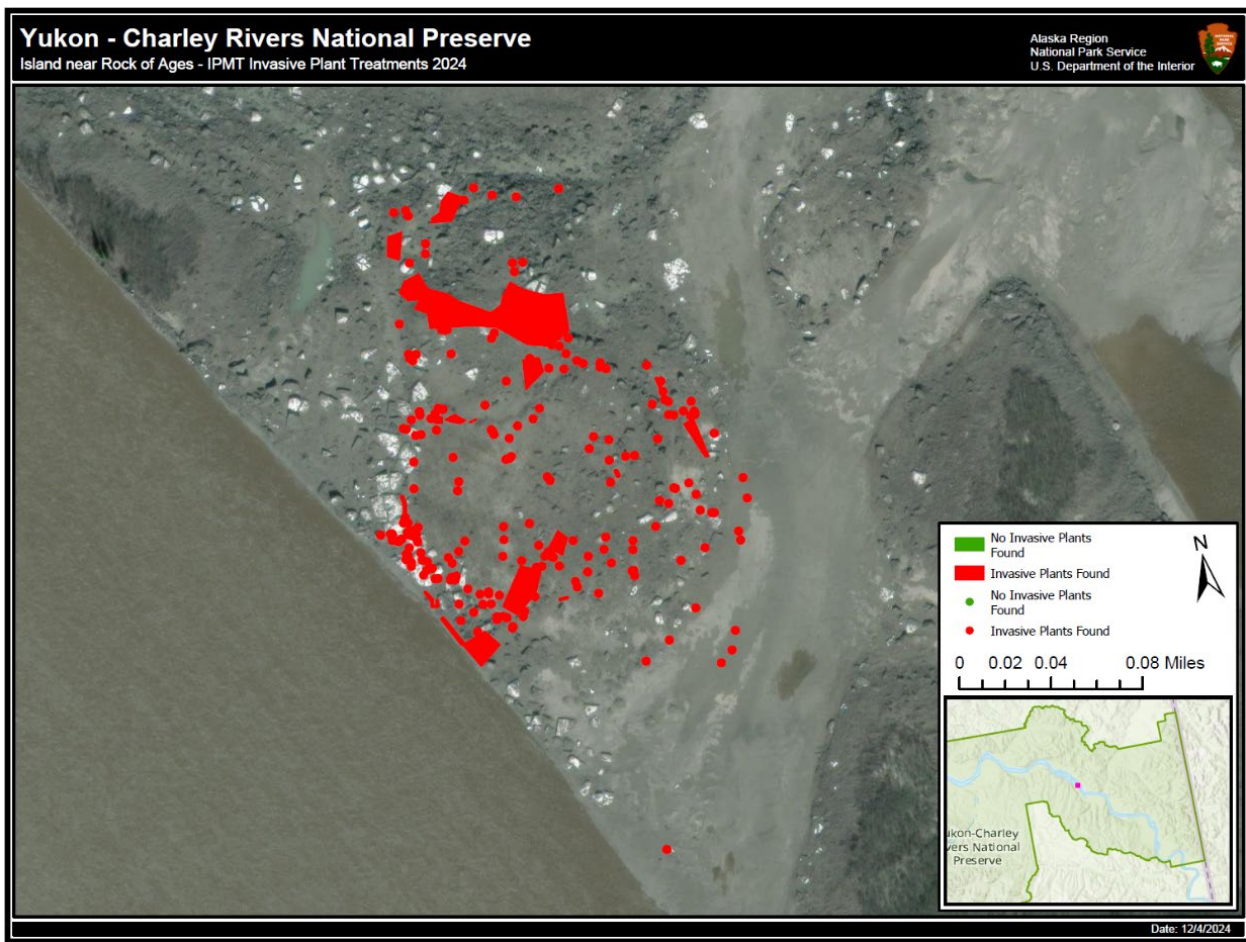


Figure 3. Invasive plant treatments made on the island near Rock of Ages 2024.

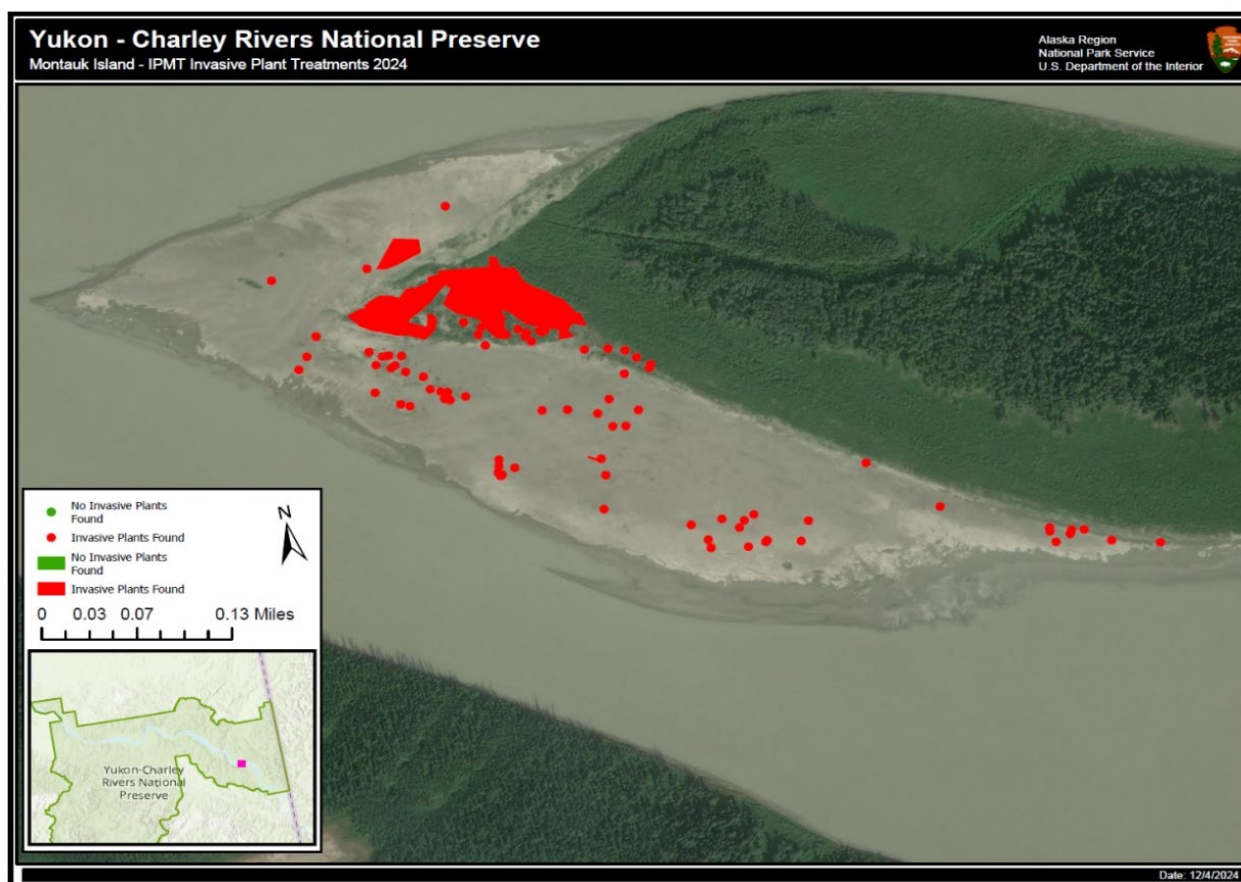


Figure 4. Invasive plant treatments made on Montauk Island 2024.

No treatments were made in Coal Creek since the priority for that area was native seed collection. However, surveys were made by the crew when time permitted. When surveying for invasive plant species, the Coal Creek area was separated into three different sections, Slaven's Roadhouse, the historic gold dredge, and Coal Creek Camp and airstrip (Figures 5-7). At all three sites *Taraxacum officinale* was found and *Hordeum jubatum* was found at Slaven's and Coal Creek Camp. When compared to historical data there are fewer species documented in 2024. This is likely due to the limited time dedicated to surveys and inclement weather that was present during surveying. Since no treatment has occurred at Coal Creek, we do not expect that there has been an actual change in the total number of invasive species in the area.

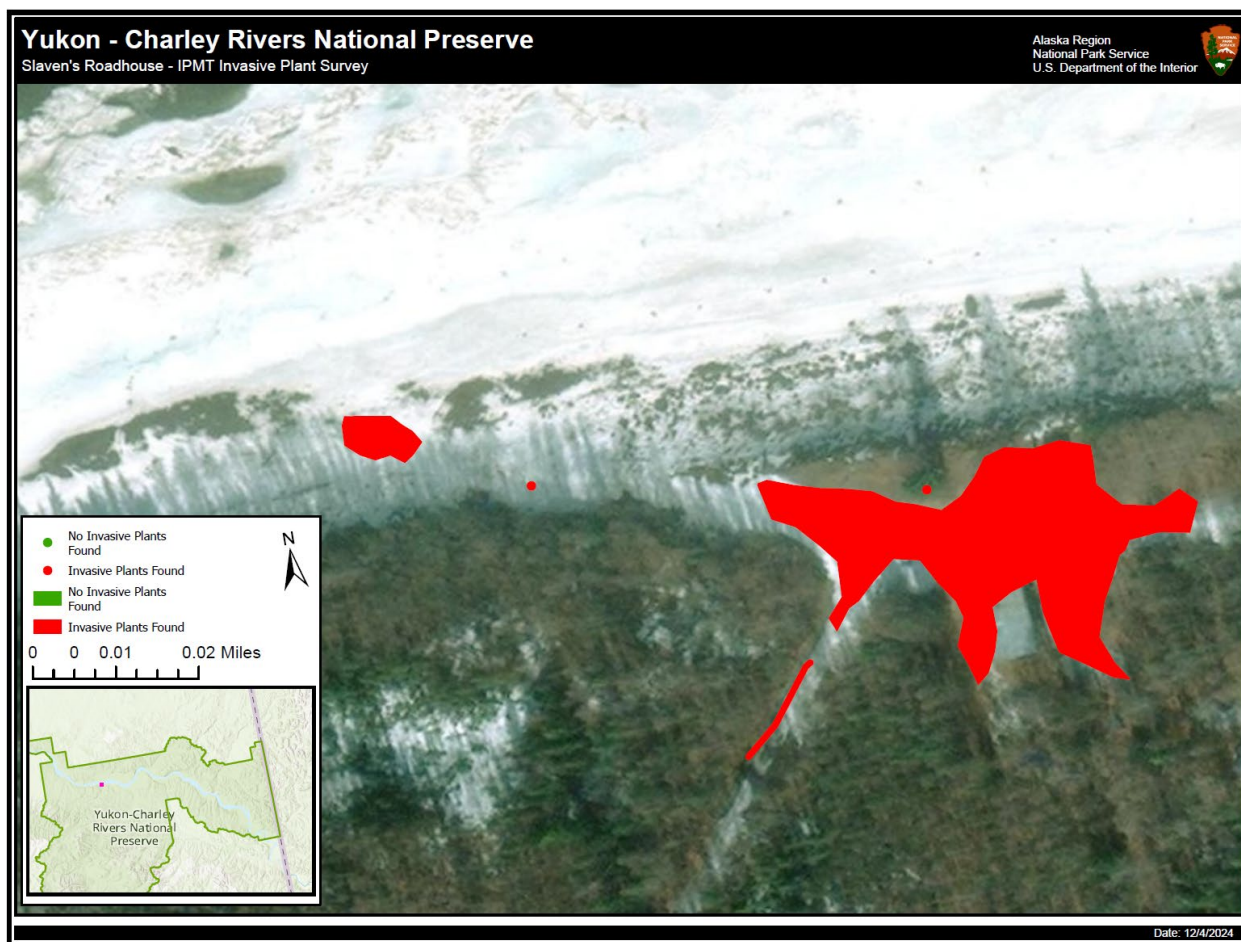


Figure 5. Invasive plant surveys conducted near Slaven's Roadhouse 2024.



Figure 6. Invasive plant surveys conducted near Coal Creek Dredge 2024.

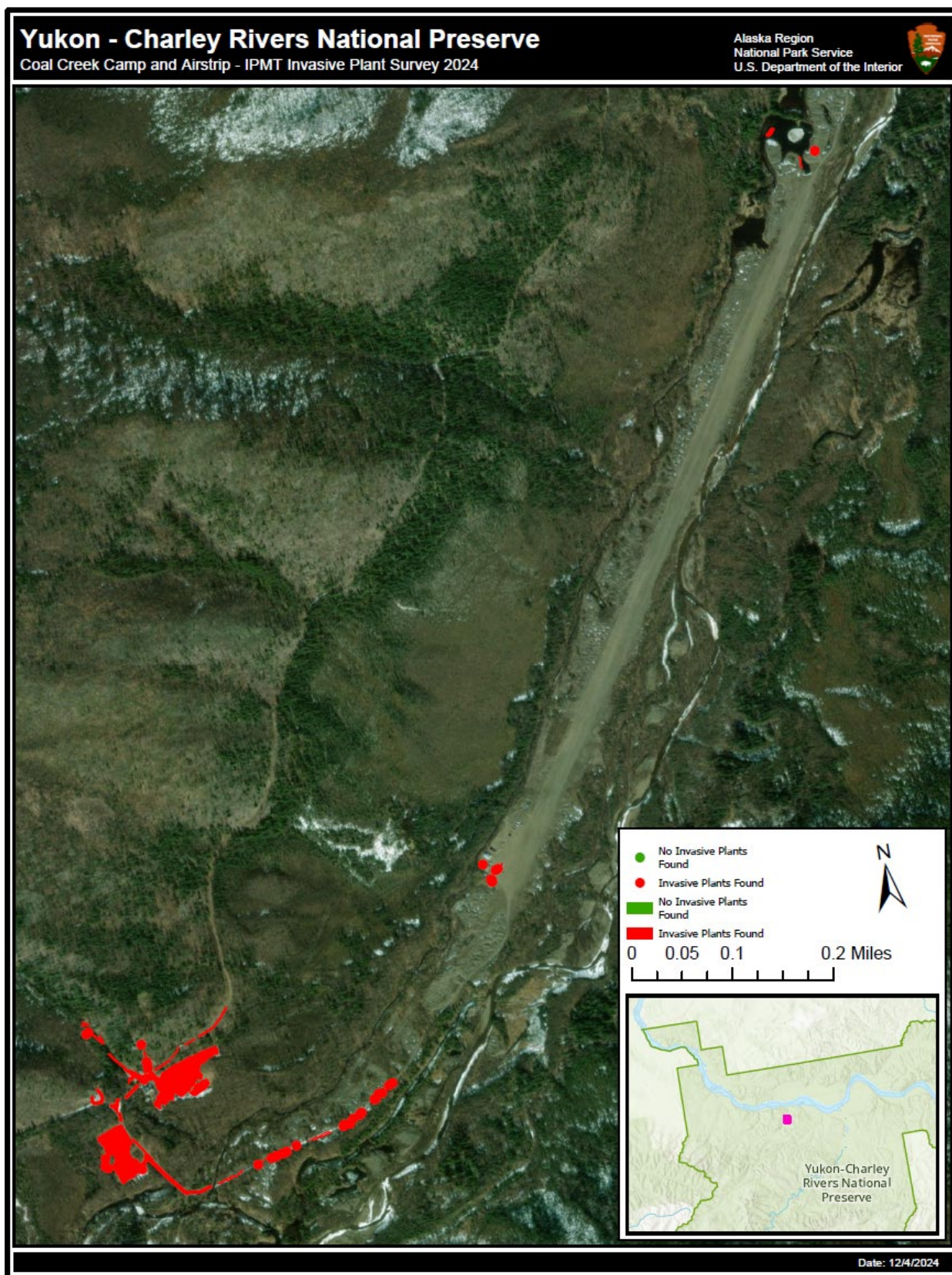


Figure 7. Invasive plant surveys conducted near Coal Creek Camp and Airstrip 2024.

The Seeds Crew scouted and collected native plant seeds during both work trips in YUCH during the 2024 field season. The crews submitted a total of 33 scouting forms and of those 17 collections were made. (Figure 8) Scouting was done trying to maximize the variability of seed mix and ultimately a total of 14 native plant species were collected in the Coal Creek area (Table 2).

Table 2: Native plant seeds scouted and collected for Seeds of Success in Coal Creek 2024.

Species			SOS Survey Location
Latin name	Common Name	USDA Plant Code	Coal Creek
<i>Achillea millefolium</i>	common yarrow	ACMI2	X
<i>Arctagrostis</i> ssp.	polargrass	ARCTA	S
<i>Arctagrostis latifolia</i> ssp. <i>arundinacea</i>	wideleaf polargrass	ARLAA5	X
<i>Bromus</i> ssp.	brome	BROMU	S
<i>Bromus inermis</i> ssp. <i>pumpellianus</i> var. <i>pumpellianus</i>	Pumpelly's brome	BRINP5	X
<i>Calamagrostis</i> ssp.	reedgrass	CALAM	S
<i>Calamagrostis canadensis</i>	bluejoint	CACA4	S
<i>Calamagrostis canadensis</i> var. <i>longedactylis</i>	bluejoint	CACAL3	X
<i>Calamagrostis purpurascens</i>	purple reedgrass	CAPU	X
<i>Carex bigelowii</i>	Bigelow's sedge	CABI5	X
<i>Carex utriculata</i>	Northwest Territory sedge	CAUT	X
<i>Chamerion angustifolium</i>	fireweed	CHAN9	X
<i>Chamerion latifolium</i>	dwarf fireweed	CHLA13	S
<i>Dasiphora fruticosa</i>	shrubby cinquefoil	DAFR6	X
<i>Elymus</i> ssp.	wildrye	ELYMU	S
<i>Festuca altaica</i>	Altai fescue	FEAL	X
<i>Galium boreale</i>	northern bedstraw	GABO2	X
<i>Polygonum alpinum</i>	Alaska wild rhubarb	POAL11	X
<i>Saxifraga tricuspidata</i>	three toothed saxifrage	SATR5	X
<i>Solidago multiradiata</i>	Rocky Mountain goldenrod	SOMU	X

Key: S= Scouted only, X= Scouted and Collected

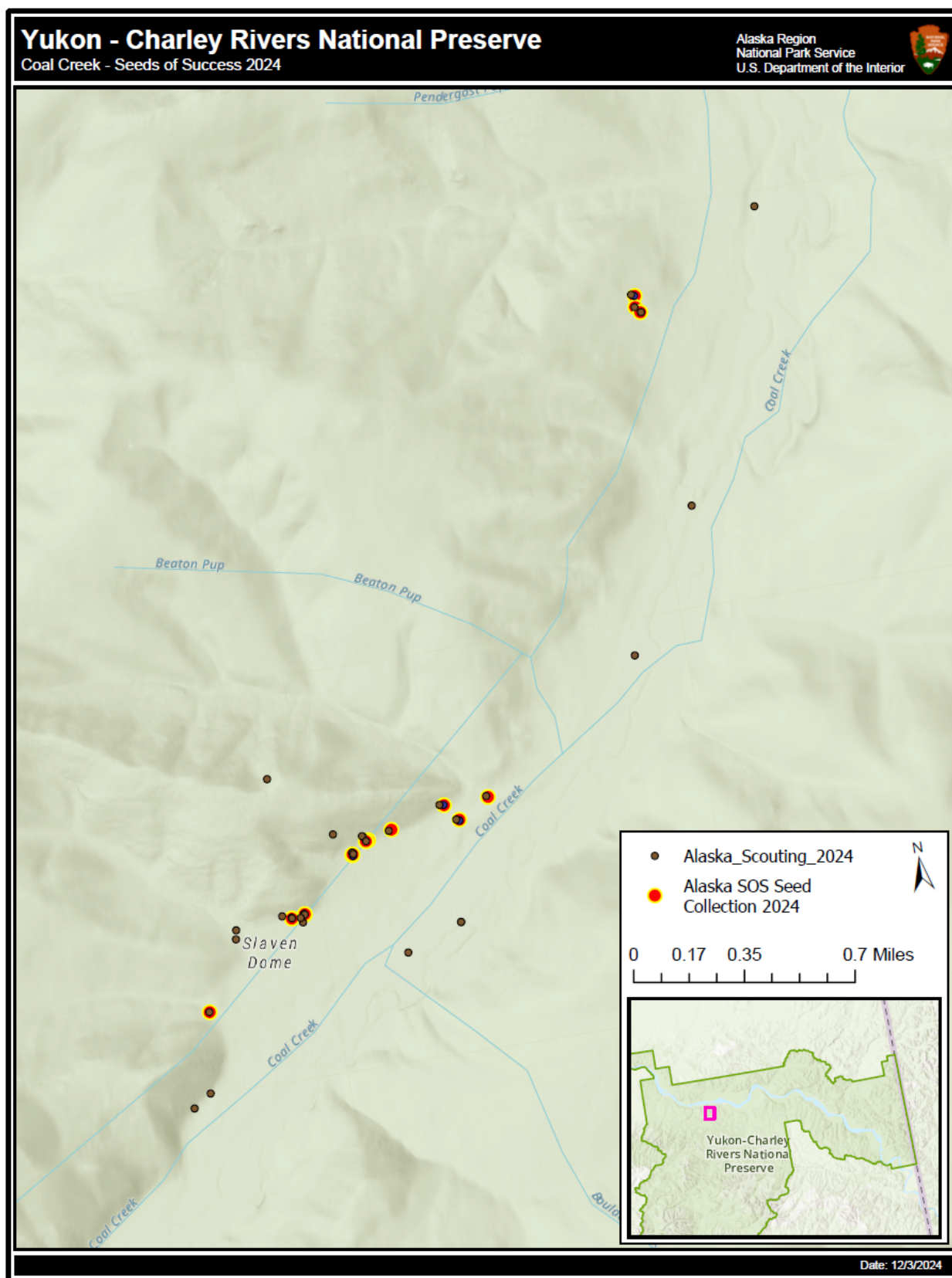


Figure 8. Seeds of Success work done in Coal Creek 2024.

Lastly, the August Crew collected a total of 15 dragonflies (Figure 9) and 4 bees. The dragonflies collected were then delivered to Krista Bartz, the Aquatic Ecologist with the Southwest Alaska Network (SWAN) who will then use them for individual sampling for mercury analysis. The bees collected were delivered to Justin Fulkerson, Lead Botanist and Collections Manager at UAA, who then identifies them and adds them to the bee atlas.



Figure 9. Dragonfly larva collected in Coal Creek during August trip

Discussion

In 2024, due to hiring difficulties, there were no SCA interns stationed in Eagle to assist with invasive plant management or seed collection efforts like there had been in 2023. Yukon – Charley Rivers National Preserve is considered among one of the more remote parks in the country and takes over 10 hours of driving to be reached from Anchorage, AK. This presents a problem for the IPMT crew because they are limited to how many times, they can visit a singular park in a season since they coordinate with all the park units in Alaska. This year we were only able to dedicate one work trip to the removal of invasive plant species and two to the collection of native plant seeds. However, since it takes at least a day and a half (one way) to arrive at the camping locations and then travel back home, the crew only gets 4 full workdays in the field during an eight-day hitch schedule. Since the crews are not allowed to use herbicide, relying on manual treatments significantly slows down the rate of our treatments. Having in park staff throughout the field season would allow more work to be done. With the help of, preferably two, SCA interns the Yukon River islands, the public use cabins, Coal Creek and any other high traffic areas could be scouted and treated throughout the summer. Having in park staff would also be beneficial to the Seeds of Success program because they would have a better grasp on the phenology of the plants throughout the summer and be ready to collect seeds when they are viable. The IPMT crew would then serve as supplemental help to treat areas with dense invasive infestations or areas that have a high population of native plants for seed collection.

Although the infestation of white sweet clover has shrunk significantly on the unnamed island near Rock of Ages it still takes a full day of intense gridding to survey its entirety. Montauk Island's infestation has significantly grown, doubling in size from 2022 to 2023 and then again in 2024. In 2023 the island was mostly covered in first year growth and 2024 was predominantly second year growth. Due to the growth of infestation and timing issue the 2024 crew was unable to finish treatments; treatments had historically been completed in one day but were left unfinished in 2024 even after a second day of treatments. In 2022 and 2023, the crews were able to reach two additional islands: an unnamed island and Woodchopper Island. The unnamed island had an infestation surveyed in 2021 but by 2022 all vegetation had been wiped off by the river; by 2023 only one small seedling had been observed and treated. Woodchopper Island's infestation is located along the bank of the island, currently it is thought to only be on one side of the island. Depending on the water level this island can sometimes be split up into three separate sections. Previous crews were able to treat the whole bank in 2023.

The first sighting of white sweet clover was observed and reported by NPS employee Mike McDougal in 2019 while in the park during his personal time. Since then, several other infestations have been reported by park staff. In 2024 Melanie Flamme and her crew took time from their schedule to mark down several infestations found. While some of the infestations they listed were already known, their list showed the infestation had moved significantly down river of where it was previously thought to be. A comprehensive list of infestations reported to IPMT Liaison Anna O'Brien can be found in Appendix A of the report. Also in 2024, a BLM crew treated for white sweet clover near and around the boat ramp in Eagle. This potentially helped reduce the spread of the infestation to other locations along the river.

For the 2025 invasive plant season, aside from in-park interns, it would be beneficial to have even more people help with treatments down the river since the infestations are abundant. This would require additional planning due to maximum weight limit of boats and boat availability. The discussion of herbicide use within

the park needs to be reopened due to the size of the infestations and the lack of success with manual treatments thus far. Herbicide treatments would allow for planning additional hitches for a small crew to complete additional treatments or breaking up the larger crew during the big hitch to focus specifically on Montauk Island.

For Seeds of Success, the IPMT crews were able to collect seed and scout locations for seed collection next year. This is the second year that seeds have been collected in this area for future stream restoration. The area slated for restoration is large and Salcha-Delta Soil and Water Conservation District (Salcha-Delta SWCD) has stated that 200 pounds of seed will be needed for this project; Salcha-Delta SWCD will be doing most of the stream work. Currently, less than five pounds of seed has been collected and cleaned by the Alaska Plant Material Center (PMC). The PMC is planning on growing out rushes and sedges in boxes in 2025 for seed increasing. There are also plans, through a financial agreement, that Salcha-Delta SWCD will be able to negotiate a contract with a private plant nursery to increase seed due to the limited space at PMC. To help with restoration efforts, Jason Duke also collected willow cuttings in the Coal Creek area and shipped them to the PMC where they will be potted and grown for a few years before they are transplanted in the restoration area. For the 2025 field season and subsequent years, the IPMT crews should continue to collect as much seed as possible on site since seed increasing can be difficult.

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Appendix A: Known infestations of White Sweet Clover with coordinates.

Location Name	Coordinates of about center	Township *	Range*	Section *	2024	2023	2022	2021	2020
Circle, Alaska	-144.0618018°W 65.8251213°N							S^	S^
Unnamed Island	-144.0534413°W 65.6382917°N	9 North 10 North	18 East 18 East	6,5 32				S	
Unnamed Island	-144.0176679°W 65.6060027°N	9 North	18 East	17, 16				S	
Unnamed Island	-144.0148798°W 65.5936827°N	9 North	18 East	17, 16, 20, 21				S	
Yukon River Riverbank	-143.9804434°W 65.5807100°N	9 North	18 East	27				S	
Yukon River Riverbank	-143.9213705°W 65.5779142°N	9 North	18 East	26,25				S	
Unnamed Island	-143.8504317°W 65.5818188°N	9 North	19 East	30, 29				S	
Unnamed Island	-143.6898874°W 65.5138894°N	8 North	20 East	18, 17, 20				S	
Yukon River Riverbank across from Takoma Bluff	-143.6773364°W 65.4867467°N	8 North	20 East	29, 32				S	
Yukon River Riverbank across from Takoma Bluff	-143.6718006°W 65.4792399°N (2024 infestation reported at - 143.67177°W 65.47923°N)	8 North	20 East	32	I^ ++				
Unnamed Island by Thanksgiving Creek	-143.6382007°W 65.4348809°N	7 North	20 East	9,16				S	
Smith Public Use Cabin	-143.5575809°W 65.4267862°N	7 North	20 East	14		S^		S	
Unnamed Island by Webber Creek	-143.5403976°W 65.4107702°N (2024 infestation reported at - 143.54039°W 65.41079°N)	7 North	20 East	25	I^ ++				
Yukon River Riverbank (Near area locally called McGregor Bluff)	-143.4778067°W 65.3823145°N (2024 infestation reported at - 143.26437°W 65.35871°N)	7 North 6 North	21 East 21 East	31, 32 5	I^ ++			S	

Location Name	Coordinates of about center	Township *	Range*	Section *	2024	2023	2022	2021	2020
Unnamed Island (Near area locally known as Edwards Creek)	-143.4179412°W 65.3611455°N (2024 infestation reported at - 143.17902°W 65.36110°N)	6 North	21 East	9	I^ ++				
Yukon River Riverbank	-143.2774514°W 65.3638160°N	6 North	22 East	7, 8				S	
Unnamed Island	-143.1603517°W 65.3553007°N (2024 infestation reported at - 143.16028°W 65.35531°N)	6 North	22 East	11	I^ ++				
Slaven's Roadhouse	-143.1225519°W 65.3506049°N	6 North	22 East	13	S	S^	S^	S^	S
Island by Andrew Creek	-143.0364726°W 65.3595830°N	6 North	23 East	8, 9					S
Unnamed Island	-142.9615801°W 65.3476982°N	6 North	23 East	14					S
Unnamed Island	-142.9231899°W 65.3390100°N	6 North	23 East	24					S
Yukon River Riverbank across from the Carley River	-142.7820970°W 65.3258089°N	6 North	24 East	22					S
Unnamed Island by Chester Bluff	-142.7148553°W 65.3382051°N (2024 infestation reported at - 142.71489°W 65.33820°N)	6 North	24 East	24	I^ ++				
Unnamed Island Near Chester Bluffs	-142.6878811°W 65.3618293°N	5 North	25 East	7					S
Yukon River Riverbank Biederman's Cabin area	-142.5398199°W 65.3770455°N	6 North	25 East	2					S
Kandik River Public Use Cabin	-142.5183426°W 65.3761241°N	6 North	25 East	1, 2					S
Unnamed Island	-142.4853585°W 65.3528845°N (2024 infestation reported at - 142.485350°W 65.352889°N)	6 North	26 East	18	I^ ++				
Unnamed Island	-142.4182823°W 65.3305540°N	6 North	26 East	20, 21					S

Location Name	Coordinates of about center	Township *	Range*	Section *	2024	2023	2022	2021	2020
Yukon River Riverbank by the Steam Tractor	-142.3674537°W 65.3249832°N	6 North	26 East	27				S	S
Glenn Creek Public Use Cabin	-142.0926553°W 65.3016836°N	6 North	27 East	36					S
Unnamed Island by Logan and Dewey Creeks	-141.9782063°W 65.2738143°N	5 North	28 East	9				S	
Unnamed Island by Butte Creek	-141.9416427°W 65.2612721°N	5 North	28 East	14, 15				S	
Unnamed Island	-141.9215090°W 65.2518938°N	5 North	28 East	23				S	
Unnamed Island by Rock of Ages	-141.9024214°W 65.2440312°N	5 North	28 East	23, 24	T	T	T	S	S
Unnamed Island by Nation Bluff Cabin	-141.7666278°W 65.2030051°N	4 North	29 East	1, 2					S
Nation Bluff Cabin	-141.7390644°W 65.2027213°N	4 North	29 East	1	S^	S^	S^	S^	S
Unnamed Island (original site of discovery in the park in 2019)	-141.6730308°W 65.1427082°N	4 North	30 East	29		T^^^	S~ ~	I	I
Montauk Island	-141.5305468°W 65.1083186°N	3 North	31 East	7	T^^	T	T	I^	I
Unnamed island (locally called Wood Island)	-141.3750658°W 65.0599860°N	3 North	31 East	23, 25, 26		T	T^^	I^	I
Unnammed Island by Seventymile Creek	-141.2991685°W 64.9335148°N	1 North	32 East	7					I
Yukon River Riverbank across from Seventymile Creek	-141.3064900°W 64.9345156°N	1 North	32 East	7					I
Eagle, Alaska	-141.1812386°W 64.7822248°N				T+	I^	I^	I^	I

S= Surveyed only and non-Found

I=Surveyed an infestation but not treated

T=Treated

* Township, Range and Sections were included for location finding assistance because most of the Islands and banks are un-named

~~ this island was brushed clear at the infestation site by the river breakout.

^ Not mapped using GPS

^^ this island was not finished in the marked year due to infestation size and timing.

^^^ only one plant was found on this island the year after the river scoured the area

+ treated by BLM

++ Coordinates collected by Melanie Flamme and her crew