SPRING 2021

ON THE EDGE

Oregon spotted frog, *Rana pretiosa*

One of Canada's most endangered species, this frog is now returning to BC through WPC's conservation breeding and release program. Photo: Pourya Sardari

In This Issue:

Loggerhead shrike
Photo: A Samuelson

Letter from Lance

Conservation continues with WPC leading the way

It has been a long winter, but we are now waking up to the sounds, smells, and sights of springtime.

This is one of the most exciting times of the year for all of us here at Wildlife Preservation Canada. We are experiencing renewed energy with visions of the year's conservation successes to come. Our field teams are getting back out into the field and working with the animals we love. We are determined to see that these species recover and remain a thriving part of the world around us.

While our health and safety protocols are a little different than previous years, we have adapted so that our hands-on recovery can continue while keeping all of us safe. The good news is that we are already seeing early signs of hope and success.

Oregon spotted frog egg masses have been found at the release site in the Fraser River Valley in BC for the second year in a row. This population appears to be well on the road to recovery thanks to WPC's conservation breeding and release program. Even more amazing, we have breaking news that we have already hatched out more than 18,000 tadpoles this spring. The previous record was 1,800! This success is due to changes in how we introduced frogs to each other during courtship and mating this year. Attention to detail requires dedicated staff willing to put in the extra effort to learn as much as possible about the animals they work with. This expert knowledge and attention to the little things is very often what leads to a "leap" forward in endangered species recovery, like this one.

At the other end of the spectrum, WPC continues to lead by bringing others together to collaborate to save species from extinction. Our loggerhead shrike team have recently accepted the role of Caretaker for the Napanee Limestone Plain Important Bird and Biodiversity Area in Ontario, a critical habitat for loggerhead shrikes. A major part of this role will be facilitating conservation partnerships to protect this area for nesting shrikes and the other grassland species that live there.

We recently held an inaugural Canada-wide workshop under the Canadian Species Initiative. More than 60 experts from a range of backgrounds; field biologists, government, First Nations, and conservation practitioners from across the country, met online to identify priorities and strategize partnerships to save threatened snakes in Canada. The three-day workshop was a resounding success, and we are looking forward to the next ones planned for later this year. WPC's leadership role in bringing together others to increase conservation impact is something we are quite proud of.

As you read through this newsletter, I hope we have been able to share the excitement and renewed energy that we have, and we look forward to continuing our conservation success together throughout the upcoming year.

Lance Woolaver Jr.

Dr. Lance Woolaver Jr.
Executive Director

Native Pollinator Initiative

Bumble bee team returns to its roots

By Sarah MacKell

There are over 800 native bees in Canada, some of which are rapidly declining, while some have disappeared completely from their historic range. To answer key bumble bee conservation questions, this spring through fall, WPC's Native Pollinator Initiative (NPI) team is assisting York University MSc student Taylor Kerekes with her research assessing bumble bee declines in southern Ontario, specifically in Guelph and Belwood. The research team will survey bumble bee habitat and document each species they come across. The sites chosen for this study are within the range of where the Critically Endangered rusty-patched bumble bee, *Bombus affinis*, was once found.

The research collaboration returns WPC to its roots since the original, and ultimate, goal of the NPI was to re-introduce the rusty-patched bumble bee to now-vacant areas of their historic range. However, despite intensive annual searches throughout Ontario since 2012, the WPC team has been unable to locate a single individual of this species. The last sighting occurred in 2009 at Pinery Provincial Park in southwestern Ontario, where WPC has run community science programs since 2015.

Taylor (left) and Tiffani (right) surveying for bumble bees at the Arboretum in Guelph, Ontario. **Photo:** Tiffani Harrison

Continuing the search for *Bombus affinis* and investigating declines of other bumble bees is crucial to identifying the distribution of bumble bee species and conserve bumble bees in Canada.

The current study replicates studies done in 1971, 1973, and 2004-2006 that showed a decline in bumble bee abundance and diversity, as well as the absence of *Bombus affinis*, Special Concern *Bombus pensylvanicus* (American bumble bee) and Endangered *Bombus bohemicus* (gypsy cuckoo bumble bee) within these sites. Replicating population studies is extremely important so we can assess declines in populations and hypothesize why declines have taken place and continue to happen.

Another interesting part of this study is that bumble bee floral interactions will be recorded to investigate what flowers bumble bees are using and see if they have changed since the first study in 1971/1973. Floral interactions will be assessed by recording what flower the bumble bee was caught on and by collecting pollen off bees to identify in the lab.

WPC's Tiffani Harrison, Conservation Outreach and Field Biologist, will be in the field with Taylor weekly from April to October catching bees and recording flowers and floral interactions. We wish them a good bumble season!

The rusty-patched bumble bee, *Bombus affinis*, foraging. This species of bumble bee has not been seen in the wild in Ontario since 2009, and has been designated as Critically Endangered.
Photo: Xerces Society/Rich Hatfield

It's all in the eyes! Beautiful flecks of green in the eyes of an Oregon spotted frog from the conservation breeding colony. **Photo**: Pourya Sardari

Fraser Valley Wetlands

Tis the season... breeding season!

By Andrea Gielens

This year WPC's Oregon spotted frog breeding program in British Columbia had 41 of its 43 adult females lay eggs. Given that almost half of our females were hatched in 2019 and are just coming into their first possible breeding season, this is an amazing result! We more closely mimicked wild breeding behaviour in our managed setting by separating males and females in the overwinter tanks, waiting to move them together until field crews told us wild animals were breeding. This replicates the wild where males move into the egg laying sites in spring, as well as prevents the animals from going into amplexus (their mating hugs) too early and injuring each other.

Once males and females were reunited, we placed some pairs in the tanks used for female overwintering and some in the male winter tanks. The pairs in the female tanks all laid eggs within one night and all in a cluster, as we would typically see in the wild. But the other two tanks that had housed males overwinter had no egg masses for over a week. We decided to move some more pairs into the seemingly magical female tank and BOOM! All of the moved pairs laid within 24 hours. We tried more pairs the next morning. They did not even wait overnight and we had egg masses within five hours. We continued until all females had laid.

The result of the pairings was that 95% of the eggs had been laid in the one female overwinter tank! Clearly we found some sort of trigger for successful breeding and will continue to put our theories to the test.

While we celebrate the breeding success, we continue to work to solve some of the mysteries of breeding these tricky frogs. During past seasons, we have found that only 11% of the frog eggs will develop. To increase this number we attacked the problem on several fronts.

Two graduate students are working on different aspects of fertility in the captive population. Pourya Sardari, WPC Research and Conservation Technician, is looking closely at the characteristics of the sperm of the frogs. He is checking the sperm production of captive animals verses wild as well as the extent to which

using hormone injections can improve sperm production over time. This will let us identify the best method for getting reliable sperm samples and timing with respect to hormone injections. We can also begin to understand if there is a significant difference between wild and captive groups, or if the difference is between individuals regardless of location. Pourya is perfecting these techniques and carrying out initial exploration, which will be expanded on in the future.

Briar Hunter from Laurentian University is looking at fertility from the perspective of the female frog. She is gathering data on female size and egg mass size in order to assess fitness and egg production levels. Briar is also collecting genetic samples to check on the resilience of the captive populations. There is value in going back through our collected data to identify any trends in breeding and mortality rates.

Above: Blair Hunter, from Laurentian University, collecting a mouth swab from a wild Oregon spotted frog to study genetics of wild populations.

Below: An Oregon spotted frog living in the artificial ponds that are part of WPC's breeding program at the Greater Vancouver Zoo.

Breaking news as this goes to print! With unseasonably warm weather in April the tadpoles began to develop quickly and were soon large enough for staff to spend the next five days doing the difficult task of counting the tiny tadpoles. Within just the first day of counting we already had more tadpoles than in any complete previous year, more than 3000, and we hadn't even made a dent. Over the next four days we would count at least 4000 more per day. If you're doing the math, you can see that number going up and up. Once the dust had settled we had counted an amazing 20,514 tadpoles!

It is generally accepted that to re-establish an endangered frog species, it is necessary to release 5,000 animals per year for five years. Our production of more than 20,000 tadpoles in this one year is double the number we've released in total over the past 10 years! We are now in a much better position to save the Oregon spotted frog from extinction. A willingness to trial new techniques based on knowledge and experience can lead to a giant "leap" forward!

Rewilding BC's painted turtles

WPC's conservation program in BC also includes a headstarting program for the western painted turtle. Hatchlings from WPC'S 2020 headstarting program are currently in their final growing season before we can release them to suitable habitat at the end of summer.

Over winter, we have been working with veterinarians and provincial animal health labs to solve some challenges regarding soft shells in some of our young turtles.

We found that we can narrow down our previous very broad diagnosis of the cause to the effect of a parasite. The zoo's veterinarians have come up with a novel treatment program, which has been extremely effective in our trials on a small number of animals.

Michelle, WPC's research technician with the turtle headstarting program, releases hatchlings into BC's Fraser Valley.

We will complete the systematic trials of this treatment with our 2021 group of hatchlings to determine the effectiveness of individual or combination treatment protocols, to keep our turtles strong and healthy.

Eastern Loggerhead Shrike

WPC: official caretaker of important shrike habitat

By Jane Spero

Late last year, Birds Canada approached WPC's Loggerhead Shrike Recovery Program with a very exciting proposition: would we take on an additional role as the official Caretaker of Napanee's Important Bird and Biodiversity Area (IBA). The Napanee Limestone Plain in Ontario is one of the few remaining core breeding habitats for eastern loggerhead shrikes in Canada, which is partly why it is considered an IBA. Since WPC already plays an active role in loggerhead shrike breeding and release, bird surveys, and stewardship on the Napanee Limestone Plain, we gladly took on the mantle of IBA Caretaker.

What is an IBA? The Important Bird and Biodiversity Areas Program is an international program that identifies, monitors, and helps conserve important sites for birds and biodiversity around the world. Almost 600 IBAs have been identified and designated in Canada, including both core breeding sites for eastern loggerhead shrikes in Ontario (the Carden Alvar and Napanee Limestone Plain). Alvar habitat can be found on both sites and hosts a highly diverse range of grassland flora, fauna, and funga. The Napanee Limestone Plain in particular hosts the largest breeding population of eastern loggerhead shrikes in Canada, with 11 observed pairs in 2019 and 2020.

A male shrike feeding a brooding female. The Napanee Limestone Plain hosts the largest breeding population of eastern loggerhead shrike in Canada. **Photo:** P. Rathner.

A WPC field biologist carrying banding supplies on the Napanee Limestone Plain in Eastern Ontario. **Photo:** V. Luk/Everman, courtesy of the Nature Conservancy of Canada.

What is the role of a Caretaker? Caretakers monitor bird populations and keep track of habitat changes within their IBA. Regular reporting helps partners engage in effective bird conservation efforts and respond quickly to habitat threats. The Loggerhead Shrike Recovery Program is already a conservation leader on the Napanee Limestone Plain: we organize habitat stewardship initiatives, engage in community outreach and assess site biodiversity through our volunteer Adopt-A-Site program, making the role of official IBA Caretaker a natural next step.

Why is this so exciting? Since IBAs are part of a global initiative they transcend borders and promote international collaboration for bird conservation, which is especially important for endangered migratory species like loggerhead shrikes that breed in eastern Canada and overwinter in the United States. Becoming the official IBA Caretaker of the Napanee Limestone Plain will allow us to provide partners with up-to-date survey data and the tools needed to help conserve one of the most important breeding areas for eastern loggerhead shrikes.

What's next? The Napanee Limestone Plain IBA will eventually be designated as a Key Biodiversity Area (KBA). These are sites recognized more broadly for their exceptional biodiversity and ecosystems. The transition from an Important Bird and Biodiversity Area to a Key Biodiversity Area will help Napanee gain broader recognition for the essential role the landscape plays for many species at risk.

Learn more about our role as an IBA Caretaker and about Canada's KBAs at: **wildlifepreservation.ca/IBAcaretaker**

Yellow-banded bumble bee
Photo: Sarah Johnson

Conservation continues with your help

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Spotted in North Carolina!

An eastern loggerhead shrike was found earlier this year trapped in the attic of an old farmhouse near Tabor City, North Carolina. Generally we keep a respectful distance from wildlife, but a hands-on approach was necessary here to help the bird out, and as a bonus it allowed us to confirm that the shrike had been banded by WPC in the Napanee area last June.

Ontario shrikes have been seen during the winter in Delaware and the Virginias, but this is the southernmost sighting to date, giving us just a little bit more information about where our birds go after the breeding season.

Shrikes are amongst the first migrants to return to Ontario to breed, so hopefully we'll see this bird back in the province soon.

Have you seen loggerhead shrike in Ontario, banded or otherwise? Let us know! Send your sightings to:
birds@wildlifepreservation.ca

A loggerhead shrike visiting a farm in Napanee. We now know that this individual might journey as far south as North Carolina in the winter. **Photo**: N. Cairns.

Ojibway Prairie Reptile Recovery

Massasauga release sites get passing grade for second year!

By Jonathan Choquette

The primary goal of the Ojibway Prairie Reptile Recovery (OPRREC) program in Ontario is to recover the Ojibway Prairie population of eastern massasauga rattlesnakes – a genetically, ecologically, and geographically distinct Canadian population of this endangered species.

Our long-term goal includes conservation translocations with conservation-bred animals. Translocations have been attempted with massasaugas, however, the lack of successful techniques and high overwinter mortality has limited progress in previous studies. To increase success, we are using the data obtained from our hibernation habitat study that began in 2015 to identify release sites that include suitable overwintering habitat, essentially flood-free areas with animal burrows that allow snakes to descend deep enough under ground to avoid freezing and stay moist. We are well into the second phase of the project where we are evaluating those release sites with live snakes, following an approach approved by a university animal care committee.

Jonathan Choquette, OPRREC Lead Biologist, installing a new artificial hibernaculum in fall 2020 as part of a project to evaluate massasauga release sites.

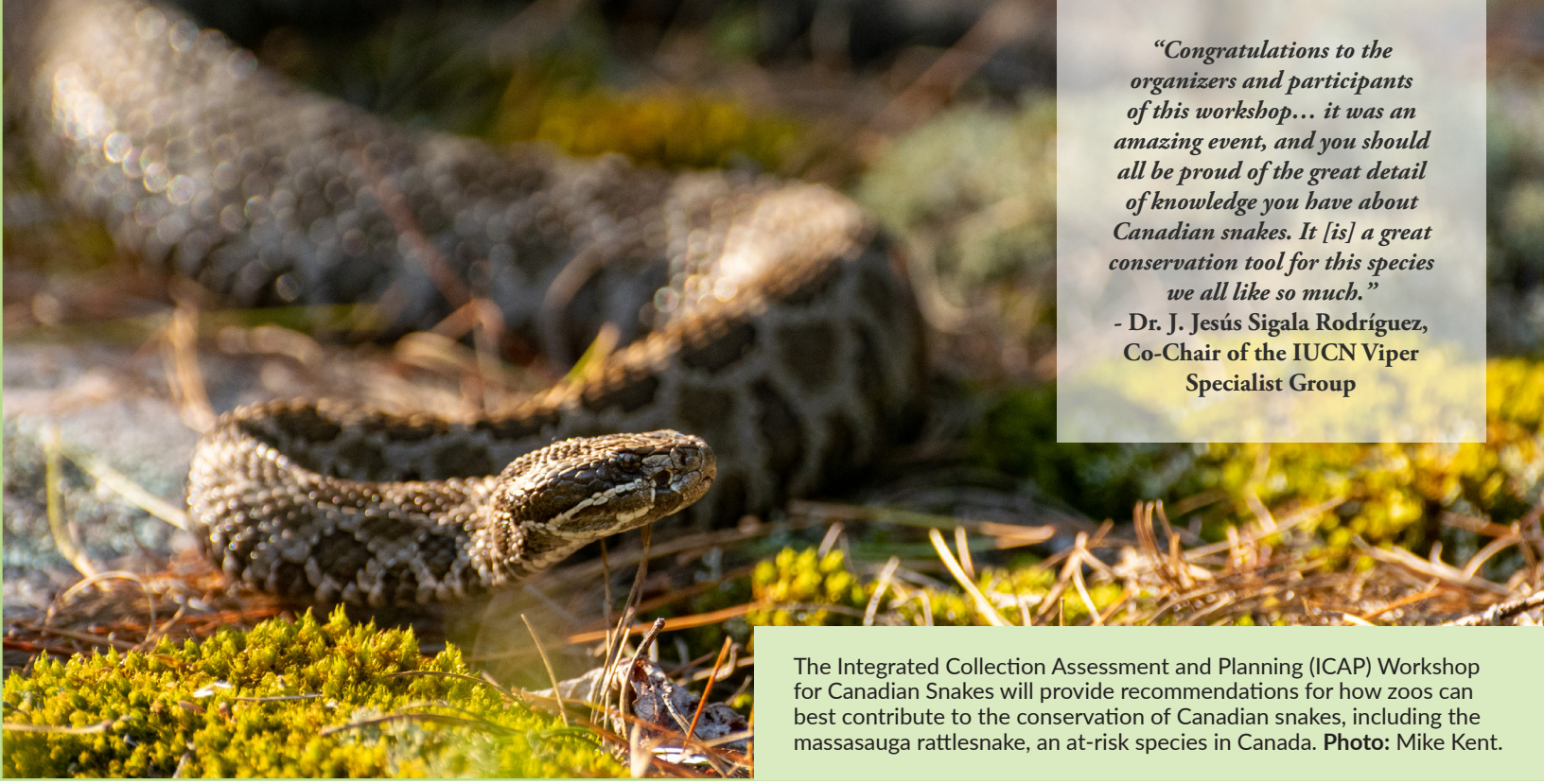
In the fall of 2019 we placed 21 wild eastern gartersnakes (*Thamnophis sirtalis*) inside nine artificial hibernacula (spread across three proposed release sites) for the winter. The hibernacula are similar to crayfish burrows where snakes naturally like to hibernate. Gartersnakes were chosen as a surrogate species for massasaugas because they hibernate in the same features and are not a species at risk. We were pleased with the results of year one of the release site evaluation when an overwhelming 95% (20/21) of our snakes survived! The survival of these "inspector" snakes confirmed that our habitat study had identified areas with suitable overwintering conditions.

Due to the very successful first year, we expanded the study. We built and installed an additional eight artificial hibernacula, and hibernated over twice as many snakes across six distinct release sites. We placed 54 eastern gartersnakes, both captive-reared and wild, in hibernation in November 2020 and have been monitoring the snakes with a borescope camera every two weeks.

We are elated to announce that on our last check we confirmed 51 snakes remain alive in the artificial hibernacula – a 91% survival rate so far! Winter mortality is a natural occurrence in snakes and our results are at the very high end of survival rates recorded in studies of wild gartersnakes.

Our combined results from both years suggest a preliminary survival rate of 92%, which shows a lot of promise for successfully translocating massasaugas and helping restore the population. The next step is to conduct a trial with massasaugas. Until then however, we are thankful to the gartersnakes of winters '19 and '20 for their contribution to massasauga rattlesnake recovery!

An adult female eastern gartersnake held by a WPC volunteer immediately after being removed from an artificial hibernaculum at Ojibway Prairie Provincial Park, in spring 2020.



"Congratulations to the organizers and participants of this workshop… it was an amazing event, and you should all be proud of the great detail of knowledge you have about Canadian snakes. It [is] a great conservation tool for this species we all like so much."
- Dr. J. Jesús Sigala Rodríguez, Co-Chair of the IUCN Viper Specialist Group

The Integrated Collection Assessment and Planning (ICAP) Workshop for Canadian Snakes will provide recommendations for how zoos can best contribute to the conservation of Canadian snakes, including the massasauga rattlesnake, an at-risk species in Canada. **Photo:** Mike Kent.

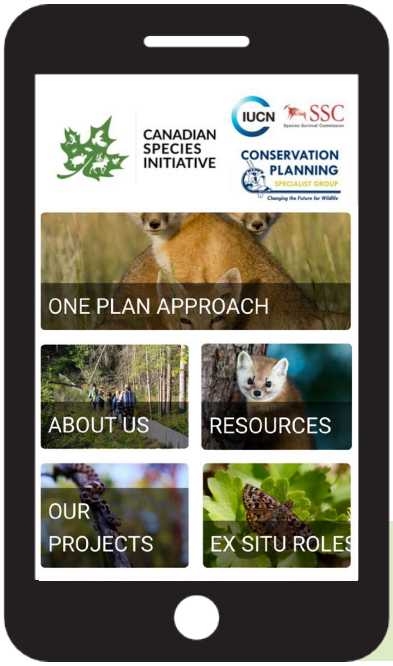
Snakes leading the way: a new path for conservation planning in Canada

Stephanie Winton

In 2020, WPC launched the Canadian Species Initiative (CSI) in partnership with African Lion Safari to consider all potential conservation tools and partners, in the wild and in human care, to conserve Canadian species at risk. The Canadian Species Initiative will bring together experts from a range of backgrounds to work side by side. "Breaking down siloes", identifying priority actions together, and involving all possible stakeholders at the beginning of conservation planning will lead to more effective conservation projects. Identifying how each can bring their strengths to endangered species recovery efforts will be the most effective path forward for ensuring success. The Canadian Species Initiative was recently recognised as the Regional Resource Centre in Canada for the International Union for Conservation of Nature Species Survival Commission's Conservation Planning Specialist Group (CPSG), the world leader in effective species conservation planning.

CSI hosted the inaugural workshop in March this year, in partnership with CPSG, focused on the conservation of threatened Canadian snakes. We were joined virtually by an amazing group of over 60 experts including field biologists, federal and provincial government representatives, First Nations biologists and managers, academics, zoo and other facility staff, and other species conservation experts from across Canada, the United States, and Mexico. Over three days, we discussed conservation options for all snakes in Canada – 39 unique species and populations, to identify priorities for zoo-based conservation activities such as reintroduction, headstarting, and conservation-based education. This participatory process will ensure that the full complement of knowledge, skills, and strengths are brought together to identify the most effective conservation actions.

This inaugural workshop was the first of a series of conservation planning workshops CSI will be delivering over the next several years, identifying the priority actions and creating the partnerships needed to save a wide range of threatened species from extinction here in Canada.



For more information and updates on CSI's activities: CanadianSpeciesInitiative.ca

Each flag represents a caterpillar reintroduction site within suitable patches of microhabitat in Helliwell Provincial Park. **Photo**: Michelle Polley. **Inset**: A female Taylor's checkerspot butterfly on Hornby Island in 2020, the result of caterpillars reared by WPC and released on the island that spring. **Photo**: Bonnie Zand.

Native Pollinator Initiative

Next gen caterpillars hard to spot

By Michelle Polley

It has been a busy spring for WPC's Taylor's checkerspot team. We headed to Helliwell Provincial Park on Hornby Island to follow up on our groundbreaking re-introduction of the species last spring, when we released Taylor's checkerspot caterpillars to restored and historic habitat on the island for the first time.

Along with other members of the Taylor's Checkerspot Recovery Team, we were hoping to spot some of the familiar black, fuzzy Taylor's checkerspot caterpillars. If we found caterpillars this spring, it would prove that our 2020 released caterpillars had successfully reproduced as butterflies in the wild, and their offspring had survived the winter on Hornby.

Though we searched thoroughly over a series of weeks, the weather wasn't ideal and we were not able to spot any caterpillars. This doesn't mean our reintroduction efforts haven't been successful – the caterpillars are only slightly longer than a tic-tac, after all. It is entirely possible that some caterpillars were hiding among the grasses and, if so, they will be happy to learn that backup has already arrived!

Once we had concluded our surveys, we brought over 1,250 additional caterpillars to the island to be released in the same area. These new recruits are the result of a year of conservation breeding work by WPC at facilities at the Greater Vancouver Zoo, and will contribute genetic diversity to the previously released caterpillars on Hornby. We released the caterpillars into carefully selected patches of micro-habitat that provide the shelter, food, and sunshine they require. Once again, we leave them to their own devices, and wait to see the outcome.

Biologists will return to Hornby Island later this year to count and observe the butterflies that our caterpillars will become. In the meantime, we are busy caring for our breeding stock, a small group of caterpillars that, when they emerge as butterflies in our breeding program, will be responsible for producing the next wave of caterpillar reinforcements on Hornby Island.

We were hoping to encounter some of these familiar black, fuzzy caterpillars in our search of Helliwell Provincial Park early this spring but they were too difficult to spot. **Photo**: Chris Junck.

Native Pollinator Initiative

Reintroducing mottled duskywing to Pinery Provincial Park

By Jessica Steiner

WPC has been involved in efforts to reintroduce the mottled duskywing, one of the most endangered butterflies in Canada to formally occupied habitat since 2017. This year will mark the fruition of those efforts with our first releases at Pinery Provincial Park, Ontario. This will be the first ever butterfly reintroduction in Ontario and will serve as a model for butterfly conservation efforts across Canada.

The mottled duskywing is so tiny that at first glance it may not look like much, but it's rapidly disappearing from Canada, and restricted to several small isolated pockets. The reintroduction work is a collaboration with the Ontario Butterfly Species at Risk Recovery Team, a diverse group with representatives from academia, non-government organizations, government, the private sector, conservation authorities, and First Nations.

WPC is leading the post-release monitoring program at Pinery as part of a collaborative research program lead by Dr. Ryan Norris at the University of Guelph. Mottled duskywings are being reared at the Cambridge Butterfly Conservatory, and we will be experimenting with releases of different life stages – larvae, pupae, and adult butterflies – to help us learn the most effective techniques. WPC's field team will be responsible for conducting intensive butterfly and habitat surveys, which will allow us to evaluate the program and adapt our release methods, while at the same time learning more about this diminutive yet important part of Canada's wildlife.

Above: Named for its dappling of yellow-brown spots, the mottled duskywing is representative of some of the rarest ecosystems in Canada, such as oak woodlands, pine woodlands, tall grass prairies, and alvar grasslands. **Photo:** Jessica Linton

Below: WPC's Conservation Programs Director, Jessica Steiner, assists with mottled duskywing surveys in 2019 at one of the last remaining sites for this species in Canada. **Photo**: Angela Demarse

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- Jessica Steiner, Conservation Programs Director

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