The Confluence

Winter 2023

Swan Valley Connections

From the Director

As I write this, tomorrow will be the shortest day of the year. Though if the sun made it up today, you wouldn't know it. The sky is a thick blanket of white, almost indistinguishable from the snow-covered ground and the weighed-down tree branches. The forecast is predicting historic low temperatures in Montana this week, with Condon expecting 30 below (Fahrenheit) Wednesday evening.

These conditions sound inhospitable, but I feel surrounded by an abundance of life. On my counter sit defrosting cherries from Flathead Lake, waiting to be transformed into preserves that will later remind us of warm sunny days and the richness of summer. This week I plan to finish grinding meat scraps from our fall harvests into sausage, the final step in processing deer and elk into food for our freezer. In my bedroom hang two lamb hides (much to Luke's displeasure, as he does not find "barnyard" to be as sweet and nostalgic a scent as I do) that I am in the process of tanning.

These lambs were born in Bigfork, just 45 miles from where I sit now, and were raised by Amanda Shine, an alumnus of our Master Naturalist 2021 class (check out Roving Ram Ranch online). As I work the hides, opening and stretching the fibers to make them more receptive to the fatty tanning solution, I imagine those lambs grazing under the same sunshine as me, converting that sun into meat and wool through grass.

I now have that precious sun stored in my home in various vessels– cherries and huckleberries in the freezer, squash and pumpkins on my counter, and animal products throughout the house. I am not unlike the pika, hunkered down beneath the snow-covered rocks in the high country, feasting on dried forbs harvested in late summer. I hope the following stories nourish you like stored sunshine, reminding you of all that has been accomplished this year, and energizing you for another year ahead.

Cheers to the new year,

Sara Lamar, Education Director

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The Confluence is published by Swan Valley Connections, a non-profit organization situated in Montana's scenic Swan Valley. **Our mission is to inspire conservation and expand stewardship in the Swan Valley.** Images by Swan Valley Connections' staff, students, or volunteers unless otherwise noted. Change service requested.

SwanValleyConnections.org

Front Cover: "In the Company of Goats"
By Beth Vallieres Art
Back Cover: Alpenglow Grouse
Photo by Andrea DiNino

The Largest Wetland Restoration Project in Montana's History

By Luke Lamar

I had spent plenty of time traversing jagged mountainous terrain and thrashing through some gnarly bushwacks, but this place was a different kind of harshness that completely worked me over. The area is extremely flat for the Swan Valley, but trudging across it every day in waders through knee-deep water, often with thick muck sucking at each boot, a healthy population of relentless mosquitoes, and some hot, humid summer weather was extremely fatiguing. Sometimes I wondered if I stepped in the wrong place if the muck might swallow me whole like quicksand. Add the invasive reed canary grass (Phalaris arundinacea) into the mix, which can grow up to eight feet tall and form dense monocultures that outcompete all other native vegetation, and often I couldn't see five feet in front of me for a good portion of the day. I also discovered that when reed canary grass is pollinating, I'm allergic to it, as witnessed by my co-workers one day when I showed back up in the office unknowingly with hives and a swollen face. In late summer the dense thickets of spiky hawthorn trees that line the Swan River attract a fair number of bears, and I would often find myself following matted down bear trails that weaved between the berry-filled trees. Several times I scared up bears 10-20 feet away, and with the thick, tall grass and other vegetation, could never see the bears, only heard them as they huffed away. Another time, I was wading through a flat of reed canary grass and my next step found a deep ditch and ended up landing on my face. Yes, this place was getting the better of me with its unassuming ruggedness.

Back in 2015, former SVC executive director (and expert botanist) Maria Mantas and I found ourselves spending what felt like countless days combing the Swan River National Wildlife refuge (refuge). The refuge is managed by the U.S. Fish and Wildlife Service (USFWS), primarily for migratory birds, as it provides important year-round habitat for diverse waterfowl and bird species, as well as large and small mammals. SVC had been contracted by the USFWS to conduct vegetation surveys and create a map of vegetative communities across the entire 1,979-acre refuge as part of the first step in a long-term process and assessment to ultimately restore hundreds of acres of wetlands that had previously been manipulated by landowners prior to the USFWS purchasing the property in 1973.

The manipulations began back in the 1920s when the Montana Muskrat Company built the nation's largest muskrat fur farm on the property. After going belly up in the Great Depression, the land was hayed and grazed by homesteaders. As often occurred during the homesteading era, it was easier to cultivate and 'prove up' on a piece of land by ditching and draining its wetlands, rather than clearing the forest and trying to convert it to agricultural uses. Specifically, numerous shallow ditches were dug and a few long, deep ditches were excavated for the purpose of draining the wetlands to create pasture and hay meadows. It is obvious that these ditches were focused on draining water off the refuge into Swan Lake. It also appears that a small portion of the refuge was tilled or disced and seeded with non-native pasture grasses.

The result of these manipulations has dried the wetlands on the refuge to various degrees, making them vulnerable to the colonization and spread of non-native species, particularly reed canary grass, while also reducing the quality and quantity of valuable waterfowl habitat. Several levees were also constructed on the Swan River to restrict overbank flow from the river to refuge land, and one large levee was built on the southern shoreline of Swan Lake. The ditches and levees have extensively altered the natural wetland hydrology of the refuge. The changes to wetland hydrology, combined with the spread of invasive reed canary grass, have resulted in a striking departure from the natural vegetation communities and habitat that likely existed prior to the turn of the 19th century. What remained after these manipulations, on what became the refuge, were an elaborate and complex series of ditches and

berms, some of which may have been intended to hold water back for muskrat habitat at one time, and others intended at drying the wetlands to produce better haying and grazing opportunities.

Fast-forward to 2015, when the USFWS began the process of evaluating the possibility of restoring the wetlands on the refuge to their natural function and hydrology. The first step was to map the existing vegetation across the entire refuge, which is when Swan Valley Connections first became involved as a partner. Shockingly, reed canary grass was found in high cover over most of the refuge, with very few areas being devoid of it. A specific goal of the mapping project was to determine the extent to which native wetland vegetation communities exist in association with a high coverage of reed canary grass. This information helped refuge managers plan effective management prescriptions to reduce cover of this exotic species, thus promoting the ecological integrity and diversity of the refuge. SVC found that 312 acres of the refuge were 100% reed canarygrass, and a large portion of the refuge had some component of the non-native grass.

After SVC completed the surveys and created a map of vegetation communities, in 2017 the USFWS completed an assessment to evaluate wetland restoration potential at the refuge. Objectives were to identify opportunities for restoration of wetland hydrology, and to determine the impacts of restoration actions on existing plant communities and wetland habitat. Long term goals were the restoration of wetland hydrology and wetland vegetation to the refuge by reversing the actions by which the wetlands were originally altered.

The USFWS then hired Whitefish-based consulting company River Design Group (RDG) to install groundwater monitoring wells at various locations across the refuge. Using that groundwater data, RDG provided an assessment that linked elevations and the water table throughout the refuge with existing vegetation. RDG essentially found that in areas that had a higher water table, there was still native vegetation, such as sedges and rushes. In areas that were slightly higher or where the water table was about a foot lower, there was invasive plant species such as reed canary grass. Based on previous restoration projects and research, it is known that reed canary grass dominates where it is seasonally flooded, but then the water table recedes, and surface conditions dry out. But if a system stays inundated with water all or most of the year, then reed canary grass essentially gets drowned out and conditions passively convert back to native wetland vegetation that waterfowl and many other wildlife species rely upon.

RDG then evaluated the elevation of all the ditches and berms across the refuge and came up with an assessment to strategically put back, or plug, the ditches with dirt fill that was originally removed from those locations, raising the water table in certain areas by approximately a foot or more, which would result in restored natural hydrology and reed canary grass being drowned out and passively converted back to native plant communities. Based on RDG's assessment, a mind-boggling 15.7 miles of drainage ditches were identified, but by filling 4,960 linear feet (0.94 miles) of them at strategic locations, it was concluded that a whopping 609 acres of wetlands could be restored to their natural hydrology and function, and 394 acres of reed canarygrass could potentially be reduced or eliminated.

It was an exciting design that lacked one crucial element: funding. Once again, that is where SVC played a critical role. A project of this magnitude requires a significant amount of funding, and competitive North American Wetland Conservation Act (NAWCA) grants make projects like this possible. The goal of the NAWCA program and funding is to increase bird populations and wetland habitat, while supporting local economies and American traditions such as hunting, fishing, and bird watching. NAWCA was originally passed, in part, to support activities under the North American Waterfowl Management Plan, an international agreement that provides a strategy for the long-term protection of wetlands and associated habitats needed by waterfowl and other migratory birds. Since 1989, $2 billion in grants have gone to 3,262 projects that have improved, conserved, or restored over 31 million acres of wetlands and associated uplands.

In order to successfully secure funding from the NAWCA grant program, one does not just hold out their hands and a suitcase of cash suddenly appears. In 2020, I spent over 400 hours researching, meeting with partners, writing, and revising what became known as the Southwest Crown Wetland Conservation Montana proposal. After what seemed like a maddening amount of time behind a computer, the $1 million grant proposal was successfully awarded, and not only included funding for the Swan River National Wildlife refuge wetland restoration project, but also included funds that went towards permanently protecting 3,225 acres on two private land conservation easements, and towards a 45-acre Big Blackfoot Chapter of Trout Unlimited stream and wetland restoration project in the Blackfoot Valley.

With funding secured for the refuge wetland restoration project, there were the next steps of writing an Environmental Assessment (EA), public scoping, archaeological surveys and compliance, securing a thick stack of necessary permits, partner meetings, public presentations, and contractor bid tours. When

the dust settled on those actions, Glacier Excavating out of Eureka, Montana was selected as the contractor based on their bid price and previous experience completing large-scale wetland restoration projects.

After so many years, all the planning and effort from the team of partners working towards restoring the refuge had come together! Construction began on August 1st of this year and was completed by mid-October. An impressive amount of dirt (over 25,000 cubic yards) was moved and strategically placed in approximately a mile of certain ditch plug locations. In some wetter areas, filter fabric and pit run (which were later removed) had to be placed over temporary travel routes to avoid damaging sensitive wetland habitat and to keep excavators and dump trucks from sinking. In even wetter areas, logs were laid down to temporarily travel over with equipment. The logs were locally sourced and delivered to the site by Condon-based Euchre Mountain Logging. Over 3,000 linear feet of these temporary access roads were constructed over saturated ground. Based on RDG's design, and using GPS equipment mounted to the excavator buckets, Glacier Excavating knew exactly how far down to dig into berms to predetermined elevations, where to dump the fill in certain ditch locations, and how high to fill each ditch. Before excavating any berms, sods were salvaged and then put back on top when done. A native seed mix was also spread on any disturbed areas. There were 5.4 miles of temporary access roads, the majority of which were on top of pre-existing berms and levees, which were then removed as the contractors worked backwards from certain locations.

SVC, along with the USFWS and RDG, hosted a public tour on August 31st and about 30 interested members of the public showed up to see the restoration work in progress. Glacier Excavating did a fabulous job diligently working to complete the project after the refuge somewhat dried out from the late spring/summer runoff and before the wet autumn weather rolled in, and they did a wonderful job rehabbing temporary roads as they left. Within weeks, water was already starting to back up in some wetlands behind the ditch plugs, and we can't wait to see it all next spring after the wetlands have been recharged from spring runoff! By converting ditch water currents to flow across the ground surface through plugging the ditches in strategic locations, water inundation will permeate through wetland soils and recharge wetlands. It is also expected that this groundwater level increase will result in a shift from invasive reed canary grass-dominated wetlands in some areas to habitat dominated by desirable native wetland sedges, rushes, and horsetails, especially in northern refuge locations.

This is what SVC does- we work with partners and collaborate to help further the missions of our federal and state land management agencies, while providing boots-on-the-ground conservation and stewardship. We incorporate conservation education into everything we do, whether that's through public tours or newsletter articles. Collaboration takes time, leadership, determination, consistency, and good partnerships all working towards a common goal. In this instance, it took eight years, countless mosquito bites, leaky waders, close bear encounters, near-broken necks, hives, and many meetings, but in the end, it was all worth it to be a part of the team that completed the largest wetland restoration project in Montana state history!

Left: Contractor starting to remove Levee A, a berm along an oxbow of the Swan River.

Right: Post-restoration with berm removed and sods laid back on top of disturbed location.

Left: A ditch plug immediately post-restoration.

Right: Water inundating the site two weeks later

To view more before-and-afters, visit www.swanvalleyconnections.org/wetland-restoration

A Fond Farewell to a Favorite in Fisheries
Celebrating Beth Gardner

By Sara Lamar

On a sunny morning in early October, I sat in my car parked along the Swan River, waiting for Beth Gardner and her crew. Since 1994, Beth has been the fisheries biologist for the Swan Lake and Tally Lake Ranger Districts on the Flathead National Forest. We were meeting to search for bull trout (*Salvelinus confluentus*) redds in a major tributary of the Swan River. These redd counts are one of the last opportunities for Beth to get out in the field as she wraps up a 34-year career with the U.S. Forest Service (USFS) this winter. When Beth and her team arrive, we decide to split into two groups, with each crew walking downstream about a mile looking for redds.

A redd is essentially a nest, where the female fish removes sediment from an area the size of her body by rolling onto her side and flapping her tail. This motion moves fine sediment into the water column, allowing it to flow downstream. This commotion also attracts males, who compete for courtship with the female. The successful male and female then release "milt" and an average of 5,000 eggs over the redd. The fertilized eggs then settle into the interstitial space between rocks, where clean, cold water flows over the eggs and delivers oxygen to the developing young fish, known as fry. The word "redd" comes from Middle English, meaning "to clear space," and that is what we are looking for- a depression in the stream where the gravel looks as though it has been polished clean compared to the surrounding rocks. Redds from migratory bull trout (those that spend most of their time in a lake and only venture into the river tributaries to spawn) can be as large as three feet wide and six feet long. Biologists conduct these surveys to measure population trends. A decline in the number of redds in a stream can indicate a decline in habitat quality and/or population decline. Bull trout population health is of particular interest to managers, as they are currently listed as "Threatened" under the Endangered Species Act.

While the textbook definition of a redd might sound obvious, I relied heavily on Beth for her wealth of experience conducting this type of field work. We hopped into our chest waders and began to work our way downstream. As we climbed over logs and weaved through brush with our eyes glued to the river rocks, I had the opportunity to pepper Beth with questions and learn about her career in fisheries management.

When Beth left her hometown of Cincinnati, Ohio for college, she wasn't exactly sure what she wanted to study. All she knew was that her happiest memories growing up took place outside. Living within city limits and far away from public land made it challenging for her family to spend time outdoors, but when they did go camping or hiking it was a deeply fulfilling experience. She landed at Michigan State University and dove into fish and wildlife biology. She enjoyed studying both terrestrial and aquatic wildlife, but the more she learned about fish, the more she felt drawn to their mystery. Beth graduated in 1988 and accepted a position with the USFS immediately after graduation. At that time there were hardly any women in fisheries and wildlife management. Beth recalls at meetings and conferences, "There was never a line for the women's bathroom." This is one of the many aspects of the field that Beth has seen change over the course of her career.

In addition to more equitable recruiting and hiring processes, technology has greatly shifted biologists' ability to collect, analyze, and share data. The instruments have greatly evolved, such as water temperature loggers and GPS devices, but GIS has been the most impactful in allowing managers to create maps that tell stories about the landscape and reveal ecological relationships. As far as changes specific to the Swan Valley, Beth remarks that she is most proud of fixing up the roads. "If you think there are a lot of roads now, you should have seen how many roads there were back then," she offered.

*Beth setting a net line for an electroshocking fish survey in Piper Creek. (*The shock is just enough to temporarilly stun the fish without harming them. They rest in the safety of a recovery bin before being put back in the creek.)*

Beth at work setting trap nets in 1993 to study fish populations in Little AuSable Lake in Michigan. Photo courtesy of Beth Gardner

"Take time to build relationships; it's the key to success, and I sincerely mean that."

Over the last three decades the USFS has made great strides to reduce the negative impacts forest roads have on the ecosystem by reducing the total miles of roads, improving eroding roads, and replacing culverts that impede fish movement. Eroding roads are problematic for fish because they leak fine sediment into streams that smother eggs and suffocate developing fry. Culverts can be especially tricky, as Beth notes we will continue to need bigger culverts in many streams as climate change leads to more violent and less predictable runoff cycles. Beth says she can't take credit for all of this restoration work and that none of it would be possible without partners such as Plum Creek, Department of Environmental Quality, and Swan Valley Connections. Beth assures me that her praise of SVC is not just for my benefit, and, in fact, working with partners and building relationships has brought so much joy to her work. "We need them" she says, speaking of all of the people and organizations she worked with over the years. "It's more fun working with partners, and they bring great ideas to the table that I wouldn't have otherwise thought of."

Suddenly, our walk through the stream became noticeably easier. All the logs leaning over the stream bank now bore chainsaw marks. We had just crossed the USFS boundary, and the land on either side of the creek was private property. While these cut trees allowed for easier human travel through the water, this loss of coarse woody debris (CWD- the good kind, not Chronic Wasting Disease) is detrimental for fish. CWD provides structural complexity in waterways, giving fish shade and hiding cover, and even more importantly, slows the current and facilitates the development of pools and spawning habitat.

We were past the halfway point in our survey, and we had not spotted a single redd. While declines in bull trout and their redds are being recorded throughout the Swan watershed, Beth feels that the removal of CWD is likely part of the problem in this particular stream. Managing native fish in Montana can sometimes feel like a daunting task, as the needs and desires of fish, landowners, anglers, and other stakeholders can be in direct opposition to one another, but Beth isn't discouraged. Forever the optimist, Beth sees an opportunity to bring people together. "These landowners are likely concerned about their bank eroding and losing their property; we might be able to help them while also helping fish." In addition to providing benefits to fish, CWD can also help absorb and redistribute the energy of a stream, rather than pounding away at and eroding the banks.

Almost finished with our survey, we sat down in the sun to enjoy our lunch. While Beth certainly has a knack for maintaining a positive attitude, she does acknowledge that watching bull trout decline over her career has been discouraging. The primary cause of bull trout decline is the ever-increasing presence of lake trout (*Salvelinus namaycush*). Lake trout are native to the Great Lakes region and northern North America, and were introduced to Flathead Lake in 1905 to increase fishing opportunities. Now, they are found in most valley bottom lakes throughout the Swan watershed and are out-competing bull trout. Beth doesn't think bull trout will go extinct, but she worries that with reduced numbers the public won't be able to fish for them, and without that opportunity, people will lose appreciation and interest in the species.

One of Beth's favorite memories from her career was when she was standing in a stream and a three-foot-long bull trout stopped to rest on her foot, presumably after spawning. Beth watched the enormous fish hover for a few minutes until she leaned over to get a closer look and the fish swam away. Of all the wild things, we rarely get the opportunity to have personal experiences like this with fish and other aquatic animals, and Beth thinks a lot about the opportunity for future generations to experience what we have now. Beth is more optimistic about westslope cutthroat trout (Oncorhynchus clarkii lewisi), our other native trout threatened by non-native species and habitat loss. Beth acknowledges that we may never restore westslope cutthroat to their historic population levels, but feels that we have measures in place to protect key conservation populations for future generations.

I met Beth early on when I started working for SVC, and it's hard to imagine talking about aquatics in the Swan

with anyone else. Beth assures us that she isn't going anywhere. She plans to spend this next phase of her life putting more time into the things she loves, like gardening, hockey, fishing, and working part-time. We are deeply grateful for everything Beth has done for this watershed and all its inhabitants. While we'll miss her in the workplace, I look forward to running into her while fishing high mountain lakes.

For my final question of the day, I asked Beth if she had any advice for her successor. Beth said, "Take time to build relationships; it's the key to success, and I sincerely mean that."

If you are a private landowner in the Swan River watershed and have questions about restoring stream and river habitat for native fish, please contact Conservation Director Luke Lamar at luke@svconnections.org

Right: Beth, Luke Lamar, and volunteers Dan Stone and Dean Johnson electroshocking Piper Creek

About the Artist (and Her Wilderness Connection)

By Andrea DiNino

Our cover artist, Beth Vallieres, was one of two artists selected for the 2022 Artist-Wilderness Connection (AWC) program, a collaboration between SVC, Bob Marshall Wilderness Foundation, Hockaday Museum of Art, and the USFS - Flathead National Forest. The program has been going on for the past 19 years, and has supported 52 artists, ranging from musicians to poets to visual artists, painters, and more - artists of all mediums are encouraged to apply!

Beth spent eleven days in Granite Cabin, a forest service cabin on the banks of the Middle Fork of the Flathead River, and adjacent to a trail that follows the Middle Fork for several miles leading to the historic Schafer Work Center in the Great Bear Wilderness. Granite Cabin was built circa 1950 and is one of four cabin options for selected artists. (*These cabins are not available to the public.*)

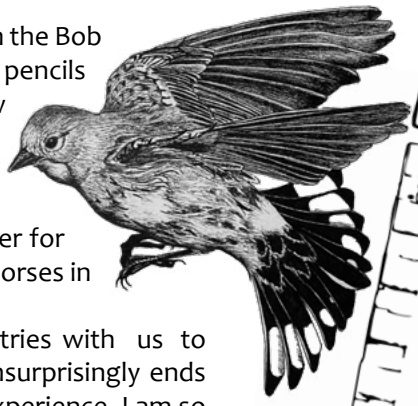
Beth is a graphite artist based in Whitefish, Montana. She grew up exploring the mountains of Colorado on horseback and moved to Montana to explore more wild places after graduating from Metropolitan State University of Denver with a Bachelor of Fine Arts.

After finding healing and inspiration in the Bob Marshall Wilderness, she has picked up her pencils again in an attempt to communicate how valuable wild places and their inhabitants are, whether for our mental, emotional, and physical health, or for the health of our planet. Outside of her day job as barn manager for a private horse farm, she enjoys packing her horses in the Bob, trail riding, hiking, and hunting.

Beth shared some of her journal entries with us to give a glimpse into her experience, which unsurprisingly ends with "at this point, I have had an incredible experience. I am so not ready to go home. But first, I need to sketch out my ideas I've been having!"

Applications for the 2023 Artist-Wilderness Connection are open January 6 - February 17, 2023! Find more information on our events page, at https://bmwf.org, and https://hockadaymuseum.com

To see more from Beth's trip (and order a print of "In the Company of Goats"), check out her website: https://www.bethvallieres.com



Beth's species list from her time in the Great Bear Wilderness

9/14
"...THE BIRDS & BUGS WERE OUT TODAY! MY DIPPER KEPT ME COMPANY, AS WELL AS A KINGFISHER THAT MADE APPEARANCES. AND I HAVE A LITTEL CHIPMUNK COMPANION, TOO. WHILE LOOKING FOR OBJECTS TO MAKE A STILL LIFE, I SPOOKED A LARGE TOAD/FROG OUT OF A LITTLE BURROW & GOT SOME GOOD PICS! NOW I'M TRYING TO FINISH MY BONE BROTH & FINISH UP OUTSIDE EARLY."

9/15
"WHILE ENJOYING MY BREAKFAST I SAW **FIVE** DIPPERS ON THE RIVER! PLUS A SANDPIPER, AND TWICE I HEARD ROCKS SLIDING ON THE BANK ACROSS FROM CAMP. COULDN'T SEE ANYTHING OBVIOUS, MAYBE SQUIRREL? HAD AN IDEA FOR A LARGE DRAWING LAST NIGHT. GOING TO START A SPECIES LIST."

9/17
"I TOOK THE SCENIC ROUTE/EXPLORED DIPPER CAVE A LITTLE...IT WAS INCREDIBLE. I FOUND SOME CAMP SPOTS, TONS OF MOOSE SIGN, & THEN THERE WAS THE LAKE. WOW. THE RAIL OPENS UP INTO THIS BASIN, CARPETED WITH PURPLE ASTERS & CLIFFS, AND THEN TAKES YOU AROUND A CORNER TO WHERE YOU CAN SEE THE LAKE ITSELF, WITH FALL COLORED BUSHY SLOPES BEHIND IT. IT WAS UNREAL. I HAD IT ALL TO MYSELF! THIS DAY IN PARTICULAR HAS MADE ME FEEL LIKE WE HUMANS DON'T DESERVE THIS PLACE, THIS PLANET. THIS TRIP HAS LIT THE FIRE IN ME TO DO MORE TO TAKE CARE OF IT."

Illustration opposite page: Granite Cabin, illustrations on this page: yellow-rumped warbler, western toad, and trout fish fry
All illustrations by Beth, inspired by her AWC experience

Swan Lands Coordinating Network 2022 Updates

The purpose of the SLCN is to provide agencies, organizations and civic groups working in the Swan Valley a venue for coordinating with one another, and to provide a flow of information with interested members of the community.

Here's a look at what some of our partners have been up to in the past year.

MONTANA DEPARTMENT of NATURAL RESOURCES and CONSERVATION - SWAN UNIT

The 2022 fire season on the Swan Unit was on par with previous years in terms of initial attack responses. As it was fairly slow around here, our engines were able to get out on assignments to help other areas of the state with the firefighting load.

Our timber program laid out and has put out for bid the Lost Ridge Timber Sale, the second in the Lost Napa Multiple Timber Sale Project. This timber sale offers approximately 4.5 MMBF (million board feet) of sawlogs to benefit the Common Schools Trust. Salvage harvests were conducted this summer on last year's Whitetail Fire. Forest improvement work was also completed throughout the state forest, including planting roughly 44,000 seedlings and completion of three broadcast burns. Multiple sediment reduction projects were completed, including a major road Best Management Practices (BMP) repair in the North Soup drainage.

We have several new employees at the Swan. Lindsey Glastetter, a valley resident, is our new office manager. We also have a completely new forest management team: Chad Blanchard is the new forest supervisor, with Alex Golden, Hiram Jones and Josh Reed as the new management foresters.
The Swan Unit has plans to increase outreach going into 2023, so look forward to seeing more of Lindsey, Jack, or David Kopilow, our Fire Operations Specialist.

Jack White, *Service Forester*
DNRC Swan River State Forest
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Spring Prescribed Burn Unit 23-07. The intent of this 42-acre burn was to clean up slash created by logging and create sites for both natural regeneration and planting. This unit will be planted in the spring of 2023.

MONTANA FISH, WILDLIFE & PARKS - FISHERIES

Montana FWP continues to monitor fish populations in the Swan watershed. Monitoring occurs in valley-bottom lakes, mountain lakes, and the river and it's tributaries. While many of these fisheries are self-sustaining, wild populations, some popular lakes are stocked with hatchery fish for recreational angling. FWP has been periodically monitoring the valley-bottom lakes for many years, and also sample the high-mountain lakes occasionally as well. In 2022, we sampled Loon, Shay, Van, Peck, Russ, and Fran Lakes to evaluate hatchery raised rainbow trout plants. Angler reports and periodic monitoring revealed some lakes with low survival, so in 2022 we began taking the hatchery fingerlings further out into the lakes when planting. Future monitoring will help determine if this type of planting improves survival.

The Swan Lake bull trout population continues to be the focus of much of the work FWP does in the Swan watershed. Swan Lake bull trout are monitored through both juvenile electrofishing estimates in the tributaries during summer months, and spawning nest (or redd) surveys every fall. Similarly, lake trout and Mysis shrimp are monitored in Swan Lake to follow trends in organisms that affect the persistence of bull trout. The trend of the Swan Lake bull trout population is troubling, and redd counts in 2022 revealed the lowest number of spawning nests in the history of the survey (>30 years). This decline in bull trout is not surprising, as the number of non-native lake trout has continued to increase over the years. Discussions with the US Fish and Wildlife Service are ongoing, as we search for alternatives that can improve conditions for what was once the most robust bull trout population in Montana.

Leo Rosenthal, *Fisheries Biologist*
Montana Fish, Wildlife & Parks, Region 1
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CONFEDERATED SALISH & KOOTENAI TRIBES

The Confederated Salish & Kootenai Tribes (CSKT) owns the east half of Section 35 west of Condon, containing the confluence of Elk Creek and the Swan River. Since 2007, CSKT and Swan Valley Connections (SVC), who owns the west half of Section 35, have co-managed the section as the Elk Creek Conservation Area (ECCA).

Throughout 2022, the CSKT Fisheries Program worked closely with our partners at SVC and in the Elk Flats Road community on projects within the ECCA. In late April, CSKT and SVC staff, as well as several local volunteers, spent two days cleaning up blowdown from an intense January 2021 wind event in the southeast corner of the ECCA. More work is needed in this area, which will continue in the spring of 2023.

During the summer of 2022, the CSKT Fisheries Program and SVC contributed funding to have noxious weed populations treated with herbicides in July along Elk Flats Road and other spur roads throughout the ECCA. Also, CSKT and SVC staff met in August to discuss plans for constructing an educational kiosk at an existing pull-out area along Elk Flats Road. Installation of this educational area is planned for next year.

Finally, the CSKT Fisheries Program was able to contribute funding in October, in conjunction with existing USFWS Partners for Fish and Wildlife Program funds secured by SVC, to purchase two additional culverts for Elk Flats Road. These culverts will be installed by CSKT staff in the spring of 2023, to the west of the Elk Creek bridge, to assist with the conveyance of flood flows and prevent the movement of fine sediments from the road into Elk Creek.

Rusty Sydnor, *Restoration Botanist*
Confederated Salish & Kootenai Tribes
(406) 250-2113, rusty.sydnor@cskt.org

Clearing blowdown on the Elk Creek Conservation Area

SWAN LAKERS

The Swan Lakers have continued our program of testing and sampling the waters of Swan Lake. We are on the water four times a year, from spring through fall. Happily, we can report that the sag in dissolved oxygen that, in earlier years, we have seen in the south basin is no longer as severe.

We continue to inspect boats for AIS that are using the USFS launch ramp at the south end of the lake. But, we need to increase our coverage by having more inspectors. Everyone got an urgent wake-up call when a mussel fouled boat was detected at the Whitefish Lake launch ramp. This could easily have been Swan Lake, or any other water body in the Flathead Basin. Unfortunately Montana does not staff its inspection stations 24/7. Clearly, an AIS contaminated boat can, and has, transited across the entire state without inspection.

Lastly, we are delighted that the Swan Refuge Wetland Restoration Project has been completed. Nature's filtration system is now up and running. Thanks to everyone, especially Swan Valley Connections, for their efforts and tenacity in seeing this through.

Jeff Kemp, *Board President*
Swan Lakers
jkemp42@rocketmail.com

Westslope cutthroat trout from Smith Creek

U.S. FOREST SERVICE - FISHERIES

The Native Fish Committee remains productive, focused, and fun. We work together to conserve westslope cutthroat trout in select tributary streams. This year we put a lot of energy into the Smith Creek project. A barrier to block any further upstream invasion of brook trout into Smith Creek was installed in 2017, and we have been removing brook trout (via electrofishing) ever since. This year we got very close to the finish line. I estimate that Smith Creek has about 571 adult cutthroat trout and only about three brook trout left. New this year, we decided to add Schmidt Creek to our list of valuable populations worth conserving and debated about removing Owl Creek (due to sparse numbers). We also 'discovered' a population in Rumble Creek that might benefit from conservation measures but still need more information before proceeding. Some of you may recall that last year we collectively worked to gather population and genetic information on nine populations. The genetic lab is behind schedule, and we are still awaiting results.

Every three years we work together to monitor all fish species in the Swan River. Our goal is to track any broad changes in species distribution. Snorkeling is the best method to do this and, yeah, it is fun too! This year we also collected habitat information at our sample areas to have more confidence in our sampling efficiency. Any guesses on the most numerous fish species? The mountain whitefish. We have noticed an increase in rainbow trout and brook trout in the river. Cutthroat trout are very rare. There seems to be no change in distribution of bull trout, suckers, pikeminnow or shiners.

On a personal note, I will be retiring this winter. It has been an honor to work with you to conserve native fish and water quality. The Forest Service plans to fill the position and keep alive our partnership with you.

Beth Gardner, *Fisheries Biologist*
USFS Flathead National Forest
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VITAL GROUND

The Vital Ground Foundation had a busy and productive 2022 and is looking forward to maintaining that momentum in 2023. Our mission is twofold: to conserve and connect habitat for grizzly bears and other wildlife, and to help communities prevent conflicts between bears and people. We work with landowners to conserve that habitat, and we provide funds for conflict prevention projects that encourage coexistence between wildlife and people.

We completed many conservation projects this year, with one located in the Swan Valley in the Salmon Prairie area. We worked with both the property's landowners and Montana Freshwater Partners to protect a large wetland within a key wildlife corridor. This was done along with plans to develop a habitat restoration plan for portions of the wetland that were previously converted for agricultural purposes. This conservation easement sits between public land and protected private land and will provide linkage between the Mission and Swan Mountain ranges. This property will now join the many other protected private land parcels that provide quality habitat and movement between more extensive areas of public lands.

We also partnered with Swan Valley Bear Resources and supported their conflict prevention activities. These included building several electric fences to protect poultry and orchards and providing education and outreach to the communities of the Swan Valley. Projects like these are increasingly important, especially during a time when development is rapidly increasing in Montana. Protecting wildlife habitat and educating people about coexistence with wildlife are the keys to maintaining one of the last wildlife strongholds in the lower 48 states.

Brittani Rosas, *Land Steward*
The Vital Ground Foundation
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Be Bear Aware educating the public about bear spray at the SVBR Bear Fair, hosted at the Swan River Community Hall

U.S. FOREST SERVICE - TRAILS

The 2022 trails field season for Forest Service (USFS) operations utilized project funding through the Great American Outdoors Act throughout the Mission Mountains Wilderness. Three trails were improved with the efforts of USFS and Montana Conservation Corps crews addressing deferred maintenance; Hemlock Trails #607/515 and the North Crystal/ Lindbergh Lake #351/490 system. Heavy brushing, bog logs, and tread improvements were the highlights of this work to make the system trails more sustainable. General maintenance on all the Mission Wilderness trails was completed by opening the corridor and drainage through USFScrews, contract crews, and partner collaboration efforts. The Mission Mountain Wilderness will continue to have extra efforts put into the trail system for the next three years with the support from the Great American Outdoors Act. The USFS thanks all who contributed and utilized the amazing trails network!

Derrick Mercer, *Recreation Mgmt Specialist*
U.S. Forest Service
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SVC - FOREST STEWARDSHIP

SVC completed ten wildfire risk reduction projects on private land in 2022. These projects reduced fuels on 147 acres, improving defensible space around structures, improving firefighter access routes to properties, and improving forest health and forest preparedness for wildfire. SVC assisted landowners with cost-share grant funds to help pay for the projects through Western States Wildland Urban Interface (WSF) grant funds sub-awarded by the U.S. Forest Service and Montana Department of Natural Resources and Conservation (MT DNRC).

SVC assisted private landowners with forest management questions and helped direct landowners to resources that might help them meet their forest stewardship goals. We also hosted a public tour, pile burning workshop, and tree planting workshop on our Swan Legacy Forest (SLF) property. SVC is working with the Montana Department of Fish, Wildlife & Parks (MT FWP) to improve forest health and reduce wildfire risk on MT FWP Horseshoe Lake and Swan River Fishing Access Sites near Ferndale. We also helped organize and participate in a 100-acre cross-boundary prescribed burn between the USFS (90 acres) and a private landowner (10 acres) in May. SVC will be receiving additional grant funds in 2023 for cost-share private fuels reduction projects. We are looking forward to more wildfire preparedness and wildfire risk reduction projects in the Swan Valley in 2023.

Mike Mayernik, *Conservation & Stewardship Associate*
Swan Valley Connections
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SVC - WETLANDS

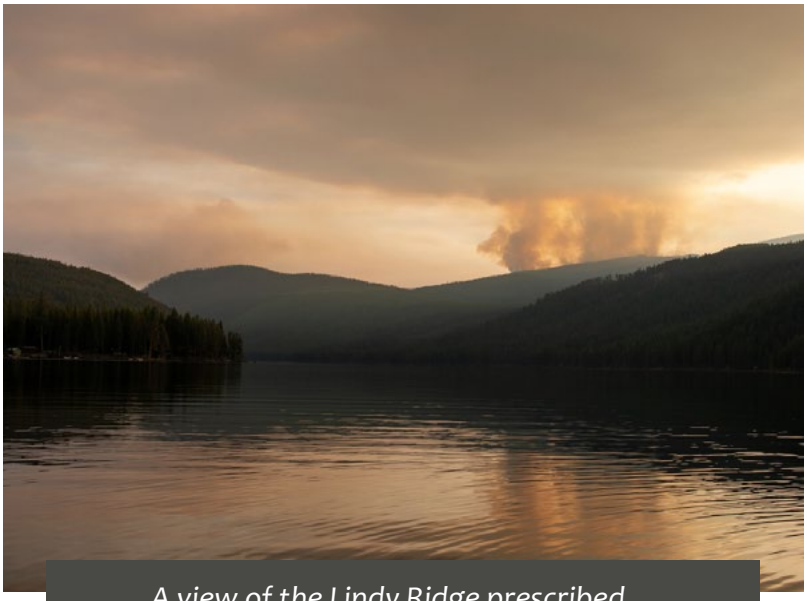
SVC partners with the U.S. Fish and Wildlife Service's (USFWS) Partners for Fish and Wildlife Program and private landowners to implement wetland, stream, and riparian restoration projects, as well as grizzly bear conflict mitigation efforts, such as electric fencing. Projects in the Swan Valley are targeted towards the recovery of focal species, including bull trout, trumpeter swans, and grizzly bears. This program has helped restore 13 streams and wetlands on over 150 acres since its inception. SVC has one private land wetland restoration project that it hoped to complete in 2022, but due to contractor availability, we now expect to complete that project in 2023. With help of habitat improvements from these projects, trumpeter swans are slowly re-colonizing the Swan Valley. There were two pairs of trumpeter swans that established territories on Swan Valley wetlands in 2022, both of which successfully reared three cygnets.

The U.S. Forest Service (USFS) and National Forest Foundation, in partnership with SVC, implemented the Cold Ponds Wetland Restoration Project that restored the hydrology of approximately 30 acres of ditched and drained wetlands in the Cold Creek area on USFS lands. Local contractor Watershed Consulting completed the project in early November, and the area will be seeded with a native grass mix in the spring.

See article about the Swan River National Wildlife Refuge wetland restoration project for more information on that 600+ acre project!

Luke Lamar, *Conservation Director*
Swan Valley Connections
(406) 754-3137, luke@svconnections.org

Swan pair and their three cygnets on Glacier Slough



A view of the Lindy Ridge prescribed burn from Lindbergh Lake

MPG NORTH

MPG North's 200 acres lie in the Cooney Creek watershed. Our organization is improving the habitat, providing security, peace, and quiet for wildlife. Recently, our major project has been protecting Westslope Cutthroat and Bull Trout in Cooney Creek. These native fish have long shared the stream with Eastern Brook Trout, non-native fish that crowd every pool and undercut bank. But in 2018, we observed the first invasion of Rainbow Trout into Cooney. The cutthroats in Cooney harbor relatively pure DNA, and with the threat of rainbow-cutthroat hybridization imminent, we and our partners rapidly mobilized to remove the non-native fish.

Since 2019, we've electrofished Cooney every year, targeting areas with non-native fish. Non-native fish are euthanized, and native fish are promptly returned to the cold, clear water. In 2022, we caught 60% fewer brook trout and 37% more cutthroats. We've kept rainbow numbers very low and restricted them to the lower reaches of Cooney; so far, cutthroat genetics haven't changed. And although Bull Trout aren't numerous in Cooney, there are 83% more of them than there used to be.

Whatever progress we've made started with pure serendipity. We truly caught the first invading rainbow trout in Cooney, an improbable wonder. This only happened because all of us have been working together, paying attention, and caring about what happens to native fish. Thanks to the Swan Native Fish Committee, MT Fish, Wildlife & Parks, the Rocky Mountain Research Station, Swan Valley Connections, and landowners along Cooney, native fish there have a chance. But electrofishing won't keep Rainbow Trout out of Cooney forever. A fish barrier must be constructed, which is a challenge in Cooney Creek. We are working on a solution and hope to talk more about this with everyone in the coming year.

Beau Larkin, *MPG North Manager and Forest Ecologist*
MPG Ranch
blarkin@mpgranch.com

USFS - FLATHEAD NATIONAL FOREST

- Mid Swan Project moved into the consultation process with the USFWS.
- Cold Ponds wetland restoration was completed with help from NFF for contract administration with the exception of one culvert that will need to wait until next summer.
- The District added two new recreation management positions and an additional silviculturist position to its organization. We are expecting the positions to be filled by sometime in January.
- Our fire organization acquired a Type 4 wildland fire engine to replace one of our Type 6 engines. This results in added fire suppression and prescribed fire capabilities.
- Utilizing Great American Outdoor Act funding, we were able to complete additional work on the district including roof replacement on cabins and trail work.
- We have a new campground concessionaire that will be beginning on January 1st for the Swan Lake, Holland Lake, and Lindbergh Lake campgrounds.
- In October we completed the Lindy Ridge prescribed burn resulting in over 1,500 acres of fuels treatment helping implement some of the recommendations of the Seeley-Swan Community Wildfire Protection Plan to reduce fuels near and adjacent to private land and residences within the WUI.
- We implemented the District's first Wyden Authority prescribed fire burn with partners on private land. This was part of the Valley Bottom Prescribed Fire project that treated fuels in the Swan Valley last spring.
- The District saw a higher than average number of fire starts last year and was successful in full suppression.
- We had multiple bear incidents at Van Lake, Owl Packer Camp, and Holland Lake Campground from bears that caused damage from receiving food rewards. We also were challenged with a lot of food storage order violations in the campgrounds this year by the public.
- We conducted the scoping for the proposal at the Holland Lake Lodge.
- The District conducted field reconnaissance work for identifying vegetation forest health and fuels needs in the Rumbling Owl project area located generally between Rumble Creek and Owl Creek.
- Processed several recreation residence transfers.
- Conducted a review of potential emergency services boat access sites for rescue needs on Holland Lake.
- Implemented a non-native brook trout removal effort on Smith Creek.
- Completed a hand pulling effort for removal of invasive fragrant water lily on Holland Lake.
- Conducted trail clearing and maintenance with crews and partners.
- Active sale area work was performed in Beaver Creek Stewardship, Glacier Loon, Swan Flats Stewardship, and Lunar Kraft.

Christopher Dowling, *Swan Lake District Ranger*
USFS Flathead National Forest
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SWAN VALLEY BEAR RESOURCES

In 2022 SVBR distributed 59 bear-resistant garbage containers to local residents, which was more than any previous year. Currently, 405 containers and 28 dumpsters have been distributed to community members or businesses as part of the program throughout the Swan Valley. We also assisted eight residents with construction of permanent electric fences. For three of the resident locations, SVBR built electric fences that had experienced previous bear conflicts due to chickens, livestock grain, and orchard fruit, while the other five locations included residents eager to take proactive preventative measures to secure chickens, ducks, livestock grain, and orchard trees.

SVC staff responded to multiple bear conflicts when FWP grizzly bear management specialists were overwhelmed with other conflicts. In these situations, SVC staff installed temporary electric fencing and/or critter gitters, deployed trail cameras to monitor bear activity, provided bear resistant garbage cans, picked up garbage from broken trash cans, picked fruit from trees, and coordinated all conflicts and related activities with bear managers

As part of our education and outreach efforts, we hosted a virtual Spring Bear Wake-up Social with a presentation by FWP Research Biologist Lori Roberts on grizzly bear biology, habitat connectivity, awareness, and conflict management; a bear awareness event at the Bigfork VFW that featured a presentation by FWP Stewardship Outreach Specialist Danielle Oyler; and our popular summer event, the Bear Fair, at the Swan River community hall in the greater Ferndale/Bigfork area. In addition to these events, SVC staff created a Bear Fair How-To video, available on our Vimeo and SVBR "Events" page (found through the link below). SVBR partnered with the *Bigfork Eagle* to publish monthly bear awareness columns and increased efforts in the greater Bigfork area thanks to our volunteer arm called Bear Aware Bigfork (BAB).

To view the full Swan Valley Bear Resources 2022 Annual Report, visit http://www.swanvalleyconnections.org/swan-valley-bear-resources

Luke Lamar, *Conservation Director*
Swan Valley Connections
(406) 754-3137, luke@svconnections.org

MONTANA FISH, WILDLIFE & PARKS - WILDLIFE

Each spring, at the height of green-up, FWP conducts spring recruitment surveys to monitor whitetail fawn production and survival. On April evenings, when deer congregate along roads and fields, feeding on the first green shoots of the season, we drive a prescribed route, counting deer and classifying them as either fawn or adult. While the total count is influenced by many factors beyond the size of the local whitetail population, the proportion of fawns to adults provides a good indication of population trajectory. For the past ten years and beyond, fawn recruitment has correlated strongly with total hunter harvest. When we see recruitment above 40 fawns per 100 adults, we anticipate a growing population and greater hunter harvest; when recruitment falls below that, we expect decline.

Fawn recruitment is influenced by several factors, chief among them is winter severity as measured by snow depth and temperature. Below 10-degrees Fahrenheit, deer expend energy to stay warm. Winter survival of fawns, as well as birth weights of next year's brood, decrease with winter severity. Thus, a hard winter has a two-season-reach, impacting survival of fawns on the ground, and those to be born in the coming spring. Predation too can impact fawn survival, and studies out of Idaho suggest that black bears, mountain lions, and bobcat do take a number of whitetail neonates – fawns younger than six months. A harsh winter can trump all other factors.

This year, following the third consecutive spring of positive recruitment (exceeding 40 fawns: 100 cows) FWP again provided antlerless opportunity during the first week of the season, the first time since 2018. Doing so helps relieve pressure on young bucks, provides additional opportunity, and maintains regulation consistency across NW Montana. All said, throughout the hunting season we heard from hunters that this year was a tough one for hunting the Swan. Folks were seeing lots of tracks – of bears and wolves, but not those of whitetail deer. Some questioned whether we should be harvesting any does given the lack of sign. Regardless, although down slightly, harvest numbers at our Game Check Station south of Ferndale were comparable to 2021. We will have a better picture of the 2022 game season later this winter after our hunter phone survey is complete, but as of yet, we wait for what this winter will bring and how it will impact fawn recruitment next spring.

Franz Ingelfinger, *Kalispell Area Wildlife Biologist*
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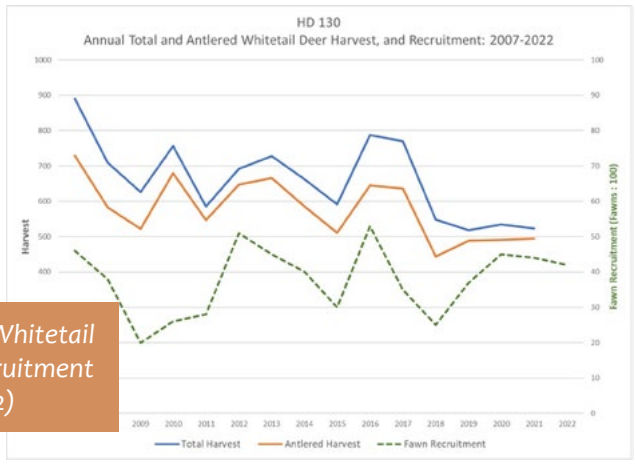

Annual Total and Antlered Whitetail Deer Harvest and Fawn Recruitment in HD 130 (2007 - 2022)

SWAN VALLEY CONNECTIONS
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UPCOMING EVENTS

Please check our website or call (406) 754-3137
for the most up-to-date information.

JANUARY 23
Bubble Cap Orders Open

JANUARY 28
Wildlife Tracks & Sign Class

FEBRUARY 4-5
Weeked Warrior Master Naturalist Begins!

FEBRUARY 17
Artist-Wilderness-Connection Application Closes

MARCH 10-18
Spring Break 1- Weeklong Wildlife Tracks & Sign Course & Certification

MARCH 18-26
Spring Break 2- Weeklong Wildlife Tracks & Sign Course & Certification

MARCH 20
Bubble Cap Orders Close

APRIL 5
Community Potluck & Presentation (hybrid event)
Annual Spring Bear Wake-Up Social

APRIL 21
Pile Burning Workshop
Swan Legacy Forest

APRIL 28
Tree Planting Workshop
Swan Legacy Forest