Obtawaing Case Studies

June, 2023

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Outline

Purpose Statement

Case Studies

The SMAP/GLOBE Partnership| Citizen Scientists Measure Soil Moisture
Project BudBurst | Citizen Scientists Track Seasonal Plant Changes
The Monarch Larva Monitoring Project | Citizen Scientists Monitor Monarch
Butterflies

Endangered Species
White Fish River Stocking Project by TNC, Tribal Partners, and MDNR
The Great Lakes Piping Plover

Large Landscape Conservation

Greater Sage Grouse Conservation Plan
Altar Valley Conservation Alliance
Wallowa Resources

1. Purpose Statement

To learn from past efforts to address common problems that affect OBR
To learn from outcomes of different efforts to address Climate Change on a regional
scale
Create an accessible document for partners and anyone else to read about case
studies that concern issues that OBR seeks to address

2. Case Studies

Forest Carbon

[Big Wild Michigan DNR Forest Carbon Project (2020)](#)

Contact: Stephen Handler, Climate Change Specialist, US Forest Service Northern Institute of
Applied Climate Science 906-482-6303, stephen.handler@usda.gov

Summary: Michigan agreed to limit logging at the 110,000-acre Pigeon
River Country State Forest and sell carbon offsets to a local utility.
Carbon offsets are calculated based on tree carbon sequestration capacity
over time

DTE Energy, a Detroit- based energy company purchased the first 10 years of carbon offsets from the DNR project.

> They plan to sell these credits to larger industrial DTE clients that want to offset their carbon emissions.
>
> Also available to residential and small businesses who want to reduce their carbon footprint

Project development was completed in 2022 with DTE Energy purchasing the first decade of carbon offset credits. The total project term is 40 years. Carbon storage capacity will be assessed annually by Bluesource, and then the resulting carbon credits will be sold.

Project creates a portfolio of carbon offset credits generated from sustainable forest management activities.

Michigan is the first state in the US to enroll a forest system into a carbon offset program

Revenues will be invested into DNR sustainability, climate change adaptation or mitigation efforts.

Innovation: In past carbon credit programs, credits are sold to many different clients, but in this program, all credits are sold to one "anchor tenant" who distributes the carbon credits and will support the project for 10 years

Developments: Another project, Wolverine- Copper Country Forest Carbon Project, is taking inspiration from this project and became the second forest carbon project. Development began in 2022 and is located on over 120,000 acres in the northern lower and western upper peninsula (overlaps with OBR) in the Jordan River Valley and Keweenaw Management Area. Contractor Anew Climate is now seeking a buyer for the carbon offset credits.

Bishop Forest Project- Large Scale Compliance Forest Carbon

Summary: On 200,000 acres of timberland in Upper Peninsula Michigan, owned by The Forestland Group, sustainable harvesting resulted in enhanced carbon sequestration

Improved Forest Management (IFM) generated carbon credits by sequestering carbon at a rate above the regional average.

> Ensured that future landowners will maintain high carbon stocks

All 1.7 million credits issued in 2014 have been sold to compliance buyers, and is projected to reach 3 million credits in the first decade

The project property is also an important site for wildlife habitat (elk, white tailed deer, black bears, wolves, snowshoe hares, etc) as well as recreation

Innovation: The first compliance project successfully conducted on Timber Investment Management Organization (TIMU) land

Goodman Forestry Project- Balance of Hardwood Timber Management and Carbon Sequestration

Summary: On 28,000 acres of forest in northern Wisconsin, carbon offset generation and timber management are intertwined through sustainable harvest practices
700,000 ARB offset credits issued in 2015 and pre-sold to major compliance market participants
The project site is also important habitat for species like black bears, wolves, osprey, bald- eagles and for recreation.
Committing to maintain high carbon stock levels into the future
Similar to Bishop Forest Project

Wetland Restoration

[Prioritizing Locations for Wetland Restoration](#)

Contact: Laura Flessner; NOAA Coastal Fellow - Association of State Floodplain Managers & The Nature Conservancy, **laura.flessner**@tnc.org

Summary: The City of Sheboygan and Wisconsin DNR are restoring habitat at three project sites to support healthy native plants and animals, improve fish habitat, recreational opportunities, and to restore the capacity of the environment to filter pollutants and to reduce peak flows and potential downstream flooding.
Agricultural and urban development has resulted in the loss of 41% of the original wetlands in the Mullet River watershed and the removal of riparian vegetation and stream cover in the city of Plymouth.
Agriculture is dominant, covering 96% of the city.
Wetland restoration began by identifying sites where wetlands can be restored to filter pollution in upstream tributaries to help reduce pollution to Lake Michigan, and sites where ecosystem services like water retention/flood risk reduction could be reinstated .
Goal of the study: to identify where wetlands could be restored with relative ease and to develop a framework for prioritizing potential restoration sites based on their ability to store flood waters and capture nutrients.
  Criteria for Prioritization
    Wetland characteristics- the ability to store nutrients and slow the speed, and ultimately retain flood waters
    Potentially restorable wetlands- identified from a dataset from TNC

Connectivity to the River or Floodplain- hydrology and conveyance, correlates to a wetland's ability to reduce floods and capture nutrients

Measured by connectivity to floodplain headwaters and whether the area was incapable of growing crops due to the frequent presence of excess water

Precipitation intensity and frequency- correlates to run-off, which is a primary contributor or phosphorus and other nutrients to surface waters

Methodology

Site Selection- key stakeholders and project partners + local gov.

Data Collection- literature, aggregated data sets, and set of criteria for prioritization of restoration sites

Decision Support Tool Selection: project partners reviewed and compared multiple decision support tools that measure impacts of land use change and runoff

Data Analysis- OpenNSPECT used to model predicted runoff over study area under multiple climate scenarios , and potential restoration sites were prioritized

Restoration Impact Analysis- potential restoration sites that have high levels of desired ecosystem services to design "what if" management scenarios

Ancillary Analysis- potential restoration sites were analyzed and prioritized based on performance and compared to planned development

ii. **Lake County, Illinois Stormwater Commision Develops a Tool to Support Wetland Restoration Planning**

Contact: Mike Prusila Lake County Stormwater Management Commission Planning Supervisor 847-377-7713 mprusila@lakecountyil.gov

Summary: The decision support tool, created in ArcGIS, took existing wetland datasets from across the county, added hydrogeomorphic codes and National Wetland Inventory codes, and applied a modified protocol for a desktop functional analysis to Lake County's existing and historic wetlands to evaluate their ecosystem function. The Tool is used to determine which wetlands to conserve/restore.

Action Steps:

Convene relevant partners and raise necessary funds

Conduct necessary analysis to inform tool development

Literature analyses, site assessments, technical advisory group

Create publicly available tool to present results

Combine research results into an online mapping tool to help others plan wetland restoration

USFWS Wetland Inventory Lake County Decision Tool

Inventories have limited function for restoration planning because they simply denote existence, not functionality.

USFWS Dr. Ralph Tiner published a classification system to evaluate the significance of wetland functions by combining National Wetland Inventory codes and hydrogeomorphic codes for landscape position, landform, water flow path, and waterbody types.

Due to loss of historic wetland area and function, the Lake County commission implemented a "no net loss" wetland acreage policy, with a goal for net gain in wetland function to improve water quality and flood storage capacity.

There is a landscape level assessment created by MDEQ to make this tool [MDEQ Landscape Level Assessment](#) [Michigan Wetland Viewer](#)

[Status and Trends of Michigan's Wetlands](#) [Status and Trends Tool](#)

 They selected which functions would be evaluated for wetlands and water bodies in Lake County. The following functions were included:

> carbon sequestration, flood water storage, native fish habitat, nutrient transformation, sediment and other particulate retention, shoreline/streambank stabilization, stream baseflow maintenance, stream shading, unique wetland resources, waterfowl habitat, wetland-dependent bird habitat, wildlife movement corridors, woodland amphibian habitat

After updating maps and conducting field studies, the existing and historic wetland data were evaluated to determine the functionality of each wetland. The results were then incorporated into the online planning tool.

Timeline: 2015-2019

Outcomes: For example, the Commission used a draft of the potentially restorable wetland layer to identify a potential project location in the Des Plaines River watershed plan and was successful in obtaining [section 319 (Clean Water Act) grant](#) funding for wetland restoration at this site.

One potentially restorable wetland site identified by the decision support tool has already secured wetland restoration funding through a section 319 grant. The Commission used this site as a litmus test for the potentially restorable wetland layer in the tool. Mitigation bankers can also use the tool to identify areas to restore wetlands for selling bank credits. These projects will protect and restore wetlands for nutrient transformation and other functions.

Challenges: The sheer amount of data collected proved to be difficult to analyze and process. It required extensive staff hours as it was not always possible to automate the processes. Additionally, the right data were not always available. Some of the functions the Commission initially considered for evaluation included invertebrate species habitat, fish and shellfish habitat, beach habitat, shrub swamp habitat, groundwater recharge, forested swamp habitat, pollination, and coastal storm surge protection. However, for some of these, the Commission did not have

enough data to be used in the tool or they were of lower priority than the functions ultimately selected.

Mike Prusila, the Planning Supervisor for the Commission, gave the following advice: "If I had to do it all over again, I would try to get more staff involved in the geographic data work. There is some bias with only one person doing it and it takes a lot of time. I would absolutely keep the field assessment as it has helped make our tool more accurate and reliable. It lets the end-users know the tool has been field calibrated and provides a level of credibility."

c.`   Habitat Restoration

i.   [Climate Consideration for Habitat Restoration](#)

Contacts: Katherine Kahl, The Nature Conservancy, & Tara Baranowski, The Nature Conservancy . tbaranowski@tnc.org 419.707.4242

Summary: Lake Erie is in a state of decline due to development, conversion, drainage, and modified hydrology and sedimentation patterns with recurrent, harmful algal blooms plaguing the Lake and wetlands and shorelines of western. Lake Erie Biodiversity Conservation Strategy aims to restore 585 acres of coastal habitat in Ottawa National Wildlife Refuge.

Only 5% of the estimated original 307,000 acres of Lake Erie wetlands remain, and these losses continue. Land cover since 1800 has mostly converted from forests and wetlands to agriculture. Agricultural runoff has become a major source of pollution and nutrient loading in the lake since the 1800s

Goal to reinstate ecosystem services in wetlands and forests while also considering climate change impacts and conservation. Partners project enhanced resilience to climate change through improved water level control and conveyance to restored wetlands

Restoration managers elected the most "restorable areas", focusing on hydrologic reconnection, similar to Lake County criterion

They used Climate Wizard by The Nature Conservancy to analyze potential sites under alternative future climate scenarios. Also used Great Lakes Water level Dashboard (NOAA) to evaluate historic and future projections of water levels in the Great Lakes

Update: All restoration work has been completed

5 separate restoration sites within the Refuge totaling 585 acres

Blausey Tract - restored 100 acres of new emergen, herbaceous wetlands

Helle and MS#2 Tracts- restored 83 acres of forested uplands and wetlands

Kontz Tract- restored 33 acres of grasslands and sedge meadow

Blausey and Pool 2a Tract- create 170 acres of new fish habitat

Blausey, Helle, Kontz, and MS#2 Tract- enhanced 296 acres of fish and wildlife habitat

ii.   [Climate Adaptation Planning for Forest Management](#)

Contact: Stephen Handler, Climate Change Specialist, US Forest Service Northern Institute of Applied Climate Science 906-482-6303, stephen.handler@usda.gov

Summary: 80% of current birch and aspen stands in the Superior National Forest are old and dying. Additionally, and even more concerning, there is very little conifer regeneration in the understory of North Shore forests because of the low abundance of older pine and cedar trees . These forests are vital for wildlife habitat, as regulators of stream temperatures, and as scenic elements of the North Shore. Efforts are being undertaken to resort native plants like the white pine and white cedar to ensure the health and resilience of the forest .

European settlement and subsequent logging converted the once successful, conifer dominant North Shore of Lake Superior into a paper birch and quaking aspen dominated forest. Logging in the late 1800s to early 1900s removed most of the white pine and white cedar

The North Shore Restoration Project began in 2013 with collaboration from the Superior National Forest, State of Minnesota, and the Grand Portage Tribe to address this loss.

After initial assessment and planning for forest restoration, a robust assessment of potential climate change impacts of the region was included The collaborators utilized the Climate Change Response Framework,the USDA Forest Service Climate Change Atlas Tool and the recent climate change vulnerability assessment for northern Minnesota forests to inform restoration plans.

Project Procedure

> Step 1: Define project area, management goals and timelines
>
> Step 2: Asses climate risks and opportunities
>
> Step 3: Evaluate management objectives
>
> Step 4: Identify adaptation approaches
>
> Step 5: Monitor and evaluate effectiveness

"In order to understand how the climate is changing and what impacts these changes can have on coastal forests, observed and predicted changes in climate must be described, as well as the implications these changes have on other factors that affect forest health like succession, biodiversity, invasive species and disturbance regimes"

Outcome: In the implementation stage, I have not found any info on the outcome. Collaboration with landowners. Last updated in 2016

d. Invasive Species

i. Combating Invasive Species in the Les Cheneaux Watershed

Contact: Bridget Faust, Association of State Floodplain Managers bridget@floods.org

In Mackinac County in the UP, invasive Eurasian Watermilfoil, a rapidly growing aquatic weed, is contributing to declining fish populations, disrupting human water activity, and declining water levels.

The eurasian watermilfoil is a burden to the local community, with additional labor being required to maintain docks, harbors, and points of access. This problem is not getting any more manageable with climate change sure to add to these stressors
The Mackinac County community has paid $600,000 to invasive pest management
Les Cheneaux Watershed Council had managed eurasian watermilfoil using:

> Bottom dragging in channels
> Mechanical harvesting
> Native biological control fungus produced by the USDA
> Encouraging property owners to reduce milfoil

e.   Green Infrastructure

i.   [National Stormwater Calculator: Great Lakes Applications Webinar Archive](#)

Contact: National Stormwater Calculator: Jason Bernagros [bernagros.jason@epa.gov](#)
Great Lakes Restoration Initiative Case Study: Karly McMorrow [mcmorrow.karly@epa.gov](#)

Summary: The [Software application](#) developed by the EPA estimates the annual amount of rainwater and frequency of runoff from a specific location in the United States. It is being used to inform site developers on how well they can meet a stormwater retention target with and without the use of green infrastructure as well as performing screening level analysis of small footprint sites up to several dozen acres in size with uniform soil conditions. The software also allows users to consider how runoff may vary based both on historical weather and potential future climate. The estimates are based on local soil conditions, land cover, and historic rainfall records
The StormWater Calculator calculates annual gallons captured. It also features a robust collection of resources for applicants with varying skill sets, and uses consistent methodology when comparing applicants.
Outcomes: The Great Lakes Restoration Initiative used the SWC in green infrastructure (GI) projects to reduce the impacts of polluted runoff on nearshore water quality. Northeast Ohio Regional Sewer District's Green Infrastructure Grants Program used the SWC in GI grants program to achieve its ultimate goal of calculating gallons captured. The University of Michigan's Great Lakes Integrated Sciences and Assessments program used SWC to provide tribal natural resources departments with considerable time and costs savings and help to build their scientific capacity

f.   Citizen Science

i.   [The SMAP/GLOBE Partnership| Citizen Scientists Measure Soil Moisture](#)
Contact: Ming-Ying Wei Email: [mwei@nasa.gov](#)

Summary: In 2015, NASA launched the *Soil Moisture Active Passive (SMAP)* satellite mission to collect data on soil moisture around the world. The SMAP mission is in collaboration with the Global Learning and Observations to Benefit the Environment (GLOBE) Program to develop sound scientific protocols for citizens to use in collecting local soil moisture data. Through the *SMAP/GLOBE partnership*, student volunteers are taking measurements to determine the moisture content of their local soils, then comparing them to NASA satellite data.

The goal of this initiative is to foster scientific literacy and to allow citizens to add to existing knowledge about the environment.

Challenges: Data validity can be a concern with citizen science projects, however, this project addresses that by using a standardized protocol developed with input from *SMAP* scientists, and by requiring repeated observations in the same place over time.

Outcomes: *SMAP* benefits from the ground-truthing measurements collected by *GLOBE* volunteers, which help support the SMAP calibration and validation program. Additionally, *SMAP* gets feedback from students on how soil moisture information can benefit local communities. The partnership also builds public awareness of and appreciation for the *SMAP* mission and for *SMAP*'s high-quality data products.

The *SMAP/GLOBE partnership* case study illustrates the following steps in the Federal Citizen Science and Crowdsourcing Toolkit:

Design a Project — List Your Resources
In developing the infrastructure for global projects, especially the technology, remember that many countries have limited bandwidth for computer access. Although apps are becoming more popular in citizen science for data entry, community members from around the world can still have issues with access.

Build a Community — Engage Your Community
Creating a scientific protocol in a collaborative fashion takes time but pays off. Involving both scientists and educators in the process is key. Having scientists share their data analysis and findings encourages community engagement and ongoing data collection.

Manage Your Data — Analyze Your Data
Create a system that allows easy data entry and retrieval so that community members can access data quickly and effectively.

ii.   Project BudBurst | Citizen Scientists Track Seasonal Plant Changes

Contact: Elizabeth Blood : eblood@nsf.gov Sandra Henderson: shenderson@neoninc.org

Summary: In 2007, climate change researchers decided to engage volunteers in collecting data on seasonal changes in plants. Sponsored by the National Science Foundation and run by the National Ecological Observatory Network in partnership with the Chicago Botanic Garden, *Project BudBurst* is now a flourishing network of volunteers across the United States who monitor plants for seasonal changes

Project BudBurst has thousands of volunteers in all 50 states, with participants tracking more than 250 plant species. The volunteers can track any plant they choose, but project organizers encourage them to choose from among 10 plants in particular.

Each volunteer receives online training on plant monitoring, then they choose a particular plant to monitor location and seasonal changes

Challenges: As with most citizen science programs, recruitment and retention of volunteers is always a challenge.

Outcomes: By comparing the results to historical data, researchers can detect some of the long-term impacts of climate change, and data from *Project BudBurst* are already going into scientific studies across the country. This initiative is also good for engaging the public in science and connecting with the landscape.

The *Project Budburst* case study illustrates the following steps in the Federal Citizen Science and Crowdsourcing Toolkit:

[Scope Your Problem](#) — Know Where Your Project Fits
It takes considerable time and resources to successfully launch a new citizen science program. Take the time to understand the citizen science and crowdsourcing projects already available about your topic of interest and figure out how your project fits into that landscape. How can your project build on what is already being done? How can your project add value?

[Build a Community](#) — Engage Your Community
Participant motivation varies from community to community. Talk to the communities you wish to reach or who are interested in your project to decide whether you are on the right track. Work with potential partner organizations to understand their needs (for science, education and outreach) and their audiences/stakeholders.

[Manage Your Data](#) — Analyze Your Data
Analyzing and sharing data are an area of growth in citizen science and crowdsourcing. More tools are available for data sharing than ever before, and using the best ones for your project can help motivate your participants. Expect your methods of data sharing to evolve as new tools emerge.

iii. [The Monarch Larva Monitoring Project | Citizen Scientists Monitor Monarch Butterflies](#)

Contact: Karen Oberhauser info@mlmp.org Wendy Caldwell info@monarchjointventure.org

Summary: In the 1990s, researchers at the University of Minnesota decided to use citizen science to collect long-term data on monarch larvae and milkweed habitat in order to provide information that decision makers can use to help prevent the monarch's decline. The *Monarch Larva Monitoring Project* has grown to involve volunteers from across Canada and the United States.

Volunteers undergo training in different life stages of the butterfly and the milkweed and then are tasked with monitoring a specific site. Then they report on

the development of both species on a weekly basis from the first sprouting of milkweed.

Volunteers can elect to report on other data as well, such as parasitism and precipitation.

Challenges: Data validity can be a concern in citizen science projects, but the project addresses such concerns by using a standardized protocol and requiring repeated observations of the same species in the same place over time. The *MLMP* also offers in-person and [online training](), and all data are carefully checked before they are used for research purposes.

Another challenge is getting volunteers to report zeroes, or the lack of monarchs. As the monarch population declines, fewer and fewer monarchs are found during monitoring; this can discourage volunteers and cause them to not want to collect or submit data. *MLMP* staff work with volunteers to highlight the importance of knowing where monarchs are *not found*, as well as where they are present.

Outcomes: As of 2015, project participants had monitored almost 1,100 sites in 43 states and three Canadian provinces, along with the Mexican state of Jalisco. Data provided by citizen scientists have allowed the scientific community to track the health of monarch populations and the habitats they depend on, forming the basis for a growing number of scientific publications.

The *Monarch Larva Monitoring Project* case study illustrates the following steps in the Federal Citizen Science and Crowdsourcing Toolkit:

Manage Your Data **— Analyze Your Data**

All data entered on the *MLMP* website are immediately available to the public, letting people explore population data as they emerge. However, the project emphasizes that the initial data have not been vetted and should be used only for exploratory or teaching purposes, not for management or research. Researchers may request data that have been vetted and cleaned for analysis.

Sustain and Improve **— Communicate Effectively**

Maintain an active social media presence to recruit and retain volunteers and increase the visibility of your project. The *MLMP* uses bimonthly newsletters to update volunteers on project news and the status of the monarch butterfly. The newsletters also highlight the actions of outstanding volunteers, recognizing their achievements and inspiring others.

g. Endangered Species

i. White Fish River Stocking Project by TNC, Tribal Partners, and MDNR

Contact: Ryan Hermes TNC Phone: 517-999-7745 Email: ryan.hermes@tnc.org

In November 2022, 100,000 whitefish eggs in incubators were placed in the Carp River in order to re-establish Great Lakes whitefish populations. that migrate into rivers to spawn

Previously, there was a very low abundance of whitefish due to the disruption of spawning grounds by logging. Once the habitat was restored, the low abundance persisted because migration of whitefish to spawning grounds requires imprinting on the river where they hatch.

"Lake whitefish have been on the decline for over a decade and one of the main culprits is invasive quagga mussels filtering nutrients from the Great Lakes causing reduced zooplankton densities, which are the primary food source for young whitefish," said Jason Smith, assessment biologist with the Sault Tribe of Chippewa Indians

Kris Dey, hatchery manager for the Little Traverse Bay Bands of Odawa Indians. "By introducing whitefish as eggs, we are hopeful an imprinting mechanism will kick in right after hatch and help lead the adult fish back to the rivers they hatched from." In April, 2023 electrofishing boats were deployed to sample whitefish populations in the river.

ii.　　　The Great Lakes Piping Plovers

Contact: jillian_farkas@fws.gov

Summary: Piping plovers have become endangered as a result of habitat loss from changing lake levels and coastal development and nest disturbance by human activity (vehicles, foot traffic, and pets). From merely 11 nesting pairs recorded in 1980, efforts from 2011 on have resulted in a recorded 76 nesting pairs in the region.

Piping plovers traditionally nest on gravel and pebble beaches

The Great Lakes Piping Plover is a federally listed endangered species and is at risk of becoming extinct. This small bird species is a resident in the Great Lakes region from mid-April to mid-August. During the winter, Piping Plovers can be found along the Gulf of Mexico and the southeast Atlantic coast.

Since 2011, multiple stakeholders including the Superior Watershed Partnership, Great Lakes Conservation Corps and USFWS, MDNR and USFS have worked to combat these threats to the piping plover through invasive species removal, implementation of shoreline barriers to vehicle traffic, and the installation of signage near nesting sites.

When the piping plovers return in spring, wildlife monitors in the sleeping bear dunes begin watching their activities. Once they start establishing territories, staff and volunteers rope off the nesting areas. This prevents disturbance which might cause the birds to abandon their nests, as well as protecting eggs from being stepped on accidentally.

Once a nest has been found, trained staff build an enclosure, a wire fence with a mesh top, around the nest site. This prevents predators such as dogs, gulls, crows, and raccoons from taking the eggs, while allowing the plovers to pass easily in and out.

During incubation, each pair of piping plovers is checked daily to make sure that both are present and taking care of their eggs. If something should happen to one of the pairs, the other is likely to abandon the nest. In that case, park personnel will transport the eggs to the University of Michigan Biological Station to be raised in captivity and released when they are independent.

As part of the piping plover monitoring and recovery efforts, each bird is banded with colored bands that identify it. Color bands allow researchers and park staff to keep track of longevity, faithfulness to nest sites and mates, and genetics, among other things.

f. Large Landscape Conservation

      i.   [Greater Sage Grouse Conservation Plan](#)

Contact : **BLM_HQ_GRSG_Planning@blm.gov**

Summary: Greater sage grouse are dependent upon the sagebrush rangelands in the western US, they are endangered and endangered species protection laws threaten to impact ranchers in areas of grouse habitat. To overcome potential conflict, ranchers, states, and the federal government are working together to generate a conservation plan that protects sage grouse and allows for continued use of land for ranching.

Greater sage grouse inhabits 150 million acres of sagebrush-steppe habitat in the west. This 150 acres also supports western rural economies that depend on outdoor recreation, farming, energy development, and small businesses.

The conservation and restoration of the sagebrush ecosystem is a collaboration between many stakeholders including federal, state, and private land managers.

In 2015, the U.S. Fish and Wildlife Service found that listing the greater sage-grouse under the Endangered Species Act was 'not warranted' because the primary threats to the species had been ameliorated with conservation efforts on federal, state and private lands. These efforts included BLM and U.S. Forest Service land use plans for conserving, enhancing and restoring sagebrush ecosystems across the West.

These plans designated habitat management areas and sagebrush focal areas (SFAs), and recommended withdrawing SFAs from mineral extraction. In 2017, the Trump administration canceled evaluation of SFA withdrawal before completing an environmental review of the proposed action. In February 2021, a U.S. District Court judge ordered the BLM to continue considering whether SFA withdrawal is needed for sage-grouse conservation and to re-initiate the NEPA process; BLM re-started this process in August 2021.

The BLM's sage-grouse plans designate *habitat management areas* (HMAs) and identify management actions intended to avoid and minimize loss of habitat due to other uses of the lands

From 2016-2020, the BLM improved over 2.6 million acres of sagebrush-steppe in the West by removing invasive vegetation and encroaching conifers, building fuel breaks, and other measures. Additional acres are conserved or restored by state and local government agencies and private and non-governmental partners.

The BLM manages 67 million acres of sagebrush-steppe habitat, and despite their efforts, sage grouse populations are still declining from various influences, including climate change, the effects of which have hindered habitat conservation and restoration.

From 2016-2020, the BLM improved over 2.6 million acres of sagebrush-steppe in the West by removing invasive vegetation and encroaching conifers, building fuel breaks, and other measures. Additional acres are conserved or restored by state and local government agencies and private and non-governmental partners.

In response, the BLM, and other stakeholders are revising their original plan for restoration to account for changing influences while also continuing their efforts

ii.   [The Altar Valley Conservation Alliance](#)

[contact](#)

Summary: Located in southern Arizona, the Altar Valley Conservation Alliance is focused on conserving trading ranching lands through cooperation with local government conservation initiatives, reintroducing fire into the semi-arid grassland ecosystem of the area, and restoring native grasslands by managing soil erosion and runoff. The Alliance is rancher organized and lead, but has participation from local and federal government officials, other community members, and the University of Arizona.

Collaborative organization recognized as a 501 ©3 not for profit

Committed to soil and water conservation, wildfire management, habitat of native species, and other environmental initiatives as well as promoting a thriving agricultural community by encouraging better ranching and farming practices through diversification and innovation, and supporting policies that support long term economic development.

Funding from Arizona Dept. of Environmental Quality to install a mesquite herbicide treatment on three ranches over 2,00 acres to promote desert grassland, improve soil conservation, and reduce sediment discharge.

The South Legunita Grassland Restoration Project, a 1,100 acre habitat restoration area of collaborative conservation taking place on the Santa Margarita Ranch, which comprises semi-desert grassland and borders the Buenos Aires National Wildlife Refuge. Mesquite overgrowth on the land encroached heavily on the the grassland habitat and outcompeted native grasses that provide food for grassland obligates and livestock. This restoration project would enhance ecosystem function of ecosystems across a large area, positively impacting grassland obligates like bobwhite quail and pronghorn.

The main method by which this plan would improve grassland habitat is through invasive species control through physical maintenance. The land managers excavated mesquite trees with heavy machinery, then pile the brush to provide cover to mule deer and other wildlife across 1100 acres.

They conducted this in 5 phases that tackled large swaths of land at a time.

This project in combination with adjacent restoration projects, created around 3000 acres of continuous grassland habitat, to the benefit of obligate grassland species.

The success of this project has sparked conversations about increasing the project's scope and size and in 2021, additional funding was received to clear an additional 1000 acres of mesquite trees.

Additionally, the Altar Valley Watershed Working Group visited the site to begin work on a project that would increase the site's infrastructure water holding capacity and allow water from the spillway to cover the landscape and encourage grass growth post excavation. The habitat is also being evaluated as a potential site for wildlife release.

This is just one project on the Altar Valley Conservation Alliance's roster, others featured on the website include an Altar Valley Watershed Plan, Alta Valley Fire Management Plan, Altar Valley Watershed Resource Assessment, Elkhorn/Las Delicias Watershed Restoration Demonstration Project, Habitat Improvement Projects: Noon Ranch Arroyo Restoration, Sediment Discharge Reduction Through Brush Management in the Altar Valley

iii. Wallowa Resources

Contact: 541-426-8053 | info@wallowaresources.org

2021 Annual Report

Summary: Wallowa Resources is a community driven nonprofit organization that is dedicated to protecting the landscape, increasing economic opportunity, and well being in Wallowa county and in rural communities beyond. Created in response to the immense loss of jobs during the shutting down of sawmills from changing national forest management in 1996, Wallowa Resources is now a national model for community-based solutions.

Wallowa Resources supports the collective effort of landowners, local businesses, and community members to sustain and enhance the County's natural resource economy in the face of urbanization and uncertain futures for rural communities through land stewardship, educational opportunities, and job creation.

Currently, they are supporting large landscape forest and rangeland restoration initiatives, outdoor youth education programming, expansion of paid training opportunities for the workforce, and an affordable housing initiative

To date, they have treated 3,667 acres for noxious weeds, conducted 551 hours of natural resource based education, and collaboratively manage 424,000 acres of forest on public and private land.

Partnering with a wide range of public and private stakeholders, Wallowa resources seeks to identify solutions to reduce wildfire risk, increase landscape resilience, improve forest health, protect water quality, support sustainable forestry and natural resource jobs and livelihoods, and increase the public's understanding of healthy forests and ecosystems.

Some restoration initiatives

Wallowa River Restoration Project

5th generation private landowner initiated a project to restore fish habitat along a stretch of Wallowa River that ran through his land. Partnering with Oregon dept of fish and wildlife, and the Confederated tribes of the Umatilla Indian Reservation, a channel was created that now houses steelhead and chinook salmon that now spawn annually in the channel. This project, as well as others along the Wallowa and Lostine Rivers have aided in the return of Coho salmon to the region for the first time in 40 years.

Lick Creek Culvert Replacement

Largest watershed restoration project to date. The failing culvert was identified as a barrier to juvenile salmon by the Nez Perce Tribe. It obstructed access to 2.5 miles of spawning and rearing habitat for steelhead salmon, 1 mile of rearing habitat for juvenile spring Chinook salmon, 5 miles of spawning and rearing habitat for bull trout, and 2.5 miles of spawning and rearing habitat for Pacific lamprey. The culvert was replaced with a 40ft concrete bridge and a newly constructed stream channel with additional pool structures to enhance channel habitat complexity. USFS called it "one of the best culvert replacement projects that they've seen in the last 15 years"

Upper Wallowa River Restoration

1.5 miles of Wallowa and West Fork Wala rivers, a large tourist attraction, project initiative to rebuild the Wallowa Lake Dam to allow for fish passage, thereby enhancing and restoring habitat for Kokanee, bull trout and Sockeye salmon .
Goal to improve habitat while protecting public and private property and capitalize on project location to provide environmental outreach to more than 500,000 park visitors each year and local youth through the Wallowa Resources outdoor education program

Upper Joseph Creek

174,000 acres of federal and private land containing creeks, open prairies, and dense forests, as well as century old ranches and livestock operations, small-scale logging and fuel reduction, and habitat work. Land used continuously for 8,000 years, beginning with the Nez Perce Tribe.

A diverse group worked together to assess Upper Joseph Creek in four aspects: *riparian*, *rangeland*, *forest & fuels*, and *roads & recreation*. Based on this information, the group made recommendations for improving habitat and natural functions. These improvement projects created jobs as well.

> *Riparian:* poorly maintained roads and culverts from past projects blocked access of steelhead and salmon to upstream habitat. With local partners, they conducted removal of fish barriers, restoring natural channel flow to over 32 miles of the Doe, Elk, and Chesnimnus Creeks
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> *Rangeland*: the majority of Upper Joseph Creek is working rangeland. Assessments of fences, water developments, and invasive plants inspired projects to improve animal production and distribution, and relieved livestock pressure in riparian areas.
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> *Forests and Fuels:* The local forests are dependent on fire disturbance to maintain diversity. Past practices of overstory logging and fire suppression altered community composition. By combining prescribed burns and tree thinning/harvesting of Grand fir, they improved habitat quality.
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> *Roads and Recreation:* over 815 miles of road criss-cross Upper Joseph Creak at a density of over 2.5 miles of road per square mile, which exceeds USFS standard. Road access is valuable to ranchers, hikers, hunters, campers, loggers, and Nez Perce Tribe. After review of the road network, bridges and roads were repaired, and gates for seasonal road closures were installed, and 28 culverts were removed, improving road conditions and fish habitat.