

Our Mission

The mission of the Powder Basin Watershed Council is to facilitate community-supported maintenance and restoration of streams, rivers, and lakes within our watersheds.



Powder Basin Watershed Council

<https://www.powderbasinwatershedcouncil.org/>

2023 Annual Report

By PBWC Staff:

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INTRODUCTION

Initially, known as the Baker County Water Advisory Board, the Powder Basin Watershed Council (PBWC) consisted of professionals in natural resource management and water resources. In 1995, the state of Oregon authorized and began funding watershed councils throughout the state to bring the public into the process of improving the states' watersheds. Originally under the auspices of the Baker County Commission, the PBWC formed an independent 501(c)(3) corporation in 2008. The PBWC was run entirely by volunteers. This included the developing of projects, compiling and publishing data in watershed assessments, and managing the organization. Eventually, funding was acquired to hire a coordinator which served as the organization's backbone and now the PBWC has a full-time Executive Director funded primarily by a watershed council capacity grant from the Oregon Watershed Enhancement Board (OWEB).

The PBWC implements its Mission to facilitate community-supported maintenance and restoration of streams, rivers, and lakes within our watersheds across the Powder River, Burnt River and Brownlee subbasins. The PBWC's Vision is that the Powder Basin watersheds are healthy and meet the needs of the people and the environment.

2023 brought further strengthening of the organization, supported primarily by continued success in the development and funding of a diversity of aquatic restoration projects, acceptance by the landowner community of PBWC's role as Sage grouse Candidates for Conservation with Assurances program (CCAA) lead in Baker County, completion of our Strategic Plan refresh and beginning development of a Watershed Restoration Action Plan. In addition, several projects are under development and design for implementation in 2024 and 2025 including Trout Creek Ecosystem Resiliency, Johnny-Bill Irrigation Efficiency, Uplifting Anthony Creek for Native Trout and Beaver, Love Reservoir Mesic Restoration for Ritter Creek and Eagle Creek Floodplain Restoration.

The FY 2023 operating budget of nearly \$1 million, is the largest in the organizations history, supported also by a record volume of project implementation. Implementation activities occurred on four restoration projects including Camp Creek Ecosystem Resiliency, Pine Creek Fish Habitat Enhancement, Cusick Creek Restoration Phase II and Cusick Creek Restoration Phase III. Project development and implementation in 2023 also exemplifies our strengthening partnerships with the Wallowa Whitman National Forest, Idaho Power Company, Trout Unlimited and Sage Grouse Local Implementation Team.

Fulfilling a long-term goal of the PBWC, we secured funding in late 2022 to move forward with updating of our Strategic Plan and developing a watershed restoration action plan to guide the PBWC's activities over the next ten years. In early 2023, Madison O'Bryant joined the PBWC team as Watershed Restoration Coordinator to lead the planning effort and engage with stakeholders to develop project opportunities. Through the course of 2023, Madison worked with a stakeholder group (including the PBWC Board of Directors) to update the Strategic Plan, which was officially signed by the Board of Directors in November and begin the action

planning process by engaging both a Technical Team and Stakeholder Group. We anticipate completion of the Action Plan in Fall of 2024.

Water Quality Monitoring Specialist, Justin Thorson, has continued to strengthen our basis for project development by continuing to collect data on watershed condition through implementation of the OWEB-funded Long-Term Water Quality Monitoring – Enhanced project and funding received to continue monitoring of aquatic macroinvertebrate communities in 2024, first data collection by PBWC occurred in 2018. Funding for this project was acquired from OWEB and the Wildhorse Foundation.

MONITORING & ASSESSMENTS

Baker LIT Restoration Project Monitoring (OWEB Grant 222-8206-19958) and Tri-County CWMA Contract)

The project location is the Baker LIT Sage grouse planning area, focused on the Baker PAC, (identified as Core Area by ODFW), and an area near Unity, Oregon which includes leks with high attendance that were discovered after the designation of core areas. The Baker LIT planning area includes sage-grouse habitat located in Baker and Union counties. The Baker Sage-grouse Partnership’s targeted ecological outcome is to increase the quantity and quality of sage-grouse habitat and ultimately increase the Baker sage-grouse populations. The Baker LIT completed its initial Baker PAC Comprehensive Sage-grouse Threat Reduction Plan (TRP) in 2017. This plan represents the team’s local work plan to guide activities to reverse the sage-grouse population trend in Baker County. The Baker LIT planning area encompasses 1.4 million acres of private and Bureau of Land Management (BLM) land (excluding U.S. Forest Service lands because they are typically avoided by sage-grouse); approximately 70% of the planning area is privately owned. Implementation of restoration activities outlined in the TRP and Baker LIT Sage-grouse Strategic Action Plan (SAP) are ongoing. Effective monitoring of the restoration projects is included as a guiding principle in the Partnership’s SAP. The Partnership developed a monitoring framework for all LIT restoration projects. Monitoring components include restoration information (geospatial data, implementation details, target restoration goal), landscape condition (ecostate monitoring), and plot-level vegetative surveys. Pre-treatment monitoring occurs as well as annual post-treatment data collection.

The PBWC hired back Val Haworth as our Biological Technician, leading FIP restoration monitoring data collection for Tri-County Cooperative Weed Management Area, Baker County, and PBWC Sage grouse restoration projects for the 2023 season. In addition, two Seasonal employees were hired to assist in completing the monitoring work.

PBWC Strategic Plan strategies addressed: 2.D, 3.E, 3.F, 6.B, 6.C

Long-term Water Quality Monitoring (OWEB Grant 221-5058-19515)

After a one-year hiatus due to a COVID-19 related break in funding, an OWEB grant was secured to fund water quality monitoring 2022 through 2024. In addition to monitoring done as part of the past grant (OWEB 218-5055-15953), measurement of E. coli bacteria and phosphorous in the Burnt River and continuous monitoring of dissolved oxygen throughout the basin were added.

After an extended recruitment process where the number of qualified applicants was limited, we hired a highly qualified candidate, Justin Thorson, as our Water Quality Monitoring Specialist to lead the project. Justin recently received his Master of Science degree in Fisheries Science at Oregon State University.

Justin successfully re-launched the water quality monitoring program in 2022 with the support of four volunteers that have been long-term participants. The U. S. Bureau of Reclamation (BOR), Wallowa Whitman National Forest (WWNF) - Whitman District, Oregon Department of Environmental Quality (ODEQ), and Burnt River Irrigation District (BRID) were critical partners. The WWNF monitored water temperature at 15 sites in the North Fork Burnt River Watershed. The BRID collected monthly samples of E. coli and phosphorous on the Burnt River and monitored flow on the South Fork Burnt River. The U.S Bureau of Reclamation laboratory in Boise, Idaho did analysis of E. coli and phosphorous samples. ODEQ provided direction and assistance with developing a new Quality Assurance Project Plan (QAPP) and provided training for project volunteers.

In 2023, the Monitoring Coordinator, PBWC volunteers, and partner organizations took grab samples of dissolved oxygen, conductivity, pH, and turbidity at 56 monitoring sites throughout the Powder Basin. While several past volunteers were unable to assist in water quality samples this year due to time conflicts, three volunteers, including one new volunteer, spent 120 hours visiting 13 sites in the Pine and Eagle Creek watersheds in 2023. Grab sample data quality was improved from 2022 due to replacing older probes and better tracking of data, with every parameter showing a higher percentage a “A” grade sample data (96% on average) in 2023 when compared to 2022.

2023 was also important for continuous temperature monitoring efforts in the basin. The PBWC received \$1,170 of funding from volunteers, partner organizations, board members, and the public to replace 15 non-functioning temperature loggers. These new loggers brought the total number of temperature loggers replaced since 2022 to 35. In total, the PBWC installed temperature loggers at 35 sites, with the Wallowa-Whitman National Forest installing temperature loggers at an additional 15 sites in the North Fork Burnt River watershed. All but two temperature loggers were found and downloaded during the 2023 field season, including one logger that was lost during the 2020 field season.

PBWC’s DO monitoring efforts were greatly enhanced by the addition of four Onset U26 Dissolved Oxygen loggers lent to the PBWC by DEQ, which augmented the council’s MiniDOT DO loggers. This allowed the council to deploy DO loggers at a larger number of sites for a longer period of time, along with allowing direct comparisons between the U26 and MiniDOT

loggers to identify measurement adjustment curves. Both types of loggers were deployed at 13 Redband spawning locations in Spring and 7 Bull Trout spawning locations in fall (Figure 1). The loggers identified locations and time periods where low oxygen levels might present impairments during spawning season, particularly later in the spring at the Powder River near the Sumpter Valley tailing piles, at Deer Creek above Phillips Reservoir, and at the Powder River below Keating Valley.



Figure 1. Dissolved Oxygen logger installed on Lake Creek.

While *E. coli* and phosphorus monitoring started earlier than in 2022, coordination throughout much of the season was difficult due to unforeseen circumstances with Burnt River Irrigation District personnel, resulting in fewer overall sampling events in 2023 compared to previous year. There were also some coordination issues with the Bureau of Reclamation laboratory in Boise regarding the analysis of samples collected after the hurricane runoff event in late August, unfortunately resulting in no data for this sampling event. Despite these difficulties, the bacteria and nutrient surveys provided important information regarding trends in bacteria and nutrient concentrations in the Burnt River (Figure 2). The most notable difference was that *E. coli* concentrations in 2023 were an average of 4.8 times higher for all sites when compared to similar time periods in 2022, and with an earlier spike in concentrations, likely due to heavy flooding in the spring. Similar reductions in *E. coli* concentrations were found through the Burnt River Canyon reach, with an average decrease in *E. coli* of 87% between our Burnt River sites at Clarks Creek Bridge (above the canyon) and Upper Durkee (near the bottom of the canyon). The phosphorus data didn't show as much of a difference when comparing years, although a similar trend of higher concentrations below Unity Dam later in the season compared to the other sites was observed in both 2022 and 2023.



Figure 2. Monitoring site on the Burnt River at Clarks Creek Bridge.

PBWC Strategic Plan strategies addressed: 6.A, 6.B

Powder Basin Macroinvertebrate Status and Trend Monitoring (OWEB 223-5048-23000)

The PBWC successfully applied for an OWEB grant to survey aquatic macroinvertebrates throughout the Powder Basin as a continuation of surveys conducted in 2018. These efforts will

be useful in gauging trends in water quality, assessing the impacts of beaver restoration on aquatic macroinvertebrate communities, and identifying major impairments that reduce biodiversity in streams. The surveys will take place at 44 sites between mid-August and mid-October of 2024, with sample identification provided by Cole Ecological and analysis of biodiversity by DEQ. This will also complement our long-term water quality monitoring efforts by providing useful comparisons to biological data and in identifying possible locations where restoration efforts may benefit water quality, macroinvertebrates, and other important uses.

RESTORATION

Camp Creek Ecosystem Resiliency (OWEB Grant 222-5016-19918; OCRF Grant, OCRF 2021-29, USFS grant)

This project is on Camp Creek in the North Fork Burnt River (NFBR) watershed, approximately 45 miles southwest of Baker City, north of Whitney Valley on lands administered by the WWNF. Watershed issues being addressed are: 1) degraded groundwater recharge and water storage functions, 2) limited water table maintenance supporting narrower riparian vegetation communities, 3) limited zones for water quality filtering, and 4) excessive bank erosion resulting in streambeds with abundant fine silts. Throughout the 2.5-mile project reach the creek is incised, not connected with its broad historic floodplain, and beaver are not present. The result is a stream with a current riparian vegetation community consisting of sagebrush and/or lodgepole pine, instead of multiple species of willow, simplified aquatic habitat and one that is more efficient at routing water out of the system. Both Camp Creek and the NFBR experience low summer base flows and water temperatures that exceed state water quality standards (303 d water quality impaired for water temperature). The project involves utilizing low-tech process-based restoration techniques (beaver dam analogues – BDAs) to reconnect Camp Creek with its historic floodplain and facilitate restoration of the native willow community by fencing to exclude ungulates from six protection areas averaging 0.80 acres in size. This is a collaborative project between the PBWC, ODFW, and the WWNF.

In 2021 and early 2022, the PBWC applied for and received project funding from OWEB and the Oregon Conservation and Recreation Fund. The Wallowa Whitman National Forest also provided funding for the project.

Implementation was delayed in 2022 to complete the National Environmental Policy Act process for the project as well as develop and implement an agreement between the project partners, PBWC and WWNF. Both activities have been completed.

In 2022, we utilized the Baker Resources Coalition student intern crew to collect pre-implementation monitoring data including valley wide transects measuring surface elevation, vegetation, and wood as well as aquatic features. The entire reach was surveyed using the ODFW Aquatic Inventory “wood” methodology to document the density and volume of wood within the channel.

Project implementation began the summer of 2023 with the Construction of 51 beaver Dam analogs (BDAs) and directional felling of 116 conifer trees (primarily Lodgepole Pine). BDA construction was completed by four youth/young-adult crews with direction and oversight by PBWC staff (Figure 3). Work crews included: 1) a five-person young adult crew with the Northwest Youth Corps that worked on the project for three weeks in June and July harvesting post materials from the project area for BDAs and constructing BDAs; 2) a high school intern crew (four Baker High School interns and one young adult crew chief) with the Baker Resources Coalition that spent two weeks on the project in July constructing BDAs; 3) an Oregon Youth Corps crew employed through the Training and Employment Consortium, comprised of 4-6 local high school-aged youth and an adult crew chief, worked on the project for five weeks in July and August building BDAs; and a seven-person young adult volunteer crew from the Baker Technical Institute that spent approximately two weeks on the project in July and August building BDAs. These crews constructed 48 of the 51 structures completed in 2023. The remaining three structures were completed by volunteers as part of PBWC’s “Beaver Dam Barbecue”, a workshop to educate landowners and the public about the watershed benefits of beaver. Directional conifer felling was completed by qualified PBWC staff.



Figure 3. Youth crew constructing a BDA along Camp Creek, 2023.

Project completion is planned for 2024 including construction of remaining planned BDAs, post-assisted log structures (PALS), additional conifer felling and construction of buck and pole fence for six planned riparian protection areas.

PBWC Strategic Plan strategies addressed: 1.A., 1.B, 1.D, 2.A, 2.B, 3.B, 3.C, 3.D, 3.E, 4.A, 4.B, 4.C, 6.D

Cusick Creek Restoration Phase II: The Restoration Continues (OWEB Grant 221-5009-18948)

Cusick Creek is located approximately 30 miles North of Baker City and 10 miles East of North Powder. The Cusick Creek watershed drains approximately 14 square miles and flows into Thief Valley Reservoir on the Powder River. The upper reach (Phase II: ~6,000 feet stream length) of Cusick Creek is confined to a moderately narrow canyon and due to past land management practices has become more incised with moderate to severe bank erosion. Fish habitat and the properly functioning of the stream have been greatly compromised in these reaches. The lower reach (Phase I) has been restored to a functioning stream. Project elements include: pull the banks back at 11 locations to a stable 3:1 ratio; protect the toe of pulled back

banks with 27 whole tree logs, 31 (3'x3'x3') ballast rocks and 200 willow clump plantings behind the revetments/rootwads; re-direct the thalweg away from vulnerable banks; install 17 vertical post structures (VPS) J-hooks; install 22 rootwads; increase flood plain capture/create new wet meadow habitat; install 28 VPS structures to slow water and spread it out onto the flood plain, capture fine sediments and enable it to be deposited on the flood plain; remove 1,300 feet of road that is impinging on the flood plain; re-locate the road to an uphill site; grade 11 areas along 3,003 linear feet (total of about 1 acre) to increase flood plain connection by removing about 4-6 inches of topsoil above ordinary high-water mark (selected areas will not impact existing sedge/rush mats); plant 4,000 willow cuttings in trenches where pull backs/riparian cuts occur; plant 500 willow whips as part of the VPS and VPS J-Hook Barbs; plant the bank pull backs with cottonwood, aspen, alder, current, rose and dogwood; cage All plantings; and rehabilitate approximately 1,000 feet of the old ditch to create a grassed swale. Partners are the PBWC, Diebel Contracting LLC, RSI engineering, NRCS, and the landowners Bruce and Carol Hummel (Thief Valley Ranch).

In the summer of 2020, the PBWC collaborated with Diebel Contracting, LLC. and landowners of Thief Valley Ranch to develop and apply to OWEB to implement Phase II of restoration actions on Cusick Creek, a tributary to the Powder River. The grant was awarded spring of 2021.

Thief Valley Ranch had worked with the Keating Valley SWCD to implement Phase I actions on Cusick Creek 2013-2015. Then the Malheur Watershed Council received an OWEB grant to design Phase II of Cusick Creek Restoration on a reach upstream of Phase I and still on the Thief Valley Ranch.

In 2021, the PBWC and Diebel Contracting, LLC., entered into a contract for Ken Diebel to assume primary project management responsibilities. The PBWC Executive Director shares responsibilities for project management aspects.

In 2022, the project progressed as planned. The instream work was finished just before the close of the October 31 in-water work window. All bio-barbs, large wood, bank pull backs, and VPS structures are in place. A new road has been built to ensure the owner has access to his property, but it is well out of the flood plain. Almost 2,000 shrubs and trees have been planted. All bare areas created by the bank pullback have been seeded with an appropriate grass seed mix. The "old channel" left over from Phase I has been filled-in and seeded. It will function as a grass swale and an overflow channel.

The remaining planned project elements were completed in 2023 including: 1) a Natural Resource Conservation Service (NRCS) funded fencing project that will protect the new project from livestock grazing, 2) building more buck and pole fencing for protecting aspen and cottonwood groves, 3) caging plantings to protect from elk and deer, and 4) doing more plantings and grass seeding to fill-in for anticipated mortality. All work as described in the OWEB grant application has now been completed. Due to diligence of the landowner and contractors, the planned work was completed significantly under budget. In December of 2023, the PBWC requested OWEB to approve a project extension to December 31, 2024 to allow the landowner to implement additional work to increase project benefits, utilizing the unspent funds. OWEB approved our extension request to implement additional work including: 1) additional shrub

planting and plant protection, 2) reseeding areas where seed survival was low, and 3) controlling noxious weeds and invasive annual grasses within the treatment area.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 1.E, 2.B, 2.C, 3.E

Cusick Creek Restoration Phase III: Aspen Restoration and Conifer Resiliency (OWEB Grant 222-5002-19852)

This project is on Cusick Creek near Thief Valley Reservoir, which is on the Powder River. The project includes excluding cattle, deer and elk from six priority aspen stands and thinning a stand of ponderosa pine adjacent to Cusick Creek. The cattle, deer and elk are clipping the aspen sprouts year after year, which is threatening the existence of the stands. Hawthorn and shrubs are shading out the aspen. The hawthorn is dominating the stands which is leading to poor species diversity. We will install 2,650 feet of 7-foot tall buck and pole fence. This will exclude grazers from about 10 acres. To improve plant diversity, reduce competition, and stimulate aspen sprouting, we will remove a small number of hawthorn shrubs with a trac hoe. The ponderosa pine stand adjacent to Cusick Creek is 12.6 acres in size and is currently overstocked. The overstocked nature of the stand and drought are causing tree mortality from infestation of bark beetles. Reducing the stocking rate will improve tree health and make the stand less susceptible to wildfire. OWEB funds will be used for construction of buck and pole fencing, and construction of an access trail to facilitate forestry activities and construction/maintenance of the fencing.

In the fall of 2021, the PBWC worked with landowners of Thief Valley Ranch and Ken Diebel to develop and submit a restoration application to OWEB. Project funding was awarded by OWEB May of 2022.

Summer of 2022, the landowner completed construction of the access trail that will facilitate other project activities. In addition, the landowner removed hawthorn from aspen restoration sites and conducted pre-commercial thinning within some of the ponderosa pine stands. The wood material thinned was removed for the purpose of providing the logs and rootwads needed for the Phase II project. The material was transported to the Phase II project area and installed as part of Phase II construction fall of 2022.

Project activities in 2023 included construction of buck and pole fencing around all planned aspen restoration sites, completing all the OWEB funded project elements described in the grant application. As with the Phase II project, the landowner and contractors were successful in completing the project work at substantial cost savings. In December of 2023, the PBWC requested OWEB to approve a project extension to December 31, 2024 to allow the landowner to implement additional work to increase project benefits, utilizing the unspent funds. OWEB approved our extension request to implement additional work including: 1) treating additional aspen stands on the property, 2) Reseeding areas where seed survival was low, and 3) controlling noxious weeds and invasive annual grasses within the treatment area.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 1.E, 2.A, 2.B, 2.C

Higgins Reservoir Water Development Project (OWEB 222-8206-22241)

The proposed water development will occur on Secret Valley LLC property, south of Unity, Oregon on Higgins Reservoir. The Unity area includes Sage grouse leks with high attendance and the sage-grouse population found here is important to maintaining the sage-grouse populations in Baker County. The water development is planned in the NNW corner of the northern most pasture which overlaps Higgins Reservoir. A water development in the northern most pasture on the property is needed to improve utilization of the pasture and reduce pressure on riparian areas. In addition to supporting the Sage grouse LIT's goals outlined in the Baker Sage-grouse LIT FIP Strategic Action Plan, this specific issue was identified within the landowner's site-specific plan (SSP) as part of their enrollment of the Candidate Conservation Agreement with Assurances (CCAA) program. The water development will be approximately 100 yards east of the reservoir and consist of two, 1,000-gallon tire troughs set 30 feet from one another. Troughs will be fed using a submersible solar pump, have float valves to prevent overflow, and include wildlife escape ramps. Project partners include the PBWC, Baker Sage-grouse LIT, and the landowner.

Pre-monitoring using the FIP restoration monitoring protocol and the USGS rapid ocular assessment protocol was completed in 2022. Some site prep was completed Fall 2022, but due to supply chain issues, the landowner has had difficulty acquiring the necessary equipment. With the majority of equipment now in-hand, the landowner is struggling to find a contractor to complete the work. Despite the delay in the installation of the water development, when a contractor can be secured, the landowner is ready to implement the project, as weather and ground conditions allow.

PBWC Strategic Plan strategies addressed: 2.A, 2.B, 2.C, 2.D

2023 Idaho Power Company Water Efficiency Program

The PBWC assisted the Idaho Power Company (IPC) with implementing its 2023 Water Efficiency Program (WEP) in the Pine Creek Basin by participating on the project review team, implementing a service agreement to administer IPC funds to implement projects, and partnering with a recipient of the 2023 IPC WEP funds to pursue additional project funding through the Oregon Watershed Enhancement Board (Figure 4). Three projects were selected from ten applicants. The following is a description of the approved projects:



Figure 4. Center pivot completed through the IPC WEP program in 2023.

- The Pine Eagle School District project received \$10,000 of funding to complete a sprinkler project on 10 acres. This project proposes converting from flood irrigation facilitated by gravity pipe to a sprinkler system with a pump and Lateral Move Machine.

- The DelCurto project was awarded \$45,000 from the IPC Water Efficiency Program (partially funding the project) for the purchase of certified used wheel lines to facilitate the conversion of 135 acres of flood irrigated hay and pastureland to sprinkler irrigation. This project diverts water from East Pine Creek, via the Oliver-Sullivan Ditch. Conversion from flood irrigation to sprinkler irrigation will increase water use efficiency and reduce flood tail water runoff carrying excess nutrients and sediment from entering East Pine Creek. Additional project funding was requested by PBWC from OWEB through a large grant during the spring 2023 funding cycle. This project was awarded OWEB funding fall of 2023 and implementation will begin during the summer of 2024. For more information, please see the section regarding the Johnny-Bill Irrigation Efficiency Project.
- The Jackson project was awarded \$45,000 from IPC’s Water Efficiency Program (partially funding the project) towards the completion of two center pivots on 81 acres. Currently, all tail water runoff from flood irrigation on this property flows into Clear Creek and Pine Creek carrying excess sediment, nutrients, and waste. Additional project funding was requested by the Eagle Valley SWCD from OWEB through a large grant during the 2023 spring funding cycle. This project was awarded OWEB funding fall of 2023 and implementation of the first phase of the project will begin during the summer of 2024.

PBWC Strategic Plan strategies addressed: 1.A, 1.C, 1.E, 3.E

Johnny-Bill Irrigation Efficiency Project (OWEB Grant 223-5030-22966; Idaho Power Company)

The Johnny-Bill Irrigation Efficiency Project encompasses 135 acres of flood irrigated hay and pastureland within the Pine Valley portion of the Powder Basin. Streams within the Pine Creek watershed and the Pine Valley provide important habitat for Bull trout, an Endangered Species Act (ESA) Threatened species (Figure 5). The goal of this project is to improve water quantity and quality in East Pine Creek through increased irrigation efficiency, off-channel watering developments, and fencing the riparian zone to exclude cattle from the creek. Presently, this property is flood irrigated which is inefficient due to deteriorated ditches which have widened and incised and unlevel ground which leads to areas of high saturation and dry spots. Flood tail water runoff flows directly into East Pine Creek, carrying excess sediment and waste. Water quality and quantity are both concerns for East Pine Creek which is 303(d) listed as impaired for temperature year-round. One half center pivot will be installed in conjunction with 5-wheel lines and a mainline pipe to facilitate the sprinkler system. Sprinkler irrigation will improve water efficiency, allowing more water to remain in East Pine Creek throughout the irrigation season, reducing water temperature and improving fish habitat. Sprinkler irrigation will also



Figure 5. Example of degraded ditch on property.

improve water quality by eliminating flood tail water runoff into the creek. Riparian fencing will be installed on unfenced portions of the creek and off-channel watering sites will be developed to further eliminate erosion, sedimentation, and to protect riparian vegetation.

This project is a collaborative endeavor between the landowners, Idaho Power Company, the Powder Basin Watershed Council, and the Oregon Watershed Enhancement Board. During the spring of 2023, this project was awarded \$45,000 through IPC's Water Efficiency Program to facilitate the purchase of wheel lines. Additional funding for the project was awarded through an OWEB restoration grant in fall of 2023. Currently, the PBWC and landowner are working to complete permitting requirements for the project before implementation begins summer 2024. 2024 implementation objectives for the project include sourcing wheel lines, installing all fencing on the north side of the creek, installing the new mainline pipe system and pump station, and completing the installation of off-channel watering developments. Complete implementation of all project components is anticipated by summer 2025.

PBWC Strategic Plan strategies addressed: 1.C, 2.B, 3.E.

Camp Creek Fish Habitat Improvement Project (In Development)

During the fall of 2023, PBWC staff and the Wallowa-Whitman National Forest began developing a partnership project to address three structures on Camp Creek which currently impede aquatic organism passage. Camp Creek, a major tributary to the North Fork Burnt River (NFBR), is a perennial stream system which flows through the Wallowa-Whitman National Forest before entering private agricultural lands downstream. Both the NFBR and Camp Creek watersheds provide important habitat for native Columbia Basin Redband Trout which occur in both resident, fluvial, and afluvial forms. Throughout the Camp Creek watershed, current and historic land use practices limit natural stream function, reducing the quantity, quality, and availability of habitat for sustaining resilient populations of aquatic organisms and other species. These issues are exacerbated by passage barriers, which further limit habitat availability and connectivity.

The Camp Creek Fish Passage Improvement Project will focus on a 1.5-mile stretch of Camp Creek within the WWNF where two steel pipe culverts and a log weir impede aquatic organism passage and disrupt natural stream function (Figure 6). This project will address the issues presented by both culverts through replacing existing infrastructure with single radius arch culverts with precast concrete footings. This type of open-bottom culvert allows for stream simulation throughout the structure which would eliminate passage issues, improve natural stream function, and increase the resiliency of this system to climate change impacts (floods and drought). We plan to address the passage barrier created by the log weir through channel aggradation and large woody material placement to decrease gradient, increase floodplain

connection, and to restore a natural riffle in this meadow system. Addressing each passage concern will open approximately 16.2 miles of habitat to benefit various aquatic organisms at multiple life stages. This will be particularly beneficial for Columbia Basin Redband Trout which depend on quality, connected habitat throughout the Camp Creek watershed for various uses and life stages. Anticipated project partners include the WWNF (completing design and permitting work), the Oregon Department of Fish and Wildlife John Day Screen Shop (implementation of one culvert replacement), and the Oregon Watershed Enhancement Board (funding for implementation of log weir restoration and the second culvert replacement).



Figure 6. Camp Creek log weir fish passage barrier.

As of winter 2024, the WWNF has completed 30% designs for both culvert replacements and a preliminary design for the log weir restoration. We are hoping to complete 60% designs for all three project components by April 2024. The PBWC Watershed Restoration Coordinator submitted a grant to ODFW for their Private Forest Accord (PFA) funding opportunity during early winter of 2023 and funding decisions are expected in late March of 2024. Additional funding will be sought through OWEB during their 2024 spring grant cycle for the completion of project components not funded through the PFA grant opportunity.

PBWC Strategic Plan strategies addressed: 1.A, 3.C.

Love Reservoir Mesic Restoration for Ritter Creek (OWEB 224-8206-23393)

This project is an exciting partnership effort between the Powder Basin Watershed Council and the Baker County LIT to improve mesic habitat for sage-grouse within the Baker Priority Area for Conservation (PAC). Sage-grouse hens and chicks rely on mesic habitats including wetlands, riparian areas, wet meadows etc., during late summer months for abundant forage and concealment. With climate change, we anticipate an increased frequency and severity of drought due to warming temperatures and declining snowpack. Sage-grouse will be particularly vulnerable to these events meaning mesic habitat restoration and expansion is critical for improving reproductive success and increasing resiliency to drought and climate change.

The Baker LIT and associated partners completed a prioritization exercise to guide mesic habitat restoration project development in 2023. Two prioritized mesic areas were visited by the Baker LIT and the PBWC in late summer of 2023 before selecting Ritter Creek for future implementation efforts. Ritter Creek is a degraded system which is limited by channel incision, active head-cutting, lack of native stabilizing riparian vegetation, and lack of floodplain

connection. These issues are exacerbated by an undersized culvert upstream of the project reach which likely concentrates flows throughout the system and limits natural stream function. During the fall of 2023, the PBWC Watershed Restoration Coordinator and the Baker Sage-Grouse LIT Coordinator developed a Technical Assistance grant application for Ritter Creek to pursue funding to hire a qualified consultant or engineer to develop 90% designs for instream restoration work and a culvert replacement. Designs will address improving natural stream function, increasing channel aggradation, floodplain expansion/reconnection, increasing the residence time of water within the system, and improving water table elevation to support abundant riparian vegetation. Ultimately, we would like to use low-tech process-based restoration to accomplish our goals, but more invasive techniques may be necessary due to the extent of channel incision. The engineer or qualified consultant hired in 2024 will be responsible for developing three alternate designs which detail solutions ranging from light to more invasive applications. The preferred design will be selected from presented alternatives by a Mesic Restoration Design Team comprised of PBWC Staff, the Baker LIT Coordinator/associated partners, the landowner, and other relevant individuals. Our goal is to complete all design and permitting work during 2024 and 2025 with an anticipated implementation date of summer 2026. This Technical Assistance grant was funded by OWEB in winter of 2024. Project implementation will begin spring of 2024 with contractor bid tours and solicitation, assembling a Mesic Restoration Design Team to provide feedback throughout the design process, and outreach efforts with downstream water users to discuss project benefits/concerns. Implementation objectives for 2024 and early 2025 include completing the design process with input from the mesic restoration design team during all phases and collection of pre-monitoring data to support design work and future effectiveness monitoring efforts. We plan to apply for implementation funding through OWEB during the spring of 2025 with a goal to begin on the ground implementation during the summer of 2026. Finally, once implementation of all project components is complete, we will begin the process of enrolling the property into CREP during 2027.

PBWC Strategic Plan strategies addressed: 1.D, 2.D.

Pine Creek Fish Habitat Enhancement (OWEB Grant 221-5042-19551; Idaho Power Company)

This project is located on the Corrigan property within and adjacent to Pine Creek, approximately six miles upstream from the town of Halfway. Pine Creek has been the focus of attention for fish recovery during the past decade due to efforts by ODFW and IPC to re-establish migratory bull trout from the current population that resides high in the headwaters of Pine Creek year-round. In addition, Columbia Basin Redband Trout, which are considered a species of concern in Oregon, reside throughout the Pine Creek system year-round. In 2010, Pine Creek experienced a 30-year recurrence interval flood event, which highlighted to many landowners the poor health that the stream system is in. Because of this, landowners have been interested in working with us to improve function of the watershed. The goal of this project is to enhance fish habitat, while addressing concerns of the landowner regarding damage from past and future flooding. By using engineered log structures to deflect high flows and stabilize approximately 170 feet of eroding banks, managing livestock grazing through installation of a riparian buffer fence, and planting of native willows, there will be multiple benefits to Pine Creek. Benefits include reducing sediment inputs, increasing shade to lower water temperatures,

more overhanging vegetation to provide hiding cover for fish and increasing the diversity of fish habitats through pool formation and establishment of backwater habitats. Partners on this project include the landowner and IPC. IPC will provide a \$14,505 cash contribution for rootwad installation, riparian fencing installation, and an in-kind donation of boulders and willow whips for the project (\$4,928 value).

In the summer of 2020, the PBWC submitted an application to OWEB to fund the project, but funding was not awarded. PBWC worked with the landowner to address OWEB Region 5 Review Team comments and resubmitted the project for funding in April 2021. The OWEB Board approved the project for funding in October 2021. This enhancement project was the result of a project design completed as part of Upper Pine Creek Flood Restoration Design, OWEB Grant 217-5049-14218.

In 2022 we worked on project removal-fill permitting with plans to implement the instream bank stabilization, and fish habitat improvement work fall of 2023.

An archaeologist with the IPC completed an on-site assessment of historic properties (site survey) and provided a technical memo providing the results. This was provided at no cost.

We contracted with EcoWest Consulting to do wetland assessment work and assist with removal-fill permitting. EcoWest determined appropriate removal-fill permitting pathways for the project. To fit within the chosen permitting pathways, Resource Specialists Inc. (RSI) made minor modifications to the design plans and supporting information. Final permitting documents were submitted to the Oregon Department of State Lands and US Army Corps of Engineers in early 2023. All permitting authorizations were in place by June 2023.

The bank stabilization treatment was installed from September 21-29, 2023 according to the final design plans. Materials used included 49 cubic yards of ballast boulders, four cottonwood rootwads and 26 cottonwood logs. All ballast rocks were imported to the site from an upland source and stockpiled on the Corrigan property adjacent to Holbrook Creek Road. The majority of cottonwood rootwads and logs were salvaged from the Tarter Slough Diversion Project (implemented by the Eagle Valley SWCD and Idaho Power Company in 2022) and delivered to the stockpile adjacent to Holbrook Creek Road in August of 2022. Six pieces of cottonwood log were salvaged from blowdown logs in pastures on the Corrigan property. These materials were hauled to the project work site from the staging area on September 21, 2023, using a Hydrema all-terrain dump truck that exerts very low ground pressure (Figure 7), resulting in insignificant ground disturbance along the travel route from the staging area to project work site. All bank stabilization work was done with a John Deere 130 Excavator from the top of bank (Figure 8). The excavator did not access the channel.

As the project site is on a side channel of Pine Creek, work area isolation/dewatering was accomplished by installing a coffer dam of sandbags at the upstream extent of the side channel.

To restore riparian vegetation along the bank treatment, willow and cottonwood cuttings were collected from the project site and immediately placed within the constructed bank treatment.

After the cuttings were placed, they were backfilled with channel sediments and then trimmed to facilitate root development (Figures 9 and 10).



Figure 7. Photo showing Hydrema all-terrain dump truck at project site.



Figure 8. John Deere 130 Excavator at upstream extent of bank treatment showing placement of rootwads, logs and ballast rocks. Cottonwood and willow cuttings harvested from the site are being placed among the bank treatment.



Figure 9. Close-up of willow and cottonwood cuttings placed within bank treatment after backfilling with channel sediment and trimming.



Figure 10. Close-up of willow and cottonwood cuttings placed within bank treatment after backfilling with channel sediment and trimming.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 2.B, 3.E

Powder River Fish Habitat Enhancement Project (OWEB Grant 220-5023-17032)

The concept for the Fish the Powder project started in early 2019 when a passionate Baker City resident approached the PBWC with hopes to improve the Powder River's fishery. The idea gained momentum and the PBWC gained support from numerous agencies including ODFW, WWNF, Trout Unlimited, and the city staff of Baker City. To improve the Powder River fishery, the PBWC must first understand the current conditions. To accomplish this task the PBWC decided to pursue an aquatic habitat inventory.

To determine public interest in the project, The PBWC sent letters to all 199 landowners in the reach and received positive responses from 59 of them. A public meeting was also held to share the project with the public and scope public interest.

In the fall of 2019, the PBWC secured OWEB funding for the fish habitat survey. ODFW, under contract with the PBWC conducted the habitat inventory work in September 2020. ODFW provided the survey data and report, December of 2021 (Figure 11). Of the 199 properties in the eight-mile project reach, we received permission to conduct habitat inventory on 36 of these properties totaling 6.8 miles of stream (2.94 miles private ownership and 3.9 miles public ownership).



Figure 11. ODFW staff surveying the Powder River.

In 2022, a Technical Team of natural resource experts reviewed the survey data and assembled recommendations for accomplishing the goal of making fishing better including:

1. Complete PBWC watershed restoration action planning process to determine relative restoration priority/need of the Hughes Ln. to Mason Dam reach of the Powder River.
2. As opportunities are assessed/developed to address fishery limiting factors described below, pursue opportunities to improve public access for fishing/recreation.
3. Inventory Points of Diversion (POD's) within reach and develop prioritized list of screening and passage improvements. Based on this, seek opportunities to address screening and passage at priority sites.
4. Assess opportunities to improve instream habitat on private properties within the "canyon reach".
5. Develop opportunities to improve stream/floodplain function, aquatic habitat diversity and public access on the WWNF.
6. Assess opportunities to improve pools associated with existing weirs within Baker City.
7. Implement public awareness campaign regarding benefits of riparian vegetation.

Technical Team members included Tim Bailey, PBWC Executive Director (retired ODFW District Fish Biologist); Sarah Brandy, Aquatics Program Leader, WWNF; Will Glenn, District Fish Biologist, WWNF; Bob Hassmiller, District Hydrologist, WWNF; Joe Lemanski, District Fish Biologist, ODFW; and Levi Old, Trout Unlimited Northeast Oregon Restoration Director.

A public meeting has held in March 2022, to present the Technical Team findings and receive public input. The OWEB grant to complete the habitat survey and develop a restoration strategy (above), has been completed and closed-out. Based on the outcome of PBWC's watershed restoration planning process, the PBWC will re-engage with project stakeholders and develop a plan to seek funding to continue work on this initiative.

PBWC Strategic Plan strategies addressed: 1.A, 1.E, 3.A, 3.B, 3.C, 3.E, 4.B, 4.D

Trout Creek Ecosystem Resiliency (OWEB Grant (223-5035-23251))

This project is on Trout Creek in the North Fork Burnt River watershed, approximately 40 miles southwest of Baker City, southeast of Whitney Valley on lands administered by the Whitman Ranger District of the WWNF. Watershed issues addressed are: 1) degraded groundwater recharge and water storage functions, 2) limited water table maintenance supporting narrower riparian vegetation communities, 3) limited zones for water quality filtering, and 4) excessive bank erosion resulting in streambeds with abundant fine silts. Throughout the 2.5-mile project reach, the creek is incised, not connected with its broad historic floodplain, and beaver are not present. The result is a stream with an altered potential riparian vegetation community including upland species, simplified aquatic habitat and one that is more efficient at routing water out of the system (Figures 12 and 13). Both Trout Creek and the North Fork Burnt River experience very low summer base flows and water temperatures that exceed state water quality standards (303 d water quality impaired for water temperature). The project approach includes utilizing low-tech process-based restoration techniques (beaver dam analogues – BDAs and post-assisted log structures - PALS) to reconnect Trout Creek with its historic floodplain, facilitating restoration of the native willow community by fencing to exclude ungulates from four protection areas (totaling 5.54 acres) and developing upland water sources for domestic livestock.



Figure 12. Trout Creek Channel showing conifer encroachment and lack of riparian shrubs.



Figure 13. Trout Creek Channel showing channel incision and browsed willow.

The PBWC, in partnership with the WWNF, formulated the project approach and began seeking funding for this project the spring of 2023 by submitting funding applications to both OWEB and the Oregon Conservation and Recreation Fund (OCRF). Funding of approximately 34,000 has been secured from OCRF, but OWEB chose not to fund the application, pending further development of project design details and assurance that youth crews could effectively carry out the proposed work. Using funds obtained from the Roundhouse Foundation, PBWC staff worked with WWNF staff to produce a detailed plan of low-tech, process-based restoration structures including BDAs and PALS. Based on development of the project designs, we resubmitted the project to OWEB in the fall of 2023. As of January 2024, we have been informed by the OWEB Regional Project Representative that the Region 5 Review Team ranked the project number 2 out of 19 restoration project applications submitted. Thus, the project is expected to be funded spring of 2024, with implementation beginning mid-June, 2024. Summer of 2023, WWNF staff submitted a funding request to the Blues Collaborative Forest Landscape

Restoration Program, for funding to support construction of buck and pole fencing to protect native willows from browse by wild and domestic ungulates. Funding of \$77,000 has been secured.

PBWC and USFS will collaborate in early 2024 to secure necessary environmental clearances, of which efforts on NEPA and Heritage began fall of 2023. We expect all clearances to be in place for 2024 construction.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 1.E, 2.A, 2.B, 3.C, 3.D, 3.E, 4.A, 4.B

Schneider Meadows Restoration (In Development)

The PBWC is working in partnership with the Idaho Power Company (IPC), WWNF and RivHab Engineering Design to develop a restoration project on a 1/3-mile reach of Meadow Creek (tributary to Clear Creek in the Pine Creek Basin) within Schneider Meadows. Schneider Meadows is a critical source of cold streamflow within spawning and rearing habitat for ESA Threatened Bull Trout. The IPC is funding the design work by RivHab to develop a project intended to restore degraded conditions of the meadows in support of Bull Trout per forthcoming requirements under the Federal Energy Regulatory Commission Hydroelectric Relicensing for IPC's Hells Canyon Complex on the Snake River. The project design employs low-tech process-based restoration techniques, and strategic channel fill to reconnect the incised Meadow Creek channel with the historic floodplain/meadow. Completion of the design is expected Summer 2024. IPC has requested the PBWC to apply for restoration grant funds Fall of 2024 and implement the project in 2025 if successful in securing grant funds.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 2.B, 3.E

TECHNICAL ASSISTANCE

Designing for Beaver in the North Fork Burnt River Basin (OWEB Grant 224-5020-23252)

The PBWC has established a working partnership with the WWNF, Whitman Ranger District whereby the PBWC assists the WWNF in accomplishing its natural resource goals and objectives by bringing additional expertise and funding to implement projects on WWNF lands. The current emphasis of the partnership is implementing actions in the North Fork Burnt River watershed to facilitate beaver colonization and overall ecosystem resiliency. The Camp Creek Ecosystem Resiliency Project is the first of these projects with planning underway for another project on Trout Creek to begin implementation in 2024. In addition to these streams, there are numerous miles of stream in the watershed that are potentially sites for low-tech process-based restoration (LTPBR). A Beaver Restoration Assessment Tool (BRAT) assessment of the Burnt River watershed report (Macfarlane et al. 2019) provides PBWC with strong guidance on where to implement LTPBR. The proposed project will assess, design and complete all needed permitting and environmental compliance work on six streams in the North Fork Burnt River watershed including upper Trout Creek, Alder Creek, Gimlet Creek, Dry Creek, China Creek

and California Gulch. Segments of these streams to be assessed will total approximately 13 miles. Assessment work will include aquatic/vegetation inventories, digital mapping, on-site field visits to determine appropriate project approach for each stream, table-top exercises to determine initial LTPBR restoration structure locations, field visits to ground truth structure layout, coordination with WWNF range staff to develop actions to address ungulate grazing (where needed), waterway alteration permitting and National Environmental Policy Act compliance. The result will be implementation-ready projects. WWNF staff will participate in the assessment/design and complete NEPA/Heritage. OWEB funds will support PBWC staff to complete the work.

The project as described above is a direct response to our failed spring 2023 application to OWEB to fund the Trout Creek Ecosystem Resiliency project. The spring application was not funded as a design layout was not in-place. We hoped OWEB would fund the project prior to completion of the design. However, the Region 5 Review Team did not support this approach. Thus, we submitted the Designing for Beaver application to secure funding for LTPBR project design development in the North Fork Burnt River, to front-load the development process and avoid the need to individually fund project development for each site.

As of January 2024, we have been informed by the OWEB Regional Project Representative, that the Region 5 Review Team ranked the project number 1 out of 8 technical assistance project applications submitted. Thus, the project is expected to be funded by the OWEB Board, Spring of 2024. We can then engage in an iterative process of project development/design/permitting, funding and then implementation of LTPBR projects in the North Fork Burnt River Basin. We plan to begin project development/design for Gimlet and Dry Creeks, Spring/Summer 2024.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.D, 1.E, 2.A, 2.B, 3.C, 3.E

Powder Basin Watershed Action Planning (OWEB Grant 222-5041-22257)

A long-term goal of the PBWC, fall of 2022 we received an OWEB grant to fund a refresh of the Strategic Plan and development of a watershed restoration action plan with specific focus areas within our geographic scope (Brownlee, Powder and Burnt River Subbasins). While we currently have a Strategic Plan that guides overall operations, this plan lacks specific focus with respect to geography, limiting factor, action type or community need. The PBWC's geographic scope is quite large (1,603 square miles). In consideration of our foreseeable operational capacity, effectively developing and implementing actions over such a wide geography, without focus, limits our ability to achieve demonstrable results meeting specified watershed/community needs. We would like our future actions to move from being opportunity-based to strategic, with geographic and action-type focus. To accomplish this, we hired a Watershed Restoration Coordinator in 2022 to lead the PBWC in a planning and community engagement process resulting in a watershed restoration action plan in support of our Mission. In development of the action plan, we will give specific consideration to the following: 1) geographies with documented watershed needs, 2) action types with demonstrated effectiveness for the identified watershed need, 3) actions located where probability of meeting restoration objectives is high, 4) sensitive fish and wildlife species needs, 5) biological and landscape resiliency to climate

change, 6) connection between community vitality and health of natural resources, 6) needs of underserved communities and people groups, and 7) available partnerships. We have developed a list of 25 individuals, organizations, and agencies to engage in this process and we expect the scope of engagement to broaden.

The Watershed Restoration Coordinator, Madison O’Bryant, joined the council in January of 2023 to implement the Strategic Action Planning objectives and community outreach described above. Work began during the winter and spring of 2023 with review of relevant watershed assessments/plans and meeting with key partners to formulate the foundation for the “Strategic Plan Refresh” process. The goal of this process was updating the current Strategic Plan to be representative of various interests, community concerns, current and future council work, and current environmental needs. The Watershed Restoration Coordinator used the contact list developed by PBWC staff to engage with various agencies, members of the community, and PBWC board members to raise awareness of the planning process and to officially invite participants. Several participants also committed volunteer hours as in-kind match for the project which is critical to achieving project goals.

Three Strategic Plan Refresh meetings were held in Baker City with PBWC staff, Board members, various agencies, and members of the community. Each meeting averaged 20 participants, with many individuals participating in all three meetings. Meeting topics addressed a list of objectives detailed by the PBWC Board of Directors in 2022 to help organize the planning process. During the first meeting, the Watershed Restoration Coordinator presented the council’s accomplishments from the operational period of the existing Strategic Plan (2018-2022) and facilitated a discussion regarding the relevancy of these accomplishments to achieving PBWC goals. This meeting helped identify community concerns, strengths/weaknesses of past council actions, and future opportunities for improving actions to accomplish organizational goals. Notes from this meeting directed the 2nd Refresh meeting where participants provided feedback on updating 2018-2022 goals and strategies. This meeting highlighted opportunities to expand and/or condense existing goals and strategies to advance the PBWC’s vision and mission more effectively during 2023-2027. Finally, the 3rd Strategic Plan Refresh meeting addressed updates to the basin and subbasin descriptions in the existing plan. While many of the limiting factors impacting the basin remained the same, the Watershed Restoration Coordinator presented updated information on impaired water bodies throughout the Powder Basin, information regarding the upcoming Total Maximum Daily Load (TMDL) for bacteria (E. coli), and information on current climate predictions for the state of Oregon. Participants then discussed expanding or condensing the existing impairments and recommendations for each subbasin described in the 2018-2022 Strategic Plan. Ultimately, feedback from participants given during each Refresh meeting and reviews of draft planning documents were imperative for accomplishing our Strategic Plan update during 2023 and for developing a document which provides a solid foundation for future Action Planning endeavors. The updated 2023-2027 Strategic Plan provides readers an overview of the Powder Basin, updated impairments/recommendations for each subbasin, updated goals and strategies for accomplishing the PBWC’s vision and mission, and various resources throughout the document for people interested in learning more about their watershed. To view the PBWC’s 2023-2027 Strategic Plan, please visit our website at <https://www.powderbasinwatershedcouncil.org/>.

Action Plan development began in late November of 2023 and will continue throughout the winter and spring of 2024. The goal of the Action Plan is to create a 10-year framework for future PBWC work which details geographic focus areas for each subbasin and potential restoration actions to address limiting factors. There are two teams involved in the creation of the Action Plan including a Technical Team of local Natural Resources experts and a Stakeholder Group. The Technical Team is responsible for reviewing current watershed plans and assessments for the three subbasins encompassed by the Powder Basin and for providing recommendations regarding the prioritization of geographic focus areas and potential restoration actions. The Watershed Restoration Coordinator presents Technical Team recommendations to the Stakeholder Group who provide feedback on what to include in the final Action Plan. The planning process will progress by addressing each subbasin individually. In February 2024 we will host a Stakeholder Engagement meeting in Hereford, Oregon, with members of the Burnt River community. We anticipate beginning planning endeavors for the Powder River Subbasin in March and then progressing to the Brownless Subbasin in April and May. Our goal is to complete meetings of the Technical Team and Stakeholder Group for each subbasin by the end of May, 2024 and complete development and review of the Plan in the Fall of 2024.

PBWC Strategic Plan strategies addressed: 5.C.

Makin' Clarity on the Run (OWEB Grant 221-5048-19501)

This technical assistance project addresses water quality, fish passage, channel instability, and irrigation efficiency issues associated with four irrigation diversions on Bull Run Creek, tributary to the South Fork Burnt River. These diversions currently do not have permanent diversion structures, requiring the water user to annually install push-up dams to divert water. Installation of push-up dams increases sedimentation, blocks or inhibits passage of Columbia Basin Redband Trout and destabilizes the bed and banks of the stream. In addition, irrigation waters are routed to desired application areas by open ditch, where the water is applied by flood irrigation. This method of delivery/application can lead to significant loss of water. This can cause alterations in the routing of sediment, nutrients and herbicides/pesticides into the waterway. The water user desires to install permanent diversion structures and ditch piping to accomplish more time-efficient and environmentally sustainable irrigation practices. This project will result in the design of permanent diversion structures and irrigation water delivery piping. The design process will explore alternatives, and lead to a 90% engineering design of the selected alternative that best meets the needs of the water user and addresses water quality, fish passage, and channel instability issues.

In April 2022, we contracted with River Structures Consulting to do an alternatives assessment and design to replace existing irrigation diversion push-up dams with permanent fish-friendly diversions at four irrigation points of diversion on Bull Run Creek. The contract also included design of piping for delivery of water from two of the points of diversion that currently have open ditch delivery systems. With a design team including the PBWC, landowner, ODFW, OWRD, and the BRID, we have progressed through the design steps of alternative assessment, alternative selection, 60% and 90% designs. The ODFW Fish Passage Program was brought into the design/review process at the 60% design review and has provided preliminary fish passage approval. We hoped to receive a formal fish passage approval letter from ODFW, however, after

almost a year with repeated reminder, this has not occurred. The OWEB project completion reporting has been submitted and approved. The project is complete.

Unfortunately, the Moeller property, which was leased by Ben Norton, has been sold, and as a result, future implementation of the design is uncertain.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.C, 1.D, 1.E

Powder Basin Groundwater Records Review (OWEB Grant 220-5043-17407)

The PBWC developed a project in collaboration with the OWRD and the Oregon Department of Geology and Mineral Industries (DOGAMI) to utilize the existing data on groundwater resources to determine whether groundwater is declining within the Powder Basin. There is growing concern that areas within the Powder Basin may be at risk for declining groundwater levels. Changes to groundwater levels often have long-lasting direct effects to stream flow, fish habitat, water quality, and agricultural operations.

Based on conversations with the public and OWRD staff, it was determined that the most logical first step in assessing the current status of groundwater in the Powder Basin was to review existing data that is stored by OWRD. The goal of this project is to summarize existing data, identify trends in groundwater levels over time, extract geologic data that is relevant to groundwater storage, identify restoration needs to mitigate declines in groundwater, and determine data gaps. The project focus area is the Baker Valley.

PBWC's role in this project is to develop a database to organize data on groundwater levels and well lithology, and then populate the database from information gathered from OWRD well logs. OWRD and DOGAMI will then use this data in modeling exercises to characterize the groundwater resource in Baker Valley.

In 2020, the PBWC partnered with the Oregon Department of Geology and Mineral Industries (DOGAMI) to conduct a review of groundwater wells in the Powder Basin with the hopes of using the data to identify bedrock geology, aquifer locations, and water usage. The collected data included groundwater elevations, subsurface geology, and well coordinates derived from the Oregon Water Resources Department Well Report Query system. After a hiatus in 2021 and 2022, data entry into the groundwater database began again in earnest in 2023. To date, 384 records have been entered into DOGAMI's database, with 129 records remaining until the project is completed.

PBWC Strategic Plan strategies addressed: 6.B

Uplifting Anthony Creek for Sensitive Trout and Beaver: Alternatives Assessment and Design (OWEB Grant 223-2018-22501)

Resulting from our work monitoring water quality on the ODFW Elkhorn Wildlife Area elk feeding sites on the North Powder River and Anthony Creek, the wildlife area manager asked us to develop habitat restoration projects on both sites. In 2022, we agreed to first develop restoration designs for the Anthony Creek site.

Through Summer and Fall 2022 we worked with ODFW to develop a project approach and submitted an application to OWEB in October to fund alternatives assessment and design. The project was funded May of 2023.



Figure 14. Photographs of the Anthony Creek project areas including the elk feeding station (1) and simplified stream channel (2).

The project is located on a 1.5-mile reach of Anthony Creek, a tributary to the North Powder River within the ODFW Elkhorn Wildlife Area. Anthony Creek is occupied by several species of trout including native Bull Trout and Columbia Basin Redband Trout (CBRT) and non-native Brook Trout. The project reach is primarily utilized by CBRT and Bull Trout are documented to occupy Anthony Creek approximately two miles upstream from the project site. It is likely beaver occupied the reach historically, but their presence is not currently evident. Implementation of this project has potential to extend Bull Trout occupancy downstream to the project reach, which will be a focus of the design. Documented water quality impairments include 303 (d) listings for temperature and E. coli bacteria in summer months. Habitat impairments for native trout include lack of instream habitat quantity and diversity and impaired fish passage. The project will address water quality and aquatic habitat deficiencies in Anthony Creek by designing actions to improve livestock grazing management and in-channel restoration actions to: reconnect the incised stream with the historic floodplain; increase the number of quality pools; increase the loading of large wood material in the channel and encourage beaver recolonization. We will expand the existing riparian buffer fence, based the designed project footprint. We will assess opportunities for accomplishing our goals and objectives through collection of geomorphic/hydrologic/habitat data, development/assessment of alternatives,

selection of preferred alternative(s) and design of the preferred alternative for accomplishing project objectives. ODFW has committed to both in-kind and cash support of the project.

Spring of 2023 we implemented a competitive Request for Proposal (RFP) process to hire an engineering/design firm to develop restoration designs. In June we contracted with RivHab Engineering Design out of Boise, Idaho to develop project designs. To date, accomplishments include PBWC collection of aquatic inventory data for the project reach, RivHab collection of field data to support project design, RivHab development of 15% conceptual design alternatives and selection of the preferred alternative by the project review team (PBWC, ODFW and USFWS). The preferred design approach includes large wood placements, channel fill associated with large wood placements, opening of historic channel outlets, construction of BDAs and beaver suitable ponds along side-channels, and moving of elk feeding site infrastructure (hay shed) out of the active floodplain. Completion of 30% designs are expected February 2024, with final design completion on schedule for July 2024.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.C, 1.D, 1.E, 3.C

STAKEHOLDER ENGAGEMENT

Powder Basin Stakeholder Engagement (OWEB 222-5049-22249)

Fall of 2022, we received an OWEB grant to provide organizational capacity to develop project opportunities. This project includes three focus areas, the Pine Valley portion of the Pine Creek Watershed, the Powder River and tributaries upstream of Jimmy Creek, and the Burnt River and Tributaries upstream of and including Camp Creek. Within these areas we will engage with stakeholders and landowners in the development of three project types: beaver restoration and mitigation, irrigation system modernization and fish passage improvements. In the face of climate change, restoration practitioners and the community are seeing the restoration of beavers on the landscape as a necessary tool to increase the residence time of water in our watershed. Recent drought conditions have emphasized the need for more efficient use of irrigation water to maintain instream flows and ensure that users have water available to produce food. Improving and maintaining passage for bull trout in the Pine Basin is identified as a needed action in the US Fish and Wildlife Service Bull Trout Mid-Columbia Recovery Unit Implementation Plan. We will use one-on-one personal contacts through trusted sources, our newsletter (The Thalweg), development and directed mailings of informational brochures, and in-the-field workshops to engage landowners and the community to develop restoration project opportunities. Partners include the Idaho Power Company and Powder Basin community.

The Watershed Restoration Coordinator, Madison O'Bryant, joined the council in January of 2023 to implement the Stakeholder Engagement objectives detailed above. Community engagement work commenced with meeting PBWC Board Members, partner organizations, and members of the community to recruit participants for the PBWC's Strategic Plan Refresh and Action Planning Process. Developing these relationships was critical for meeting diverse stakeholders and landowners across the basin who may be interested in working with the PBWC in the future. 2023 updates will be detailed below by project type. Completion of this project is

scheduled for late 2024 and we anticipate applying for additional engagement funding through OWEB in Fall 2024 or Spring 2025 to continue our outreach and project development efforts.

Irrigation Efficiency Improvements: In spring of 2023, the Watershed Restoration Coordinator and PBWC Executive Director participated in an application review for Idaho Power Company's (IPC) Water Efficiency Program (WEP). Ultimately, the WEP review team selected two projects in the Pine Valley to receive \$45,000 in funding for irrigation efficiency improvements and IPC helped partner landowners receiving this WEP award with either the PBWC or the Eagle Valley Soil and Water Conservation District to pursue additional funding through OWEB. The Watershed Restoration Coordinator worked with IPC and the landowner receiving WEP funding to develop the Johnny-Bill Irrigation Efficiency Project OWEB application for the Spring 2023 open solicitation cycle. The Johnny-Bill OWEB grant was ranked number 1 out of 11 grants submitted during the spring 2023 cycle and funding was awarded in November of 2023. Project implementation will begin during the summer of 2024. For more information regarding this project, please see the Restoration section.

Fish Passage Improvement: Within the Burnt River focus area, the PBWC is currently engaged in project development in partnership with the Wallowa-Whitman National Forest. The Camp Creek Fish Passage Improvement project will address three structures currently impeding aquatic organism passage throughout a 1.5-mile section of Camp Creek. The National Forest is currently completing design work for all three project components while the PBWC is working to secure funding. In December of 2023 the PBWC submitted a grant application for the 2023 Private Forest Accord funding opportunity through ODFW. We anticipate receiving a funding decision in late March before requesting additional funding through OWEB's 2024 Spring Open-Solicitation cycle. For more information regarding this project, please see the Restoration section.

Beaver Coexistence: Currently, no coexistence projects have been developed with land managers within the specified areas. However, 2023 was full of beaver coexistence related activities which will amplify outreach efforts and coexistence opportunities in 2024. Beaver coexistence accomplishments are as follows:

- The Watershed Restoration Coordinator joined the BeaverCorps Training Program in 2023 through the Beaver Institute to receive professional education and hands on experience with beaver coexistence projects. The anticipated completion date for this program is spring of 2024.

- During 2023, the Oregon Department of Fish and Wildlife identified the North Fork Burnt River watershed as a Beaver Emphasis Area. This creates partnership opportunities with ODFW and the Wallowa-Whitman National Forest to bolster beaver related outreach, project implementation, and project monitoring within this focus area. ODFW will be engaged with the Beaver Emphasis Area for three years (2023-2026) and will help support PBWC efforts within the focus area during this time.
- In October of 2023, the PBWC hosted a Beaver Dam Barbecue (workshop) to offer members of the public a hands-on opportunity to learn more about beavers and low-tech process-based restoration techniques (Figure 14). Attendance far surpassed our expectations (19 participants with a goal of 10)



Figure 14: Beaver Dam BBQ participants stand in front of completed BDA.

and we successfully built three beaver dam analogues with help from the public. We are planning another Beaver Dam BBQ for the summer of 2024 along with a Beaver Coexistence Workshop in fall 2024.

- A beaver focused version of the Thalweg (PBWC Newsletter) will be developed and distributed in 2024 for landowners across the Powder Basin. This will help spread the word about beaver benefits, coexistence solutions, and resources the PBWC can offer the public.

PBWC Strategic Plan strategies addressed: 1.A, 1.B, 1.C, 1.D, 3.A.

Sage-grouse CCAA Coordinator Biennium 2 (OWEB 222-8206-19954)

In August 2020, the Endangered Species Act Section 10(a)(1)(A) Enhancement of Survival Permit associated with the Baker/Union County Programmatic Sage-grouse Candidate Conservation Agreement with Assurances (CCAA) was successfully transferred to PBWC. The CCAA is an agreement between the USFWS and the PBWC to address the local conservation needs of sage-grouse. In return for conservation measures included in the CCAA, participating property owners receive assurances that no additional conservation requirements will be imposed if sage-grouse are listed under the Endangered Species Act (ESA). To manage the CCAA program, PBWC applied for a grant to fund a Sage-grouse CCAA Coordinator position. The Baker Sage-grouse Local Implementation Team (LIT) awarded the CCAA Coordinator grant using funds from the Baker Focused Investment Partnership (FIP), a grant award provided by the OWEB. PBWC hired the Sage-grouse Candidate Conservation Agreement with Assurances (CCAA) Coordinator (hereafter, Coordinator) who started in February 2021.

Through on-going OWEB FIP funding, Powder Basin Watershed Council (PBWC) continued funding the CCAA Coordinator position in order to increase enrollment of private landowners, provide support to existing enrollees, and assist with sage-grouse conservation projects.

In 2022, three letters of intent (LOI) to enroll in the CCAA program were carried over and an additional five LOIs were submitted in 2023 bringing the total to eight active LOIs. Of the eight properties, five were inventoried, two signed up after the field season (inventory will be completed in 2024), and one property was advised that the program may not be a good fit for their operation (small property of ~ 80 acres). All five properties inventoried have draft site specific plans (SSPs) either completed or in progress and enrollment is anticipated for four out of the five properties in 2024. As it stands, approximately 41,640 acres are set to enroll in the CCAA program bringing the total to approximately 89,266 acres. Site specific plans are created to not only fit the landowner but create a roadmap for what landowners wish to accomplish over the lifetime of the agreement and beyond. Much of the work goes to improving habitat through weed treatments, seedings, juniper removal, and stream/meadow restoration which benefits the landowner's operation, sage-grouse, and the many species that rely upon sagebrush habitat. These actions help to resist/ diminish the effects of disturbances like wildfire, build a more resilient system that can rebound better after disturbances, and improve water quality. Within the Baker Priority Area of Conservation (PAC), most lands are privately held by numerous landowners creating a checkerboard of private and public lands (primarily Bureau of Land Management). As landowners continue to sign up for the CCAA program and work to improve and protect their habitat, we start to see the pieces forming a blanket which is resulting in landscape level impacts which we hope results in ecological uplift within the region.

Outreach activities for 2023 included:

- The CCAA Coordinator presented at six joint (Baker County Weed District, Tri-County Cooperative Weed Management Area, and PBWC) outreach events to promote the CCAA program and inform about the importance of sagebrush steppe to local landowners. These events occurred in Medical Springs, North Powder, Unity, and Baker City, Oregon.
- Article in local newspaper about CCAA program ("Saving sage grouse: Baker County's campaign gets federal financial boost"
https://www.bakercityherald.com/news/local/saving-sage-grouse-baker-countys-campaign-gets-federal-financial-boost/article_e5863106-084c-11ed-9abd-871f6381b79c.html)
- Assisted with the development of a short film about the CCAA program in Oregon ("Conserving Rangelands for Wildlife and People in Oregon"
<https://www.youtube.com/watch?v=6C4jqK7EeX4>)
- Had two CCAA Advisory board meetings which is made up landowners and interagency personnel to discuss ways to enhance the success of the CCAA program.

- Regularly attended and provided updates/outreach to Advisory Board meetings for Baker County Weed District and Tri-County Cooperative Weed Management Area which has landowners as board members.
- Presented at the Western Association of Fish and Wildlife Agencies Sage and Columbian Sharp-tailed Grouse Workshop.
- Presented at the annual SageCon Partnership Summit.
- Presented at Oregon Chapter of the Wildlife Society.
- Worked with SageCon Partnership to develop outreach materials for Oregon's CCAA program as a whole (no products fully produced).

PBWC Strategic Plan strategies addressed: 2.A, 2.B, 2.C and 2.D; 3.A and 3.F; 4.B, 4.C, 4.F; 6.B

OUTREACH & EDUCATION

The PBWC, again in 2023, partnered with the Baker Resources Coalition to be the employer of record for four Baker County high school student interns and a college aged crew chief. The student interns did wildfire mitigation work on five properties along the face of the Elkhorns, assisted with Whitebark Pine monitoring on the WWNF and constructed beaver dam analogs for the PBWC on the Camp Creek Ecosystem Resiliency Project. In addition, PBWC staff provided management and administrative support by serving as the Fiscal Sponsor for a grant from Coalitions and Collaboratives, Inc. that made the program possible in 2023, and assisted with recruitment, hiring and supervision of the interns and crew chief.

In 2023, the PBWC hosted four speakers to facilitate engagement with the public. Jason McClaughry with the Oregon Department of Geology and Mineral Industries gave a presentation on groundwater resources of the Baker Valley, ecologist and writer George Wuerthener gave a presentation on forest ecology and wildfire; Carlos Ochoa an Associate Professor of Rangeland Ecology and Hydrology in the Department of Animal and Rangeland Sciences at Oregon State University gave a presentation on ongoing research on water quality, vegetation cover, and groundwater relationships in a rangeland riparian ecosystem in eastern Oregon; and PBWC's Sage-grouse CCAA Coordinator, Emmy Tyrrell, gave a talk on Sage-grouse and sagebrush ecosystems.

With funding support from the Roundhouse Foundation, PBWC staff partnered with WWNF staff and the Baker Resources Coalition to host an Education Field Day at the Camp Creek Ecosystem Resiliency project site for 17 Environmental Science students (freshmen) and a few Advanced Biology students (juniors/seniors) from Baker High School.

The essential question formulated by Baker High School educators, "How have humans impacted Camp Creek and how do we address human caused issues?" was addressed by each

presenting instructor. A major field day goal was ensuring a hands-on experience for students at each station to further their education beyond the classroom.

PBWC's Camp Creek Ecosystem Resiliency project site was the perfect place to address these essential questions because it is an accessible stream which demonstrates various forms of degradation due to human influence. It is also an excellent area to discuss solutions due to the active restoration project which involves addressing historic human impacts to the system.

Education Stations Included:

1. Rewilding and Think Like a Beaver, Steve Edwards (BRC) and Madison O'Bryant (PBWC):
Steve discussed rewilding and other types of restoration. Rewilding is the process of setting the stage for nature to do the work which was discussed in the context of constructing Beaver Dam Analogues to set the stage for beavers to come in and take over restoration efforts. Madison gave a brief overview of historic trapping and other types of land use activities which have influenced Camp Creek. Madison discussed the goals of the Camp Creek Ecosystem Resiliency project and then led a hands-on activity where students helped construct a Beaver Dam Analogue.
2. Stream Ecology, Tim Bailey (PBWC):
Tim discussed various aspects of stream ecology and function in context of native trout habitat preferences and life histories, and the various types of land uses which have influenced Camp Creek. For the hands-on activity, students compared cross-section measurements between two adjacent stream channels. They began with Camp Creek which is very incised and disconnected from its floodplain and then measured Pinus Creek which is still connected with its floodplain.
3. Water Quality, Justin Thorson (PBWC):
Justin discussed various water quality parameters with students and how human influence can impact these factors. He also discussed the Camp Creek Ecosystem Resiliency project and how these restoration actions can improve water quality. For the hands-on activity, students learned to use water quality monitoring equipment to measure temperature, turbidity, dissolved oxygen, and other parameters.
4. Songbirds, Jamie Ratliff (WWNF):
Jamie discussed riparian areas and their importance to various kinds of songbirds in the context of Camp Creek which has experienced floodplain disconnection and upland vegetation encroachment due to various human influences. Jamie led a hands-on activity where students learned to identify different birds along Camp Creek and within the adjacent Aspen stand.
5. Upland and Riparian Vegetation, Bob Hassmiller (WWNF):
Bob discussed riparian vegetation and the importance of native stabilizing vegetation for stream function. He also discussed upland vegetation encroachment and how humans have influenced this issue along Camp Creek. Bob led a hands-on activity where students

performed vegetation surveys to learn more about the types and densities of upland vegetation encroaching on Camp Creek.

6. Macroinvertebrates, Will Glenn (WWNF):

Will discussed macroinvertebrates with students and how assemblages can change due to human influences on water quality and stream function. Students performed a hands-on activity where they collected and identified macroinvertebrates above and below a beaver dam analogue on Camp Creek and discussed why macroinvertebrates would differ in a lentic portion of the stream vs a lotic segment. The beaver dam analogue was constructed as part of the Camp Creek Ecosystem Resiliency project and provided a great opportunity to discuss how restoration, another human influence, can impact the stream system.

The PBWC partnered with Solve Oregon, Baker City Downtown, Anthony Lakes Resort, and North 7 Brewery to carry out trash removal and improvement along the Powder River through Baker City April of 2023. Free food, water, garbage collection supplies and gifts from Anthony Lakes and North 7 were provided. The PBWC's efforts focused on trash removal in three sections of the Powder River along the Leo Adler Memorial Parkway. Forty-five volunteers spent 90 hours removing 250 pounds of trash from the river (Figure 15), enough to fill the 1.5-yard dumpster provided by Baker Sanitary. Some of the more interesting finds by volunteers included a Razer scooter, a soccer ball, a plastic end table, a pallet, and a pair of underwear.

COUNCIL ADMINISTRATION

No changes to the Board of Directors or officers occurred in 2023. The PBWC Board of Directors includes the following individuals as of December 31, 2023:

<u>Director</u>	<u>Position</u>	<u>Residence</u>
Dorothy Mason	President	Baker City
Karen Riener	Secretary	Richland
Ben Titus	Treasurer	Baker City
Shawn Klaus	Director at large	Hereford
Margaret Durner	Director at large	Halfway
Curtis Martin	Director at large	North Powder

FINANCIAL STATUS

Balance Sheet – December 31, 2023

ASSETS

Current Assets

Checking/Savings

 Sterling Checking 109,396.02

 Cash Adjustment -925.00

Total Checking/Savings 108,471.02

Accounts Receivable

 Accounts Receivable -18,226.05

 Grants Receivable -170,479.98

Total Accounts Receivable -188,706.03

Other Current Assets

 Undeposited Funds 40,000.00

 Accrued Revenue -47,817.10

Total Other Current Assets -7,817.10

Total Current Assets -88,052.11

Fixed Assets

 Furniture and Equipment 26,101.83

 Accum Depr - Furn and Equip -22,929.00

Total Fixed Assets 3,172.83

TOTAL ASSETS - 84,879.28

LIABILITIES & EQUITY

Liabilities

Current Liabilities

Accounts Payable

 Accounts Payable -49.36

Total Accounts Payable -49.36

Other Current Liabilities	
Employee Leave Liability	53,045.94
Payroll Liabilities	1,828.53
Worker Compensation Payable	3,797.25
Unearned or Deferred Revenue	<u>-269,243.09</u>
Total Other Current Liabilities	<u>-210,571.37</u>
Total Current Liabilities	<u>-210,620.73</u>
Total Liabilities	-210,620.73
Equity	
Unrestricted Net Assets	143,690.29
Net Income	<u>-17,948.84</u>
Total Equity	<u>125,741.45</u>
TOTAL LIABILITIES & EQUITY	-84,879.28