

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022-23 SCOPE OF WORK

PROJECT: 126b & 167b

Project Title

Colorado River and White River supplemental removal of smallmouth bass and northern pike; Colorado River floodplain private ponds removal of northern pike and smallmouth bass; Kenney Reservoir removal of northern pike

Bureau of Reclamation Agreement Number:

R17AP00301

Reclamation Agreement Term

September 22, 2017 - September 30, 2022

Note: Recovery Program FY22-23 scopes of work are drafted in May 2021. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

Lead Agency:

Colorado Parks and Wildlife

Principal Investigator:

Ben Felt, Area Aquatic Biologist-Colorado River
Colorado Parks and Wildlife
711 Independent Ave.
Grand Junction, CO 81505
Phone: (970) 255-6126
Email: benjamin.felt@state.co.us

Jenn Logan, Native Aquatic Species Biologist-White River
Colorado Parks and Wildlife
0088 Wildlife Way
Glenwood Springs, CO 81601
Phone: (970) 947-2923
Email: jenn.logan@state.co.us

Tory Eyre, Area Aquatic Biologist-Kenney Reservoir
Colorado Parks and Wildlife
73485 Highway 64
Meeker, CO, 81641
Phone: (970) 878-6074

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Email: tory.eyre@state.co.us

Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other *[explain]*

Relationship to RIPRAP:

This project will involve Colorado Parks and Wildlife (CPW) removing smallmouth bass and northern pike from 17.4 river miles (RM) (two river reaches only) of the Colorado River between Silt, Colorado (RM 248.0) and Beavertail Mountain (RM 195.7), and will also focus on removal of these species in private floodplain ponds upstream of Rifle, Colorado (RM 240.4). Smallmouth bass and northern pike will be removed from the White River downstream of Taylor Draw dam (RM 104.0) in Rangely, Colorado. Northern pike will be removed from Kenney Reservoir, just upstream of the Taylor Draw dam (RM 104.0).

General Recovery Program Action Plan

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative interactions between nonnative and endangered fishes.
- III.A.2. Identify and implement viable active control measures.
- III.F. The States will commit to remove northern pike and/or replace them with a Compatible (compatible with recovery) species (as identified in the Basin wide Strategy) throughout the UCR Basin. Specific waters will be targeted based on risk of escapement, opportunity, and available resources.

Colorado River Action Plan: Mainstem

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Develop and implement control programs in reaches of the Colorado River occupied by endangered fishes. Each control activity will be evaluated for effectiveness and then continued as needed.
- III.A.4. Preclude escapement from ponds in critical habitat as needed and feasible.
- III.A.6. Develop and implement program to identify required level of smallmouth bass control.
- III.A.7. Develop and implement program to identify required level of northern pike control.
- III.A.10. Upstream of Grand Valley Project dam: Determine and implement an adequate level of mechanical removal in the main channel. More importantly, use all techniques available to eradicate northern pike (and other nonnative species of concern) from floodplain habitats.

Green River Action Plan: White River

- III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative interactions between nonnative and endangered fishes.
- III.A.1 Monitor nonnative fishes in Kenney Reservoir and upstream. Initial assessment complete (Elmblad 1998).

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- III.B.2. Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.
- III.B.2.a. Determine and implement an adequate level of mechanical removal to reduce smallmouth bass.

Study Background/Rationale and Hypotheses:

Susceptibility of the Colorado River basin to nonnative fish establishment has been attributed to the low diversity of the native fish fauna, a high degree of endemism of this fauna, and the highly altered physical habitat of the basin (Hawkins and Nesler 1991). Bezzerides and Bestgen (2002) report that the native fish fauna of the Colorado River basin consists of at least 35 species, while at least 100 nonnative fishes have been introduced into the basin (Tyus and Saunders 2000). Influences of such introductions on native fish fauna are cause for great concern, especially in areas occupied by endangered species.

Sections of the White and Colorado rivers are designated by the U.S. Fish and Wildlife Service (USFWS) as critical habitat for the federal- and state-listed Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*). Primary threats to these native species include competition with and predation by nonnative fish species (USFWS 2002). Northern pike (*Esox lucius*) and smallmouth bass (*Micropterus dolomieu*) are two nonnative species identified by Hawkins and Nesler (1991) as problematic to native fishes of the Colorado River basin. Both piscivores are well established in the upper Colorado River basin, having invaded river reaches that provide critical habitat for native listed fishes, as well as non-listed species such as the roundtail chub (*Gila robusta*), flannelmouth sucker (*Catostomus latipinnis*), and bluehead sucker (*Catostomus discobolus*). Thus, the potential impacts of northern pike and smallmouth bass competition with and predation of native, sympatric species are severe.

This proposed study is one of several designed for removal of northern pike and smallmouth bass, and evaluation of such efforts within the upper Colorado River basin. Colorado Parks and Wildlife and several partners including the USFWS-Green River Basin Fish and Wildlife Conservation Office (USFWS-Vernal), USFWS-Grand Junction Fish and Wildlife Conservation Office (USFWS-GJ) have cooperatively developed the logistics within this proposal. These collaborative efforts will increase the efficiency and effectiveness of removing northern pike and smallmouth bass within reaches of the Colorado and White rivers, as well as from private ponds located in the Colorado River floodplain. Additionally, CPW has collaborated with the Rio Blanco Water Conservancy District (RBWCD) for permission to access Kenney Reservoir for northern pike removal efforts. Evaluation of fish removal efforts will assist the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) in attaining nonnative fish management goals.

Study Goals, Objectives, End Product(s):

Colorado River

The U.S. Fish and Wildlife Service (Burdick 2007; Burdick et al. 2011) has previously documented the need for northern pike and smallmouth bass removal in the Colorado River. Colorado Parks and Wildlife will supplement the USFWS efforts by completing additional raft electrofishing passes to remove northern pike and smallmouth bass, providing backwater habitat is available and the potential exists for river connection to possible sources of nonnative fishes. During high water years, CPW will

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plan to provide a minimum of three days on the river focusing on northern pike and smallmouth bass concentration areas within reaches between Rifle, Colorado and Parachute, Colorado. For more information regarding the USFWS-GJ effort, please see the Scope of Work for Project #126. Additionally, CPW will provide a minimum of four days to remove northern pike and smallmouth bass from private ponds within the Colorado River floodplain upstream of Rifle.

Study goals for the Colorado River portion of the project include the following:

- 1) To reduce the number of northern pike and smallmouth bass in two river reaches (Rifle and Parachute) totaling 17.4 river miles of the 52.3 river miles of the Colorado River between Silt, Colorado (RM 248.0) and Beavertail Mountain (RM 195.7), thereby benefiting natives fishes of the Colorado River basin.
- 2) To reduce the number of northern pike and smallmouth bass in private ponds within the Colorado River floodplain upstream of Rifle (RM 240.4), thereby benefitting native fishes of the Colorado River basin.
- 3) To reduce the probability of northern pike and smallmouth bass escaping from private floodplain ponds when connected to the Colorado River during high water periods, thereby benefitting native fishes of the Colorado River basin.

Study objectives for the Colorado River portion of the project include the following:

- 1) To remove as many northern pike and smallmouth bass as possible within the Colorado River study area utilizing raft electrofishing and backwater block-and-shock techniques in concentrated habitats.
- 2) To remove as many northern pike and smallmouth bass as possible within private ponds within the Colorado River floodplain utilizing boat electrofishing, and gill and trap net sets.
- 3) To preclude northern pike and smallmouth bass from escaping from private ponds in the Colorado River floodplain utilizing trap nets.
- 4) To provide the USFWS-GJ with northern pike and smallmouth bass data collected from the Colorado River study area and private ponds within the Colorado River floodplain.

White River

The U.S. Fish and Wildlife Service (Smith et al. 2020) has previously documented the need for smallmouth bass removal in the White River. Colorado Parks and Wildlife will supplement the USFWS efforts by completing additional raft electrofishing passes to remove smallmouth bass and northern pike from the White River across two weeks (a minimum of six days on the river). For more information regarding the USFWS-Vernal effort, please see the Scope of Work for Project #167.

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The study goal for the White River portion of the project includes the following:

- 1) To reduce the number of smallmouth bass and northern pike in the White River from Taylor Draw dam (RM 104.0) downstream, thereby benefitting native fishes of the White River basin, as well as native fish communities downstream within the Green River basin.

Study objectives for the White River portion of the project include the following:

- 1) To remove as many smallmouth bass and northern pike as possible within the White River study area utilizing main channel raft electrofishing.
- 2) To provide the USFWS-Vernal with smallmouth bass and northern pike data collected from the White River study area.

Kenney Reservoir

Colorado Parks and Wildlife confirmed the presence of northern pike within Kenney Reservoir in the fall of 2018. In the spring of 2019, CPW validated reproducing northern pike within the reservoir. With the permission of the landowner RBWCD, CPW will complete two weeks (a minimum of six days on the reservoir) to remove northern pike from Kenney Reservoir.

The study goal for the Kenney Reservoir portion of the project includes the following:

- 1) To reduce the number of northern pike in Kenney Reservoir upstream of Taylor Draw dam (RM 104.0), thereby benefitting native fishes of the White River basin, as well as native fish communities downstream within the Green River basin.

The study objective for the Kenney Reservoir portion of the project includes the following:

- 1) To remove as many northern pike as possible within Kenney Reservoir utilizing boat electrofishing, and gill and trap net sets.

Validated CPW data will be provided to the USFWS for the portions of the project focused on the Colorado River and private floodplain ponds (USFWS-GJ), and White River (USFWS-Vernal). For the Kenney Reservoir portion of this project, CPW will prepare an Annual Report that will also be distributed to interested parties following the field season. Presentations will also be provided during the Annual Recovery Program Researchers' Meeting (generally in January) and at the Nonnative Fish Control Workshop (if convened).

In contrast to previous years of work and reaction to positive response of the fish communities (in some cases), CPW will be reducing removal efforts for all portions of this project. For example, densities of northern pike and smallmouth bass in the upper reaches of the Colorado River study area (Silt to Beavertail Mountain) have generally declined since 2018 with minimal species occurrence (Francis 2020). Thus, reduced removal effort is warranted, especially in low water years when potential river connection with possible sources of nonnative fishes is minimal and access to backwater habitat is unavailable. As such, CPW will complete raft electrofishing and backwater block-and-shock techniques in concentrated habitats during high water years (across similar effort as previous years, a minimum of

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three days). Colorado Parks and Wildlife will likely refrain from sampling during low water years, and resume sampling the following year should hydrological conditions allow. Colorado Parks and Wildlife will attempt to sample at least every other year. For years in which the river sampling will not be completed, CPW will coordinate with the Recovery Program Director's Office to either complete an additional task in another location or return these grant funds for this portion of the project. Success in removing northern pike from several private gravel ponds (Mamm Creek ponds) in the Colorado River floodplain (Francis 2020; B. Felt, personal communication, April 2021) has resulted in CPW having the flexibility to reduce removal efforts overall (by two days), while also transitioning removal efforts to other locations. Several potential sampling locations have been identified, but additional sites may arise. Colorado Parks and Wildlife will coordinate sampling locations with the Recovery Program Director's Office.

Similar to the Colorado River, CPW will also be reducing smallmouth bass and northern pike removal efforts in the White River by one week (three days on the river) so that the agency can complete native fish monitoring in the same study area, and during generally the same sampling time. USFWS-Vernal and Utah Division of Wildlife Resources will collaborate to conduct these three days of CPW's removal efforts so that overall effort does not decline in this river reach. Colorado Parks and Wildlife has removed the previous budget associated with completing this sampling effort.

Additionally, due to the successful removal and suppression of northern pike from Kenney Reservoir (Eyre 2020; T. Eyre, personal communication, April 2021), CPW will be reducing removal efforts from five weeks (20 days) to two weeks (a minimum of six days on the reservoir) across the spring and fall. Colorado Parks and Wildlife has removed the previous budget associated with completing this sampling effort.

Study Area:

Colorado River

The study area for this portion of the project will include 17.4 river miles of the Colorado River between Rifle (RM 240.4) and Parachute (RM 223.0). Slack water habitat, backwaters, and sections of the main channel near major backwaters will be raft electrofished, with block-and-shock techniques utilized within backwaters. Specific river segments to be sampled include: Reach 2: RM 240.4 (Rifle boat launch) to RM 230.0 (Rulison), and Reach 3: RM 230.0 (Rulison) to RM 223.0 (Parachute) within the overall 52.3 river miles from Silt (RM 248.0) to Beavertail Mountain (RM 195.7). In addition, private ponds within the Colorado River floodplain upstream of Rifle will also be targeted by CPW.

White River

The study area for this portion of the project will include the White River from Taylor Draw dam (RM 104.0) to the Colorado/Utah state line (RM 71.6). The main channel will be raft electrofished. Most of this effort will be focused in the upper most 10 miles of river downstream of the dam, within the area of greatest smallmouth bass concentration.

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Kenney Reservoir

The study area for this portion of the project will include Kenney Reservoir upstream of Taylor Draw dam (RM 104.0). Kenney is a mainstem reservoir, and as such, the White River flows through the reservoir. The White River immediately upstream of the reservoir (the reservoir “inlet”) will also be included within the study area, as hydrological conditions allow.

Study Methods/Approach:

Since 2015, the Recovery Program has implemented a two-tiered strategy for reducing populations of problematic nonnative predators in endangered species habitats by 1) performing large-scale removal of nonnative predators, especially focusing on spawning disruption; and 2) preventing escapement of nonnative predators from off-channel sources by containing or eradicating populations. The combination of these two strategies is important because reducing in-river reproduction and limiting emigration from off-channel sources limits population growth after in-river removal is performed. Currently, the Recovery Program removes nonnative smallmouth bass, northern pike and walleye from over 600 miles of river. Screens have been installed on 5 of 7 major reservoir outlets to prevent escapement with 2 more pending.

Over the past decade, this strategy has been applied with general success for smallmouth bass, northern pike, and walleye. For example, in the Yampa River smallmouth bass populations have been contained at Elkhead Reservoir via a spillway net and outlet screen, while spawning has been disrupted via intense nest disruption. As a result, even with occasional strong year classes, the adult population of smallmouth Bass in Little Yampa Canyon remains low compared to almost all prior years ([Hawkins 2020](#)). Northern pike are also contained at Elkhead Reservoir, while spawning in the Yampa River is disrupted via early spring backwater gill-netting. Abundance estimates show that this effort has resulted in a large reduction in Yampa River northern pike between Hayden and Craig compared to estimates a decade ago ([Bestgen et al. 2020](#)). Similarly, in the upper Colorado River, containment at Rifle Gap Reservoir, along with containment and removal at the Mamm Creek gravel ponds, appears to have successfully suppressed catch of northern pike in endangered fish habitats ([Francis 2020](#)). Reservoir containment of walleye is the priority; in-river walleye recruitment has not been documented, so spawning disruption is not needed. Catches of walleye in the middle Green River over the past few years have declined from previous norms ([Partlow and Elbin 2020](#)), likely the result of eradication and containment of populations at Red Fleet and Starvation Reservoirs. These examples demonstrate that a two-tiered approach is generally successful at limiting populations of problematic predators.

This project focuses on in-river mechanical removal of northern pike and smallmouth bass in the Colorado and White rivers; in-pond and off-channel mechanical removal of northern pike and smallmouth bass in private ponds in the Colorado River floodplain; and in-reservoir removal of northern pike in Kenney Reservoir. As part of this project, CPW will include spawning disruption of smallmouth bass in the White River, and of northern pike in private floodplain ponds of the Colorado River and also in Kenney Reservoir utilizing electrofishing, and gill and trap net sets. Off-channel escapement prevention of smallmouth bass and northern pike from private ponds within the Colorado River floodplain will also be completed utilizing electrofishing, gill and trap net sets, and potentially the merwin net. In addition, CPW will

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remove individuals of northern pike and smallmouth bass outside of the spawning period to reduce population abundances of both species in the Colorado and White rivers. Colorado Parks and Wildlife and the USFWS will measure response to these efforts by determining northern pike and smallmouth bass densities, length frequency distributions, and catch-per-unit-effort.

Colorado River

Colorado Parks and Wildlife will perform raft electrofishing and block-and-shock techniques (as appropriate) within slack water habitat, backwaters, and concentration areas to target northern pike and smallmouth bass within the Colorado River downstream of Rifle (Task 3). This portion of the study will occur between April and September. Colorado Parks and Wildlife will likely refrain from sampling during low water years when the potential for river connection with possible sources of nonnative fishes is minimal and access to backwater habitat is unavailable. In these situations, sampling will resume the following year presuming hydrological conditions allow. A minimum of three days sampling during high water years, focusing on two reaches (Rifle and Parachute) historically with the greatest smallmouth bass and/or northern pike concentrations.

Two, two-person electrofishing crews will utilize rafts equipped with outboard motors to perform sampling. Each crew will simultaneously sample the specified habitat along the left and right shorelines in a downstream direction using ETS electrofishing equipment. No river segment will be electrofished on consecutive days to allow for fish recovery and redistribution. Each raft will process fish collected.

Backwaters where CPW has obtained permission to sample will also be included within this sampling effort, when feasible. Crews will sample backwater areas along both sides of the river. A gill net may be used with a block-and-shock technique. Output power within backwaters will be adjusted based upon changes in river conductivity. Additionally, output power will be reduced during the raft approach to the backwater mouth if it is blocked by a gill net. Both processes will minimize the potential for electrofishing injuries to fish.

Private Ponds within the Colorado River Floodplain

Colorado Parks and Wildlife will target northern pike and smallmouth bass upstream of Rifle in private ponds within the Colorado River floodplain (Task 4). This portion of the study will begin in mid-March to exploit northern pike during the spawning period, and may continue intermittently thereafter. The goals of these efforts are to exploit northern pike during the spawning period, and to also reduce the possibility of smallmouth bass and northern pike escaping from floodplain ponds when connected to the Colorado River during high water periods. A minimum of four days will be expended sampling the ponds.

Two, three-person electrofishing crews will utilize jon boats to electrofish, and set gill and trap nets. A block-and-shock technique will be utilized to corral fish into nets. Day and/or evening electrofishing will occur with ETS electrofishing equipment, in addition to overnight sets of gill/trap nets. A merwin trap (over-size, floating but stationary trap net) may also be utilized as a passive capture technique when feasible. This trap may be used for two purposes: 1) in the shallows to exploit northern pike during the spawning period, and 2) to block pond outlets, precluding escapement of nonnative fishes from ponds into the Colorado River during high water periods.

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White River

Colorado Parks and Wildlife will perform main channel raft electrofishing to target smallmouth bass and northern pike in the White River downstream of Taylor Draw dam (Task 6). This portion of the study will occur in early to mid-May on the descending limb of the hydrograph when water temperatures will likely favor the smallmouth bass spawning period. A minimum of six days on the river (two weeks) will be expended sampling, primarily focusing in the upper most 10 miles of river downstream of the Taylor Draw dam, within the area of greatest smallmouth bass concentration. These efforts will be coordinated with the USFWS.

Two, two-person electrofishing crews will utilize rafts equipped with outboard motors to perform sampling in the main channel. Each crew will simultaneously sample the left and right shorelines in a downstream direction utilizing ETS electrofishing equipment. Island perimeters will also be electrofished. No river segment will be electrofished on consecutive days to allow for fish recovery and redistribution. Each raft will process fish collected.

All smallmouth bass, northern pike, and other nonnative fish (excluding salmonids and channel catfish) captured as part of the efforts on the Colorado and White rivers will be identified by species, measured for total length to the nearest millimeter, weighed to the nearest gram, and lethally removed. Fish may be retained by CPW for further analysis, and either donated or disposed of in a landfill. Capture locations for smallmouth bass and northern pike will be recorded to the nearest tenth of a river mile. Nonnative species of unusual occurrence, i.e. walleye, burbot, grass carp, etc. will have their otoliths extracted prior to disposal. Sampling efforts in the private floodplain ponds of the Colorado River will generally follow the methods outlined above and below.

Razorback sucker, bonytail, and Colorado pikeminnow captured on the Colorado and White rivers will be identified, measured in total length to the nearest millimeter, and weighed to the nearest gram. These species will be scanned to determine the presence of passive integrated transponder (PIT) tags. Passive integrated transponder tag number will be recorded and stored in the PIT tag reader for those fish encountered with PIT tags. Individuals without PIT tags will be implanted with a new PIT tag following the appropriate protocol. Capture locations for these species will be recorded to the nearest tenth of a river mile. Universal Transverse Mercator (UTM) coordinates associated with capture locations will also be recorded, when possible. All native species captured will be released alive, immediately. Any native fish captured that is visibly stressed will not be processed, but rather returned to the location of capture within the river, immediately.

Kenney Reservoir

Colorado Parks and Wildlife will target northern pike within Kenney Reservoir (Task 8). This portion of the study will begin in mid-March/April once ice is off the reservoir, and will continue until the end of the northern pike spawning period. Crews will also complete sampling in the fall to evaluate the success of the spring spawn. A minimum of six days on the reservoir (two weeks) across the spring and fall will be expended sampling the reservoir.

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Two, three-person electrofishing crews will utilize jon boats to electrofish, and set gill and potentially trap nets. A merwin trap may also be utilized as a passive capture technique in the shallows to exploit northern pike during the spawning period. A block-and-shock technique will be utilized to corral fish into nets. Day and/or evening electrofishing will occur with ETS electrofishing equipment, in addition to setting gill and trap nets.

All northern pike captured in Kenney Reservoir will be measured for total length to the nearest millimeter, weighed to the nearest gram, and lethally removed. Fish may be retained by CPW for further analysis, and either donated or disposed of in a landfill. Any listed species collected will be identified, measured in total length to the nearest millimeter, and weighed to the nearest gram. These species will be scanned to determine the presence of PIT tags. Passive integrated transponder tag number will be recorded and stored in the PIT tag reader for those fish encountered with PIT tags. Individuals without PIT tags will be implanted with a new PIT tag following the appropriate protocol. Universal Transverse Mercator (UTM) coordinates associated with capture locations will also be recorded, when possible. All native species captured will be released alive, immediately. Any native fish captured that is visibly stressed will not be processed, but rather returned to the location of capture immediately.

All data collected for the Colorado and White rivers as well as private ponds in the Colorado River floodplain will follow the same guidelines that the USFWS will be utilizing. In addition to fisheries information, water temperature, water conductivity, ETS settings, and gear effort will also be recorded. Quality assurance and quality control protocols provided annually by the Recovery Program Director's Office and/or the USFWS will be followed during data compilation and organization. Validated CPW data will be provided to the USFWS for the portions of the project focused on the Colorado River and private floodplain ponds (USFWS-GJ), and White River (USFWS-Vernal). CPW will not perform data analysis for these supplemental portions of the project; all data collected will be analyzed by the USFWS. For the Kenney Reservoir portion of this project, CPW will prepare an Annual Report that will also be distributed to interested parties following the field season. Presentations will also be provided during the Annual Recovery Program Researchers' Meeting (generally in January) and at the Nonnative Fish Control Workshop (if convened).

Two to four temporary employees will be hired for a total of 9.4 weeks (not including overtime) to accomplish these tasks. Four of these weeks (two, five-day weeks pre-sampling (Task 2) and six, five-day weeks post-sampling (Tasks 5, 7, and 9) will be devoted to crew training, preparation and maintenance of equipment, and data entry. Temporaries may be paid overtime wages pursuant to Colorado state law, and application of federal health care mandates may result in increased costs for temporary employees. Overtime wages have been included within the budget tables as a separate line item, while health care costs have not. Indirect and fringe costs have been estimated based on rates in April 2021, and are subject to change. Colorado Parks and Wildlife reserves the right to alter this Scope of Work based on outcomes of post-2023 Recovery Program discussions.

Task Description, Deliverables and Schedule :

Task 1. Establish landowner contacts and obtain permission to access properties and backwaters for sampling. (Project #126b and Project #167b)

Schedule: February - Mid March

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Task 2. Plan logistics, hire and train personnel, order and maintain equipment, and prepare for sampling. (Project #126b and Project #167b)

Schedule: February - Mid March

Task 3. Complete raft electrofishing in the Colorado River study area to capture and remove northern pike and smallmouth bass. (Project #126b)

Schedule: April - September

Task 4. Complete boat electrofishing and gill/trap net sets in private ponds within the floodplain of the Colorado River to capture and remove smallmouth bass and northern pike. (Project #126b)

Schedule: Mid March - November

Task 5. Organize and validate Project #126b data and submit to the USFWS-GJ. (Project #126b)

Schedule: By November 1

Task 6. Complete raft electrofishing in the White River study area to capture and remove smallmouth bass and northern pike. (Project #167b)

Schedule: May

Task 7. Organize and validate Project #167b data and submit to the USFWS-Vernal. (Project #167b)

Schedule: By November 1

Task 8. Complete boat electrofishing and gill/trap net sets in Kenney Reservoir to capture and remove northern pike.

Schedule: Late March/April - May; September - October

Task 9. Maintenance of equipment, data entry, data analysis, and preparation of final report (generally by the middle of November). Present findings during the Annual Recovery Program Researchers' Meeting (generally in January) and the Nonnative Fish Control Workshop (if convened).

Schedule: April - January

Overall Schedule FFY 2022-2026:

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1		X	X									
2		X	X									
3				X	X	X	X	X	X			
4			X	X	X	X	X	X	X	X	X	
5									X	X	X	
6					X							
7									X	X	X	
8			X	X	X				X	X		
9	X			X	X	X	X	X	X	X	X	X

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Budget Summary:

FFY Year	CPW
2021-2022	\$48,206
2022-2023	\$48,972
2023-2024	\$49,754
2024-2025	\$50,551
2025-2026	\$51,364
Total	\$248,848

Reviewers:

Harry Crockett, CPW, 970-472-4339, 317 West Prospect St., Fort Collins, CO 80526

Vanessa Frank, CPW, 303-242-0336, 6060 Broadway, Denver, CO 80216

Paula Nicholas, CPW, 303-866-3203 ext. 4677, 6060 Broadway, Denver, CO 80216

Lori Martin, CPW, 970-255-6186, 711 Independent Ave., Grand Junction, CO 81505

References:

Bestgen, K. R., K. A. Zelasko, T. Eyre, C. Smith, G. C. White, and M. T. Jones. 2020. Abundance estimation following increased removal verifies declining trends of northern pike in the Yampa River, Colorado. Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver Federal Center, Lakewood, Colorado. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 218.

Bezzerrides, N. and K. Bestgen. 2002. Status review of roundtail chub *Gila robusta*, flannelmouth sucker *Catostomus latipinnis*, and bluehead sucker *Catostomus discobolus* in the Colorado River Basin. Final report to the U.S. Dept. of Interior Bureau of Reclamation, Salt Lake City, Utah. Colorado State University Larval Fish Laboratory Contribution 118.

Burdick, B.D. 2007. Removal of smallmouth bass in the Upper Colorado River between Price-Stubbs Dam near Palisade, Colorado, and Westwater, Utah. Project 126a. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Burdick, B.D., L.M. Martin, and J. Logan. 2011. Removal of smallmouth bass in the Upper Colorado River between Price-Stubbs Dam near Palisade, Colorado, and Westwater, Utah. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Eyre, T. 2020. Kenney Reservoir removal of northern pike. Project 167b. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Francis, T. 2020. Removal of nonnative fish in the upper Colorado River between Grand Valley Water User's Dam (Government Highline Diversion Dam) near Palisade, Colorado, and Potash, Utah. Project 126a, 126b, 123d. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

Hawkins, J.A. 2020. Evaluation of smallmouth bass and northern pike management in the middle Yampa River. Project 125/98c. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Hawkins, J.A. and T.P. Nesler. 1991. Nonnative fishes of the Upper Colorado River Basin: an issue paper. Final report. Colorado State University Larval Fish Laboratory and Colorado Division of Wildlife, Fort Collins, Colorado.

Partlow, M.S. and K.R. Elbin. 2020. Nonnative fish control in the middle Green River. Project 123b. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Smith, C., M.J. Breen, and J. Logan. 2020. Smallmouth bass control in the White River. Project 167. Annual Report to the Upper Colorado River Endangered Fish Recovery Program.

Tyus, H.M. and J.F. Saunders, III. 2000. Nonnative fish control and endangered fish recovery. Fisheries 25(9):17-24.

U.S. Fish and Wildlife Service. 2002. Colorado pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region 6, Denver, Colorado.

SUMMARY OF PROPOSED COSTS

Name of Servicing Agency:	Colorado Parks and Wildlife
Project Name:	Colorado River and White River supplemental removal of smallmouth bass and northern pike; Colorado River floodplain private ponds removal of northern pike and smallmouth bass; Kenney Reservoir removal of northern pike

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
	10/1/2021		10/1/2022		10/2/2023		10/1/2024		10/1/2025		
	Through		Through		Through		Through		Through		
Enter the BEGINNING dates for each year ----->	9/30/2022		10/1/2023		9/30/2024		9/30/2025		9/30/2026		
Enter the ENDING dates for each year ----->	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
DIRECT LABOR AND FRINGE BENEFIT COSTS:											
Direct Labor - Hourly	\$	21,728.00	\$	22,162.56	\$	22,605.81	\$	23,057.93	\$	23,519.09	\$ 113,073.38
Fringe Benefits - Hourly	\$	4,856.21	\$	4,953.33	\$	5,052.40	\$	5,153.45	\$	5,256.52	\$ 25,271.90
Subtotal of Direct Labor & Fringe Benefits:	\$	26,584.21	\$	27,115.89	\$	27,658.21	\$	28,211.37	\$	28,775.60	\$ 138,345.29
OTHER DIRECT COSTS:											
Materials and Supplies	\$	4,223.60	\$	4,308.08	\$	4,394.23	\$	4,482.13	\$	4,571.77	\$ 21,979.81
Travel Costs	\$	9,888.00	\$	9,888.00	\$	9,888.00	\$	9,888.00	\$	9,888.00	\$ 49,440.00
Equipment	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Contractors	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Other Direct Costs:	\$	14,111.60	\$	14,196.08	\$	14,282.23	\$	14,370.13	\$	14,459.77	\$ 71,419.81
INDIRECT/OVERHEAD COSTS:											
Subtotal of Labor and Other Direct Costs:	\$	40,695.81	\$	41,311.97	\$	41,940.44	\$	42,581.50	\$	43,235.37	
Total dollars exempt from indirect/overhead base:	\$	14,111.60	\$	14,196.08	\$	14,282.23	\$	14,370.13	\$	14,459.77	
<Enter Description of Indirect/OH Cost #1>	28.25%	\$ 7,510.04	28.25%	\$ 7,660.24	28.25%	\$ 7,813.44	28.25%	\$ 7,969.71	28.25%	\$ 8,129.11	\$ 39,082.54
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
<Enter Description of Indirect/OH Cost #2>	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Indirect/Overhead Costs:	\$	7,510.04	\$	7,660.24	\$	7,813.44	\$	7,969.71	\$	8,129.11	\$ 39,082.54
GRAND TOTAL:	\$	48,205.85	\$	48,972.21	\$	49,753.88	\$	50,551.22	\$	51,364.48	\$ 248,847.64

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Enter Escalation Rates ----->	Yr 2 Escalation Rate	2.00%
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	Task # or Description	Position Title	Current Hourly Rate	YEAR 1					YEAR 2				
				10/1/2021		Through	9/30/2022		10/1/2022		Through	10/1/2023	
				# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost
1	2	Tech I	\$ 15.50	40.0	\$ 15.50	\$ 620.00	22.35%	\$ 138.57	40.0	\$ 15.81	\$ 632.40	22.35%	\$ 141.34
2	2	Tech II	\$ 16.50	40.0	\$ 16.50	\$ 660.00	22.35%	\$ 147.51	40.0	\$ 16.83	\$ 673.20	22.35%	\$ 150.46
3	3	Tech I	\$ 15.50	24.0	\$ 15.50	\$ 372.00	22.35%	\$ 83.14	24.0	\$ 15.81	\$ 379.44	22.35%	\$ 84.80
4	3	Tech I	\$ 15.50	24.0	\$ 15.50	\$ 372.00	22.35%	\$ 83.14	24.0	\$ 15.81	\$ 379.44	22.35%	\$ 84.80
5	3	Tech II	\$ 16.50	24.0	\$ 16.50	\$ 396.00	22.35%	\$ 88.51	24.0	\$ 16.83	\$ 403.92	22.35%	\$ 90.28
6	3	Tech II	\$ 16.50	24.0	\$ 16.50	\$ 396.00	22.35%	\$ 88.51	24.0	\$ 16.83	\$ 403.92	22.35%	\$ 90.28
7	3	Tech I-OT	\$ 23.25	9.0	\$ 23.25	\$ 209.25	22.35%	\$ 46.77	9.0	\$ 23.72	\$ 213.44	22.35%	\$ 47.70
8	3	Tech I-OT	\$ 23.25	9.0	\$ 23.25	\$ 209.25	22.35%	\$ 46.77	9.0	\$ 23.72	\$ 213.44	22.35%	\$ 47.70
9	3	Tech II-OT	\$ 24.75	9.0	\$ 24.75	\$ 222.75	22.35%	\$ 49.78	9.0	\$ 25.25	\$ 227.21	22.35%	\$ 50.78
10	3	Tech II-OT	\$ 24.75	9.0	\$ 24.75	\$ 222.75	22.35%	\$ 49.78	9.0	\$ 25.25	\$ 227.21	22.35%	\$ 50.78
11	4	Tech I	\$ 15.50	32.0	\$ 15.50	\$ 496.00	22.35%	\$ 110.86	32.0	\$ 15.81	\$ 505.92	22.35%	\$ 113.07
12	4	Tech I	\$ 15.50	32.0	\$ 15.50	\$ 496.00	22.35%	\$ 110.86	32.0	\$ 15.81	\$ 505.92	22.35%	\$ 113.07
13	4	Tech II	\$ 16.50	32.0	\$ 16.50	\$ 528.00	22.35%	\$ 118.01	32.0	\$ 16.83	\$ 538.56	22.35%	\$ 120.37
14	4	Tech II	\$ 16.50	32.0	\$ 16.50	\$ 528.00	22.35%	\$ 118.01	32.0	\$ 16.83	\$ 538.56	22.35%	\$ 120.37
15	5	Tech I	\$ 15.50	40.0	\$ 15.50	\$ 620.00	22.35%	\$ 138.57	40.0	\$ 15.81	\$ 632.40	22.35%	\$ 141.34
16	5	Tech II	\$ 16.50	40.0	\$ 16.50	\$ 660.00	22.35%	\$ 147.51	40.0	\$ 16.83	\$ 673.20	22.35%	\$ 150.46
17	6	Tech I	\$ 15.50	80.0	\$ 15.50	\$ 1,240.00	22.35%	\$ 277.14	80.0	\$ 15.81	\$ 1,264.80	22.35%	\$ 282.68
18	6	Tech I	\$ 15.50	80.0	\$ 15.50	\$ 1,240.00	22.35%	\$ 277.14	80.0	\$ 15.81	\$ 1,264.80	22.35%	\$ 282.68
19	6	Tech II	\$ 16.50	80.0	\$ 16.50	\$ 1,320.00	22.35%	\$ 295.02	80.0	\$ 16.83	\$ 1,346.40	22.35%	\$ 300.92
20	6	Tech II	\$ 16.50	80.0	\$ 16.50	\$ 1,320.00	22.35%	\$ 295.02	80.0	\$ 16.83	\$ 1,346.40	22.35%	\$ 300.92
21	7	Tech I	\$ 15.50	40.0	\$ 15.50	\$ 620.00	22.35%	\$ 138.57	40.0	\$ 15.81	\$ 632.40	22.35%	\$ 141.34
22	7	Tech II	\$ 16.50	40.0	\$ 16.50	\$ 660.00	22.35%	\$ 147.51	40.0	\$ 16.83	\$ 673.20	22.35%	\$ 150.46
23	8	Tech I	\$ 15.50	80.0	\$ 15.50	\$ 1,240.00	22.35%	\$ 277.14	80.0	\$ 15.81	\$ 1,264.80	22.35%	\$ 282.68
24	8	Tech I	\$ 15.50	80.0	\$ 15.50	\$ 1,240.00	22.35%	\$ 277.14	80.0	\$ 15.81	\$ 1,264.80	22.35%	\$ 282.68
25	8	Tech II	\$ 16.50	80.0	\$ 16.50	\$ 1,320.00	22.35%	\$ 295.02	80.0	\$ 16.83	\$ 1,346.40	22.35%	\$ 300.92
26	8	Tech II	\$ 16.50	80.0	\$ 16.50	\$ 1,320.00	22.35%	\$ 295.02	80.0	\$ 16.83	\$ 1,346.40	22.35%	\$ 300.92
27	8	Tech I-OT	\$ 23.25	20.0	\$ 23.25	\$ 465.00	22.35%	\$ 103.93	20.0	\$ 23.72	\$ 474.30	22.35%	\$ 106.01
28	8	Tech I-OT	\$ 23.25	20.0	\$ 23.25	\$ 465.00	22.35%	\$ 103.93	20.0	\$ 23.72	\$ 474.30	22.35%	\$ 106.01
29	8	Tech II-OT	\$ 24.75	20.0	\$ 24.75	\$ 495.00	22.35%	\$ 110.63	20.0	\$ 25.25	\$ 504.90	22.35%	\$ 112.85
30	8	Tech II-OT	\$ 24.75	20.0	\$ 24.75	\$ 495.00	22.35%	\$ 110.63	20.0	\$ 25.25	\$ 504.90	22.35%	\$ 112.85
31	9	Tech I	\$ 15.50	40.0	\$ 15.50	\$ 620.00	22.35%	\$ 138.57	40.0	\$ 15.81	\$ 632.40	22.35%	\$ 141.34
32	9	Tech II	\$ 16.50	40.0	\$ 16.50	\$ 660.00	22.35%	\$ 147.51	40.0	\$ 16.83	\$ 673.20	22.35%	\$ 150.46
			\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
				1,300.00		\$ 21,728.00		\$ 4,856.21	1,300.00		\$ 22,162.56		\$ 4,953.33

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 3 Escalation Rate	2.00%
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Yr 4 Escalation Rate	2.00%
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	Task # or Description	Position Title	Current Hourly Rate	YEAR 3					YEAR 4				
				10/2/2023		Through	9/30/2024		10/1/2024		Through	9/30/2025	
				# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost
1	2	Tech I	\$ 15.50	40.0	\$ 16.13	\$ 645.05	22.35%	\$ 144.17	40.0	\$ 16.45	\$ 657.95	22.35%	\$ 147.05
2	2	Tech II	\$ 16.50	40.0	\$ 17.17	\$ 686.66	22.35%	\$ 153.47	40.0	\$ 17.51	\$ 700.40	22.35%	\$ 156.54
3	3	Tech I	\$ 15.50	24.0	\$ 16.13	\$ 387.03	22.35%	\$ 86.50	24.0	\$ 16.45	\$ 394.77	22.35%	\$ 88.23
4	3	Tech I	\$ 15.50	24.0	\$ 16.13	\$ 387.03	22.35%	\$ 86.50	24.0	\$ 16.45	\$ 394.77	22.35%	\$ 88.23
5	3	Tech II	\$ 16.50	24.0	\$ 17.17	\$ 412.00	22.35%	\$ 92.08	24.0	\$ 17.51	\$ 420.24	22.35%	\$ 93.92
6	3	Tech II	\$ 16.50	24.0	\$ 17.17	\$ 412.00	22.35%	\$ 92.08	24.0	\$ 17.51	\$ 420.24	22.35%	\$ 93.92
7	3	Tech I-OT	\$ 23.25	9.0	\$ 24.19	\$ 217.70	22.35%	\$ 48.66	9.0	\$ 24.67	\$ 222.06	22.35%	\$ 49.63
8	3	Tech I-OT	\$ 23.25	9.0	\$ 24.19	\$ 217.70	22.35%	\$ 48.66	9.0	\$ 24.67	\$ 222.06	22.35%	\$ 49.63
9	3	Tech II-OT	\$ 24.75	9.0	\$ 25.75	\$ 231.75	22.35%	\$ 51.80	9.0	\$ 26.26	\$ 236.38	22.35%	\$ 52.83
10	3	Tech II-OT	\$ 24.75	9.0	\$ 25.75	\$ 231.75	22.35%	\$ 51.80	9.0	\$ 26.26	\$ 236.38	22.35%	\$ 52.83
11	4	Tech I	\$ 15.50	32.0	\$ 16.13	\$ 516.04	22.35%	\$ 115.33	32.0	\$ 16.45	\$ 526.36	22.35%	\$ 117.64
12	4	Tech I	\$ 15.50	32.0	\$ 16.13	\$ 516.04	22.35%	\$ 115.33	32.0	\$ 16.45	\$ 526.36	22.35%	\$ 117.64
13	4	Tech II	\$ 16.50	32.0	\$ 17.17	\$ 549.33	22.35%	\$ 122.78	32.0	\$ 17.51	\$ 560.32	22.35%	\$ 125.23
14	4	Tech II	\$ 16.50	32.0	\$ 17.17	\$ 549.33	22.35%	\$ 122.78	32.0	\$ 17.51	\$ 560.32	22.35%	\$ 125.23
15	5	Tech I	\$ 15.50	40.0	\$ 16.13	\$ 645.05	22.35%	\$ 144.17	40.0	\$ 16.45	\$ 657.95	22.35%	\$ 147.05
16	5	Tech II	\$ 16.50	40.0	\$ 17.17	\$ 686.66	22.35%	\$ 153.47	40.0	\$ 17.51	\$ 700.40	22.35%	\$ 156.54
17	6	Tech I	\$ 15.50	80.0	\$ 16.13	\$ 1,290.10	22.35%	\$ 288.34	80.0	\$ 16.45	\$ 1,315.90	22.35%	\$ 294.10
18	6	Tech I	\$ 15.50	80.0	\$ 16.13	\$ 1,290.10	22.35%	\$ 288.34	80.0	\$ 16.45	\$ 1,315.90	22.35%	\$ 294.10
19	6	Tech II	\$ 16.50	80.0	\$ 17.17	\$ 1,373.33	22.35%	\$ 306.94	80.0	\$ 17.51	\$ 1,400.79	22.35%	\$ 313.08
20	6	Tech II	\$ 16.50	80.0	\$ 17.17	\$ 1,373.33	22.35%	\$ 306.94	80.0	\$ 17.51	\$ 1,400.79	22.35%	\$ 313.08
21	7	Tech I	\$ 15.50	40.0	\$ 16.13	\$ 645.05	22.35%	\$ 144.17	40.0	\$ 16.45	\$ 657.95	22.35%	\$ 147.05
22	7	Tech II	\$ 16.50	40.0	\$ 17.17	\$ 686.66	22.35%	\$ 153.47	40.0	\$ 17.51	\$ 700.40	22.35%	\$ 156.54
23	8	Tech I	\$ 15.50	80.0	\$ 16.13	\$ 1,290.10	22.35%	\$ 288.34	80.0	\$ 16.45	\$ 1,315.90	22.35%	\$ 294.10
24	8	Tech I	\$ 15.50	80.0	\$ 16.13	\$ 1,290.10	22.35%	\$ 288.34	80.0	\$ 16.45	\$ 1,315.90	22.35%	\$ 294.10
25	8	Tech II	\$ 16.50	80.0	\$ 17.17	\$ 1,373.33	22.35%	\$ 306.94	80.0	\$ 17.51	\$ 1,400.79	22.35%	\$ 313.08
26	8	Tech II	\$ 16.50	80.0	\$ 17.17	\$ 1,373.33	22.35%	\$ 306.94	80.0	\$ 17.51	\$ 1,400.79	22.35%	\$ 313.08
27	8	Tech I-OT	\$ 23.25	20.0	\$ 24.19	\$ 483.79	22.35%	\$ 108.13	20.0	\$ 24.67	\$ 493.46	22.35%	\$ 110.29
28	8	Tech I-OT	\$ 23.25	20.0	\$ 24.19	\$ 483.79	22.35%	\$ 108.13	20.0	\$ 24.67	\$ 493.46	22.35%	\$ 110.29
29	8	Tech II-OT	\$ 24.75	20.0	\$ 25.75	\$ 515.00	22.35%	\$ 115.10	20.0	\$ 26.26	\$ 525.30	22.35%	\$ 117.40
30	8	Tech II-OT	\$ 24.75	20.0	\$ 25.75	\$ 515.00	22.35%	\$ 115.10	20.0	\$ 26.26	\$ 525.30	22.35%	\$ 117.40
31	9	Tech I	\$ 15.50	40.0	\$ 16.13	\$ 645.05	22.35%	\$ 144.17	40.0	\$ 16.45	\$ 657.95	22.35%	\$ 147.05
32	9	Tech II	\$ 16.50	40.0	\$ 17.17	\$ 686.66	22.35%	\$ 153.47	40.0	\$ 17.51	\$ 700.40	22.35%	\$ 156.54
			\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
				1,300.00		\$ 22,605.81		\$ 5,052.40	1,300.00		\$ 23,057.93		\$ 5,153.45

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 5 Escalation Rate	2.00%
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				YEAR 5							
				10/1/2025		Through	9/30/2026		Total Salary Cost	Total Fringe Cost	Total Labor Cost
Task # or Description	Position Title	Current Hourly Rate	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost				
1	2	Tech I	\$ 15.50	40.0	\$ 16.78	\$ 671.11	22.35%	\$ 149.99	\$ 3,226.50	\$ 721.12	\$ 3,947.63
2	2	Tech II	\$ 16.50	40.0	\$ 17.86	\$ 714.41	22.35%	\$ 159.67	\$ 3,434.67	\$ 767.65	\$ 4,202.31
3	3	Tech I	\$ 15.50	24.0	\$ 16.78	\$ 402.66	22.35%	\$ 90.00	\$ 1,935.90	\$ 432.67	\$ 2,368.58
4	3	Tech I	\$ 15.50	24.0	\$ 16.78	\$ 402.66	22.35%	\$ 90.00	\$ 1,935.90	\$ 432.67	\$ 2,368.58
5	3	Tech II	\$ 16.50	24.0	\$ 17.86	\$ 428.64	22.35%	\$ 95.80	\$ 2,060.80	\$ 460.59	\$ 2,521.39
6	3	Tech II	\$ 16.50	24.0	\$ 17.86	\$ 428.64	22.35%	\$ 95.80	\$ 2,060.80	\$ 460.59	\$ 2,521.39
7	3	Tech I-OT	\$ 23.25	9.0	\$ 25.17	\$ 226.50	22.35%	\$ 50.62	\$ 1,088.95	\$ 243.38	\$ 1,332.32
8	3	Tech I-OT	\$ 23.25	9.0	\$ 25.17	\$ 226.50	22.35%	\$ 50.62	\$ 1,088.95	\$ 243.38	\$ 1,332.32
9	3	Tech II-OT	\$ 24.75	9.0	\$ 26.79	\$ 241.11	22.35%	\$ 53.89	\$ 1,159.20	\$ 259.08	\$ 1,418.28
10	3	Tech II-OT	\$ 24.75	9.0	\$ 26.79	\$ 241.11	22.35%	\$ 53.89	\$ 1,159.20	\$ 259.08	\$ 1,418.28
11	4	Tech I	\$ 15.50	32.0	\$ 16.78	\$ 536.89	22.35%	\$ 119.99	\$ 2,581.20	\$ 576.90	\$ 3,158.10
12	4	Tech I	\$ 15.50	32.0	\$ 16.78	\$ 536.89	22.35%	\$ 119.99	\$ 2,581.20	\$ 576.90	\$ 3,158.10
13	4	Tech II	\$ 16.50	32.0	\$ 17.86	\$ 571.52	22.35%	\$ 127.74	\$ 2,747.73	\$ 614.12	\$ 3,361.85
14	4	Tech II	\$ 16.50	32.0	\$ 17.86	\$ 571.52	22.35%	\$ 127.74	\$ 2,747.73	\$ 614.12	\$ 3,361.85
15	5	Tech I	\$ 15.50	40.0	\$ 16.78	\$ 671.11	22.35%	\$ 149.99	\$ 3,226.50	\$ 721.12	\$ 3,947.63
16	5	Tech II	\$ 16.50	40.0	\$ 17.86	\$ 714.41	22.35%	\$ 159.67	\$ 3,434.67	\$ 767.65	\$ 4,202.31
17	6	Tech I	\$ 15.50	80.0	\$ 16.78	\$ 1,342.22	22.35%	\$ 299.99	\$ 6,453.01	\$ 1,442.25	\$ 7,895.26
18	6	Tech I	\$ 15.50	80.0	\$ 16.78	\$ 1,342.22	22.35%	\$ 299.99	\$ 6,453.01	\$ 1,442.25	\$ 7,895.26
19	6	Tech II	\$ 16.50	80.0	\$ 17.86	\$ 1,428.81	22.35%	\$ 319.34	\$ 6,869.33	\$ 1,535.30	\$ 8,404.63
20	6	Tech II	\$ 16.50	80.0	\$ 17.86	\$ 1,428.81	22.35%	\$ 319.34	\$ 6,869.33	\$ 1,535.30	\$ 8,404.63
21	7	Tech I	\$ 15.50	40.0	\$ 16.78	\$ 671.11	22.35%	\$ 149.99	\$ 3,226.50	\$ 721.12	\$ 3,947.63
22	7	Tech II	\$ 16.50	40.0	\$ 17.86	\$ 714.41	22.35%	\$ 159.67	\$ 3,434.67	\$ 767.65	\$ 4,202.31
23	8	Tech I	\$ 15.50	80.0	\$ 16.78	\$ 1,342.22	22.35%	\$ 299.99	\$ 6,453.01	\$ 1,442.25	\$ 7,895.26
24	8	Tech I	\$ 15.50	80.0	\$ 16.78	\$ 1,342.22	22.35%	\$ 299.99	\$ 6,453.01	\$ 1,442.25	\$ 7,895.26
25	8	Tech II	\$ 16.50	80.0	\$ 17.86	\$ 1,428.81	22.35%	\$ 319.34	\$ 6,869.33	\$ 1,535.30	\$ 8,404.63
26	8	Tech II	\$ 16.50	80.0	\$ 17.86	\$ 1,428.81	22.35%	\$ 319.34	\$ 6,869.33	\$ 1,535.30	\$ 8,404.63
27	8	Tech I-OT	\$ 23.25	20.0	\$ 25.17	\$ 503.33	22.35%	\$ 112.49	\$ 2,419.88	\$ 540.84	\$ 2,960.72
28	8	Tech I-OT	\$ 23.25	20.0	\$ 25.17	\$ 503.33	22.35%	\$ 112.49	\$ 2,419.88	\$ 540.84	\$ 2,960.72
29	8	Tech II-OT	\$ 24.75	20.0	\$ 26.79	\$ 535.80	22.35%	\$ 119.75	\$ 2,576.00	\$ 575.74	\$ 3,151.74
30	8	Tech II-OT	\$ 24.75	20.0	\$ 26.79	\$ 535.80	22.35%	\$ 119.75	\$ 2,576.00	\$ 575.74	\$ 3,151.74
31	9	Tech I	\$ 15.50	40.0	\$ 16.78	\$ 671.11	22.35%	\$ 149.99	\$ 3,226.50	\$ 721.12	\$ 3,947.63
32	9	Tech II	\$ 16.50	40.0	\$ 17.86	\$ 714.41	22.35%	\$ 159.67	\$ 3,434.67	\$ 767.65	\$ 4,202.31
			\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
				1,300.00		\$ 23,519.09		\$ 5,256.52	\$ 113,073.38	\$ 25,271.90	\$ 138,345.29

SUMMARY OF MATERIALS AND SUPPLIES

SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

Yr 2 Escalation Rate	2.00%
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	Task # or Description	Item Description	Rationale for Proposed Cost	Year 1			Year 2		
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	2	Maintenance	Price estimated based on historical purchase	\$ 1,125.00	1	\$ 1,125.00	\$ 1,147.50	1	\$ 1,147.50
2	2	ETS Factory Calibration and Shipping	Mark, ETS 608-661-0599	\$ 170.00	3	\$ 510.00	\$ 173.40	3	\$ 520.20
3	2	Generator Motor Oil and Fuel, Misc. Parts, Tools	Generator oil estimated at 2 quarts total for	\$ 318.80	1	\$ 318.80	\$ 325.18	1	\$ 325.18
4	2	Boat Motor Oil and Grease	Boat motor oil estimated at approximately	\$ 104.00	1	\$ 104.00	\$ 106.08	1	\$ 106.08
5	2	Boat Fuel	Boat fuel estimated at 24 gallons total for	\$ 70.56	1	\$ 70.56	\$ 71.97	1	\$ 71.97
6	2	Boat and Rail Trailer Maintenance	Price estimated based on historical purchase	\$ 800.00	1	\$ 800.00	\$ 816.00	1	\$ 816.00
7	2	Experimental Gill Net	https://duluthfishnets.com/product-category/	\$ 300.00	3	\$ 900.00	\$ 306.00	3	\$ 918.00
8	8	Generator Motor Oil and Fuel, Misc. Parts, Tools	Generator oil estimated at 2 quarts total for	\$ 289.40	1	\$ 289.40	\$ 295.19	1	\$ 295.19
9	8	Boat Fuel	Boat fuel estimated at 36 gallons total for	\$ 105.84	1	\$ 105.84	\$ 107.96	1	\$ 107.96
10				\$ -	0	\$ -	\$ -	0	\$ -
11				\$ -	0	\$ -	\$ -	0	\$ -
12				\$ -	0	\$ -	\$ -	0	\$ -
13				\$ -	0	\$ -	\$ -	0	\$ -
14				\$ -	0	\$ -	\$ -	0	\$ -
15				\$ -	0	\$ -	\$ -	0	\$ -
16				\$ -	0	\$ -	\$ -	0	\$ -
17				\$ -	0	\$ -	\$ -	0	\$ -
18				\$ -	0	\$ -	\$ -	0	\$ -
19				\$ -	0	\$ -	\$ -	0	\$ -
20				\$ -	0	\$ -	\$ -	0	\$ -
21				\$ -	0	\$ -	\$ -	0	\$ -
22				\$ -	0	\$ -	\$ -	0	\$ -
23				\$ -	0	\$ -	\$ -	0	\$ -
24				\$ -	0	\$ -	\$ -	0	\$ -
25				\$ -	0	\$ -	\$ -	0	\$ -
TOTAL:						\$ 4,223.60			\$ 4,308.08

SUMMARY OF MATERIALS AND SUPPLIES

SUMMARY OF MATERIALS, SUPPLIES, SERVICES	Yr 3 Escalation Rate	2.00%	Yr 4 Escalation Rate	2.00%
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	Task # or Description	Item Description	Year 3			Year 4			
			Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	
1	2	Maintenance	\$ 1,170.45	1	\$ 1,170.45	\$ 1,193.86	1	\$ 1,193.86	
2	2	ETS Factory Calibration and Shipping	\$ 176.87	3	\$ 530.60	\$ 180.41	3	\$ 541.22	
3	2	Generator Motor Oil and Fuel, Misc. Parts, Tools	\$ 331.68	1	\$ 331.68	\$ 338.31	1	\$ 338.31	
4	2	Boat Motor Oil and Grease	\$ 108.20	1	\$ 108.20	\$ 110.37	1	\$ 110.37	
5	2	Boat Fuel	\$ 73.41	1	\$ 73.41	\$ 74.88	1	\$ 74.88	
6	2	Boat and Rail Trailer Maintenance	\$ 832.32	1	\$ 832.32	\$ 848.97	1	\$ 848.97	
7	2	Experimental Gill Net	\$ 312.12	3	\$ 936.36	\$ 318.36	3	\$ 955.09	
8	8	Generator Motor Oil and Fuel, Misc. Parts, Tools	\$ 301.09	1	\$ 301.09	\$ 307.11	1	\$ 307.11	
9	8	Boat Fuel	\$ 110.12	1	\$ 110.12	\$ 112.32	1	\$ 112.32	
10			\$ -	0	\$ -	\$ -	0	\$ -	
11			\$ -	0	\$ -	\$ -	0	\$ -	
12			\$ -	0	\$ -	\$ -	0	\$ -	
13			\$ -	0	\$ -	\$ -	0	\$ -	
14			\$ -	0	\$ -	\$ -	0	\$ -	
15			\$ -	0	\$ -	\$ -	0	\$ -	
16			\$ -	0	\$ -	\$ -	0	\$ -	
17			\$ -	0	\$ -	\$ -	0	\$ -	
18			\$ -	0	\$ -	\$ -	0	\$ -	
19			\$ -	0	\$ -	\$ -	0	\$ -	
20			\$ -	0	\$ -	\$ -	0	\$ -	
21			\$ -	0	\$ -	\$ -	0	\$ -	
22			\$ -	0	\$ -	\$ -	0	\$ -	
23			\$ -	0	\$ -	\$ -	0	\$ -	
24			\$ -	0	\$ -	\$ -	0	\$ -	
25			\$ -	0	\$ -	\$ -	0	\$ -	
					\$ 4,394.23				\$ 4,482.13

SUMMARY OF MATERIALS AND SUPPLIES

SUMMARY OF MATERIALS, SUPPLIES, SERVICES	Yr 5 Escalation Rate	2.00%
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	Task # or Description	Item Description	Year 5			TOTAL
			Unit Price	Unit Quantity	Subtotal	
1	2	Maintenance	\$ 1,217.74	1	\$ 1,217.74	\$ 5,854.55
2	2	ETS Factory Calibration and Shipping	\$ 184.01	3	\$ 552.04	\$ 2,654.06
3	2	Generator Motor Oil and Fuel, Misc. Parts, Tools	\$ 345.08	1	\$ 345.08	\$ 1,659.05
4	2	Boat Motor Oil and Grease	\$ 112.57	1	\$ 112.57	\$ 541.22
5	2	Boat Fuel	\$ 76.38	1	\$ 76.38	\$ 367.20
6	2	Boat and Rail Trailer Maintenance	\$ 865.95	1	\$ 865.95	\$ 4,163.24
7	2	Experimental Gill Net	\$ 324.73	3	\$ 974.19	\$ 4,683.64
8	8	Generator Motor Oil and Fuel, Misc. Parts, Tools	\$ 313.26	1	\$ 313.26	\$ 1,506.05
9	8	Boat Fuel	\$ 114.56	1	\$ 114.56	\$ 550.80
10			\$ -	0	\$ -	\$ -
11			\$ -	0	\$ -	\$ -
12			\$ -	0	\$ -	\$ -
13			\$ -	0	\$ -	\$ -
14			\$ -	0	\$ -	\$ -
15			\$ -	0	\$ -	\$ -
16			\$ -	0	\$ -	\$ -
17			\$ -	0	\$ -	\$ -
18			\$ -	0	\$ -	\$ -
19			\$ -	0	\$ -	\$ -
20			\$ -	0	\$ -	\$ -
21			\$ -	0	\$ -	\$ -
22			\$ -	0	\$ -	\$ -
23			\$ -	0	\$ -	\$ -
24			\$ -	0	\$ -	\$ -
25			\$ -	0	\$ -	\$ -
					\$ 4,571.77	\$ 21,979.81

SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	Task 6	Task 6	Task 6	Task 6	Task 6	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	6	6	6	6	6	
Airfare						
Lodging (Per Night)	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	
MI&E Per Day	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-see notes	
Total Per Trip	\$ 906.00	\$ 906.00	\$ 906.00	\$ 906.00	\$ 906.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 18,120.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	Task 6	Task 6	Task 6	Task 6	Task 6	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	2	2	2	2	2	
Airfare						
Lodging (Per Night)	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	
MI&E Per Day	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-see notes	
Total Per Trip	\$ 276.00	\$ 276.00	\$ 276.00	\$ 276.00	\$ 276.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 5,520.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
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SUMMARY OF TRAVEL COSTS

Trip #	Task 6	Task 6	Task 6	Task 6	Task 6	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	2	2	2	2	2	
Airfare						
Lodging (Per Night)						
MI&E Per Day	\$ 27.00	\$ 27.00	\$ 27.00	\$ 27.00	\$ 27.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	see notes
Total Per Trip	\$ 54.00	\$ 54.00	\$ 54.00	\$ 54.00	\$ 54.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 216.00	\$ 216.00	\$ 216.00	\$ 216.00	\$ 216.00	\$ 1,080.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	Task 8	Task 8	Task 8	Task 8	Task 8	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	6	6	6	6	6	
Airfare						
Lodging (Per Night)	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	
MI&E Per Day	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	see notes
Total Per Trip	\$ 906.00	\$ 906.00	\$ 906.00	\$ 906.00	\$ 906.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 3,624.00	\$ 18,120.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
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SUMMARY OF TRAVEL COSTS

Trip #	Task 8	Task 8	Task 8	Task 8	Task 8	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	2	2	2	2	2	
Airfare						
Lodging (Per Night)	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	\$ 96.00	
MI&E Per Day	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-see notes	
Total Per Trip	\$ 276.00	\$ 276.00	\$ 276.00	\$ 276.00	\$ 276.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 1,104.00	\$ 5,520.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	Task 8	Task 8	Task 8	Task 8	Task 8	
From-To	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	to Rangely, CO	
Reason	Field Work	Field Work	Field Work	Field Work	Field Work	
# of Days (include travel days)	2	2	2	2	2	
Airfare						
Lodging (Per Night)						
MI&E Per Day	\$ 27.00	\$ 27.00	\$ 27.00	\$ 27.00	\$ 27.00	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-se	Did not use formula-see notes	
Total Per Trip	\$ 54.00	\$ 54.00	\$ 54.00	\$ 54.00	\$ 54.00	
No. of persons	4	4	4	4	4	
Mileage rate						
Total miles						
SUBTOTAL =	\$ 216.00	\$ 216.00	\$ 216.00	\$ 216.00	\$ 216.00	\$ 1,080.00

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
TOTAL COST BY PERIOD =	\$ 9,888.00	\$ 9,888.00	\$ 9,888.00	\$ 9,888.00	\$ 9,888.00	\$ 49,440.00