RECOVERY PROGRAM Recovery Program Project Number: 126b & 167b
FFY 2020-2021 SCOPE OF WORK for:

Colorado River and White River Supplemental Removal of Smallmouth Bass and Northern Pike; Kenney Reservoir Removal of Northern Pike

Reclamation Agreement number: R17AP00301
Reclamation Agreement term: September 22, 2017 – September 30, 2022

Lead agency: Colorado Parks and Wildlife

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Category:
__ Ongoing project
_X_ Ongoing-revised project
__ Requested new project
__ Unsolicited proposal

Expected Funding Source:
_X Annual funds
__ Capital funds
__ Other *[explain]*

I. Title of Proposal:

Supplemental removal of smallmouth bass and northern pike in the Colorado River between Silt, Colorado and Beavertail Mountain, with expanded removal upstream of Rifle, Colorado, in constructed, private ponds within the Colorado River floodplain; supplemental smallmouth bass and northern pike removal in the White River downstream of Taylor Draw dam in Rangely, Colorado; and removal of northern pike in Kenney Reservoir

II. Relationship to RIPRAP:

This study will remove smallmouth bass and northern pike from 17.4 river miles (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 three constructed, private ponds (Mamm Creek Pit #1, #2, and #3) 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.

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.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.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.

III. Study Background/Rationale and Hypotheses:

Colorado River

The U.S. Fish and Wildlife Service (USFWS) (Burdick 2007, 2011) has previously documented the need for smallmouth bass and northern pike removal in the Colorado River. Colorado Parks and Wildlife (CPW) will supplement the USFWS efforts by adding additional removal passes (a minimum of three total days) within the smallmouth bass and northern pike concentration areas identified by Burdick (2007 and 2011). For more information regarding the USFWS effort, please see the Scope of Work for Project #126.

White River

CPW will provide three weeks (a minimum of nine total days) of assistance to the USFWS to remove smallmouth bass from the White River. For more information regarding the USFWS effort, please see the Scope of Work for Project #167.

Kenney Reservoir

CPW confirmed the presence of northern pike within Kenney Reservoir in the fall of 2018. In the spring of 2019, validated reproducing northern pike within the reservoir. With the permission of the landowner (Rio Blanco Water Conservancy District), CPW will complete five weeks (a minimum of 20 total days) of field work to remove northern pike from Kenney Reservoir.

Study Considerations

Colorado River

CPW will remove smallmouth bass and northern pike from the main channel utilizing raft electrofishing and from backwaters utilizing block-and-shock techniques. A minimum of three total days will be expended within the 52.3 river mile study area, focusing on two river reaches historically with the greatest smallmouth bass and/or northern pike concentrations.
from Rifle (RM 240.4) to Rulison (RM 230.0) and from Rulison to Parachute (RM 223.0), pending appropriate hydrological conditions. Three days will be spent electrofishing and utilizing block-and shock methods (as appropriate) within slack water, backwaters, and 0.5 mile of shoreline downstream of major backwaters within the Rifle to Parachute reaches. A crew of four people will be required to complete this portion of the project. Temporaries will be hired for a total of , 5-day weeks at 40-hours per week. Two and one-half weeks (one week pre-

sampling and one and a half week post-sampling) will be devoted to crew training, preparation and maintenance of equipment, and data entry. Temporaries will work one week (5 days/week of which at least three days will be on the river), pending appropriate hydrological conditions, to target smallmouth bass and northern pike.

CPW will also expand removal efforts targeting smallmouth bass and northern pike upstream of Rifle, Colorado in constructed private ponds within the Colorado River floodplain. A minimum of 6 days will be expended within Mamm Creek Pit #1, #2, and #3. These efforts will focus on use of the Merwin trap, boat electrofishing, gill net and potentially fyke net sets. A crew of six people (of which four will be temporary employees) will be required to complete this portion of the project. Temporaries will be hired for a total of 2, 5-day weeks at 40-hours per week. Temporaries will work two weeks in the ponds to target smallmouth bass and northern pike.

White River

CPW will remove smallmouth bass and northern pike from the main channel utilizing raft electrofishing. A minimum of nine total days will be expended from Taylor Draw dam downstream to the Colorado/Utah state line, pending appropriate hydrological conditions. 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. A crew of four people will be required to complete this portion of the project. Temporaries will be hired for 4, 5-day weeks at 40-hours per week. One week post-sampling will be devoted to data entry. Temporaries will work three weeks (5 days/week of which at least three days will be on the river) to target smallmouth bass.

Kenney Reservoir

CPW will remove northern pike from Kenney Reservoir utilizing boat electrofishing, gill net and potentially fyke net sets, and the possible use of the Merwin trap. A crew of six people (of which four will be temporary employees) will be required to complete this portion of the project. Temporaries will be hired for a total of 6, 5-day weeks at 40-hours per week. One week post-sampling will be devoted to data entry. Temporaries will work five weeks (5 days/week of which at least four days will be on the reservoir) to target northern pike.

IV. Study Goals, Objectives, End Product(s):

Study Goals/Objectives

Colorado River

1) To assist the USFWS in reducing the numbers of smallmouth bass and northern pike in two river reaches 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 smallmouth bass and northern pike in constructed, private ponds within the Colorado River floodplain upstream of Rifle, Colorado (RM 240.4), thereby benefitting native fishes of the Colorado River Basin.

3) To reduce the probability of smallmouth bass and northern pike escaping from floodplain ponds when connected to the Colorado River during high water periods, thereby benefitting native fishes of the Colorado River Basin.

White River

1) To assist the USFWS in reducing 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.

Kenney Reservoir

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.

End Product

Colorado River

In compiling and organizing the data collected, CPW will follow quality assurance and quality control protocols provided annually by the Recovery Program Director's Office and/or the USFWS. All of the CPW validated data will be provided to the USFWS. CPW will not perform data analysis for this supplemental project; all data collected will be analyzed by the USFWS office in Grand Junction.

White River

In compiling and organizing the data collected, CPW will follow quality assurance and quality control protocols provided annually by the Recovery Program Director's Office and/or the USFWS. All of the CPW validated data will be provided to the USFWS. CPW will not perform data analysis for this supplemental project; all data collected will be analyzed by the USFWS office in Vernal.

Kenney Reservoir

In compiling and organizing the data collected, CPW will follow quality assurance and quality control protocols provided annually by the Recovery Program Director's Office. An annual report will be prepared and distributed to interested parties following the field season. A presentation will also be provided during the Annual Nonnative Fish Control Workshop (if convened), and at the Annual Recovery Program Researchers' Meeting.

Revisions Beginning in 2018

In 2018, CPW included work to remove nonnative fish from floodplain gravel ponds (Task 3) in all years. Because of low catch rates, work to remove nonnative fish in the mainstem Colorado River was reduced (Task 2). Remaining effort is adequate to monitor the reach and target

backwaters with higher catch rates. CPW included overtime costs because agency guidance requires the payment of overtime in lieu of compensatory time.

Revisions Beginning in 2019

In 2019, CPW has included additional work to address the recent illegal introduction of northern pike into Kenney Reservoir. CPW and the Recovery Program may determine that other elements within this Scope of Work (i.e., tasks associated with other projects contained herein) may be reduced to compensate for the new work included at Kenney Reservoir. CPW included overtime costs because agency guidance requires the payment of overtime in lieu of compensatory time.

In August 2019, CPW revised this Scope of Work for FYs 2019-2020 and 2020-2021 for the Colorado River and Mamm Creek Pits #1, #2, and #3, reducing labor efforts for both of these projects. Sampling efforts were reduced for the Colorado River from a minimum of 7 days to a minimum of 3 days (reduced from 60 hours to 40 hours regular hours, and from 30 hours to 15 hours of overtime. Further, crews will only be focusing on two stretches of river, from Rifle to Rulison and Rulison to Parachute. Sampling efforts were also reduced for Mamm Creek Pits #1, #2, and #3 from a minimum of 14 days to a minimum of 6 days (reduced from 160 hours to 80 regular hours). These changes in effort are reflected in hours of temporary time required (Task 2), resulting in a decrease of total costs of $12,437.21 in FY 2020 and $12,685.95 in FY 2021. Cost adjustments for years beyond FYs 2020 and 2021 were not included in these most recent revisions.

V. Study Area:

Colorado River

The study area for this project will include 17.4 river miles of the Colorado River between Rifle, Colorado (RM 240.4) and Parachute, Colorado (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: ~~Rea~~ch 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, Colorado (RM 248.0) to Beavertail Mountain (RM 195.7)

Three constructed, private ponds (Mamm Creek Pit #1, #2, and #3) within the Colorado River floodplain upstream of Rifle, Colorado (RM 240.4) will also be targeted.

White River

The study area for this project will include the White River from Taylor Draw dam (RM 104.0) to the Colorado/Utah state line. 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.

Kenney Reservoir

The study area for this 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 environmental conditions allow.

VI. Study Methods/Approach:

Field Methods-Colorado River

Temporarily reducing riverine smallmouth bass and northern pike populations appears viable under certain environmental conditions, but both species can easily reverse these reductions in population abundance and return to pre-removal abundances under favorable environmental conditions (Breton et al. 2014; Zelasko et al. 2015). Therefore, mechanical removal efforts will attempt to reach eradication of nonnative fish populations in the river. However, recent synthesis reports investigating effectiveness of in-river removal efforts for northern pike and smallmouth bass determined that reducing in-river populations of these two species would not be successful unless in-river reproduction and reservoir escapement were controlled (Breton et al. 2014; Zelasko et al. 2015). Therefore, mechanical removal efforts will continue to temporarily suppress riverine populations, and will focus on reducing in-river reproduction when feasible. Simultaneously, Recovery Program partners will work on other means to reduce in-river reproduction and reservoir escapement, in order to make mechanical removal more effective and to attempt to reach complete eradication of riverine populations.

<u>Mainstem Electrofishing and Backwater Block-and-Shock</u>

Electrofishing and block-and-shock techniques (as appropriate) within slack water habitat, backwaters, and 0.5 mile of shoreline downstream of major backwaters to target smallmouth bass and northern pike will be the focus of this sampling effort. This portion of the study will occur between June and September. A minimum of three total days will be expended during this portion of the study, focusing on two reaches 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. Backwater habitats will be sampled until the river recedes and habitats are no longer accessible. 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.

<u>Constructed, Private Ponds within the Colorado River Floodplain</u>

This sampling effort will include targeting smallmouth bass and northern pike upstream of Rifle, Colorado in constructed, private ponds (Mamm Creek Pit #1, #2, and #3) within the Colorado River floodplain. This portion of the study will begin in mid-March and continue intermittently until after high water. The goals of these efforts are to exploit northern pike during the spawning period, and to also reduce the probability of smallmouth bass and northern pike escaping from floodplain ponds when connected to the Colorado River during high water periods. A minimum of 7 total days will be expended within the ponds.

Two, three-person electrofishing crews will utilize jon boats to electrofish, and set gill and potentially fyke 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/fyke nets. A Merwin trap (over-size, floating but stationary fyke net) may also be utilized as a passive capture technique in the largest pond, Mamm Creek Pit #1. This trap will be used for two purposes: 1) in the shallows to exploit northern pike during the spawning period, and 2) to block the pond outlet, precluding escapement of nonnative fishes from the pond into the Colorado River during high water periods.

Field Methods-White River

Main channel electrofishing to target smallmouth bass will be the focus of this sampling effort. 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 nine total days will be expended during this portion of the study, which will primarily focus 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.

Field Methods-Kenney Reservoir

This sampling effort will include targeting northern pike within Kenney Reservoir. 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 evaluate the success of the spring spawn. A minimum of 20 total days will be expended sampling the reservoir.

Two, three-person electrofishing crews will utilize jon boats to electrofish, and set gill and potentially fyke nets. A Merwin trap (over-size, floating but stationary fyke net) 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 overnight sets of gill/fyke nets.

Fish Processing Methods

Colorado River and White River

All smallmouth bass, northern pike, and other nonnative fish (excluding salmonids and channel catfish) captured will be identified by species, measured for total length to the nearest millimeter, weighed to the nearest gram, and lethally removed and either disposed of in a landfill or provided to licensed anglers. 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.

Razorback sucker, bonytail, and Colorado pikeminnow captured 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. PIT 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. UTMs 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

All northern pike captured 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, disposed of in a landfill or provided to licensed anglers. 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 passive integrated transponder (PIT) tags. PIT 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. UTMs 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 immediately.

Data Collection and Analysis

Colorado River and White River

All data collected 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. Data collected will be validated, and then provided to the USFWS offices in Grand Junction (Colorado River) and Vernal (White River). CPW will not perform data analysis for the Colorado River and White River supplemental projects; all data collected will be analyzed by the USFWS.

Kenney Reservoir

Fisheries data along with water quality and gear specifics will 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. Data collected will be validated, and analyzed to determine northern pike length frequency distribution and catch per unit effort. An annual report will be prepared and will include the data analyses mentioned above in addition to other relevant information. A presentation will also be provided during the Annual Nonnative Fish Control Workshop (if convened), and at the Annual Recovery Program Researchers' Meeting.

VII. Task Description and Schedule:

Task 1. Plan logistics, hire and train personnel, order and maintain equipment, and prepare for sampling (Project #126b and #167b)
Schedule: January-Mid March

Task 2. Sample Colorado River study area to capture and remove smallmouth bass and northern pike (Project #126b)
Schedule: June-September

Task 3. Sample constructed, 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 4. Organize and validate Project #126b data and submit to the USFWS (Project #126b)
Schedule: By November 1

Task 5. Sample White River study area to capture and remove smallmouth bass (Project #167b)
Schedule: May-July

Task 6. Organize and validate Project #167b data and submit to the USFWS (Project #167b)
Schedule: By November 1

Task 7. Sample Kenney Reservoir to capture and remove northern pike.
Schedule: Late March/April-May; September/October

Task 8. Data entry, data analysis, and preparation of final report. Present findings during the Annual Nonnative Fish Control Workshop (if convened), and at the Annual Recovery Program Researchers Meeting.
Schedule: October-January

Overall Schedule FFY 2020:

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	X	X	X									
2						X	X	X	X			

3			X	X	X	X	X	X	X	X	X	
4			X	X	X	X	X	X	X	X		
5					X	X	X					
6					X	X	X	X	X	X		
7			X	X	X				X	X		
8	X									X	X	X

Overall Schedule FFY 2021:

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

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

IX. Budget Summary:

FFY 2020: $94,429
FFY 2021: $95,805
FFY 2022: $110,149
FFY 2023: $111,839
FFY 2024: $113,564

X. Reviewers:

Harry Crockett, Brianna Franco, CPW

XI. References:

Burdick, B.D. 2007. Colorado River smallmouth bass removal. Scope of work prepared for the Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin. Recovery Program Project Number 126. U.S. Fish and Wildlife Service, Colorado River Fishery Project, Grand Junction, Colorado.

----. 2011. Colorado River smallmouth bass removal. Scope of work prepared for the Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin. Recovery Program Project Number 126. U.S. Fish and Wildlife Service, Colorado River Fishery Project, Grand Junction, Colorado.