

**RECOVERY PROGRAM  
FY 2016-2017 SCOPE OF WORK for:**

Recovery Program Project Number: 125

*Middle Yampa smallmouth bass and northern pike removal*

Reclamation Agreement number: R14AP00001

Reclamation Agreement term: Oct. 1, 2014 – Sep. 30, 2018

Note: Recovery Program FY16-17 scopes of work are drafted in May 2015. 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.

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Potions of this work receive personnel and equipment assistance from USFWS- see attached budgets.

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Category:

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

Expected Funding Source:

- Annual funds  
 Capital funds  
 Other *[explain]*

**I. Title of Proposal: Evaluation of smallmouth bass and northern pike management in the middle Yampa River.**

Relationship to RIPRAP: (draft version 3/12/2015)

See RIPRAP at <http://www.coloradoriverrecovery.org/documents-publications/foundational-documents/recovery-action-plan.html/>

	Action Plan: General Recovery Program Support.
<b>III.</b>	<b>REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)</b>
III.A.	Reduce negative interactions between nonnative and endangered fishes.
III.A.1.	Where not already generally known, identify negative impacts (e.g., predation, competition, hybridization) of problem species.
III.A.1.c.	Re-evaluate levels of hybridization with white sucker and assess effects on razorback sucker populations. (Program will monitor for evidence of hybridization as razorbacks increase in the system.)
III.A.1.c.(1)	If necessary, implement actions to minimize hybridization between white sucker and razorback sucker.
III.A.2.	Identify and implement viable active control measures.

III.A.2.c.	Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement an integrated, viable active control program.
III.A.2.c.(1)	Project-level synthesis: synthesize data on each species/river nonnative fish control effort and concomitant native fish response (e.g., smallmouth bass in the Yampa River and native fish response in the Yampa River) (completed by PI's and identified as a task in individual scopes of work). (YS G-3) See Bestgen et al., 2007 for Yampa River native fish response report (2003-2006) and Skorupski et al 2012 for Middle Green River native fish response report (2005-2008).
III.A.2.c.(3)	Develop one or more standardized nonnative fish datasets to facilitate data analyses and information tracking (one dataset will incorporate all tagging data, others may incorporate all movement, mark-recapture, removal data, etc.) *YS G-1.) Relates to item V.A.1., Interagency Data Management.
III.A.2.c.(4)	Evaluate additional techniques to improve data analysis (e.g., advanced software, exploitation models, ecosystem response models). (YS M-1,2). See, for example, Haines and Modde, 2007.
III.A.2.c.(5)	Develop a measure of successful suppression of smallmouth bass.
III.G.	Remove smallmouth bass and / or replace them with a Compatible species (as identified in the Basinwide Strategy) everywhere they occur throughout the UCRB (exceptions = McPhee Res., Lake Powell Res., and upstream of Flaming Gorge Dam; and 'containment' may prove to be a viable management option for smallmouth bass at Starvation Res.). Specific waters will be targeted based on risk of escapement, opportunity and available resources.
	<b>Action Plan: Yampa River.</b>
III.B.	Implement CPW Yampa Basin aquatic wildlife management plan and the Recovery Program's Yampa River Nonnative Fish Control Strategy. Each control activity will be evaluated for effectiveness and then continued as needed. See also III.A.2.c.1.& 2. under General Recovery Program Support Action Plan.
III.B.1.c.	Remove northern pike and smallmouth bass above Craig, CO (YS C-3)
III.B.1.d.	Target spawning areas (YS C-4)
III.B.1.d.(1)	Northern pike
III.B.1.d.(1)(a)	Identify and evaluate natural and artificial spawning/nursery habitats for northern pike in the Yampa River for exclusion devices.
III.B.1.d.(1)(b)	Implement remedial measures to reduce pike reproduction in Yampa River.
III.B.1.(d)(2)	Smallmouth bass
III.B.1.f.	Convert and extend the ongoing Stagecoach Reservoir northern pike escapement study to a removal effort (will require an addendum to existing FERC Biological Opinion).
III.B.2.	Control nonnative fishes via mechanical removal
III.B.2.a.	Estimate nonnative abundance, status, trends & distribution (YS I-3)
III.B.2.b.	Develop and refine nonnative fish removal criteria (YS K-1)
III.B.2.c.	Identify and evaluate gear types and methods to control nonnative fishes (YS I-5)
III.B.2.d.	Remove (formerly "and translocate") northern pike from Yampa River. See Hawkins et al. 2005. (YS J-1)
III.B.2.d.(1)	Increase mechanical removal of northern pike in main channel and floodplain habitats as directed by Colorado Parks and Wildlife.
III.B.2.e.	Remove (formerly "and translocate") smallmouth bass. (YS J-1)
III.B.2.h.	Monitor native and endangered fish response (YS L-2)

## II. Study Background/Rationale and Hypotheses:

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, 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.

III. Study Goals, Objectives, End Product(s): We are implementing mechanical removal of nonnative smallmouth bass and northern pike in the middle and upper Yampa River; we coordinate our sampling with Colorado Parks and Wildlife (CPW) and U.S. Fish and Wildlife Service (FWS) who are responsible for removal of those species in adjacent reaches. CPW will be responsible for management and analysis of northern pike data collected from the middle Yampa River. We (CSU) will be responsible for management and analysis of smallmouth bass data collected from the middle Yampa River, and northern pike data collected from our study reach in the upper Yampa River.

#### *Smallmouth bass*

The goal is to reduce the number of smallmouth bass and decrease their spawning success in two study sites in the Yampa River in order to benefit native fishes and assist in the recovery of endangered fishes.

#### Objectives:

1. Obtain an estimate of the number of smallmouth bass in Little Yampa Canyon using a mark-recapture abundance estimator.
2. Conduct at least one adequate marking pass in Little Yampa Canyon and seven removal passes in Little Yampa Canyon and Lily Park.
3. Reduce the success of smallmouth bass spawning in the South Beach, Little Yampa Canyon, and Juniper reaches.
4. Calculate the proportion of juvenile and adult smallmouth bass removed from Little Yampa Canyon based on initial population size.
5. Remove large numbers of age-0 and age-1 smallmouth bass from a 12-mile treatment reach (RM100-112) in Little Yampa Canyon and in Lily Park in coordination with Recovery Program Project 140 (Native fish response evaluation).

#### *Northern pike*

The goal is to reduce the number of northern pike from two study sites in the middle Yampa River and one site in the upper Yampa River (appended Project 98c) in order to benefit native fishes and assist in the recovery of endangered fishes. We will coordinate northern pike removal with CPW and FWS.

#### Objectives:

1. In the upper Yampa River between Steamboat Springs and Hayden (Project 98c):
  - a. obtain an estimate of the number of northern pike using a mark-recapture abundance estimator.

- b. remove northern pike on two removal passes,
  - c. identify potential spawning locations.
2. In the lower Yampa River sites (Lily Park and Little Yampa Canyon) conduct eight removal passes for northern pike and provide data to CPW.
  3. Assist Wyoming Game and Fish (WGF) with removal of northern pike from the Little Snake River near Baggs, Wyoming.

*Other species*

The goal is to reduce the number of other nonnative species from all treatment reaches in order to benefit native fishes and assist in the recovery of endangered fishes.

Objectives:

1. Remove white sucker, white sucker hybrids, and common carp, and other nonnative species such as green sunfish, black crappie, black bullhead, and brook stickleback. These species will be removed on all sample occasions as the effort for their removal does not reduce our ability to remove target species of smallmouth bass and northern pike.
2. Evaluate changes in relative abundance of these species over time using catch per unit effort (CPUE).

Results will be reported in Annual Reports and at the annual Nonnative Fish Workshop and Upper Basin Researchers' meetings.

IV. Study Area and sample dates:

Upper Yampa River:

Steamboat – Hayden: 24 miles: Tree Haus Bridge (RM 189.2) to CPW boat ramp at Highway 40 Bridge and Hayden Power plant intake (RM 170.6).

March-April: Adult pike sampling with raft electrofishing (timing dependent upon flows, temperatures, and access).

June-October: Young-of-year (YOY) pike sampling with seine, dipnet, backpack electrofisher, light traps, or electric seine.

Middle Yampa River:

Little Yampa Canyon, 24- miles : Round Bottom (RM 124) to about 1-mile upstream of Government Bridge (RM 100)

Lily Park: 8-miles: downstream end of Cross Mountain Canyon (RM 55.5) to Dinosaur National Monument (RM 47.5).

May – mid-July: Smallmouth bass sampling with boat electrofishing using a 10-days on and 4-days off rotation including eight consecutive sampling days and two travel days. Both northern pike and smallmouth bass are susceptible to electrofishing when they occupy shallow shoreline and flooded off-channel habitats during runoff flows. Spring runoff sampling also allows for safer navigation with large electrofishing boats. As discharge declines and water clears, young smallmouth bass become more susceptible to capture.

Mid -July- August: Age-0 bass sampling during base flow from Lily Park and the lower 12-miles of the Little Yampa Canyon reach. Removing age-0 bass only in the 12-mile treatment reach in Little Yampa Canyon maintains the Control-Treatment study design originally designated in 2004 in the native fish response evaluation by Project 140.

August- September: River-wide fish community sampling from Craig to Dinosaur National Monument.

Little Snake River:

Within 5 miles up- or downstream of Baggs, Wyoming.

September: northern pike sampling assistance to WGF for one week.

V. Study Methods/Approach:

Upper Yampa River- Pike: This reach is primarily located within private property and all of the current access points (boat ramps) require landowner permission. Although much of the work can occur on the water without touching land, gaining access to launch boats, take-out boats, set nets, or process fish requires landowner permission. The short section through Steamboat Springs contains several low bridges that are not navigable during higher flow events. This section also has minimal northern pike habitat and will be excluded from sampling if deemed unsafe. CPW will mail a letter informing landowners of the work and the PI will contact and seek landowner permission for bank access for the mentioned activities. CPW will provide electrofishing rafts for CSU use. We will focus primarily on sampling backwaters to reduce potential negative effects on sport fish (trout and whitefish). The reach will be sampled on at least three occasions, most likely in April, depending on access and flows. We will mark northern pike on the first sample pass with Floy tags and remove pike on two subsequent passes. Abundance will be estimated using a modified Lincoln-Peterson estimator. Catch per unit effort will be calculated for each pass for comparison with other reaches where pike are being removed.

We will note sex and sexual conditions of all pike captured and obtain GPS locations of confirmed or potential spawning sites. If we can obtain permission, we will return to those locations and sample with fyke, trammel, or gill nets during high flows.

Spawning location and density will be confirmed by sampling for YOY. We will return later in the year to sample backwaters where we had earlier observed ripe fish and also sample other suitable spawning locations to capture YOY pike with seine, dipnet, backpack electrofisher, light trap, or electric seine. Knowledge of spawning locations will direct future removal or management efforts that target spawning pike in an attempt to reduce production.

Lower Yampa River:

*Sampling protocol*— Each year, we will remove smallmouth bass from each study site on multiple occasions in an attempt to reduce their number and size structure. Fish will be captured with boat electrofishing from May through mid-July when flow is sufficient (>1000 cfs) to navigate the river with 17-ft. aluminum, Jon-boats fitted with outboard jet motors. Both shorelines will be sampled concurrently with two electrofishing boats using ETS brand, pulsed – DC current following Standard Operating Procedures (Martinez and Kolz, 2015). Sampling will occur in a downstream direction covering about 6 miles per day until the entire reach is sampled.

Other sampling gear may include backpack or bank electrofisher, seine, trammel, fyke, or gill net, angling, or suction devices for young fish. A third boat will be used to process, maintain, and transport live fish as needed. Each reach will be sampled on multiple occasions each year with an interval of 4–10 days between occasions. In the Little Yampa Canyon reach only, smallmouth bass  $\geq 100$  mm TL will be marked with a numbered Floy tag and released on at least one sample occasion each year to serve as a mark for abundance estimation. On all other non-marking sample occasions, smallmouth bass will be removed from the river. For a description of the sampling protocol see Hawkins et al. (2009a).

We will process fish every ½-mile. Smallmouth bass that are returned to the river will be Floy tagged and released within the ½-mile section from which they were captured. Backwater and flooded tributary mouth areas will be sampled by electrofishing boat, fyke, gill, or trammel nets or block-and-shock techniques described by Nesler (1995). To determine spawning locations and timing of smallmouth bass reproduction, we will note when we observe males moving off nests and the reproductive condition of captured fish. Spawning areas will be intensively targeted for removal of nesting, spawning or nest guarding adult fish, young bass will be removed from active nests, and nest sites will be physically destroyed when possible.

*Removal effort*— We will attempt to maximize the number of removal occasions each year based on time and resources.

*Removal evaluation*— Each year we will estimate the abundance and capture probability of smallmouth bass at Little Yampa Canyon using mark-recapture methods. We will calculate catch per unit effort (CPUE) for adult smallmouth bass for each sample occasion and obtain an average CPUE for all sample occasions each year at both sites. Removal effectiveness will be determined primarily by examining changes in annual abundance of juvenile (100-199mm TL) and adult ( $\geq 200$  mm TL) smallmouth bass in Little Yampa Canyon.

*Intensive sampling during smallmouth bass spawning* —We will use current knowledge about smallmouth bass spawning ecology to focus and increase removal of spawning smallmouth bass starting in 2010. Once temperatures reach 16° C, we will increase removal efforts in areas with known or potential spawning habitat by organizing and coordinating a multi-agency effort known as “The Surge”. Our goal is to disrupt all stages of the spawning period, including pre-spawn nest building, spawning, and nest guarding. This activity has been shown in our annual reports to increase the catch and removal of adult fish, disrupt the spawning event, remove guarding males from active nests, and is expected to ultimately reduce the survival of young hatchlings. Modeling shows that disrupting early season nests via the Surge is an effective means to reduce overwinter survival of young bass, thus reducing the abundance of year classes throughout the future. Removing spawning adults from nesting areas during the earlier nest building and spawning stages will create a sink in these areas for late spawners which will then be targeted for removal. Adult bass on nests are vulnerable to electrofishing gear because they are in shallow water and they have a tendency to remain and protect the nest rather than flee. Our plan is to remove spawning fish and create a void in desirable spawning habitat so that new bass can occupy those areas and be removed on subsequent sampling occasions. In that process, we will also be disrupting and decreasing the survival of eggs or young in nests. Sampling effort will be directed at river sections with concentrations of spawning bass. We will focus on the reaches between South Beach and Lower Juniper (RM 135–90), because those reaches have

well-known spawning habitat. This sampling will be conducted with electrofishing aluminum jon-boats and rafts.

*Smallmouth bass spawning* —Spawning activity begins when temperatures reach about 16–18° C (60–65° F) which in the Yampa River can range from early to late June. Bestgen presented back-calculated hatching dates based on otolith increments at the 2009 Nonnative Workshop that support a start of spawning at 16° C which can vary depending on discharge volume and timing (Figure 1). Hatching date ranges from two to nine days after spawning, depending on temperatures. Optimum incubation and hatching temperatures range from 19–22°C (66–72°F) and shorten hatching time. After hatching, larvae drop into the gravel nest and they eventually emerge and remain in the nest for an additional 6–15 days. Males will often remain in the area and guard the slowly dispersing young for as long as 28 days.

Removing the male from a nest (typically reported in the literature by angling) often results in large losses of eggs or larvae due to predation on the young or abandonment of the nest by the male if released back to the water.

*Additional resources during The Surge*— Increased removal effort requires additional people and equipment; therefore, we (CSU) will work closely and receive assistance from CPW and FWS crews. During intensive spawning sampling, CPW will increase sampling in South Beach, upper and lower Maybell, and Lower Juniper prior to spawning and will contribute a total of four people and three boats during intensive sampling. FWS- Grand Junction will assist with intensive sampling for 2 weeks and provide three people, two electrofishing jet boats or rafts, and two trucks. FWS- Vernal will assist for 2 weeks and provide two people and one truck. See attached budgets for FWS field station participation.

Effort required to complete one pass of the South Beach, Little Yampa Canyon, and lower Juniper reaches is about 7 days. But with one extra crew (in addition to the CSU crew), we can increase our sampling effort to complete all three reaches within 3-4 days. We will also allow each section to have about a 3-4-day reset period before returning to resample in order to allow spawning habitat to reset with either displaced fish or new spawners.

*Prediction of spawning period* —CSU will measure water temperature daily at the Maybell gage and report to CPW and FWS when temperatures are expected to reach 16° C. Based on past years, this typically occurs between late-May and the end of June. Spawning generally starts during the last part of the descending hydrograph and ends when young bass leave the nest about the time runoff drops to base flow. Bass nests are active for 10-20 days depending on temperatures and we plan to sample intensively so that almost all nests, no matter when started, would be disturbed on two to five occasions. Intensive sampling should start within 5 days of temperatures reaching 16° C and continue for approximately 4 weeks or until water levels decline to a point that the river is un-navigable.

Spawning habitat probably occurs in all reaches but nests are often dispersed along the river shoreline or in backwaters and can vary in density. We propose sampling through all three reaches at least once to discover and document either specific locations or sections of river where spawning is concentrated. We will then target spawning concentrations or river sections with high densities of spawning habitat on future removal occasions. If time and logistics allow, we

will extend some effort in other reaches where spawning could be occurring after we have confirmed that spawning is occurring in known reaches.

*YOY bass removal:* After spawning and during low stream discharge in July and August, we will focus on removing young (age-0 and age-1) smallmouth bass from the lower 12-mile section of the Little Yampa Canyon study site (i.e. the original treatment reach designated in 2004). This reach is part of the control–treatment design within the native fish evaluation study (Bestgen et al. 2007). Young smallmouth bass will be captured with a 10 m-long electric seine powered by a 2000-watt generator. Other gear may include boat or backpack electrofisher, angling, seine, trap net, or cages with baited or scented attractants. We will conduct at least three separate sampling occasions, in July and August, each about 10 days long and reaches will be sampled multiple times on each occasion. We will sample primarily shallow, low-velocity shorelines associated with backwaters, embayments, or among boulders deposited from talus slopes. All native and nonnative species will be handled as they are during boat electrofishing and as specified in Table 2 unless specified differently by the state collecting permit.

*Fish handling* — Fish captured with boat electrofishing will be placed in a live well, measured to the nearest mm TL, and weighed with a Pesola<sup>®</sup> spring scale. Fish handling time will be reduced by subsampling lengths and weights of fish, except for tagged or recaptured fish, which we will measure and weigh. Northern pike will be euthanized. Smallmouth bass > 100 mm TL captured in Little Yampa Canyon will be tagged with a numbered, Floy<sup>®</sup> t-bar anchor tag (model FD-94) and released on one sampling occasion for information about abundance, growth, and movement and on all other sample occasions they will be euthanized. At all other reaches smallmouth bass will be euthanized on all sample occasions. Fish that are euthanized will be overdosed with Tricaine methanesulfonate (MS-222).

Endangered fishes and roundtail chub will be handled per guidelines and permits of the CPW and the FWS. All Colorado pikeminnow and roundtail chub will be captured, PIT tagged per Recovery Program protocol, their location recorded within 0.1 mile. Other native fishes will be captured, measured, and released. All trout species and channel catfish will be measured and released in the river. Other nonnative species captured that will be euthanized include northern pike, centrarchids, black bullhead *Ameiurus exile*, walleye *Stizostedion vitreum*, brook stickleback, common carp *Cyprinus carpio*, white sucker, and white sucker hybrids. Any other species captured that is on the Colorado prohibited species list will be removed and euthanized. See Colorado's prohibited species list: <http://wildlife.state.co.us/RulesRegs/Regulations/> Fish that are euthanized will be provided to CPW researchers, kept as voucher specimens and cataloged into the LFL fish collection, or disposed of per state collecting permit requirements. We will evaluate if we are having a removal effect on white sucker and common carp by comparing their CPUE and relative abundance.

*Fish Community (1-mile) sampling*— We will monitor relative abundance of the fish community at four, 1–mile sites in Little Yampa Canyon and one, 1–mile site at Lily Park. These locations include RM 118.0–119.0 near Milk Creek, RM 112.5–113.5 near Sand Spring Gulch, RM 108.0–109.0 near Duffy Tunnel inlet, RM 104–103 near Morgan Gulch and RM 52.0–53.0 near Lily Park Bridge. Each site will be sampled at least monthly with boat electrofishing concurrently with smallmouth bass sampling. At each site we will net, count, and measure lengths and weights of all fish species.

*Riverwide fish community sampling*— To assess the success of spawning disruption from intensive removal of spawning adult smallmouth bass and to look for high density areas of YOY smallmouth bass that indicate nearby areas of high spawning density, we will sample the middle Yampa River longitudinally from Elkhead Creek to Dinosaur National Monument (RM 147–46) including both Juniper Canyon (2 miles) and Cross Mountain Canyon (3 miles). Sampling will occur in August when YOY smallmouth bass are relatively small but large enough to be susceptible to the sampling gear. Sampling gear will include seine, dipnet, backpack electrofisher, and electric seine. We will estimate YOY smallmouth bass abundance by their relative abundance to other species and their catch per unit effort (CPUE).

*Northern pike removal in Little Snake River*--- In September or October, we will assist WGF with two people for four days sampling backwaters or refugia pools below three diversion dams including Baggs and Stateline diversions in Wyoming and Trowel Diversion in Colorado. The purpose is to document occurrence and possible local production of northern pike in the upper reaches of the Little Snake River. Sample gear will include trammel nets and electrofishing barge or Jon Boat.

Justification for marking and releasing fish:

Middle Yampa Smallmouth bass

Methods: Smallmouth bass  $\geq 100$  mm total length in the 24-mile Little Yampa Canyon (LYC) reach would be marked with a numbered Floy tag on one sampling occasion (pass). On all other passes, bass will be removed and euthanized. Reasons to mark bass include:

- The primary purpose is to obtain abundance (population size) data.
- We have marked smallmouth bass here since 2003 and consider it a sentinel reach because it is within the epicenter of smallmouth bass production in the Yampa River.
- It will allow us to continue monitoring the effects of changing management activities on smallmouth bass population dynamics.
- Marked fish will provide information about dispersal, movement, and growth; things that may change as the population responds to environmental or removal effects.
- Tracking abundance and immigration into LYC may help evaluate the effectiveness of the Elkhead screen. Recall that most of the bass that escaped Elkhead Reservoir moved into LYC and abundance data could help determine the effectiveness of that screen in reducing immigration and therefore abundance of smallmouth bass in LYC.
- Abundance data from mark and release studies has historically provided the best evidence of the effects of removal.

Upper Yampa northern pike

Methods: Northern pike in the upper 28-mile reach of the Yampa River from Steamboat Springs-Hayden Power Plant Intake will be marked with a numbered Floy tag and released on one sampling occasion (pass). On all other passes, pike will be removed and euthanized. Reasons to mark pike include:

- The primary purpose is to obtain abundance data.

- The last estimate of abundance of northern pike in this reach was in 2005 and no sampling or removal of that species has occurred in this reach since that time.
- Since 2005, there has been a large effort by CPW to remove northern pike from the river upstream of Steamboat Springs and from Catamount Reservoir. This effort has most likely reduced the dispersal of northern pike into the study reach and an abundance estimate will determine the population change compared to 10 years ago.
- An initial abundance estimate will provide a baseline for this and any future removal projects in this reach.

#### VI. Task Description and Schedule:

1. **Oct-Jan:** (Project 125/ 98c) Consolidate data collected during previous fiscal year, write annual report, assemble and submit data to Recovery Program and Colorado Collecting Permit (SciColl) databases. Summarize results for National Park Service Investigator's Annual Report. Attend coordinating meetings and workshops with other agencies and PIs including database workshop, nonnative PI coordinating meeting, and training workshops. Prepare and present results of the previous year's field work at three annual meetings: Dinosaur River Symposium, nonnative fish workshop, and Researcher's Annual Meeting.
2. **Feb-Apr:** (Project 125/ 98c) Prepare equipment, train crew, assemble maps and land ownership information, coordinate with CPW regarding access. Contact landowners and obtain permission for access on private property. Hire and train field crew; purchase, prepare, and fabricate equipment.
3. **Apr- May:** (Project 98c) Conduct one marking pass and two removal passes for northern pike between Steamboat and Highway 40 Bridge.
4. **Apr-Jul:** (Project 125) River sampling in Little Yampa Canon and Lily Park to capture, and remove smallmouth bass, northern pike and other invasive nonnative species.
5. **Jun-Jul:** (Project 125) Coordinate and conduct smallmouth bass removal and spawning disruption during the spawning period.
6. **May- Jul:** (Project 98c) Sampling for YOY pike to confirm spawning locations.
7. **Sep:** Assist Wyoming Game and Fish with sampling for northern pike in the Little Snake River.
8. **Jul-Aug:** (Project 125) Capture and remove YOY and yearling smallmouth bass from treatment sites.
9. **Aug:** (Project 125) River-wide sampling for relative abundance of the small-bodied fish community including smallmouth bass.
10. **Aug-Sep:** (Project 125/ 98c) Equipment maintenance. Data entry and analysis. Meetings, interaction, and data sharing with other biologists and researchers.

Table of Task schedule

Task	Project	Oct	Sep	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	125 98c	x	x	x	x	x								
2	125 98c						x	x	x					
3	98c								x	x				
4	125								x	x	x	x		
5	125										x	x		
6	98c									x	x	x		
7	125													x
8	125											x	x	
9	125												x	
10	125 98c												x	x

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

Budget Notes:

Larval Fish Laboratory, sampling and data analysis

Larval Fish Laboratory: Annual increases in budget each year are attributed only to 3% salary increase each year for LFL employees. LFL fringe benefits are 27% of the total amount of salaries and are figured into salary costs. LFL overhead rate is 17.5% (per agreement with BOR) and is charged to all items.

Travel: Travel costs include travel from primary residence in Fort Collins to a rental house 25 miles south of Craig, Colorado and near the project location on the Yampa River. We are stationed at the field location for 8 days of sampling on the Yampa River on each trip. Daily travel is from the rental house to various field locations on the Yampa River for daily field work. Travel to the field site from Ft Collins requires 2-3 trucks depending on the number of crew and boats being transported. During field sampling the number of trucks varies from 3-4 depending on the number of boats being transported or shuttles. Housing costs assume ability to rent a house for the crew while at their field location and the associated costs of cooking and providing meals while at the field location. Daily per diem rate of \$20 /day /person reflects the amount needed to purchase groceries for the crew while they are in the field and is substantially less than the IRS per diem rate for western Colorado. Lack of the rental house would result in increased costs for motel and per Diem. Mileage is based on the standard rate for Motor Pool vehicles, which varies depending on age and size of the vehicle

Personnel: Personnel include a senior biologist (P.I.), two junior biologists, and up to four seasonal technicians. Salaries include 27% fringe rate. Costs remain the same for all items except for a 3% increase in salaries each year.

Supplies: A boat motor was included on only in 2016 and partial costs for a truck are included only in the first 4 years. Supplies are used primarily in constructing, maintaining, and repairing boats and electrofishing equipment and secondarily in maintaining other equipment for field sampling and lab analysis of specimens. Containers and preservatives are to hold field specimens and to curate specimens in the lab, preservative are formalin and ethanol for preservation of samples. Nets include seines and trammel nets, disposable goods that need replacements due to attrition. Fyke nets are stationary gear for pike sampling and need to be replaced due to attrition. Tools for repairs include hand and electrical tools to assist with repair and maintenance of sampling gear in the field. Boating gear includes personal flotation devices, straps and other rigging for aluminum jon-boats and rafts, oars, shocking boat booms, frame repair or replacement, and flooring. Estimated costs based on past expenses and current prices procured from various online sources (local vendors, NRS rafting supplies, Christiansen Inc, for net supplies)

FY 2016--2020

Deliverables; Project annual reports to Program Directors Office by November each year

Budget by task and year:

Task and explanation of costs	2016	2017	2018	2019	2020
<b>Task 1- (Projects 125 &amp; 98c)-Meetings</b>					
Labor-Biologist Sr. Researcher (\$1854/week – 4 weeks)	7416	7638	7868	8104	8347
Labor-Biologist Researcher III (\$1273/week – 4 weeks)	5092	5245	5402	5564	5731
Travel-Lodging (\$80/night-2 nights/trip x 2 people x 3 trips)	960	960	960	960	960
Travel-per Diem (\$46/day x 3 days/trip x 2 people x 3 trips)	828	828	828	828	828
Travel- Truck mileage (\$0.50/mile x 500 miles/trip x 3 trips)	750	750	750	750	750
Task subtotal	15046	15421	15808	16206	16616
<b>Task 2 (Project 125)-Field Prep and train crew</b>					
Labor-Biologist Sr.Researcher (\$1854/week – 3 week)	5562	5729	5901	6078	6260
Labor-Biologist Researcher III (2 x \$1273/week – 3 weeks)	7638	7868	8104	8346	8596
Travel-Lodging (\$80/night-2 nights x 2 people)	320	320	320	320	320
Travel-per Diem (\$46/day x 4 days x 2 people)	368	368	368	368	368
Travel- Truck mileage (\$0.50/mile x 500 miles)	250	250	250	250	250
Task subtotal	14138	145347	14942	15362	15794
<b>Task 3 (Project 98c)-Pike removal</b>					
Labor-Biologist Sr. Researcher (\$1854/week –	7416	7638	7868	8104	8347

4 weeks)					
Labor-Biologist Researcher III (1 x \$1273/week – 4 weeks)	5092	5245	5402	5564	5731
Labor- Biological Technicians (2 techs x \$798/week x 4 weeks)	6384	6576	6773	6976	7185
Travel-Lodging (\$100/night-5 nights/trip x 2 people x 4 trips)	4000	4000	4000	4000	4000
Travel-per Diem (\$59/day x 6 days/trip x 4 trips x 4 people)	5664	5664	5664	5664	5664
Equipment- Truck purchase- 1/4 portion of new truck purchase.	5000	5000	5000		
Travel- Truck mileage ¾ ton (\$0.50/mile x 500 miles/trip x 4 trips)	1000	1000	1000	1000	1000
Travel- Truck mileage ¾ ton (\$0.50/mile x 500 miles/trip x 4 trips)	1000	1000	1000	1000	1000
Supplies- Electrofishing Generator gas (2 gallons/day x \$3.85/gal x 5 days/trip x 4 trips)	154	154	154	154	154
Service- repair and maintenance- Welding , rigging and field equipment maintenance. Cost based on average of past expenses.	500	500	500	500	500
Task subtotal	36210	36777	37361	32962	33581

**Task 4 (Project 125)-Bass removal**

Labor-Biologist Sr. Researcher (\$1854/week – 15 weeks)	27810	28644	29504	30389	31300
Labor-Biologist Researcher III (2 x \$1273/week – 15 weeks)	38190	39336	40516	41731	42983
Labor- Biological Technicians (3 techs x \$798/week x 15 weeks)	35910	36987	38097	39240	40417
Travel-Lodging rental house (\$1200/ month x 4 months)	4800	4800	4800	4800	4800
Travel-per Diem (\$20/day x 10 days/trip x 6 trips x 7 people)	8400	8400	8400	8400	8400
Travel- Truck Insurance and motor pool fees (\$380/yr x 4 trucks)	1520	1520	1520	1520	1520
Travel- Truck mileage ¾ ton people hauler- 2 trucks (2 trucks x \$0.50/mile x 700 miles/trip x 6 trips)	4200	4200	4200	4200	4200
Travel- Truck mileage 1-ton fish hauler (\$0.63/mile x 700 miles/trip x 6 trips)	2646	2646	2646	2646	2646
Travel- Truck mileage gas hauler (\$0.92/mile x 100 miles/trip x 6 trips)	552	552	552	552	552
Supplies- Boat Gas (3 boats x \$3.85/gal x 15 gal/day x 8 days/trip x 6 trips)	8316	8316	8316	8316	8316

Supplies-Field supplies (sampling nets, boots and waders, electrical safety gloves, tools, and tune up parts for generators. electrical connector replacement for safe electrofishing operation)	1200	1200	1200	1200	1200
Supplies- Boat 2-cycle oil (\$27/gal x 3 gallons/boat/trip x 3 boats x 6 trips)	1701	1701	1701	1701	1701
Service- Annual boat engine service at dealer (\$500/boat based on average cost in the past x 4 boats)	2000	2000	2000	2000	2000
Service- Boat repair and maintenance- Welding , rigging and field equipment repair Boat engine- 115 HP Optimax	500	500	500	500	500
Service- cell phone and Wireless broadband modem for work related email and communication in the field	828	828	828	828	828
Task subtotal	138573	141630	144779	148023	151364

**Task 5 (Project 125)-Bass spawn removal**

Labor-Biologist Sr. Researcher (\$1854/week – 2 weeks)	3708	3819	3934	4052	4173
Labor-Biologist Researcher III (2 x \$1273/week – 2 weeks)	5092	5245	5402	5564	5731
Labor- Biological Technicians (4 techs x \$798/week x 2 weeks)	6384	6576	6773	6976	7185
Travel-per Diem (\$20/day x 10 days/trip x 2 trips x 7 people)	2800	2800	2800	2800	2800
Travel- Truck mileage ¾ ton people hauler (\$0.50/mile x 700 miles/trip x 2 trips)	700	700	700	700	700
Travel- Truck mileage 1-ton (\$0.63/mile x 700 miles/trip x 2 trips)	882	882	882	882	882
Task subtotal	19566	20022	20491	20974	21472

**Task 6 (Project 98c)- YOY pike**

Labor-Biologist Sr. Researcher (\$1854/week – 2 weeks)	3708	3819	3934	4052	4173
Labor- Biological Technicians (4 techs x \$798/week x 2 weeks)	6384	6576	6773	6976	7185
Travel-per Diem (\$59/day x 6 days/trip x 4 trips x 4 people)	5,664	5,664	5,664	5,664	5,664
Travel- Truck mileage ¾ ton (\$0.50/mile x 500 miles/trip x 4 trips)	1000	1000	1000	1000	1000
Travel- Truck mileage 1-ton (\$0.50/mile x 500 miles/trip x 4 trips)	1000	1000	1000	1000	1000

Supplies- Electrofishing Generator gas (4 gallons/day x \$4/gal x 5 days/trip x 4 trips)	320	320	320	320	320
Task subtotal	18,076	18,379	18,691	19,012	19,343

**Task 7 (Project 125)-Little Snake River pike**

Labor-Biologist Sr. Researcher (\$1854/week – 1 week)	2039	2101	2164	2229	2295
Labor- Biological Technician (\$798/week x 1 week)	878	904	931	959	988
Travel-per Diem (\$20/day x 5 days x 2 people)	200	200	200	200	200
Travel- Truck mileage 3/4-ton (\$0.50/mile x 600 miles)	300	300	300	300	300
Travel: Motel \$80/night x 4 nights	320	320	320	320	320
Field Supplies- sampling nets	200	200	200	200	200
Task subtotal	3937	4025	4115	4208	4303

**Task 8 (Project 125)-YOY bass removal**

Labor-Biologist Sr. Researcher (\$1854/week – 4 weeks)	7416	7638	7868	8104	8347
Labor-Biologist Researcher III (2 x \$1273/week – 4 weeks)	10184	10490	10804	11128	11462
Labor- Biological Technicians (3 techs x \$798/week x 4 weeks)	9576	9863	10159	10464	10778
Travel-Lodging rental house (\$1200/ month x 1 months)	1200	1200	1200	1200	1200
Travel-per Diem (\$20/day x 10 days/trip x 4 trips x 5 people)	4000	4000	4000	4000	4000
Travel- Truck mileage ¾ ton people hauler (\$0.50/mile x 700 miles/trip x 4 trips)	1400	1400	1400	1400	1400
Travel- Truck mileage 1-ton (\$0.62/mile x 700 miles/trip x 4 trips)	1736	1736	1736	1736	1736
Supplies- Electric seine repair and maintenance (replacement of electrical connections to maintain safe operation)	550	550	550	550	550
Task subtotal	36062	36877	37717	38582	39473

**Task 9 (Project 125)-River-wide fish community**

Labor-Biologist Sr. Researcher (\$1854/week – 4 weeks)	7416	7638	7868	8104	8347
Labor- Biological Technicians (1 tech*\$798/week x 4 weeks)	3192	3288	3386	3488	3593
Travel-per Diem (\$20/day x 10 days/trip x 4 trips x 2 people)	1600	1600	1600	1600	1600
Travel- Truck mileage 1-ton	1736	1736	1736	1736	1736

(\$0.62/mile x 700 miles/trip x 4 trips)

Task subtotal	13944	14262	14590	14928	15275
<b>Task 10 (Projects 125 &amp; 98c)-Equip. maintenance, data entry, analysis</b>					
Labor-Biologist Sr. Researcher (\$1854/week – 5 weeks)	9270	9548	9835	10130	10433
Labor-Biologist Researcher III (\$1273/week – 4 weeks)	5092	5245	5402	5564	5731
Labor- Biological Technicians (\$798/week x 5 weeks)	3990	4110	4233	4360	4491
Computer- hardware and software updates for data analysis	404	405	406	407	408
Task subtotal	18756	19308	19876	20461	21063
Sub Total all Tasks	314308	321235	328369	330716	338284
CSU overhead BOR rate 17.5%	55004	56216	57465	57875	59200
<b>Total- CSU LFL</b>	<b>369312</b>	<b>377451</b>	<b>385834</b>	<b>388591</b>	<b>397484</b>

VIII. Budget Summary: **\*\*Detailed FWS Budgets Attached in Appendix\*\***

	CSU-LFL	FWS- Grand Junction	FWS- Vernal	Total
FY-2016	369,312	16,128	20,264	405,704
FY-2017	377,451	16,511	21,318	415,280
FY-2018	385,834	16,910	22,257	425,001
FY-2019	388,591	17,314	22,667	428,572
FY-2020	397,484	17,734	23,083	438,301

IX. Reviewers: Kevin Mcabee, June; August 2015;

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## Appendix A

Annual budgets for Vernal CRFP participation in smallmouth bass "Surge" (Project 125)

### 2016

Task Activity	Rate \$/h	Hours	Cost
<b>Task 1</b>			
<b>Labor</b>			
GS-7 Biologist	\$24.96	80	\$2,275
1 GS-5 Tech/ WG-5 Boat Operator	\$18.91	80	\$1,997
Overtime for tech	\$37.44	20	\$749
<b>Subtotal</b>			<b>\$5,021</b>
 <b>Travel</b>			
Lodging and per diem (2 people/day x \$129/person x 8 nights)			\$2,064
<b>Subtotal</b>			<b>\$2,064</b>
 <b>Equipment</b>			
(2 trucks/trip x 550 mi/truck x \$0.31/mi x 2 trips) Vernal to Craig and during boat shuttles, round trip			\$682
(12 gal gas/boat x 2 boats/day x \$4.00/gal x 10 days)			\$960
GSA truck (rate/mo x # truck-months)	\$313	1	\$313
GS-8 Fisheries Tech Maintenance work	\$38.72	196	\$7,589
Boat propellers, boating equipment replacement/repair, safety equipment (PFDs, etc)			\$500
<b>Subtotal</b>			<b>\$10,044</b>
<b>TASK 1 TOTAL</b>			<b>\$17,129</b>
<hr/>			
<b>Task 2- Data Analysis, Project Administration</b>			
<b>Labor</b>			
GS-9 Admin Assist.	\$39.19	80	\$3,135
<b>Subtotal</b>			<b>\$3,135</b>
<b>TASK 2 TOTAL</b>			<b>\$3,135</b>
<b>SOW TOTAL</b>			<b>\$20,264</b>

**2017**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-9 Biologist	\$35.36	80	\$2,829
1 GS-5 Tech/ WG-5 Boat Operator	\$25.70	80	\$2,056
Overtime for tech	\$38.55	20	\$771
<b>Subtotal</b>			<b>\$5,656</b>
<b>Travel</b>			
Lodging and per diem (2 people/day x \$137/person x 8 nights)			\$2,192
<b>Subtotal</b>			<b>\$2,192</b>
<b>Equipment</b>			
(2 trucks/trip x 550 mi/truck x \$0.32/mi x 2 trips) Vernal to Craig and during boat shuttles, round trip			\$704
(12 gal gas/boat x 2 boats/day x \$4.00/gal x 10 days)			\$960
GSA truck (rate/mo x # truck-months)	\$320	1	\$320
GS-8 Fisheries Tech Maintenance work	\$39.74	196	\$7,788
Boat propellers, boating equipment replacement/repair, safety equipment (PFDs, etc)			\$500
<b>Subtotal</b>			<b>\$10,272</b>
<b>TASK 1 TOTAL</b>			<b>\$18,120</b>
<b>Task 2- Data Analysis, Project Administration</b>			
<b>Labor</b>			
GS-9 Admin Assist.	\$39.98	80	\$3,198
<b>Subtotal</b>			<b>\$3,198</b>
<b>TASK 2 TOTAL</b>			<b>\$3,198</b>
<b>SOW TOTAL</b>			<b>\$21,318</b>

**2018**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-11 Biologist	\$42.93	80	\$3,435
1 GS-5 Tech/ WG-5 Boat Operator	\$26.48	80	\$2,118
Overtime for tech	\$39.72	20	\$794
<b>Subtotal</b>			<b>\$6,347</b>
<b>Travel</b>			
Lodging and per diem (2 people/day x \$137/person x 8 nights)			\$2,192
<b>Subtotal</b>			<b>\$2,192</b>
<b>Equipment</b>			
(2 trucks/trip x 550 mi/truck x \$0.33/mi x 2 trips) Vernal to Craig and during boat shuttles, round trip			\$726
(12 gal gas/boat x 2 boats/day x \$4.00/gal x 10 days)			\$960
GSA truck (rate/mo x # truck-months)	\$325	1	\$325
GS-8 Fisheries Tech Maintenance work	\$40.53	196	\$7,944
Boat propellers, boating equipment replacement/repair, safety equipment (PFDs, etc)			\$500
<b>Subtotal</b>			<b>\$10,455</b>
<b>TASK 1 TOTAL</b>			<b>\$18,994</b>
<b>Task 2- Data Analysis, Project Administration</b>			
<b>Labor</b>			
GS-9 Admin Assist.	\$40.78	80	\$3,262
<b>Subtotal</b>			<b>\$3,262</b>
<b>TASK 2 TOTAL</b>			<b>\$3,262</b>
<b>SOW TOTAL</b>			<b>\$22,257</b>

**2019**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-11 Biologist	\$43.79	80	\$3,503
1 GS-5 Tech/ WG-5 Boat Operator	\$27.27	80	\$2,182
Overtime for tech	\$40.91	20	\$818
<b>Subtotal</b>			<b>\$6,503</b>
<b>Travel</b>			
Lodging and per diem (2 people/day x \$137/person x 8 nights)			\$2,192
<b>Subtotal</b>			<b>\$2,192</b>
<b>Equipment</b>			
(2 trucks/trip x 550 mi/truck x \$0.34/mi x 2 trips) Vernal to Craig and during boat shuttles, round trip			\$748
(12 gal gas/boat x 2 boats/day x \$4.00/gal x 10 days)			\$960
GSA truck (rate/mo x # truck-months)	\$332	1	\$332
GS-8 Fisheries Tech Maintenance work	\$41.35	196	\$8,105
Boat propellers, boating equipment replacement/repair, safety equipment (PFDs, etc)			\$500
<b>Subtotal</b>			<b>\$10,645</b>
<b>TASK 1 TOTAL</b>			<b>\$19,339</b>
<b>Task 2- Data Analysis, Project Administration</b>			
<b>Labor</b>			
GS-9 Admin Assist.	\$41.60	80	\$3,328
<b>Subtotal</b>			<b>\$3,328</b>
<b>TASK 2 TOTAL</b>			<b>\$3,328</b>
<b>SOW TOTAL</b>			<b>\$22,667</b>

**2020**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-11 Biologist	\$44.67	80	\$3,573
1 GS-5 Tech/ WG-5 Boat Operator	\$28.09	80	\$2,247
Overtime for tech	\$42.14	20	\$843
<b>Subtotal</b>			<b>\$6,663</b>
<b>Travel</b>			
Lodging and per diem (2 people/day x \$137/person x 8 nights)			\$2,192
<b>Subtotal</b>			<b>\$2,192</b>
<b>Equipment</b>			
(2 trucks/trip x 550 mi/truck x \$0.35/mi x 2 trips) Vernal to Craig and during boat shuttles, round trip			\$770
(12 gal gas/boat x 2 boats/day x \$4.00/gal x 10 days)			\$960
GSA truck (rate/mo x # truck-months)	\$338	1	\$338
GS-8 Fisheries Tech Maintenance work	\$42.17	196	\$8,265
Boat propellers, boating equipment replacement/repair, safety equipment (PFDs, etc)			\$500
<b>Subtotal</b>			<b>\$10,833</b>
<b>TASK 1 TOTAL</b>			<b>\$19,689</b>
<b>Task 2- Data Analysis, Project Administration</b>			
<b>Labor</b>			
GS-9 Admin Assist.	\$42.43	80	\$3,394
<b>Subtotal</b>			<b>\$3,394</b>
<b>TASK 2 TOTAL</b>			<b>\$3,394</b>
<b>SOW TOTAL</b>			<b>\$23,083</b>

## Appendix B

### RECOVERY PROGRAM

Recovery Program Project Number: 125

### FY 2016-2017 SCOPE OF WORK for:

(Remove spawning adult smallmouth bass from the middle Yampa River)

Reclamation Agreement number: R13PG40018

Reclamation Agreement term: June 3, 2013 – Sept. 30, 2017

Note: Recovery Program FY16-17 scopes of work are drafted in May 2015. 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.

Supporting agency: Fish and Wildlife Service

Colorado River Fishery Project – Grand Junction (CRFP-GJ)

Submitted by: Travis Francis, Fishery Biologist

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Date Last Modified: 8/27/2015 4:45:00 PM

#### I. Task Description and Schedule:

##### Description

Task 1. provide a three-person field crew for **eight days**<sup>a</sup> with administrative support sometime from mid-June to mid-July; provide either jet-powered electrofishing hard-bottom craft or row-powered electrofishing inflatables.

<sup>a</sup> reduced from 10 to 8 days since FY2011 to remain with budget limits set by the Recovery Program

Task 1. 6/2016-7/2016; 6/2017-7/2017

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

FY 2016 *Tasks 1*

FY 2016										
	<b>Labor</b>	<b>Title</b>	<b># of employees</b>	<b>Hours</b>	<b>Reg. Rate</b>	<b>OT Hours</b>	<b>OT Rate</b>		<b>Total</b>	
		Project Leader GS-14		1	0	83.42	0	0	0	
		Administrative Officer GS-09		1	0	44.72	0	0	0	
		Fishery Biologist GS-11		1	40	49.36	0	0	1974.4	
		Fishery Biologist GS-07		1	40	33.7	0	50.54	1348	
		Crew leader Tech. GS-06		1	80	32.76	25	49.14	3849.3	
		Biological Tech. GS-05		1	80	24.96	25	37.44	2932.8	
	<b>Labor Subtotal</b>								10104.5	
	<b>Equipment &amp; Supplies</b>	<b>Category</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate</b>	<b>Duration</b>		<b>Total</b>	
		Office Supplies	Computer Supplies and Peripherals						0	
		Office Supplies	Ink Cartridges and paper						0	
		Office Supplies	Cell, SAT, and Office phone service						0	
		Field Equipment	GSA vehicle lease per month		2 each	364.97	0.5		364.97	
		Field Equipment	Mileage		1,800 miles	0.33	1		594	
		Field Equipment	Boat Gasoline 91 octane		400 gallons	4.37	1		1748	
		Field Equipment	Motor, Generator, Boat Repair (Based on 10 year depreciation and replacement costs)		1 see basis	100	1		100	
		Field Equipment	*Misc. Field Supplies See Justification		1 see basis	100	1		100	
	<b>Equipment Total</b>								2,907	
		<b>Type Of Travel</b>	<b>Number of Travelers</b>	<b>Hotel Costs</b>	<b>Per Diem</b>	<b>TAV Fee</b>	<b># days</b>	<b># of trips</b>	<b>Total</b>	
		Moffat County GSA Per Diem Rate 2015		3	83	46	15	8	2	3117
	<b>Travel Total</b>								3117	
	<b>USFWS Grand Jct.</b>								<b>Grand Total</b> 16,128	

Grand Junction CRFP Total in FY16: **\$16,128**

\*Misc. Field Supplies

Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study would include the following:

- Spark plugs for generators – 5 at \$7 each = \$35
- Synthetic oil for generators - 5 quarts at \$7 each = \$35
- Generator repair/tune-up - 5 hrs @ \$75/hr = \$375
- 2 stroke Optimax Oil – 20 gallons @ \$38/Gallon = \$760
- Hip boots – 2 pair at \$50/pair = \$100
- Breathable chest waders - 2 pair @ \$125/pair = \$250
- Stearns Type III life jackets – 3 @ \$70 each = \$210
- Electrical Gloves - 3 pairs @ \$65/pair = \$195
- Dura-Frame electrofishing dip nets – 2 @ \$300 each = \$600
- Boat trailer maintenance
  - Signal light pigtail adapters – 2 @ \$30 each = \$60
- Replace any missing NRS HD-brand tie-down straps:
  - Ten 2-ft straps @ \$4.20 each = \$42
  - Five 3-ft straps @ \$4.30 each = \$21.50
  - Ten 4-ft straps @ \$4.70 each = \$47
  - Five 6-ft straps @ \$5.05 each = \$25.25
  - Five 9-ft straps @ \$5.7 each = \$28.50
  - Five 12-ft straps @ \$6.15 each = \$30.75
- Jet Shoe Replacement Parts = \$100's
- Replace any missing D-style carabiners, each boat needs:
  - 10 @ \$7.50 each = \$75
- Mesh rig bag – 1 @ \$50 each = \$50
- Yeti 125-quart coolers – 1 @ \$500 each = \$500
- Rafting oars, oar blades, and oar rowing sleeves
  - Carlisle 10-foot oar shafts – 2 @ \$90 each = \$180
  - Carlisle Oars blades – 4 @ \$65 each = \$260
  - Oar sleeves – 4 @ \$12 each = \$48
- 5-gallon plastic gasoline jerry cans – 5 @ \$20 each = \$100

Other potential uses for these same funds could include replacing hand tools (ratchet and sockets, screw drivers, vise grips, pliers, Allen wrenches, crescent wrenches, hammer, etc.), WD-40, marine grade grease, bailing wire, duct tape, electrical supplies (12 and 14 gage wire for the boats, junction boxes, extra male & female plugs, wire nuts, fuses, Ohm meter, electrical tape), batteries (C, AA and AAA), Gott 5-gallon water jugs, shovels, 5-gallon buckets, cargo nets, fix chips or cracks in vehicle windshields, bulbs, lenses, and wiring to fix trailer lights and pigtails, new electrofishing spheres, wire rope for replacing electrofishing “witches brooms,” 2-man dome tents, pencils, repair/replace river maps, etc.

**FY 2017: Tasks 1**

<b>FY 2017</b>									
	<b>Labor</b>	<b>Title</b>	<b># of employees</b>	<b>Hours</b>	<b>Reg. Rate</b>	<b>OT Hours</b>	<b>OT Rate</b>		<b>Total</b>
		Project Leader GS-14		1	0	85.92	0	0	0
		Administrative Officer GS-09		1	0	46.06	0	0	0
		Fishery Biologist GS-11		1	40	50.84	0	0	2033.6
		Fishery Biologist GS-07		1	40	34.71	0	52.06	1388.4
		Crew leader Tech. GS-06		1	80	33.74	25	50.62	3964.7
		Biological Tech. GS-05		1	80	25.7	25	38.55	3019.75
	<b>Labor Subtotal</b>								10406.45
	<b>Equipment &amp; Supplies</b>	<b>Category</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate</b>	<b>Duration</b>		<b>Total</b>
		Office Supplies	Computer Supplies and Peripherals						0
		Office Supplies	Ink Cartridges and paper						0
		Office Supplies	Cell, SAT, and Office phone service						0
		Field Equipment	GSA vehicle lease per month	2	each	375.92	0.5		375.92
		Field Equipment	Mileage	1,800	miles	0.34	1		612
		Field Equipment	Boat Gasoline 91 octane	400	gallons	4.5	1		1800
		Field Equipment	Motor, Generator, Boat Repair (Based on 10 year depreciation and replacement costs)	1	see basis	100	1		100
		Field Equipment	*Misc. Field Supplies See Justification	1	see basis	100	1		100
	<b>Equipment Total</b>								2,988
		<b>Type Of Travel</b>	<b>Number of Travelers</b>	<b>Hotel Costs</b>	<b>Per Diem</b>	<b>TAV Fee</b>	<b># days</b>	<b># of trips</b>	<b>Total</b>
		Moffat County GSA Per Diem Rate 2015	3	83	46	15	8	2	3117
	<b>Travel Total</b>								3117
									<b>Grand Total</b>
	<b>USFWS Grand Jct.</b>								16,511

Grand Junction CRFP Total in FY17: **\$16,511**

\*Misc. Field Supplies (see FY2016 explanation)

**Out-year budgets for Yampa Surge: 2018-2020**  
**These budgets are estimates only and may not represent actual costs**

**FY 2018: *Tasks 1***

FY 2018									
	<b>Labor</b>	<b>Title</b>	<b># of employees</b>	<b>Hours</b>	<b>Reg. Rate</b>	<b>OT Hours</b>	<b>OT Rate</b>		<b>Total</b>
		Project Leader GS-14	1	0	88.5	0	0		0
		Administrative Officer GS-09	1	0	47.44	0	0		0
		Fishery Biologist GS-11	1	40	52.37	0	0		2094.8
		Fishery Biologist GS-07	1	40	35.75	0	53.62		1430
		Crew leader Tech. GS-06	1	80	34.76	25	52.13		4084.05
		Biological Tech. GS-05	1	80	26.48	25	39.72		3111.4
	<b>Labor Subtotal</b>								10720.25
	<b>Equipment &amp; Supplies</b>	<b>Category</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate</b>	<b>Duration</b>		<b>Total</b>
		Office Supplies	Computer Supplies and Peripherals						0
		Office Supplies	Ink Cartridges and paper						0
		Office Supplies	Cell, SAT, and Office phone service						0
		Field Equipment	GSA vehicle lease per month	2	each	387.2	0.5		387.2
		Field Equipment	Mileage	1,800	miles	0.35	1		630
		Field Equipment	Boat Gasoline 91 octane	400	gallons	4.64	1		1856
		Field Equipment	Motor, Generator, Boat Repair (Based on 10 year depreciation and replacement costs)	1	see basis	100	1		100
		Field Equipment	*Misc. Field Supplies See Justification	1	see basis	100	1		100
	<b>Equipment Total</b>								3,073
		<b>Type Of Travel</b>	<b>Number of Travelers</b>	<b>Hotel Costs</b>	<b>Per Diem</b>	<b>TAV Fee</b>	<b># days</b>	<b># of trips</b>	<b>Total</b>
		Moffat County GSA Per Diem Rate 2015	3	83	46	15	8	2	3117
	<b>Travel Total</b>								3117
	<b>USFWS Grand Jct.</b>								<b>Grand Total</b> 16,910

Grand Junction CRFP Total in FY18: **\$16,910**

\*Misc. Field Supplies (see FY2016 explanation)

**FY 2019: Tasks 1**

FY 2019									
	<b>Labor</b>	<b>Title</b>	<b># of employees</b>	<b>Hours</b>	<b>Reg. Rate</b>	<b>OT Hours</b>	<b>OT Rate</b>		<b>Total</b>
		Project Leader GS-14		1	0	91.16	0	0	0
		Administrative Officer GS-09		1	0	48.86	0	0	0
		Fishery Biologist GS-11		1	40	53.94	0	0	2157.6
		Fishery Biologist GS-07		1	40	36.82	0	55.23	1472.8
		Crew leader Tech. GS-06		1	80	35.8	25	53.7	4206.5
		Biological Tech. GS-05		1	80	27.27	25	40.91	3204.35
	<b>Labor Subtotal</b>								11041.25
	<b>Equipment &amp; Supplies</b>	<b>Category</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate</b>	<b>Duration</b>		<b>Total</b>
		Office Supplies	Computer Supplies and Peripherals						0
		Office Supplies	Ink Cartridges and paper						0
		Office Supplies	Cell, SAT, and Office phone service						0
		Field Equipment	GSA vehicle lease per month	2	each	398.82	0.5		398.82
		Field Equipment	Mileage	1,800	miles	0.36	1		648
		Field Equipment	Boat Gasoline 91 octane	400	gallons	4.78	1		1912
		Field Equipment	Motor, Generator, Boat Repair (Based on 10 year depreciation and replacement costs)	1	see basis	100	1		100
		Field Equipment	*Misc. Field Supplies See Justification	1	see basis	100	1		100
	<b>Equipment Total</b>								3,159
		<b>Type Of Travel</b>	<b>Number of Travelers</b>	<b>Hotel Costs</b>	<b>Per Diem</b>	<b>TAV Fee</b>	<b># days</b>	<b># of trips</b>	<b>Total</b>
		Moffat County GSA Per Diem Rate 2015	3	83	46	15	8	2	3117
	<b>Travel Total</b>								3117
									<b>Grand Total</b>
	<b>USFWS Grand Jct.</b>								17,317

Grand Junction CRFP Total in FY19: **\$17,317**

\*Misc. Field Supplies (see FY2016 explanation)

**FY 2020: *Tasks 1***

FY 2020										
	<b>Labor</b>	<b>Title</b>	<b># of employees</b>	<b>Hours</b>	<b>Reg. Rate</b>	<b>OT Hours</b>	<b>OT Rate</b>		<b>Total</b>	
		Project Leader GS-14		1	0	93.89	0	0	0	
		Administrative Officer GS-09		1	0	50.33	0	0	0	
		Fishery Biologist GS-11		1	40	55.56	0	0	2222.4	
		Fishery Biologist GS-07		1	40	37.93	0	56.89	1517.2	
		Crew leader Tech. GS-06		1	80	36.87	25	55.3	4332.1	
		Biological Tech. GS-05		1	80	28.09	25	42.14	3300.7	
	<b>Labor Subtotal</b>								11372.4	
	<b>Equipment &amp; Supplies</b>	<b>Category</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate</b>	<b>Duration</b>		<b>Total</b>	
		Office Supplies	Computer Supplies and Peripherals						0	
		Office Supplies	Ink Cartridges and paper						0	
		Office Supplies	Cell, SAT, and Office phone service						0	
		Field Equipment	GSA vehicle lease per month		2 each	410.78	0.5		410.78	
		Field Equipment	Mileage		1,800 miles	0.37	1		666	
		Field Equipment	Boat Gasoline 91 octane		400 gallons	4.92	1		1968	
		Field Equipment	Motor, Generator, Boat Repair (Based on 10 year depreciation and replacement costs)		1 see basis	100	1		100	
		Field Equipment	*Misc. Field Supplies See Justification		1 see basis	100	1		100	
	<b>Equipment Total</b>								3,245	
		<b>Type Of Travel</b>	<b>Number of Travelers</b>	<b>Hotel Costs</b>	<b>Per Diem</b>	<b>TAV Fee</b>	<b># days</b>	<b># of trips</b>	<b>Total</b>	
		Moffat County GSA Per Diem Rate 2015		3	83	46	15	8	2	3117
	<b>Travel Total</b>								3117	
									<b>Grand Total</b>	
	<b>USFWS Grand Jct.</b>								17,734	

Grand Junction CRFP Total in FY20: **\$17,734**

\*Misc. Field Supplies (see FY2016 explanation)

Budget Summary:

<b>FY2016</b>	\$16,128
<b>FY2017</b>	\$16,511

**2016-2017 Total = \$32,639**

Estimated Budget Summary for Fiscal Years 2018-2020:

<b>FY2018</b>	\$16,910
<b>FY2019</b>	\$17,317
<b>FY2020</b>	\$17,734

**2018-2020 Total = \$51,961**

**5-Year Total = \$84,600**

III. Reviewers: **Kevin McAbee, June 2015;**

IV. References: NA