

**RECOVERY PROGRAM  
FY 2014-2015 SCOPE OF WORK for:**

Recovery Program Project Number: 123b

Nonnative Fish Control in the Middle Green River

Reclamation Agreement number: R09AP40870

Reclamation Agreement term: October 1, 2008 – November 30, 2013

Lead agency: Utah Division of Wildlife Resources

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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: Nonnative Fish Control in the Middle Green River

II. Relationship to RIPRAP:

**GENERAL RECOVERY PROGRAM SUPPORT 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.A.2.c. Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement and integrated, viable active control program.

**GREEN RIVER ACTION PLAN: MAINSTEM**

- III. Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative impacts to endangered fishes from sportfish management activities.

- III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed.
- III.A.4.a. Northern pike in the middle Green River.
- III.A.4.b. (3) Smallmouth bass in the middle and lower Green River.

### III. Study Background/Rationale and Hypotheses:

The Upper Colorado River Endangered Fish Recovery Program has determined that control of nonnative fish in the upper Colorado River basin is essential to the recovery of the four endangered fish species: Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). This determination has been documented specifically for Colorado pikeminnow, razorback sucker, and bonytail in nursery habitats and in the mainstem middle Green River in Section 4.3.2 of each species' Recovery Goals document (USFWS 2002).

Smallmouth bass (*Micropterus dolomieu*) abundance has dramatically increased in the Green River since 2000. This increase resulted in a recommendation from the December 2003 Nonnative Fish Control Workshop (Grand Junction, CO) to attempt control of this species in the Green River. Three years of removal, from 2004-2006 and annual Nonnative Fish Control Workshops have added to the knowledge base of the effort required to successfully remove smallmouth bass from the Green River. During the December 2006 workshop, participants discussed the importance of increasing this removal effort and discussed the need for a significant increase to adequately suppress the middle Green River smallmouth bass population. The increased removal effort began in 2007 and will continue through subsequent years. Several adjustments were made in 2012 to increase our effectiveness and efficiency (Skorupski and Breen 2012). During the second full pass, it was apparent that multiple smallmouth bass concentration areas were present, due to a high spawning success under low flow conditions (i.e. Split Mountain and Ouray Refuge sections). Thus, we used an adaptive fisheries management strategy to target "hot spots" maximizing our catches with the funds and time available. Our adjustments were extremely successful, producing high catch rates (>100 fish/hr.) and removing 15,624 smallmouth bass. In the future, full passes will identify concentration areas and remaining effort will be allocated as necessary to maximize removal efficiency within a 16-week period.

Northern pike (*Esox lucius*) are a significant predatory and competitive threat to the endangered fishes and were rated as one of the six nonnative species of greatest concern by experts on the Colorado River native fish assemblage (Hawkins and Nesler 1991). Northern pike became established in the Yampa River in the early 1980's. Originally introduced as game fish in Elkhead Reservoir in 1977, the species escaped and invaded the upper Yampa River and have expanded their number and range within the Yampa and Green rivers (Tyus and Beard 1990). In previous years, there has been evidence of successful spawning in Stewart Lake near Jensen, Utah and in Old Charlie Wash on the Ouray National Wildlife Refuge (K. Christopherson, Division of Wildlife Northeastern Regional Supervisor, pers. comm.; T. Modde, U.S. Fish and Wildlife Service, Project Leader, pers. comm.). A control program for

northern pike in the Yampa River was initiated in 1999 and removal of northern pike in the middle Green River was initiated in 2001. Based on trends in catch rates over subsequent years, removal efforts have been successful at reducing the number of northern pike and maintaining this reduced level in the middle Green River. However, in 2012 more than three times as many northern pike captured than in 2011 (Skorupski and Breen 2011) and most were in a smaller size class, likely representing age-1 fish. This large age class likely represents a high level of spawning success in 2011. High flows created additional habitat during the spring in the middle Green River, which allowed for a more successful spawning year for northern pike. Future effort will be adaptive to target northern pike in concentration areas during the spring to maximize efficiency, including exploratory removal efforts in areas where northern pike are being reported for the first time.

White sucker (*Catostomus commersoni*) are present in the middle Green River and just as successful in younger life stages as the native suckers. For example, in years when native sucker abundance is low, white sucker seem to be just as prevalent. The species is problematic due to its ability to hybridize with native suckers (McDonald et al. 2008) and compete with native suckers for limited resources. In southwestern Missouri, white suckers become mature around 275 mm (Wakefield and Beckman 2005). Because of this, our goal for removing white suckers is to keep the average total length of the white sucker population less than 275 mm. Although 275 mm is the target benchmark, we will evaluate this value in fish collected in subsequent years by dissection and fin ray collection (i.e., age, growth, reproductive status) in the middle Green River. This may not address their ability to compete with native suckers; however, it should limit their ability to hybridize with native catostomids.

At the 2013 Nonnative Fish Workshop, walleye (*Sander vitreus*) were identified as a substantial threat to the recovery of endangered fishes in the upper Colorado River basin, due to increasing densities and the predatory and competitive pressure this species imposes. However, there is currently not a removal program in place that focuses on walleye when they are most vulnerable to capture. Recent observations of increasing densities have mainly come from ancillary captures during Colorado pikeminnow population estimates (project #128), which typically occur earlier in the spring than smallmouth bass removal and in only three out of every five years. Therefore, our future efforts will apply adaptive strategies to target walleye when other projects are not in place for adequate removal efforts.

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

Goal: Sufficiently reduce the abundance of adult smallmouth bass, northern pike, white sucker, and walleye in the middle Green River such that their potential to spawn and their predatory and competitive impacts on the growth, recruitment, and survival of endangered and other native fishes is minimized.

Objectives:

1. Conduct two smallmouth bass removal passes in the middle Green River from Split Mountain boat ramp to Tabyago Riffle. Full passes will identify concentration areas that will be focused on for the remainder of the field work.

2. Conduct northern pike removal in the middle Green River in concentration areas to maximize efficiency.
3. Conduct white sucker removal in the middle Green River to minimize the threat of hybridization with native fishes.
4. Conduct walleye removal in the mainstem middle Green River during off-years for Colorado pikeminnow population estimates (project #128).

#### V. Study Area:

The study area encompasses the middle Green River from Split Mountain boat ramp (RM 319.3) to Tabyago Riffle (RM 206.8). Effort will focus on concentration areas identified during full passes. We will also sample off channel habitats for northern pike and white sucker just prior to and immediately after ice-off to document spawning and remove ripe adults.

#### VI. Study Methods/Approach:

Smallmouth bass will be removed primarily by electrofishing. Sampling crews will conduct removal activities in a manner that minimizes potential negative impacts to endangered fish. This includes discontinuing electrofishing when elevated numbers of endangered fish are known to be present. Situations when this is likely to occur will be when Colorado pikeminnow are staging in tributary mouths or backwater habitats prior to spawning, when razorback sucker are on or near spawning bars, and following recent stocking of endangered fish. Two electrofishing boats will simultaneously electrofish each shoreline of the river. Electrofishing passes will be conducted when spring peak flows recede below 10,000 cfs. Effort will be focused on shoreline habitat that is likely to contain smallmouth bass. Two full passes will extend from Split Mountain boat ramp to Tabyago Riffle. Effort for the remaining 12 weeks will be allocated to concentration areas identified during complete passes (such as Split Mountain, Ouray National Wildlife Refuge, and below the Duchesne River). Fish lengths and weights will be recorded on each pass. All smallmouth bass will be disposed of on site. All northern pike and white sucker collected during smallmouth bass removal will be removed and disposed of as well.

Initial bass removal efforts (i.e., June electrofishing) may serve to identify concentrations of spawning fish. These areas will receive additional electrofishing effort in subsequent passes. If ripe fish or nesting males are encountered, additional effort will be spent at that time to capture other potential spawning or nesting fish in that area. Two methods will be used in an attempt to identify bass spawning periods and locations. First, crews will examine shoreline areas for nests and destroy any found; crews will also examine all bass captured in the first few passes for spawning condition. Further effort may also give an indication as to the presence of young-of-year (YOY) bass. Locations of congregations of YOY bass will be noted and these areas will receive additional electrofishing effort as well in an effort to displace YOY bass.

In addition, smallmouth bass will be removed from Island Park to Rainbow Park in Dinosaur

National Monument. In collaboration with USFWS Vernal—CRFP, 2014 will serve as an initial experiment to conduct a “surge” effort in this reach to maximize nest disturbance during the active spawning period. We will conduct three passes per week in this reach over a three week period; two passes by UDWR—Vernal, followed up by a third pass by Vernal—CRFP.

Known concentration areas for northern pike and white sucker in the middle Green River during spring include: the mouth of Brush Creek (RM 304.5), Cliff Creek (RM 302.9), Stewart Lake Drain (RM 300.0) and Ashley Creek (RM 299.0). These areas will be targeted for removal of northern pike and white sucker. Other main channel habitats (from RM 394 to 381) will be sampled in early spring to target northern pike; specifically, Brown’s Park. This effort includes three separate trips: scouting, electrofishing and fyke net setting, and net pulling. Removal will primarily be completed with the use of fyke nets and raft electrofishing. Sampling methods will be adjusted depending on whether difficulties arise (i.e., otters in the fyke nets, high flows, etc.). We will also evaluate white sucker reproductive maturity because of the limited information on these fish specific to the upper Colorado River basin. All white suckers over 150 mm will be dissected to observe their reproductive organs. We will determine the sex of each fish and whether they are reproductively mature and ripe at the time of sampling.

Walleye removal efforts will be an adaptive process using past capture locations to identify concentration areas. Given what we know from past captures, removal efforts will focus on the time period from mid-late April until June, with consideration for specific temperatures and flow conditions. Only occurring during off-years for Colorado pikeminnow population estimates (2014–2015), additional removal effort (equivalent to one pass for pikeminnow estimates) will occur earlier in the spring when walleye are more abundant and vulnerable to capture in the mainstem Green River.

Nonnative removal and evaluation efforts, which includes tagging and marking of endangered and target nonnative fishes, are also being conducted by other researchers and agencies in other reaches of the Green and Yampa Rivers. Therefore, sampling crews will examine all captured endangered and target nonnative fish for tags or marks and record pertinent information. This information will then be reported to pertinent principal investigators and included in annual reporting. This information will also be provided to the Recovery Program for submission to the Program’s database.

Besides the targeted smallmouth bass, northern pike, white sucker, and walleye, all nonnative fish encountered during sampling will be removed except for common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and small-bodied cyprinids. The nonnative fishes that will be removed include, but are not limited to black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), gizzard shad (*Dorosoma cepedianum*), and potentially burbot (*Lota lota*). Otolith structures will be collected from specific nonnative species (burbot, walleye, etc.) upon Upper Colorado River Recovery Program request.

All endangered fishes captured during nonnative removal projects will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive.

VII. Task Description and Schedule:

Task 1. Northern pike, white sucker, and walleye removal

Task 2. Smallmouth bass removal

Task 3. Data entry, analysis, and reporting

Task	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1			X	X	X							
2						X	X	X	X	X		
3										X	X	X

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

FY 2014

Task 1. Northern pike, white sucker, and walleye removal

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	31.95	118.3	3779
Biologist II	32.70	278.3	9100
Journey Maintenance/Construction Specialist	25.92	243.3	6307
Technician II (Field Supervisor)	22.24	383.3	8523
Technician II (Assistant Crew Leader)	17.14	226.7	3886
Technician I	15.91	366.7	5835
Shuttle Drivers	16.25	93.3	1517
		<b>Subtotal</b>	<b>\$38,946</b>
<b>Travel<sup>a</sup></b>			
3 trucks @ 10% of annual use	20400.00	0.15	3060
Per diem (18 day trips x 3 people; 3 overnights x 7 people) (7 day trips x 4 people for walleye removal)	18.20	102.3	1862
		<b>Subtotal</b>	<b>\$4,922</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.00	238	952
Boat oil (quarts)	11.00	18	198
Replacement props	150.00	30	4500
Fyke nets (Memphis Net & Twine)	900.00	1	900
Electrofishing repairs (ETS Electrofishing)			500
Boat/motor repair and maintenance <sup>b</sup>			1000
Sampling equipment <sup>c</sup>			500
Camping supplies <sup>d</sup>			1000
		<b>Subtotal</b>	<b>\$9,550</b>
		<b>Task 1 Total</b>	<b>\$53,418</b>

<sup>a</sup> The State of Utah uses Automotive Resources Inc. for motor pool operations. Rental is approximately \$6,800/year/vehicle (includes fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

<sup>b</sup> Includes, but is not limited to, anode/boom repairs & replacement (\$500), electrofishing safety mats (Tapeswitch-2@\$200/each), foot pedal (\$50), electrofishing plugs/connectors (\$200), straps (NRS-\$120), oar shaft, blade & sleeve (NRS-\$230), filters/grease/gas cans/misc.maintenance items (\$500), shop supplies/tools/safety gear/misc. small parts (\$500).

<sup>c</sup> Includes, but is not limited to, cooler (NRS-\$450), tents (REI-3@\$100/each), sleeping pads (Aire-2 @\$150), stove (\$200), rolla table (\$90), dry bags (NRS-2 @\$80 & 2 @\$30), chairs (3@\$20/each), cooking utensils & supplies/propane/toilet supplies (\$380).

<sup>d</sup> Includes, but is not limited to, batteries (\$200), waders (Simms-\$400), nets (Cummins-12@\$40), vials/envelopes/paper/notebooks (Forestry Suppliers-\$200), scale (\$200), sunscreen/bugspray (\$150), first-aid supplies (\$30).

<sup>b,c,d</sup> Estimated costs based on current prices procured from various sources and previous expenditures for items under each category; outyears (FY2015 and beyond) include an annual 2% cost of living increase.

## Task 2. Smallmouth bass removal

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	31.95	100	3195
Biologist II	32.70	100	3270
Journey Maintenance/Construction Specialist	25.92	1000	25924
Technician II (Field Supervisor)	22.24	640	14230
Technician II (Assistant Crew Leader)	17.14	320	5485
Technician I	15.91	2000	31824
Shuttle Drivers	16.25	640	10403
		<b>Subtotal</b>	<b>\$94,331</b>
<b>Travel <sup>a</sup></b>			
3 trucks @ 60% of annual use	20400.00	0.6	12240
Per diem (32 day trips; 24 overnights x 4 people)	23.72	224	5312
		<b>Subtotal</b>	<b>\$17,552</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.00	1536	6144
Boat oil (quarts)	11.00	72	792
Replacement water pumps	75.00	10	750
Steering helm assembly	250.00	2	500
Replacement lower units	1200.00	3	3600
Replacement gear box/remote assembly	455.00	2	910
Lower unit oil (bucket)	160.00	1	160
Electrofishing control box (ETS Electrofishing)	5982.30	1	5982
Honda generator	2448.00	1	2448
Honda 50-hp outboard motor	6784.00	1	6784
Data logger and programming fees (Allegro)	4500.00	0	0
Seasonal housing (monthly rent)	1200.00	9	10800
Camping supplies <sup>d</sup>			1000
Electrofishing repairs (ETS Electrofishing)			500
Boat/motor repair and maintenance <sup>b</sup>			1500
Sampling equipment <sup>c</sup>			1160
		<b>Subtotal</b>	<b>\$43,030</b>
<b>Task 2 Total</b>			<b>\$154,913</b>

<sup>a</sup> The State of Utah uses Automotive Resources Inc. for motor pool operations. Rental is approximately \$6,800/year/vehicle (includes fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

<sup>b</sup> Includes, but is not limited to, anode/boom repairs & replacement (\$500), electrofishing safety mats (Tapeswitch-2@\$200/each), foot pedal (\$50), electrofishing plugs/connectors (\$200), straps (NRS-\$120), oar shaft, blade & sleeve (NRS-\$230), filters/grease/gas cans/misc.maintenance items (\$500), shop supplies/tools/safety gear/misc. small parts (\$500).

<sup>c</sup> Includes, but is not limited to, cooler (NRS-\$450), tents (REI-3@\$100/each), sleeping pads (Aire-2 @\$150), stove (\$200), rolla table (\$90), dry bags (NRS-2 @\$80 & 2 @\$30), chairs (3@\$20/each), cooking utensils & supplies/propane/toilet supplies (\$380).

<sup>d</sup> Includes, but is not limited to, batteries (\$200), waders (Simms-\$400), nets (Cummins-12@\$40), vials/envelopes/paper/notebooks (Forestry Suppliers-\$200), scale (\$200), sunscreen/bugspray (\$150), first-aid supplies (\$30).

<sup>b,c,d</sup> Estimated costs based on current prices procured from various sources and previous expenditures for items under each category; outyears (FY2015 and beyond) include an annual 2% cost of living increase.

### Task 3. Data entry, analysis, and reporting

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	40	1278
Biologist II	32.70	80	2616
Technician II (Field Supervisor)	22.24	80	1779
Computer fees/year	2286	4	9144
Phone fees/year	600	4	2400
		<b>Task 3 Total</b>	<b>\$17,217</b>
		<b>FY 2014 TOTAL</b>	<b>\$225,549</b>

## FY 2015

### Task 1. Northern pike, white sucker, and walleye removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	32.58	118.3	3855
Biologist II	33.35	278.3	9282
Journey Maintenance/Construction Specialist	26.44	243.3	6434
Technician II (Field Supervisor)	22.68	383.3	8693
Technician II (Assistant Crew Leader)	17.48	226.7	3963
Technician I	16.23	366.7	5952
Shuttle Drivers	16.58	93.3	1547
		<b>Subtotal</b>	<b>\$39,725</b>
Travel <sup>a</sup>			
3 trucks @ 10% of annual use	20808	0.15	3121
Per diem (18 day trips x 3 people; 3 overnights x 7 people) (7 day trips x 4 people for walleye removal)	18.56	102.3	1899
		<b>Subtotal</b>	<b>\$5,020</b>
Equipment			
Boat fuel (gallons)	4.08	238	971
Boat oil (quarts)	11.22	18	202
Replacement props	153	30	4590
Fyke nets (Memphis Net & Twine)	918	0	0
Electrofishing repairs (ETS Electrofishing)			510
Boat/motor repair and maintenance <sup>b</sup>			1020
Sampling equipment <sup>c</sup>			510
Camping supplies <sup>d</sup>			1020
		<b>Subtotal</b>	<b>\$8,823</b>

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**Task 1 Total** **\$53,568**

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## Task 2. Smallmouth bass removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	32.58	100	3258
Biologist II	33.35	100	3335
Journey Maintenance/Construction Specialist	26.44	1000	26443
Technician II (Field Supervisor)	22.68	640	14515
Technician II (Assistant Crew Leader)	17.48	320	5594
Technician I	16.23	2000	32460
Shuttle Drivers	16.58	640	10611
		<b>Subtotal</b>	<b>\$96,217</b>
Travel <sup>a</sup>			
3 trucks @ 60% of annual use	20808.00	0.6	12485
Per diem (32 day trips; 24 overnights x 4 people)	24.19	224	5418
		<b>Subtotal</b>	<b>\$17,903</b>
Equipment			
Boat fuel (gallons)	4.08	1536	6267
Boat oil (quarts)	11.22	72	808
Replacement water pumps	76.50	10	765
Steering helm assembly	255.00	2	510
Replacement lower units	1224.00	3	3672
Replacement gear box/remote assembly	464.10	2	928
Lower unit oil (bucket)	163.20	1	163
Electrofishing control box (ETS Electrofishing)	6101.95	0	0
Honda generator	2496.96	0	0
Honda 50-hp outboard motor	6919.68	1	6920
Data logger and programming fees (Allegro)	4590.00	2	9180
Seasonal housing (monthly rent)	1224.00	9	11016
Camping supplies <sup>d</sup>			1020
Electrofishing repairs (ETS Electrofishing)			510
Boat/motor repair and maintenance <sup>b</sup>			1530
Sampling equipment <sup>c</sup>			1183
		<b>Subtotal</b>	<b>\$44,472</b>
		<b>Task 2 Total</b>	<b>\$158,593</b>

## Task 3. Data entry, analysis, and reporting

	Rate	Hours/Units	Cost
Labor			
Project Leader	32.59	40	1304
Biologist II	33.35	80	2668
Technician II (Field Supervisor)	22.68	80	1815
Computer fees/year	2332	4	9327
Phone fees/year	612	4	2448
		<b>Task 3 Total</b>	<b>\$17,562</b>
		<b>FY 2015 TOTAL</b>	<b>\$229,723</b>

## FY 2016

### Task 1. Northern pike, white sucker, and walleye removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.24	110	3656
Biologist II	34.02	270	9185
Journey Maintenance/Construction Specialist	26.97	160	4315
Technician II (Field Supervisor)	23.13	330	7634
Technician II (Assistant Crew Leader)	17.83	200	3566
Technician I	16.55	200	3311
Shuttle Drivers	16.91	40	676
		<b>Subtotal</b>	<b>\$32,344</b>

Travel <sup>a</sup>			
3 trucks @ 10% of annual use	21224.16	0.1	2122
Per diem (18 day trips x 3 people; 3 overnights x 7 people)	20.81	75	1561
		<b>Subtotal</b>	<b>\$3,683</b>
Equipment			
Boat fuel (gallons)	4.16	110	458
Boat oil (quarts)	11.44	12	137
Replacement props	156.06	30	4682
Fyke nets (Memphis Net & Twine)	936.36	1	936
Electrofishing repairs (ETS Electrofishing)			520
Boat/motor repair and maintenance <sup>b</sup>			1040
Sampling equipment <sup>c</sup>			520
Camping supplies <sup>d</sup>			1040
		<b>Subtotal</b>	<b>\$9,334</b>
		<b>Task 1 Total</b>	<b>\$45,362</b>

## Task 2. Smallmouth bass removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.24	100	3324
Biologist II	34.02	100	3402
Journey Maintenance/Construction Specialist	26.97	1000	26972
Technician II (Field Supervisor)	23.13	640	14805
Technician II (Assistant Crew Leader)	17.83	320	5706
Technician I	16.55	2000	33110
Shuttle Drivers	16.91	640	10823
		<b>Subtotal</b>	<b>\$98,142</b>
Travel <sup>a</sup>			
3 trucks @ 60% of annual use	21224.16	0.6	12734
Per diem (32 day trips; 24 overnights x 4 people)	24.67	224	5527
		<b>Subtotal</b>	<b>\$18,261</b>
Equipment			
Boat fuel (gallons)	4.16	1536	6392
Boat oil (quarts)	11.44	72	824
Replacement water pumps	78.03	10	780
Steering helm assembly	260.10	2	520
Replacement lower units	1248.48	3	3745
Replacement gear box/remote assembly	473.38	2	947
Lower unit oil (bucket)	166.46	1	166
Electrofishing control box (ETS Electrofishing)	6223.98	1	6224
Honda generator	2546.90	1	2547
Honda 50-hp outboard motor	7058.07	1	7058
Data logger and programming fees (Allegro)	4681.80	0	0
Seasonal housing (monthly rent)	1248.48	9	11236
Camping supplies <sup>d</sup>			1040
Electrofishing repairs (ETS Electrofishing)			520
Boat/motor repair and maintenance <sup>b</sup>			1561
Sampling equipment <sup>c</sup>			1207
		<b>Subtotal</b>	<b>\$44,769</b>
		<b>Task 2 Total</b>	<b>\$161,172</b>

## Task 3. Data entry, analysis, and reporting

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.24	40	1330
Biologist II	34.02	80	2722
Technician II (Field Supervisor)	23.14	80	1851
Computer fees/year	2378	4	9513
Phone fees/year	624	4	2497
		<b>Task 3 Total</b>	<b>\$17,913</b>
		<b>FY 2016 TOTAL</b>	<b>\$224,446</b>

FY 2017

## Task 1. Northern pike, white sucker, and walleye removal

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	33.90	110	3729
Biologist II	34.70	270	9369
Journey Maintenance/Construction Specialist	27.51	160	4402
Technician II (Field Supervisor)	23.60	330	7787
Technician II (Assistant Crew Leader)	18.19	200	3638
Technician I	16.89	200	3377
Shuttle Drivers	17.25	40	690
		<b>Subtotal</b>	<b>\$32,991</b>
<b>Travel <sup>a</sup></b>			
3 trucks @ 10% of annual use	21648.64	0.1	2165
Per diem (18 day trips x 3 people; 3 overnights x 7 people)	21.22	75	1592
		<b>Subtotal</b>	<b>\$3,757</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.24	110	467
Boat oil (quarts)	11.67	12	140
Replacement props	159.18	30	4775
Fyke nets (Memphis Net & Twine)	955.09	0	0
Electrofishing repairs (ETS Electrofishing)			531
Boat/motor repair and maintenance <sup>b</sup>			1061
Sampling equipment <sup>c</sup>			531
Camping supplies <sup>d</sup>			1061
		<b>Subtotal</b>	<b>\$8,566</b>
		<b>Task 1 Total</b>	<b>\$45,314</b>

## Task 2. Smallmouth bass removal

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	33.90	100	3390
Biologist II	34.70	100	3470
Journey Maintenance/Construction Specialist	27.51	1000	27511
Technician II (Field Supervisor)	23.60	640	15101
Technician II (Assistant Crew Leader)	18.19	320	5821
Technician I	16.89	2000	33772
Shuttle Drivers	17.25	640	11040
		<b>Subtotal</b>	<b>\$100,105</b>
<b>Travel <sup>a</sup></b>			
3 trucks @ 60% of annual use	21648.64	0.6	12989
Per diem (32 day trips; 24 overnights x 4 people)	25.17	224	5637
		<b>Subtotal</b>	<b>\$18,626</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.24	1536	6520
Boat oil (quarts)	11.67	72	840
Replacement water pumps	79.59	10	796
Steering helm assembly	265.30	2	531
Replacement lower units	1273.45	3	3820
Replacement gear box/remote assembly	482.85	2	966
Lower unit oil (bucket)	169.79	1	170
Electrofishing control box (ETS Electrofishing)	6348.46	0	0
Honda generator	2597.84	0	0
Honda 50-hp outboard motor	7199.24	1	7199
Data logger and programming fees (Allegro)	4775.44	2	9551
Seasonal housing (monthly rent)	1273.45	9	11461
Camping supplies <sup>d</sup>			1061
Electrofishing repairs (ETS Electrofishing)			531
Boat/motor repair and maintenance <sup>b</sup>			1592
Sampling equipment <sup>c</sup>			1231
		<b>Subtotal</b>	<b>\$46,269</b>
		<b>Task 2 Total</b>	<b>\$165,000</b>

## Task 3. Data entry, analysis, and reporting

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.91	40	1356
Biologist II	34.70	80	2776
Technician II (Field Supervisor)	23.60	80	1888
Computer fees/year	2426	4	9704
Phone fees/year	637	4	2547
		<b>Task 3 Total</b>	<b>\$18,271</b>
		<b>FY 2017 TOTAL</b>	<b>\$228,585</b>

## FY 2018

### Task 1. Northern pike, white sucker, and walleye removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	34.58	110	3804
Biologist II	35.39	270	9556
Journey Maintenance/Construction Specialist	28.06	160	4490
Technician II (Field Supervisor)	24.07	330	7942
Technician II (Assistant Crew Leader)	18.55	200	3711
Technician I	17.22	200	3445
Shuttle Drivers	17.59	40	704
		<b>Subtotal</b>	<b>\$33,651</b>
Travel <sup>a</sup>			
3 trucks @ 10% of annual use	22081.62	0.1	2208
Per diem (18 day trips x 3 people; 3 overnights x 7 people)	21.65	75	1624
		<b>Subtotal</b>	<b>\$3,832</b>
Equipment			
Boat fuel (gallons)	4.33	110	476
Boat oil (quarts)	11.91	12	143
Replacement props	162.36	30	4871
Fyke nets (Memphis Net & Twine)	974.19	1	974
Electrofishing repairs (ETS Electrofishing)			541
Boat/motor repair and maintenance <sup>b</sup>			1082
Sampling equipment <sup>c</sup>			541
Camping supplies <sup>d</sup>			1082
		<b>Subtotal</b>	<b>\$9,712</b>
		<b>Task 1 Total</b>	<b>\$47,195</b>

### Task 2. Smallmouth bass removal

	Rate	Hours/Units	Cost
Labor			
Project Leader	34.58	100	3458
Biologist II	35.39	100	3539
Journey Maintenance/Construction Specialist	28.06	1000	28061
Technician II (Field Supervisor)	24.07	640	15403
Technician II (Assistant Crew Leader)	18.55	320	5937
Technician I	17.22	2000	34447
Shuttle Drivers	17.59	640	11261
		<b>Subtotal</b>	<b>\$102,107</b>
Travel <sup>a</sup>			
3 trucks @ 60% of annual use	22081.62	0.6	13249
Per diem (32 day trips; 24 overnights x 4 people)	25.67	224	5750
		<b>Subtotal</b>	<b>\$18,999</b>
Equipment			
Boat fuel (gallons)	4.33	1536	6650
Boat oil (quarts)	11.91	72	857
Replacement water pumps	81.18	10	812
Steering helm assembly	270.61	2	541
Replacement lower units	1298.92	3	3897
Replacement gear box/remote assembly	492.51	2	985
Lower unit oil (bucket)	173.19	1	173

Electrofishing control box (ETS Electrofishing)	6475.43	1	6475
Honda generator	2649.79	1	2650
Honda 50-hp outboard motor	7343.22	1	7343
Data logger and programming fees (Allegro)	4870.94	0	0
Seasonal housing (monthly rent)	1298.92	9	11690
Camping supplies <sup>d</sup>			1082
Electrofishing repairs (ETS Electrofishing)			541
Boat/motor repair and maintenance <sup>b</sup>			1624
Sampling equipment <sup>c</sup>			1256
		<b>Subtotal</b>	<b>\$46,577</b>
		<b>Task 2 Total</b>	<b>\$167,683</b>

### Task 3. Data entry, analysis, and reporting

	Rate	Hours/Units	Cost
Labor			
Project Leader	34.58	40	1383
Biologist II	35.40	80	2832
Technician II (Field Supervisor)	24.07	80	1926
Computer fees/year	2474	4	9898
Phone fees/year	649	4	2598
		<b>Task 3 Total</b>	<b>\$18,636</b>
		<b>FY 2018 TOTAL</b>	<b>\$233,514</b>

### IX. Budget Summary:

<b>FY 2014</b>	<b>\$225,549</b>
<b>FY 2015</b>	<b>\$229,723</b>
<b>FY 2016</b>	<b>\$224,446</b>
<b>FY 2017</b>	<b>\$228,585</b>
<b>FY 2018</b>	<b>\$233,514</b>
<b>TOTAL</b>	<b>\$1,121,985</b>

### X. Reviewers:

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