COLORADO RIVER RECOVERY PROGRAM Project No.: 127
FY-2018-2019 SCOPE OF WORK
Colorado pikeminnow population estimates - Colorado River

Reclamation Agreement number: R15PG00083
Reclamation Agreement term: Oct. 1, 2014 – Sep. 30, 2019

Lead Agency: U.S. Fish and Wildlife Service
Grand Junction Fish and Wildlife Conservation Office

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Category:
X Ongoing
___ Ongoing-revised project
___ Requested new project
___ Unsolicited proposal

Expected Funding Source:
X Annual funds
___ Capital funds
___ Other (explain)

I. Title of Proposal: Monitoring the Colorado pikeminnow population in the mainstem Colorado River via periodic population estimates.

II. Relationship to RIPRAP:
Colorado River Action Plan: Colorado River Mainstem,
V. Monitor populations and habitat and conduct research to support recovery actions.
V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

III. Study Background/Rationale and Hypotheses:

The currently-accepted standard for monitoring populations of Colorado River endangered fishes is to periodically develop population estimates using closed-model capture-recapture methods. Such estimates provide information on population status (abundance), and when repeated periodically over an extended period can also provide information on population trends. Such estimates have been made for the Colorado River population of Colorado pikeminnow for fifteen years: 1992-1994, 1998-2000, 2003-2005, 2008-2010, and 2013-2015 (see Osmundson and Burnham 1998, Osmundson 2002, Osmundson and White 2014). Recovery goals for Colorado pikeminnow require that three annual population estimates be

conducted from 2018-2020 (Program Director's Office 2002). During the first two 3-year efforts, time, manpower and funding limitations allowed only a minimal sampling regime in the Colorado River. This consisted of three passes, or capture efforts, through the upper reach (upstream of Westwater Canyon) and two through the lower reach (downstream of Westwater Canyon) each year. This was largely accomplished with one 2-person crew. In addition, data from annual ISMP electrofishing surveys were also included which provided part of one of the passes in each reach. Without this help, the two-person crew would not have been able to complete the sampling regime. Even with this assistance, estimates were considered generally inadequate based on wide confidence intervals, low probability of capture (*p*), and high coefficients of variation (CV). Pollock et al. (1982) suggests a good 'rule-of-thumb' is to achieve a CV of 20% or less. During 1991-1994 and 1998-2000, annual CV for pikeminnow >450 mm TL ranged from 15.4% to 45.5% in the upper study reach, and from 39.2% to 64.4% in the lower study reach. Annual ISMP electrofishing surveys have since been discontinued; hence, future field efforts will need to be much greater to make estimates more precise and make up for the shortfall left from discontinuing ISMP. To improve estimates, a target of four passes in the lower reach (Cisco, UT to the Colorado/Green River confluence) and five passes in the upper reach (upstream of Westwater Canyon to Government Highline Dam) was adopted for the Colorado River. In addition, increased effort per pass also improves precision of estimates. In the past, trammel-netting backwaters yielded many more pikeminnow per day of effort than did electrofishing shorelines. However, at any one time, there may be many pikeminnow that are not in the backwaters; hence, our current capture strategy includes a combination of electrofishing shorelines and trammel-netting backwaters. This expanded effort is intended to increase capture probabilities and decrease coefficients of variation, resulting in greater precision of the point estimates. This sampling regimen was employed during 2003-2005 and 2008-2010. The overall mean CV of the twelve annual combined-reach estimates for fish > 450 mm TL was 16.8% (Osmundson and White 2014). During the most recent three-year effort (2008–2010), the mean CV was 13.2%, the best (lowest) of any of the four multi-year efforts (first three years: 25%; second three years, 14.3%; third three years, 15.2%). However, the best single year was 2005, with a CV of 9.4%. The current regimen of increased effort and number of annual passes is scheduled to be continued in 2018-2020.

IV. Study Goals, Objectives, End Product:

Goal

Our goal is to provide three annual whole-river estimates of population abundance for Colorado pikeminnow $\geq$ 250 mm TL and for Colorado pikeminnow $\geq$ 450 mm TL in the Colorado River mainstem, with coefficients of variation of 20% or less.

Objectives

1. Capture and mark juvenile (< 400 mm TL), sub-adult (400-450 mm TL) and adult (> 450 mm TL) Colorado pikeminnow throughout the river for a three-year period, attempting to complete five passes through the upper reach (upstream of Westwater Canyon) and four through the lower reach (downstream of Westwater Canyon) each year.
2. Develop a population estimate from mark-recapture data.

3. Assess recruitment trends by analyzing length-frequency histograms and estimating abundance of individuals 400-450 mm TL.

4. Also, reduce centrarchid and walleye abundance in the study area by removing those encountered during field sampling so as to help meet objectives of Project 126 (bass removal).

5. Capture razorback sucker and bonytail opportunistically for assessment of their populations. Development of abundance estimates for razorback sucker using mark-recapture data collected here will be covered under a separate scope of work.

End Product

Provide a final report on study findings. A draft report for the 2018-2020 sampling period will be ready for peer review on August 30, 2021. A draft final report will be ready for approval consideration October 31, 2021. Report to be finalized December 31, 2021.

V. Study Area:

The Colorado River will be sampled from Government Highline Dam (RM 194.4) downstream to the confluence with the Green River (RM 0.0), excluding Westwater Canyon (12 miles: rm 112-124), from early-April to late-June, 2018-2020. In addition, the lower 2.3 miles of the Gunnison River downstream of Redlands Diversion Dam will also be sampled, as fish utilizing this reach are generally part of the Colorado River population. Hence, a total of 179 miles will be sampled. The rationale for omitting Westwater Canyon is that sampling there requires specialized whitewater expertise, is time consuming, and, based on past experience, will yield very few pikeminnow (captures have averaged about one per year over nine years despite intensive sampling associated with other studies [unpublished Recovery Program database data]).

VI. Study Methods/Approach:

Juvenile, sub-adult and adult Colorado pikeminnow will be captured from throughout the Colorado River study area. In each of two sub-reaches (upstream and downstream of Westwater Canyon), there will be two crews working concurrently: one 2-person crew will electrofish shorelines while another two-person crew will trammel-net flooded backwaters. During low water periods, only electrofishing sampling will be deployed. There will therefore be a total of four 2-person crews working simultaneously at any one time (eight individuals). Additional individuals will be required to run shuttles, clean nets and maintain equipment. An additional person will also be needed to pilot a baggage boat when sampling in Canyonlands is conducted. In some reaches, where backwaters are scarce, both shorelines will be electrofished, either concurrently or on separate days. In reaches where shoreline electrofishing supplements backwater netting, the electrofishing crew will sample both shorelines, targeting what the driver believes to be the best habitats. No electrofishing will occur in backwaters; and electrofishing boats that get out ahead of netting crews will steer clear of backwater mouths to avoid scaring fish from these areas. Concurrent crews working in the same reach will embark at the same location but will be prepared to operate and work up fish independently. The technique, or combination of techniques, that most effectively

samples the pikeminnow population varies by reach, and some flexibility will be required to modify sampling protocols as reach and flow conditions vary. All fish will be measured for total length (mm), weighed with an electronic balance (nearest gram) and checked for the presence of a PIT-tag. If a PIT tag is not present the fish will be marked with one.

For concurrent bass removal efforts, all centrarchids will be measured and removed from the river as well as other non-native predators that may be encountered such as northern pike and walleye. These will be frozen, and either transferred to Colorado Parks and Wildlife or deposited in the county landfill. Data will be turned over to the Principle Investigator for Project 126a (centrarchid removal) for inclusion in their analysis.

The Principal Investigator will train crew members, act as overall crew leader and actively participate in data collection efforts. One higher-grade technician, certified for electrofishing, will be present in each reach, and will function as a sub-reach crew leader. Although the duration of the annual data collection effort is anticipated to be 11-12 weeks, additional time will be required prior to field sampling to ready equipment and train new crew members in motor boat operation and field techniques specific to this project.

The Principal Investigator will work closely with a biostatistician familiar with running program MARK or other appropriate mark-recapture programs that develop estimates of population abundance and rates of survival. Size structure of the population will be analyzed and compared against earlier data (1991-1994, 1998-2000, 2003-2005, 2008-2010, 2013-2015) to determine recent trends in recruitment frequency, identification of strong year-classes, etc. Average body condition will also be monitored as a means to assess fish health.

VII. Task Description and Schedule

Description

Task 1. Capture and PIT tag Colorado pikeminnow (early April-late June)
Task 2. Input and analyze data
Task 3. Write annual reports
Task 4. Prepare final report

Schedule

Task 1:	2018, 2019, 2020
Task 2:	2018, 2019, 2020
Task 3:	2018, 2019, 2020
Task 4:	2021

VIII. **FY-2018 – First Year of Three Year Sampling Rotation**

Deliverables/Due Dates: Annual Report for field work due 11/2018

Budget

Task 1. Field Work						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Fish Biologist (GS-11)	1	560	560	$52.80	$29,568
	Bio Tech Crew Leader (GS-7)	1	560	560	$31.82	$17,819
	Bio Tech Crew Leader (GS-7) overtime	1	80	80	$47.73	$3,818
	Biological Technician (GS-5)	7	480	3360	$22.94	$77,078
	Biological Technician (GS-5) overtime	7	80	560	$34.41	$19,270
Labor Subtotal						**$147,554**
Travel and Per Diem*						
*Based on 2017 rates with 2% annual increase		**Number of Personnel**	**Days Per Trip**	**Trips Per Year**	**Rate**	**Total**
	Lodging in Moab, Utah (32 nights total)	4	2	4	$165.24	$5,288
	Per Diem for Moab, Utah (48 days total)	4	3	4	$65.28	$3,133
Per Diem (Camp Rate) $28/day/person						
	Loma to Westwater Ranger Station (50 days	5	2	5	$28.00	$1,400
	Cisco to Dewey Bridge (40 days total)	5	2	4	$28.00	$1,120
	Dewey Bridge to Take-out Beach (32 days)	4	2	4	$28.00	$896
	Potash to Confluence (100 days total)	5	5	4	$28.00	$2,800
Travel Subtotal						**$14,637**
Equipment and Supplies*				**Units**	**Rate**	**Total**
	Satellite phone service			**2**	$100.00	$200

	Spark plugs for generators			5	$7.50	$38
	Oil for generators			11	$7.00	$77
	Generator repair and tune-up			5	$75.00	$375
	Hip waders			2	$50.00	$100
	Chest waders			2	$125.00	$250
	Life Jackets			3	$70.00	$210
	Electrical gloves			3	$65.00	$195
	Dip nets			2	$300.00	$600
	Signal light pigtail adapters			2	$30.00	$60
	Raft frame repair aluminum welding			3	$150.00	$450
	Raft glue			4	$22.50	$90
	Hypalon material			5	$37.00	$185
	Acetone			1	$17.50	$18
	Toluene			1	$17.50	$18
	Cam straps					
	2 foot			10	$4.20	$42
	3 foot			5	$4.30	$22
	4 foot			10	$4.70	$47
	6 foot			5	$5.05	$25
	9 foot			5	$5.70	$29
	12 foot			5	$6.15	$31
	Carabiners			10	$7.50	$75
	Mesh rig bag			1	$50.00	$50
	125 quart cooler			1	$500.00	$500
	10 foot oars			2	$90.00	$180
	oar blades			4	$65.00	$260
	Oar sleeves			4	$12.00	$48
	5 gallon gas can			5	$20.00	$100
	NRS 3.8 heavy duty Bill's Bag			2	$100.00	$200
	Clavey (7 x 17) dry bag			3	$22.00	$66
	Clavey (10x24) dry bag			4	$26.00	$104

	20 lb propane tanks			3	$20.00	$60
	Ohaus electronic scales repair and maintenance			5	$100.00	$500
Equipment and Supplies Subtotal						**$5,203**
*Other potential uses for equipment and supply funds could include replacing hand tools (ratchets, sockets, wrenches, screw drivers, vise grips, pliers, Allen wrenches, crescent wrenches, etc.), WD-40, bailing wire, duct tape, electrical repair supplies (12 and 14 gage wire, junction boxes, male and female plugs, wire nuts, fuses, Ohm meters, electrical tape), batteries (C, AA, and AAA), camp stoves, lanterns, 5-gallon Gotts, shovels, 5-gallon buckets, cargo nets, fix chips, or cracks in vehicle windshields, light bulbs, lenses, eletrofishing spheres, wire rope, dome tent, dry storage boxes, ammo cans, camping dishes (bowls, plates, utensils, cups), rolla tables, camp chairs, sleeping pads, data books, river maps, etc.						
Vehicles and Fuel						
Vehicle maintenance and fuel ($365/month) + $0.42/mile)		**Number of Vehicles**	**Months or Miles Per Vehicle**	**Total Units**	**Rate**	**Total**
7 vehicles for 3 months at $365/month		7	3	21	$365.00	$7,665
7 vehicles x 3 months x 1,420 miles/month		7	4260	29820	$0.42	$12,524
Boat and generator gas (91 octane) 500 gallons		-	-	500	$4.00	$2,000
Vehicles subtotal						**$22,189**
Task 1 Subtotal						**$189,583**
Tasks 2 and 3. Permitting, Coordination, Data Entry, Analysis, Annual Report Writing.						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Administrative Officer (GS-9)	1	320	320	$42.14	$13,485
	Project Leader (GS-14)	1	96	96	$80.95	$7,771
	Fish Biologist (GS-11)	1	600	600	$52.80	$31,680
Labor						
	Colorado State University Bio-Statistician	1	16	16	$135.00	$2,160
Tasks 2 and 3 Subtotal						**$55,096**

FY 2018 Grand Total					**$244,679**

FY 2019 – Second Year of Three Year Sampling Rotation

Deliverables/Due Dates: Annual Report for field work due 11/2019

Budget

Task 1. Field Work						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Fish Biologist (GS-11)	1	560	560	$53.84	$30,150
	Bio Tech Crew Leader (GS-7)	1	560	560	$32.46	$18,178
	Bio Tech Crew Leader (GS-7) overtime	1	80	80	$48.69	$3,895
	Biological Technician (GS-5)	7	480	3360	$23.40	$78,624
	Biological Technician (GS-5) overtime	7	80	560	$35.10	$19,656
Labor Subtotal						**$150,503**
Travel and Per Diem*						
*Based on 2017 rates with 2% annual increase		**Number of Personnel**	**Days Per Trip**	**Trips Per Year**	**Rate**	**Total**
	Lodging in Moab, Utah (32 nights total)	4	2	4	$168.54	$5,393
	Per Diem for Moab, Utah (48 days total)	4	3	4	$66.59	$3,196
Per Diem (Camp Rate) $28/day/person						
	Loma to Westwater Ranger Station (50 days	5	2	5	$28.00	$1,400
	Cisco to Dewey Bridge (40 days total)	5	2	4	$28.00	$1,120
	Dewey Bridge to Take-out Beach (32 days)	4	2	4	$28.00	$896
	Potash to Confluence (100 days total)	5	5	4	$28.00	$2,800
Travel Subtotal						**$14,806**
Equipment and Supplies*				**Units**	**Rate**	**Total**

	Satellite phone service			**2**	$102.00	$204
	Spark plugs for generators			5	$7.65	$38
	Oil for generators			11	$7.14	$79
	Generator repair and tune-up			5	$76.50	$383
	Hip waders			2	$51.00	$102
	Chest waders			2	$127.50	$255
	Life Jackets			3	$71.40	$214
	Electrical gloves			3	$66.30	$199
	Dip nets			2	$306.00	$612
	Signal light pigtail adapters			2	$30.60	$61
	Raft frame repair aluminum welding			3	$153.00	$459
	Raft glue			4	$22.95	$92
	Hypalon material			5	$37.74	$189
	Acetone			1	$17.85	$18
	Toluene			1	$17.85	$18
	Cam straps				$0.00	
	2 foot			10	$4.28	$43
	3 foot			5	$4.39	$22
	4 foot			10	$4.79	$48
	6 foot			5	$5.15	$26
	9 foot			5	$5.81	$29
	12 foot			5	$6.27	$31
	Carabiners			10	$7.65	$77
	Mesh rig bag			1	$51.00	$51
	125 quart cooler			1	$510.00	$510
	10 foot oars			2	$91.80	$184
	oar blades			4	$66.30	$265
	Oar sleeves			4	$12.24	$49
	5 gallon gas can			5	$20.40	$102
	NRS 3.8 heavy duty Bill's Bag			2	$102.00	$204
	Clavey (7 x 17) dry bag			3	$22.44	$67

	Clavey (10x24) dry bag			4	$26.52	$106
	20 lb propane tanks			3	$20.40	$61
	Ohaus electronic scales repair and maintenance			5	$102.00	$510
Equipment and Supplies Subtotal						**$5,307**
*Other potential uses for equipment and supply funds could include replacing hand tools (ratchets, sockets, wrenches, screw drivers, vise grips, pliers, Allen wrenches, crescent wrenches, etc.), WD-40, bailing wire, duct tape, electrical repair supplies (12 and 14 gage wire, junction boxes, male and female plugs, wire nuts, fuses, Ohm meters, electrical tape), batteries (C, AA, and AAA), camp stoves, lanterns, 5-gallon Gotts, shovels, 5-gallon buckets, cargo nets, fix chips, or cracks in vehicle windshields, light bulbs, lenses, eletrofishing spheres, wire rope, dome tent, dry storage boxes, ammo cans, camping dishes (bowls, plates, utensils, cups), rolla tables, camp chairs, sleeping pads, data books, river maps, etc.						
Vehicles and Fuel						
Vehicle maintenance and fuel ($372/month) + $0.43/mile)		**Number of Vehicles**	**Months or Miles Per Vehicle**	**Total Units**	**Rate**	**Total**
7 vehicles for 3 months at $372/month		7	3	21	$372.00	$7,812
7 vehicles x 3 months x 1,420 miles/month		7	4260	29820	$0.43	$12,823
Boat and generator gas (91 octane) 500 gallons		-	-	500	$4.08	$2,040
Vehicles subtotal						**$22,675**
Task 1 Subtotal						**$193,290**
Tasks 2 and 3. Permitting, Coordination, Data Entry, Analysis, Annual Report Writing.						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Administrative Officer (GS-9)	1	320	320	$42.98	$13,754
	Project Leader (GS-14)	1	96	96	$82.57	$7,927
	Fish Biologist (GS-11)	1	600	600	$53.84	$32,304
Labor						
	Colorado State University Bio-Statistician	1	16	16	$137.70	$2,203
Tasks 2 and 3 Subtotal						**$56,188**

FY 2019 Grand Total						**$249,477**

FY 2020 – Third Year of Three Year Sampling Rotation

Deliverables/Due Dates: Annual Report for field work due 11/2020

Budget

Task 1. Field Work						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Fish Biologist (GS-11)	1	560	560	$54.92	$30,755
	Bio Tech Crew Leader (GS-7)	1	560	560	$33.11	$18,542
	Bio Tech Crew Leader (GS-7) overtime	1	80	80	$49.67	$3,973
	Biological Technician (GS-5)	7	480	3360	$23.87	$80,203
	Biological Technician (GS-5) overtime	7	80	560	$35.81	$20,051
Labor Subtotal						**$153,524**
Travel and Per Diem*						
*Based on 2017 rates with 2% annual increase		**Number of Personnel**	**Days Per Trip**	**Trips Per Year**	**Rate**	**Total**
	Lodging in Moab, Utah (32 nights total)	4	2	4	$171.92	$5,501
	Per Diem for Moab, Utah (48 days total)	4	3	4	$67.92	$3,260
Per Diem (Camp Rate) $28/day/person						
	Loma to Westwater Ranger Station (50 days	5	2	5	$28.00	$1,400
	Cisco to Dewey Bridge (40 days total)	5	2	4	$28.00	$1,120
	Dewey Bridge to Take-out Beach (32 days)	4	2	4	$28.00	$896
	Potash to Confluence (100 days total)	5	5	4	$28.00	$2,800
Travel Subtotal						**$14,978**

Equipment and Supplies*				Units	Rate	Total
	Satellite phone service			**2**	$104.04	$208
	Spark plugs for generators			5	$7.80	$39
	Oil for generators			11	$7.28	$80
	Generator repair and tune-up			5	$78.03	$390
	Hip waders			2	$52.02	$104
	Chest waders			2	$130.05	$260
	Life Jackets			3	$72.83	$218
	Electrical gloves			3	$67.63	$203
	Dip nets			2	$312.12	$624
	Signal light pigtail adapters			2	$31.21	$62
	Raft frame repair aluminum welding			3	$156.06	$468
	Raft glue			4	$23.41	$94
	Hypalon material			5	$38.49	$192
	Acetone			1	$18.21	$18
	Toluene			1	$18.21	$18
	Cam straps					
	2 foot			10	$4.37	$44
	3 foot			5	$4.47	$22
	4 foot			10	$4.89	$49
	6 foot			5	$5.25	$26
	9 foot			5	$5.93	$30
	12 foot			5	$6.40	$32
	Carabiners			10	$7.80	$78
	Mesh rig bag			1	$52.02	$52
	125 quart cooler			1	$520.20	$520
	10 foot oars			2	$93.64	$187
	oar blades			4	$67.63	$271
	Oar sleeves			4	$12.48	$50
	5 gallon gas can			5	$20.81	$104
	NRS 3.8 heavy duty Bill's Bag			2	$104.04	$208

	Clavey (7 x 17) dry bag			3	$22.89	$69
	Clavey (10x24) dry bag			4	$27.05	$108
	20 lb propane tanks			3	$20.81	$62
	Ohaus electronic scales repair and maintenance			5	$104.04	$520
Equipment and Supplies Subtotal						**$5,413**
*Other potential uses for equipment and supply funds could include replacing hand tools (ratchets, sockets, wrenches, screw drivers, vise grips, pliers, Allen wrenches, crescent wrenches, etc.), WD-40, bailing wire, duct tape, electrical repair supplies (12 and 14 gage wire, junction boxes, male and female plugs, wire nuts, fuses, Ohm meters, electrical tape), batteries (C, AA, and AAA), camp stoves, lanterns, 5-gallon Gotts, shovels, 5-gallon buckets, cargo nets, fix chips, or cracks in vehicle windshields, light bulbs, lenses, eletrofishing spheres, wire rope, dome tent, dry storage boxes, ammo cans, camping dishes (bowls, plates, utensils, cups), rolla tables, camp chairs, sleeping pads, data books, river maps, etc.						
Vehicles and Fuel						
Vehicle maintenance and fuel ($380/month) + $0.44/mile)		**Number of Vehicles**	**Months or Miles Per Vehicle**	**Total Units**	**Rate**	**Total**
7 vehicles for 3 months at $380/month		7	3	21	$380.00	$7,980
7 vehicles x 3 months x 1,420 miles/month		7	4260	29820	$0.44	$13,121
Boat and generator gas (91 octane) 500 gallons		-	-	500	$4.16	$2,080
Vehicles subtotal						**$23,181**
Task 1 Subtotal						**$197,095**
Tasks 2 and 3. Permitting, Coordination, Data Entry, Analysis, Annual Report Writing.						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Administrative Officer (GS-9)	1	320	320	$43.84	$14,029
	Project Leader (GS-14)	1	96	96	$84.22	$8,085
	Fish Biologist (GS-11)	1	600	600	$54.92	$32,952
Labor						
	Colorado State University Bio-Statistician	1	16	16	$140.45	$2,247

Tasks 2 and 3 Subtotal						**$57,313**
FY 2020 Grand Total						**$254,408**

FY 2021 – No field work in 2021.

Deliverables/Due Dates: Annual Report due 11/2021.

Tasks 2, 3 and 4. Data Input, Analysis, Management & Presentation; Report Writing; Office & Administrative Support						
Labor (Federal Salary + Benefits)						
	Title	**Number of Personnel**	**Hours Per Person**	**Total Hours**	**Rate**	**Total**
	Administrative Officer (GS-9)	1	120	120	$44.72	$5,366
	Project Leader (GS-14)	1	40	40	$85.90	$3,436
	Fish Biologist (GS-11)	1	1080	1080	$56.02	$60,502
Labor						
	Colorado State University Bio-Statistician	1	40	40	$143.26	$5,730
Labor Subtotal						**$75,034**
Travel and Per Diem*						
*Based on 2017 rates with 2% annual increase		**Number of Personnel**	**Days Per Trip**	**Trips Per Year**	**Rate**	**Total**
	Lodging in Ft. Collins, Colorado	1	4	1	$117.99	$472
	Per Diem for Ft. Collins, Colorado	1	5	1	$63.86	$319
Travel Subtotal						**$791**
Equipment and Supplies				**Units**	**Rate**	**Total**
	Copier Paper			1	$53.00	$53
	Toner Cartridges			1	$212.00	$212
	Mailing Cost			1	$53.00	$53
	Data clipboards			2	$26.50	$53

	Pens/Pencils			5	$7.50	$38
Equipment and Supplies Subtotal						**$409**
FY 2021 Grand Total						**$76,234**

FY-2022 Work (off year -- no field work or reporting)

Deliverables/Due Dates: None

Budget: Off year -- no work $ 0

IX. Budget summary

FY-2018	
USFWS-GJ	$242,519
Bio-Statistician	$ 2,160
2016 Total	$244,679
FY-2019	
USFWS-GJ	$247,274
Bio-Statistician	$ 2,203
2017 Total	$249,477
FY-2020	
USFWS-GJ	$252,161
Bio-Statistician	$ 2,247
2018 Total	$254,408
FY-2021	
USFWS-GJ	$ 70,504
Bio-Statistician	$ 5,730
2018 Total	$ 76,234
FY-2022	
USFWS-GJ	$ 0
Bio-Statistician	$ 0
2018 Total	$ 0
5-Year Total =	$824,798

X. Reviewers: Recovery Program Staff and Biology Committee

XI. References

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