

RECOVERY PROGRAM
FY 2016-2017 SCOPE OF WORK for:
Smallmouth bass control in the White River

Recovery Program Project Number: 167

Reclamation Agreement number: R14AP00007 & R12PG40027
Reclamation Agreement term: 5/1/ 2014 – 9/31/ 2018; 7/17/2012-3/30/2016

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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Category:

Ongoing project

Ongoing-revised project

Requested new project

Unsolicited proposal

Expected Funding Source:

Annual funds

Capital funds

Other [*explain*]

- I. Title of Proposal: Smallmouth bass control in the White River
- II. Relationship to RIPRAP:
White River Action Plan:
 - III. REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)
 - III.B. Reduce negative impacts to endangered fishes from sportfish management activities.
 - III.B.2.a. Determine and implement an adequate level of mechanical removal to reduce smallmouth bass.
- 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 (USFWS 2002a-c): Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). The highest catch rates of adult and sub-adult Colorado pikeminnow in the Green River sub-basin are observed in the White River (Bestgen et al. 2010). Furthermore, adult razorback sucker, many in spawning condition, have been collected in the White River during

2011 and 2013 spring sampling (CRFP Vernal, unpublished data) and larval razorback sucker were documented for the first time in June 2011 (Webber et al., 2013.), suggesting this species is now utilizing this system for spawning purposes. Additionally, the White River is a stronghold for unlisted native species (Lanigan and Berry 1981; Martinez et al. 1994; Breen and Hedrick 2009, 2010), thus providing an important forage base for Colorado pikeminnow (Osmundson et al. 1998).

Smallmouth bass (*Micropterus dolomieu*) have been documented in the White River for over three decades (Crosby 1975), yet proliferation of this population has not occurred as in other systems (e.g., Yampa River). However, 41 smallmouth bass were collected during one low flow native species sampling pass (42.5 mile reach in Utah) conducted during 2009 (Breen and Hedrick 2010). In addition, increasing numbers of smallmouth bass were collected from 2011-2013 during Colorado pikeminnow abundance estimate sampling. During our initial investigation in 2012, we learned that the majority of smallmouth bass were found in the first ten miles below Taylor Draw Dam, and further downstream densities decreased dramatically. This has continued to be the overall distribution of bass in the river, but adult and sub-adult densities have increased in downstream reaches, particular after low discharge and warm river conditions that are conducive to bass reproduction.

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

Goal:

Sufficiently reduce the abundance of adult smallmouth bass in the White 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 removal passes for smallmouth bass in the White River from the Taylor Draw Dam (RM 104) to the BLM Enron Takeout (RM 24). Effort will be distributed based on greatest efficiency of bass removal.
2. Determine the feasibility of smallmouth bass removal in the White River and identify levels of control necessary to prevent population expansion.

End Product:

An annual report will provide initial information on the extent of the smallmouth bass population in the White River. Metrics to be summarized include: total abundance of adult and juvenile smallmouth bass, total CPUE, CPUE by river mile and size class, CPUE for other nonnatives, and knowledge of spawning and nesting periods and locations.

V. Study Area:

The study area encompasses the entire lower White River below Kenney Reservoir (Colorado and Utah), where we will remove smallmouth bass from the Taylor Draw Dam (RM 104) to RMI 87.5, and from the Utah/Colorado border to the BLM Enron Takeout (RM 24). Crews from USFWS CRFP – Vernal, UDWR – Vernal, and Colorado Parks and Wildlife (see SOW 126b) will share the workload to complete removal efforts through this 80 mile sample reach, thus the Colorado/Utah border (RM 72) will serve as break point for two distinct sections. We will not sample the lower 24 miles of the White River given that this is a reach of poor habitat

availability with low fish densities (Breen and Hedrick 2009), and we aim to make best use of our efforts.

VI. Study Methods/Approach:

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.

Smallmouth bass will be removed primarily by electrofishing. Two electrofishing rafts will simultaneously electrofish each shoreline of the river. Effort will be focused on shoreline habitat that is likely to contain smallmouth bass. Sampling crews will conduct removal activities in a manner that minimizes potential negative impacts to endangered fish as a result of electrofishing activities. This includes discontinuing electrofishing when elevated numbers of endangered fish are known to be present. Electrofishing passes will be conducted from June to early July, focusing on the descending limb of the hydrograph when water temperatures will likely favor smallmouth bass spawning and nesting. During removal passes, all collected smallmouth bass will be disposed of according to Colorado Parks and Wildlife protocols for fish collected in Colorado. We will not tag and release any bass for population estimates.

Several methods will be used in an attempt to identify spawning periods and locations. First, crews will examine shoreline areas for nests and destroy any found. Second, all bass captured will be examined for spawning condition. Finally, the time and locations of YOY smallmouth appearance in catches will be noted and tracked to estimate spawning period and to locate spawning areas. Otolith collection and preservation may provide further insight on exact hatch dates at the request of the Recovery Program.

In addition to the targeted smallmouth bass, other nonnative species encountered will be removed as feasible with the exception of common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and small-bodied cyprinids. All endangered fishes captured will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive. Additionally, two submersible PIT antennas are requested to supplement the stream-wide array at Bonanza Bridge. These antennas, which will be deployed during smallmouth bass removal passes, will help elucidate endangered fish use of the White River, including movement patterns and timing, and as a secondary benefit will provide much needed information on Roundtail Chub life-history. Endangered fish data will then be reported to appropriate principal investigators and included in annual reporting.

VII. Task Description and Schedule:

Task 1. Smallmouth bass removal effort from Taylor Draw Dam (RM 104) to BLM take-out (RM 87.5); May–July 2016

Task 2. Two smallmouth bass removal passes from the Colorado/Utah border (RM 72) to Enron boat ramp (RM 24); June–July 2016

Task 3. Data entry, analysis, and reporting; October–December 2016

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

FY 2016: Annual report due November 2016.

Task Activity	Rate \$/h	Hours	Cost
Task 1-USFWS			
Preparatory Labor			
GS-7 Biologist Field Preparation	\$28.44	16	\$455
3 GS-5 Technicians Field Preparation	\$24.96	48	\$1,198
Taylor Draw Dam to BLM boat ramp (6 passes)			
GS-7 Biologist	\$28.44	144	\$4,095
3 GS-5 Technicians	\$24.96	432	\$10,783
Overtime for GS-5 technicians	\$37.44	54	\$2,022
GS-8 maintenance and equipment repair	\$38.72	196	\$7,589
Subtotal			\$26,142
Travel, Equipment			
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 18 days)			\$864
GSA truck (2 trucks x rate/mo x # truck-months)	\$313	3	\$939
Vernal to Rangely round trip and local shuttles (140 mi/day x \$0.31/mile x 18 days x 2 trucks)			\$1,562
Maintenance/replacement of rafting gear (oars, repair kit supplies, raft repairs/patching, motor maintenance), sampling nets, electrofishing gear (generator maintenance, electrode replacement), safety equipment (life jackets, control pedals/mats), camping equipment (based on average annual expenses from prior years).			\$1,000
Subtotal			\$4,365
TASK 1 TOTAL			\$30,507
Task 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$55.14	40	\$2,206
GS-7 Fisheries Biologist	\$28.44	120	\$3,413
GS-9 Admin Assist.	\$39.19	80	\$3,135
USFWS TASK 3 TOTAL			\$8,754
USFWS FY 16 SOW TOTAL			\$39,261

Task 2-UDWR: Two smallmouth bass removal passes from Colorado/Utah border to Enron			
	Rate	Hours/Units	Cost
Labor			
Project Leader	35.48	150	5322.00
Biologist II	33.12	60	1987.20
Journey Maintenance/Construction Specialist	26.66	120	3199.20
Technician II (Assistant Crew Leader)	17.48	160	2622.00
Technician I	16.23	300	4869.00
Shuttle Drivers	16.58	60	994.80
		Subtotal	\$18,994
Travel			
2 trucks @ 4% of annual use ^a	13600.00	0.06	816.00
Per diem (8 days x 6 people)	39.00	72	2808.00
		Subtotal	\$3,624
Equipment			
Boat fuel (gallons)	4.00	144	384.00
Boat/motor repair and maintenance ^b			1449.00
Camping supplies ^c			450.00
Sampling equipment ^d			2612.00
Submersible PIT antennas ^e	4750.00	2	9500.00
		Subtotal	\$5,312
		Task 2 Total	\$27,930

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

^b Boat/motor repair and maintenance includes, but is not limited to oil (3 qts./motor & generator x \$11 qt. x 2 motors & generators x 1 oil change = \$66), 1 prop (\$100), water pump/filters/lower unit oil/grease/gas can/misc. maintenance items (\$500), shop supplies/tools/misc. small parts/safety equipment (\$300).

^c Camping supplies includes, but is not limited to 1 sleeping pad (Aire-\$150), cooking supplies/propane/toilet supplies (\$300).

^d Sampling equipment includes, but is not limited to first aid supplies (\$100), 2 life jackets (NRS-\$150), SPOT locator service fee (\$100), satellite phone service/maintenance (\$300), batteries (\$200), straps (NRS-\$150), livewell/buckets/fish nets/measuring boards (\$100), raft repair and misc. raft materials (\$500).

^{b,c,d} 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.

^e Submersible PIT antennas will be purchased with separate funds. Costs are not included in this budget.

Task 3: UDWR Data entry, analysis, and reporting			
	Rate	Hours/Units	Cost
Labor			
Project Leader	35.48	40	1419.20
Technician II (Assistant Crew Leader)	17.48	40	699.20
		UDWR Task 3 Subtotal	\$2,118
		UDWR FY16 TOTAL	\$30,049

Combined FWS & UDWR FY16 Total: \$69,310

FY 2017: Annual report due November 2017.

Task Activity	Rate \$/h	Hours	Cost
Task 1-USFWS			
Preparatory Labor			
GS-9 Biologist Field Preparation	\$35.36	16	\$566
3 GS-5 Technicians Field Preparation	\$25.70	48	\$1,234
Taylor Draw Dam to BLM boat ramp (6 passes)			
GS-9 Biologist	\$35.36	144	\$5,092
3 GS-5 Technicians	\$25.70	432	\$11,102
Overtime for GS-5 technicians	\$38.55	54	\$2,082
GS-8 maintenance and equipment repair	\$39.74	196	\$7,788
Subtotal			\$27,863
Travel, Equipment			
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 18 days)			\$864
GSA truck (2 trucks x rate/mo x # truck-months)	\$320	3	\$960
Vernal to Rangely round trip and local shuttles (140 mi/day x \$0.32/mile x 18 days x 2 trucks)			\$1,613
Maintenance/replacement of rafting gear (oars, repair kit supplies, raft repairs/patching, motor maintenance), sampling nets, electrofishing gear (generator maintenance, electrode replacement), safety equipment (life jackets, control pedals/mats), camping equipment (based on average annual expenses from prior years).			\$1,000
Subtotal			\$4,437
TASK 1 TOTAL			\$32,300
Task 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$56.25	40	\$2,250
GS-9 Fisheries Biologist	\$35.36	120	\$4,243
GS-9 Admin Assist.	\$39.98	80	\$3,198
USFWS TASK 3 TOTAL			\$9,691
USFWS FY17 SOW TOTAL			\$41,991

Task 2-UDWR: Three removal passes from the Colorado/Utah border to Enron.

	Rate	Hours/Units	Cost
Labor			
Project Leader	36.19	150	5428.44
Biologist II	33.78	60	2026.94
Journey Maintenance/Construction Specialist	27.19	120	3263.18
Technician II (Assistant Crew Leader)	17.83	150	2674.44
Technician I	16.55	300	4966.38
Shuttle Drivers	16.91	60	1014.70
		Subtotal	\$19,374
Travels			
2 trucks @ 4% of annual use ^a	13872.00	0.06	832.32
Per diem (8 days x 6 people)	39.78	72	2864.16
		Subtotal	\$3,696
Equipment			
Boat fuel (gallons)	4.08	144	587.52
Boat/motor repair and maintenance ^b			1477.98
Camping supplies ^c			688.50
Sampling equipment ^d			2664.24
		Subtotal	\$5,418
		Task 2 Total	\$28,489

Task 3-UDWR: Data entry, analysis, and reporting.

	Rate	Hours/Units	Cost
Labor			
Project Leader	36.19	40	1447.58
Technician II (Assistant Crew Leader)	17.83	40	713.18
		Task 3 Subtotal	\$2,161
		FY17 TOTAL	\$30,650

Combined FWS & UDWR FY17 Total: \$72,641

FY 2018

Annual report due November 2018.

Task Activity	Rate \$/h	Hours	Cost
Task 1-USFWS			
Preparatory Labor			
GS-11 Biologist Field Preparation	\$42.93	16	\$687
3 GS-5 Technicians Field Preparation	\$26.48	48	\$1,271
Taylor Draw Dam to BLM boat ramp (6 passes)			
GS-11 Biologist	\$42.93	144	\$6,182
3 GS-5 Technicians	\$26.48	432	\$11,439
Overtime for GS-5 technicians	\$39.72	54	\$2,145
GS-8 maintenance and equipment repair	\$40.53	196	\$7,944
Subtotal			\$29,668
Travel, Equipment			
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 18 days)			\$864
GSA truck (2 trucks x rate/mo x # truck-months)	\$325	3	\$975
Vernal to Rangely round trip and local shuttles (140 mi/day x \$0.33/mile x 18 days x 2 trucks)			\$1,663
Maintenance/replacement of rafting gear (oars, repair kit supplies, raft repairs/patching, motor maintenance), sampling nets, electrofishing gear (generator maintenance, electrode replacement), safety equipment (life jackets, control pedals/mats), camping equipment (based on average annual expenses from prior years).			\$1,000
Subtotal			\$4,502
TASK 1 TOTAL			\$34,171
Task 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$57.38	40	\$2,295
GS-11 Fisheries Biologist	\$42.93	120	\$5,152
GS-9 Admin Assist.	\$40.78	80	\$3,262
USFWS TASK 3 TOTAL			\$10,709
USFWS SOW TOTAL			\$44,880

Task 2-UDWR: Three removal passes from the Colorado/Utah border to Enron.

	Rate	Hours/Units	Cost
Labor			
Project Leader	36.91	150	5537.01
Biologist II	34.46	60	2067.48
Journey Maintenance/Construction Specialist	27.74	120	3328.45
Technician II (Assistant Crew Leader)	18.19	150	2727.93
Technician I	16.89	300	5065.71
Shuttle Drivers	17.25	60	1034.99
		Subtotal	\$19,762
Travela			
2 trucks @ 4% of annual use ^a	14149.44	0.06	848.97
Per diem (8 days x 6 people)	40.58	72	2921.44
		Subtotal	\$3,770
Equipment			
Boat fuel (gallons)	4.16	144	599.27
Boat/motor repair and maintenance ^b			1507.54
Camping supplies ^c			702.27
Sampling equipment ^d			2717.52
		Subtotal	\$5,527
		Task 2 Total	\$29,059

Task 3-UDWR: Data entry, analysis, and reporting.

	Rate	Hours/Units	Cost
Labor			
Project Leader	36.91	40	1476.54
Technician II (Assistant Crew Leader)	18.19	40	727.45
		Task 3 Subtotal	\$2,204
		FY18 TOTAL	\$31,263

Combined FWS & UDWR FY18 Total: \$76,143

FY 2019

Annual report due November 2019

Task Activity	Rate \$/h	Hours	Cost
Task 1-USFWS			
Preparatory Labor			
GS-11 Biologist Field Preparation	\$43.79	16	\$701
3 GS-5 Technicians Field Preparation	\$27.27	48	\$1,309
Taylor Draw Dam to BLM boat ramp (6 passes)			
GS-11 Biologist	\$43.79	144	\$6,306
3 GS-5 Technicians	\$27.27	432	\$11,781
Overtime for GS-5 technicians	\$40.91	54	\$2,209
GS-8 maintenance and equipment repair	\$41.35	196	\$8,105
Subtotal			\$30,410
Travel, Equipment			
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 18 days)			\$864
GSA truck (2 trucks x rate/mo x # truck-months)	\$332	3	\$996
Vernal to Rangely round trip and local shuttles (140 mi/day x \$0.34/mile x 18 days x 2 trucks)			\$1,714
Maintenance/replacement of rafting gear (oars, repair kit supplies, raft repairs/patching, motor maintenance), sampling nets, electrofishing gear (generator maintenance, electrode replacement), safety equipment (life jackets, control pedals/mats), camping equipment (based on average annual expenses from prior years).			\$1,000
Subtotal			\$4,574
TASK 1 TOTAL			\$34,983
Task 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$58.52	40	\$2,341
GS-11 Fisheries Biologist	\$43.79	120	\$5,255
GS-9 Admin Assist.	\$41.60	80	\$3,328
USFWS TASK 3 TOTAL			\$10,923
USFWS SOW TOTAL			\$45,906

Task 2-UDWR: Three removal passes from the Colorado/Utah border to Enron.

	Rate	Hours/Units	Cost
Labor			
Project Leader	37.65	150	5647.75
Biologist II	35.15	60	2108.83
Journey Maintenance/Construction Specialist	28.29	120	3395.02
Technician II (Assistant Crew Leader)	18.55	150	2782.49
Technician I	17.22	300	5167.02
Shuttle Drivers	17.59	60	1055.69
		Subtotal	\$20,157
Travela			
2 trucks @ 4% of annual use ^a	14432.43	0.06	865.95
Per diem (8 days x 6 people)	41.39	72	2979.87
		Subtotal	\$3,846
Equipment			
Boat fuel (gallons)	4.24	144	611.26
Boat/motor repair and maintenance ^b			1537.69
Camping supplies ^c			716.32
Sampling equipment ^d			2771.88
		Subtotal	\$5,637
		Task 2 Total	\$29,640

Task 3-UDWR: Data entry, analysis, and reporting.

	Rate	Hours/Units	Cost
Labor			
Project Leader	37.65	40	1506.07
Technician II (Assistant Crew Leader)	18.55	40	742.00
		Task 3 Subtotal	\$2,248
		FY19 TOTAL	\$31,888

Combined FWS & UDWR FY19 Total: \$77,794

FY 2020

Annual report due November 2020

Task Activity	Rate \$/h	Hours	Cost
Task 1-USFWS			
Preparatory Labor			
GS-11 Biologist Field Preparation	\$43.79	16	\$701
3 GS-5 Technicians Field Preparation	\$27.27	48	\$1,309
Taylor Draw Dam to BLM boat ramp (6 passes)			
GS-11 Biologist	\$43.79	144	\$6,306
3 GS-5 Technicians	\$27.27	432	\$11,781
Overtime for GS-5 technicians	\$40.91	54	\$2,209
GS-8 maintenance and equipment repair	\$41.35	196	\$8,105
Subtotal			\$30,410
Travel, Equipment			
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 18 days)			\$864
GSA truck (2 trucks x rate/mo x # truck-months)	\$332	3	\$996
Vernal to Rangely round trip and local shuttles (140 mi/day x \$0.35/mile x 18 days x 2 trucks)			\$1,764
Maintenance/replacement of rafting gear (oars, repair kit supplies, raft repairs/patching, motor maintenance), sampling nets, electrofishing gear (generator maintenance, electrode replacement), safety equipment (life jackets, control pedals/mats), camping equipment (based on average annual expenses from prior years).			\$1,000
Subtotal			\$4,624
TASK 1 TOTAL			\$35,034
Task 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$58.52	40	\$2,341
GS-11 Fisheries Biologist	\$43.79	120	\$5,255
GS-9 Admin Assist.	\$41.60	80	\$3,328
USFWS TASK 3 TOTAL			\$10,923
USFWS SOW TOTAL			\$45,957

Task 2-UDWR: Three removal passes from the Colorado/Utah border to Enron.

	Rate	Hours/Units	Cost
Labor			
Project Leader	38.40	150	5760.70
Biologist II	35.85	60	2151.01
Journey Maintenance/Construction Specialist	28.86	120	3462.92
Technician II (Assistant Crew Leader)	18.92	150	2838.14
Technician I	17.57	300	5270.36
Shuttle Drivers	17.95	60	1076.80
		Subtotal	\$20,560
Travels			
2 trucks @ 4% of annual use	14721.08	0.06	883.26
Per diem (8 days x 6 people)	42.21	72	3039.47
		Subtotal	\$3,923
Equipment			
Boat fuel (gallons)	4.33	144	623.48
Boat/motor repair and maintenance			1568.44
Camping supplies			730.64
Sampling equipment			2827.31
		Subtotal	\$5,750
		Task 2 Total	\$30,233

Task 3-UDWR: Data entry, analysis, and reporting.

	Rate	Hours/Units	Cost
Labor			
Project Leader	38.40	40	1536.19
Technician II (Assistant Crew Leader)	18.92	40	756.84
		Task 3 Subtotal	\$2,293
		FY20 TOTAL	\$32,526

Combined FWS & UDWR FY20 Total: \$78,483

IX. Budget Summary:

	UDWR	USFWS	Total by FY
FY 2016	\$30,049	\$39,261	\$69,310
FY 2017	\$30,650	\$41,991	\$72,641
FY 2018	\$31,263	\$44,880	\$76,143
FY 2019	\$31,888	\$45,906	\$77,794
FY 2020	\$32,526	\$45,957	\$68,405
TOTAL	\$156,376	\$217,995	\$374,371

X. Reviewers: Kevin McAbee, June 2015

XI. References:

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