

MEMORANDUM | 19 April 2007

TO Peter Grigelis, Division of Economics, USFWS
FROM Industrial Economics, Incorporated (IEc)
SUBJECT Estimated Economic Impacts of Conservation Efforts in Designated Critical Habitat for the Spikedace and Loach Minnow

SUMMARY OF FINDINGS

The purpose of this memorandum is to provide information on the coextensive economic impacts of potential spikedace and loach minnow conservation efforts within or affecting areas included in the final critical habitat designation, as described in the Final Rule.¹

The November 2006 Final Economic Analysis of Proposed Critical Habitat Designation for the Spikedace and Loach Minnow (FEA) describes coextensive economic impacts associated with proposed critical habitat as described in the Proposed Rule.² The geographic scope of the November FEA is consistent with the proposed habitat as described in the Proposed Rule, and does not reflect changes made to the critical habitat areas in the Final Rule. This memorandum summarizes the coextensive economic impacts of conservation efforts in those areas identified as final critical habitat in the Final Rule.

The Final Rule excludes two areas that were proposed for exclusion in the Proposed Rule. These excluded segments are the portions of Eagle Creek occurring on the San Carlos Apache Reservation and the segment of the East Fork White River occurring on the lands of the White Mountain Apache Tribe. In addition, the Final Rule makes the following changes:

- The portions of the Verde River segment below the Prescott National Forest and Coconino National Forest boundary are not designated as final critical habitat due to potential economic impacts;
- Technical corrections are made to the township, range, section legal descriptions for the confluence point of the East Fork Black and the North Fork East Fork Black rivers and the upstream endpoint on Eagle Creek;
- Lands owned by Phelps Dodge Corporation (PDC) along Eagle Creek and the Upper Gila are excluded on the basis of PDC's Eagle Creek and Gila River Management Plans.

¹ U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the the Spikedace and the Loach Minnow; Final Rule, published in the *Federal Register* on March 21, 2007, Vol. 72, No. 54.

² U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Spikedace and the Loach Minnow; Proposed Rule, published in the *Federal Register* on December 20, 2005, Vol. 70, No. 243.

Details of the geographic scope of the final critical habitat and reasons for exclusions are described in detail in the Final Rule.

The present value economic impact of spokedace and loach minnow conservation in the final critical habitat area is estimated to be \$10.1 million to \$25.8 million over the next 20 years (assuming a seven percent discount rate), or an annualized impact of \$1.0 million to \$2.7 million as summarized in Exhibit 1 and detailed in the remainder of this memorandum. Unquantified impacts are presented in Exhibit 2.

ECONOMIC IMPACTS IN FINAL CRITICAL HABITAT BY UNIT

The following describes the nature of the coextensive costs associated with spokedace and loach minnow conservation efforts in units for which the designated area was altered in the Final Rule from the Proposed Rule. Details of these conservation efforts are provided in the FEA, as is detailed information regarding all units that remain unchanged in the Final Rule.

COMPLEX 1, VERDE RIVER REACH

Final critical habitat for the Verde River includes 43 river miles that occur primarily on National Forest lands. Impacts associated with spokedace and loach minnow conservation efforts are anticipated to include:

- Impacts on public lands grazing efforts;
- Potential changes to fire management activities;
- Species management efforts; and
- Administrative costs associated with section 7 consultations.

Costs associated with conservation efforts on the final critical habitat designation for the Verde River reach are estimated to be \$2.7 million to \$3.5 million over the next 20 years (discounted at seven percent).

COMPLEX 2, EAST FORK BLACK AND NORTH FORK EAST FORK BLACK REACHES

Final critical habitat includes nearly 17 miles on the Black Fork and North Fork East Fork Black rivers. While technical corrections are made to the township, range, section legal descriptions for the confluence point of the East Fork Black and the North Fork East Fork Black rivers and the upstream endpoint on Eagle Creek in the Final Rule, the overall mileage for these units remains largely unchanged (reduced by approximately 0.5 river miles). As discussed in the FEA, impacts associated with spokedace and loach minnow conservation efforts on these units are anticipated to include:

- Impacts on public lands grazing efforts;
- Potential changes to fire management activities; and
- Administrative costs associated with section 7 consultations.

Costs associated with conservation efforts on the final critical habitat designation for the East Fork Black are estimated to be \$0.04 to \$0.25 million over the next 20 years (discounted at seven percent). Costs associated with conservation efforts on the final

critical habitat designation for the North Fork East Fork Black are estimated to be \$0.05 to \$0.41 million over the next 20 years (discounted at seven percent).

COMPLEX 4, EAGLE CREEK REACH

Final critical habitat for the Eagle Creek reach includes nearly 18 river miles that occur primarily on National Forest lands. Impacts associated with spikedace and loach minnow conservation efforts are anticipated to include:

- Impacts on public lands grazing efforts;
- Species management efforts; and
- Administrative costs associated with section 7 consultations.

Costs associated with conservation efforts on the final critical habitat designation for the Eagle Creek reach are estimated to be \$0.14 million to \$0.41 million over the next 20 years (discounted at seven percent).

COMPLEX 5, UPPER GILA RIVER REACH

Final critical habitat for the Upper Gila reach includes 94.9 river miles that occur on National Forest, Bureau of Land Management, and private lands. Impacts associated with spikedace and loach minnow conservation efforts are anticipated to include:

- Impacts on public lands grazing efforts;
- Species management efforts;
- Potential changes to fire management activities; and
- Administrative costs associated with section 7 consultations.

Costs associated with conservation efforts on the final critical habitat designation for the Upper Gila River reach are estimated to be \$0.11 million to \$2.12 million over the next 20 years (discounted at seven percent).

EXHIBIT 1. TOTAL FUTURE IMPACTS OF SPIKEDACE AND LOACH MINNOW CONSERVATION IN FINAL CRITICAL HABITAT AREAS (2006-2025), UNDISCOUNTED

STREAM SEGMENT [1]	UNDISCOUNTED		PRESENT VALUE 3%		PRESENT VALUE 7%		ANNUALIZED 3%		ANNUALIZED 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High
Verde River	\$4,520,000	\$6,183,000	\$3,526,000	\$4,763,000	\$2,654,000	\$3,534,000	\$243,000	\$334,000	\$264,000	\$368,000
Boneyard Creek	\$3,000	\$75,000	\$2,000	\$56,000	\$2,000	\$40,000	\$0	\$4,000	\$0	\$4,000
East Fork Black River	\$89,000	\$476,000	\$66,000	\$354,000	\$47,000	\$252,000	\$6,000	\$27,000	\$8,000	\$32,000
North East Fork Black River	\$102,000	\$774,000	\$75,000	\$576,000	\$54,000	\$410,000	\$6,000	\$42,000	\$8,000	\$47,000
Aravaipa Creek	\$2,912,000	\$6,687,000	\$2,165,000	\$5,681,000	\$1,542,000	\$4,803,000	\$147,000	\$385,000	\$149,000	\$462,000
Deer Creek	\$9,000	\$149,000	\$4,000	\$87,000	\$3,000	\$62,000	\$0	\$6,000	\$0	\$6,000
Turkey Creek	\$6,000	\$140,000	\$4,000	\$104,000	\$3,000	\$74,000	\$0	\$7,000	\$0	\$7,000
Gila River	\$2,878,000	\$4,107,000	\$2,127,000	\$2,921,000	\$1,515,000	\$2,080,000	\$144,000	\$200,000	\$146,000	\$205,000
San Pedro River	\$0	\$4,459,000	\$0	\$4,329,000	\$0	\$4,167,000	\$0	\$291,000	\$0	\$393,000
Eagle Creek	\$256,000	\$790,000	\$190,000	\$588,000	\$136,000	\$418,000	\$17,000	\$48,000	\$22,000	\$62,000
San Francisco River	\$790,000	\$3,172,000	\$560,000	\$2,334,000	\$398,000	\$1,664,000	\$43,000	\$171,000	\$52,000	\$194,000
Tularosa River	\$104,000	\$474,000	\$77,000	\$352,000	\$55,000	\$251,000	\$5,000	\$24,000	\$5,000	\$24,000
Frieborn Creek	\$2,000	\$57,000	\$2,000	\$43,000	\$1,000	\$30,000	\$0	\$3,000	\$0	\$3,000
Negrito Creek	\$95,000	\$257,000	\$70,000	\$191,000	\$50,000	\$136,000	\$5,000	\$13,000	\$5,000	\$13,000
Whitewater Creek	\$88,000	\$88,000	\$65,000	\$65,000	\$46,000	\$46,000	\$4,000	\$4,000	\$4,000	\$4,000
Blue River	\$4,573,000	\$5,608,000	\$3,565,000	\$4,335,000	\$2,681,000	\$3,230,000	\$247,000	\$310,000	\$272,000	\$353,000
Campbell Blue Creek	\$41,000	\$416,000	\$30,000	\$310,000	\$22,000	\$220,000	\$3,000	\$22,000	\$3,000	\$24,000
Little Blue Creek	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dry Blue Creek	\$6,000	\$153,000	\$5,000	\$114,000	\$3,000	\$81,000	\$0	\$8,000	\$0	\$8,000
Pace Creek	\$2,000	\$40,000	\$1,000	\$30,000	\$1,000	\$21,000	\$0	\$2,000	\$0	\$2,000
East Fork Gila River	\$193,000	\$1,544,000	\$155,000	\$1,161,000	\$122,000	\$838,000	\$10,000	\$78,000	\$11,000	\$79,000
Upper Gila River	\$213,000	\$3,640,000	\$158,000	\$2,841,000	\$113,000	\$2,166,000	\$11,000	\$191,000	\$11,000	\$204,000

STREAM SEGMENT [1]	UNDISCOUNTED		PRESENT VALUE 3%		PRESENT VALUE 7%		ANNUALIZED 3%		ANNUALIZED 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High
Middle Fork Gila River	\$165,000	\$553,000	\$134,000	\$423,000	\$107,000	\$313,000	\$9,000	\$28,000	\$10,000	\$29,000
West Fork Gila River	\$649,000	\$948,000	\$430,000	\$735,000	\$365,000	\$552,000	\$29,000	\$49,000	\$34,000	\$52,000
Multiple	\$333,000	\$833,000	\$248,000	\$620,000	\$176,000	\$441,000	\$22,000	\$56,000	\$31,000	\$79,000
Total Future Impacts	\$18,029,000	\$41,623,000	\$13,659,000	\$33,013,000	\$10,096,000	\$25,829,000	\$951,000	\$2,303,000	\$1,035,000	\$2,654,000

Notes:

[1] The level of grazing in the final CHD is estimated based on the location of river miles dropped from the Proposed Rule in the Verde River, Eagle Creek, and Upper Gila River units.

EXHIBIT 2. SUMMARY OF FUTURE NON-QUANTIFIED IMPACTS BY RIVER SEGMENT AND ACTIVITY IN FINAL CHD, 2006-2025

RIVER SEGMENT	WATER USERS		MINING	TRIBES	FIRE MGT
	DOMESTIC GW WELLS IN CHD [1]	IRRIGATION WELLS IN CHD [2]	NAME OF FACILITY [2]	NAME OF TRIBE [3]	ACRES [4]
Verde River	0	0	None	None	190
Boneyard Creek	-	0	None	n/a	0
East Fork Black River	1	0	None	n/a	19
North East Fork Black River	-	0	None	n/a	0
East Fork White River	-	0	None	None	0
Aravaipa Creek	31	9	None	n/a	0
Deer Creek	-	0	None	n/a	0
Turkey Creek	-	0	None	n/a	0
Gila River	8	5	Ray/Hayden	None	0
San Pedro River	18	4	Ray/Hayden	n/a	169
Eagle Creek	3	1	None	None	0
San Francisco River	24	7	None	n/a	182
Tularosa River	7	0	None	n/a	0
Frieborn Creek	-	0	None	n/a	0
Negrito Creek	-	0	None	n/a	0
Whitewater Creek	9	1	None	n/a	0
Blue River	7	2	None	n/a	0
Campbell Blue Creek	-	0	None	n/a	0
Little Blue Creek	-	0	None	n/a	0
Dry Blue Creek	-	0	None	n/a	0
Pace Creek	-	0	None	n/a	0
East Fork Gila River	4	0	None	n/a	0
Upper Gila River	11	3	Tyrone	n/a	61
Middle Fork Gila River	-	0	None	n/a	0
West Fork Gila River	8	0	None	n/a	0
Total	131	62	See FEA Sec 5	See FEA Sec 8	621

Notes:

[1] The number of domestic wells is presented as an indicator of the pressure by domestic users on water supplies in final CHD. The number of wells in the final CHD are estimated based on the location of river miles dropped from the Proposed Rule in the Verde and Upper Gila River units.

[2] The name of mining facilities that rely on water resources in proposed CHD are included here. A detailed discussion of these resources is included in Chapter 5 of this report.

[3] The Tribes with lands in final CHD are included here. A detailed discussion of potential impacts to Tribes is included in Chapter 8 of this report. The reservation lands of the White Mountain Apache and San Carlos Apache are excluded from final CHD.

[4] The number of wildland and urban interface acres (WUI) are presented as an indicator of areas where fire management efforts are most likely to be undertaken. The acreage of WUI in the final CHD are estimated based on the percent reduction in river miles from the Proposed Rule in the Verde River and Upper Gila River units.