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December 3, 2019

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RE: Sixty-Day Notice of Intent to Sue Fort Huachuca and U.S. Fish and Wildlife Service for Endangered Species Act Violations jeopardizing the San Pedro River and the endangered species that represent and depend on the River.

Dear Dr. Espers, Mr. Bernhardt, Mr. McCarthy, Maj. Gen. Potter, Col. Rambo, Ms. Everson, Ms. Lueders, and Mr. Humphrey,

The U.S. Secretary of Defense, Secretary of the Army, Fort Huachuca Commanding General and Garrison Commander, the U.S. Secretary of the Interior, U.S. Fish and Wildlife Service Director, Region 2 Director, and Arizona Ecological Services Director are hereby notified that the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to file suit, pursuant to the citizen suit provision of the Endangered Species Act ("ESA"), 16 U.S.C. § 1540(g), and the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 701-706, to compel the reinitiation of ESA Section 7 consultation[1] to remedy Fort Huachuca activities jeopardizing the San Pedro River and the endangered species that represent and depend on the San Pedro.

EXECUTIVE SUMMARY

The San Pedro River is the last surviving, undammed desert river in the Southwest.[2] In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area ("SPRNCA") within the Sierra Vista Sub-basin "[i]n order to protect the riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."[3] The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River is one of Arizona's, the Nation's, and the World's environmental crown jewels.[4]

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[1] 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

[2] *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "*Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental Cooperation,* 1999.; *Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981.; "*In Arizona Desert, a Desert Oasis in Peril*," Jon Christensen, New York Times, May 4, 1999.; "*A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, National Geographic*, April 2000.; "Alternative Futures for Landscapes in the Upper San Pedro River Basin of Arizona and Sonora, Carl Steinitz, Robert Anderson, Hector Arias, Scott Bassett, Michael Flaxman, Tomas Goode, Thomas Maddock III, David Mouat, Righard Peiser and Allan Shearer, USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005.; "We pump too much water out of the ground—and that's killing our rivers, Alejandra Borundo, National Geographic, October 2, 2019.

[3] *Arizona-Idaho Conservation Act, 16 U.S.C. § 460xx(a)*, November 18, 1988.

[4] "*Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem,* Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978.; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values, BLM,* 1987.; "*U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report*, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988.; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988.; *San Pedro Riparian Area*," Sam Negri, Arizona Highways Magazine, April 1989.; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.; *"Arizona Riparian Protection Program Legislative Report," ADWR*, July 1994.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "*Rio San Pedro, One of the last great places*," Robert C. Dyer, Arizona Highways Magazine, May 1996.; "*The Ageless Waters of the San Pedro River*," Roseann Beggy Hanson, Arizona Highways Magazine, November 1998.; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999.; "*In Arizona Desert, a Desert Oasis in Peril,*" Jon Christensen, New York Times, May 4, 1999.; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, National Geographic, April 2000.; "*If National Geographic can see the San Pedro as a jewel, can't those of us living here?*" Editorial, Sierra Vista Herald, April 25, 2000.; ; ; "*A treasure at risk, Bill threatens San Pedro River*," Editorial, Arizona Republic, May 23, 2002.; "*Siphoning the San Pedro*," Editorial, Arizona Daily Star, May 26, 2002.; "*Last Great Places, San Pedro River, Miracle in the Desert*, The Nature Conservancy Website,

The San Pedro River in summer:

© Robin Silver

August 20, 2002.; "*Riparian rip-off, A silly rider has popped up in Congress, again – and should die again*," Editorial, Arizona Republic, May 21, 2003.; and "*A river to save, the fate of the San Pedro will rest on McCain's shoulders*," Editorial, Arizona Republic, September 2, 2003.

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year, will cease within the next century.[5] San Pedro River base flow is disappearing because the Fort Huachuca/Sierra Vista area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.[6] Department of Defense/Fort Huachuca-attributable unmitigated, deficit groundwater pumping is a major contributor to this problem.[7]

We are compelled, at this time, to seek judicial assistance in saving the San Pedro River and its representative and dependent endangered species for three major reasons:

1. We have newly secured a report previously covered up by Fort Huachuca, titled "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared by Fort Huachuca contractor, GeoSystems Analysis, Inc., in 2010.[8] The report finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003;[9] and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."[10]

   Fort Huachuca failed to share this report with the U.S. Fish and Wildlife Service ("FWS")[11] during the last evaluation in 2014 of Fort Huachuca's effects on the San Pedro River for preparation of the March 31, 2014, Endangered Species Act ("ESA") Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014. ("BiOp").[12]

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[5] Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

[6] Ibid.

[7] BiOp at 80, 85, 154, and 169.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019.

[8] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

[9] Ibid., pages 3-10, 11, 12 and 13.

[10] Ibid., page 3-11.

[11] Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

[12] U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

The March 31, 2014, BiOp authorizes Fort Huachuca activities. If the Base had not covered up the GeoSystems (2010) report conclusions, Fort Huachuca activities would not have been cleared to the current levels.

2. The City of Sierra Vista and Cochise County have failed to keep their promise to "balance the area's water deficit by 2011,"[13] while the State of Arizona and the Arizona Department of Water Resources ("ADWR") have approved 431 new wells since December 31, 2011,[14] when data gathering ended for the BiOp.[15]

Because of the failure of Sierra Vista, Cochise County, and ADWR to keep their promise and to help Fort Huachuca mitigate the approximate 40% of the off-post groundwater pumping attributable to the Base,[16] Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area will be increasing by 61.9% since the BiOp from 1,453 acre-feet per year[17] to approximately 2,325.2 acre-feet per year.[18]; and,

3. New hydrological modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdown) at year 2100 show that "[d]rawdowns exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."[19] These new findings are from Integrated Hydro Systems from Boulder, Colorado.

Relating to the Army's covered up GeoSystems (2010) report, Integrated Hydro (2019) also concludes that,

> "It should be noted that this evaluation [by Integrated Hydro (2019)] does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this [Integrated Hydro (2019)] study, the total Fort-Attributable pumping impacts on the San Pedro

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[13] "USPP's resolution called a 'bold step;' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

[14] Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[15] BiOp at 3.

[16] BiOp at 28, 153, 154 and 156.

[17] BiOp at 80, 85, 154, and 169.

[18] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[19] Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019., page 13.

River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."[20]

Integrated Hydro (2019) summarizes their new modeling of simulated Fort-attributable groundwater levels (or drawdown) at year 2100 in the following illustration of the simulated reduction in streamflow from Fort-attributable groundwater pumping:

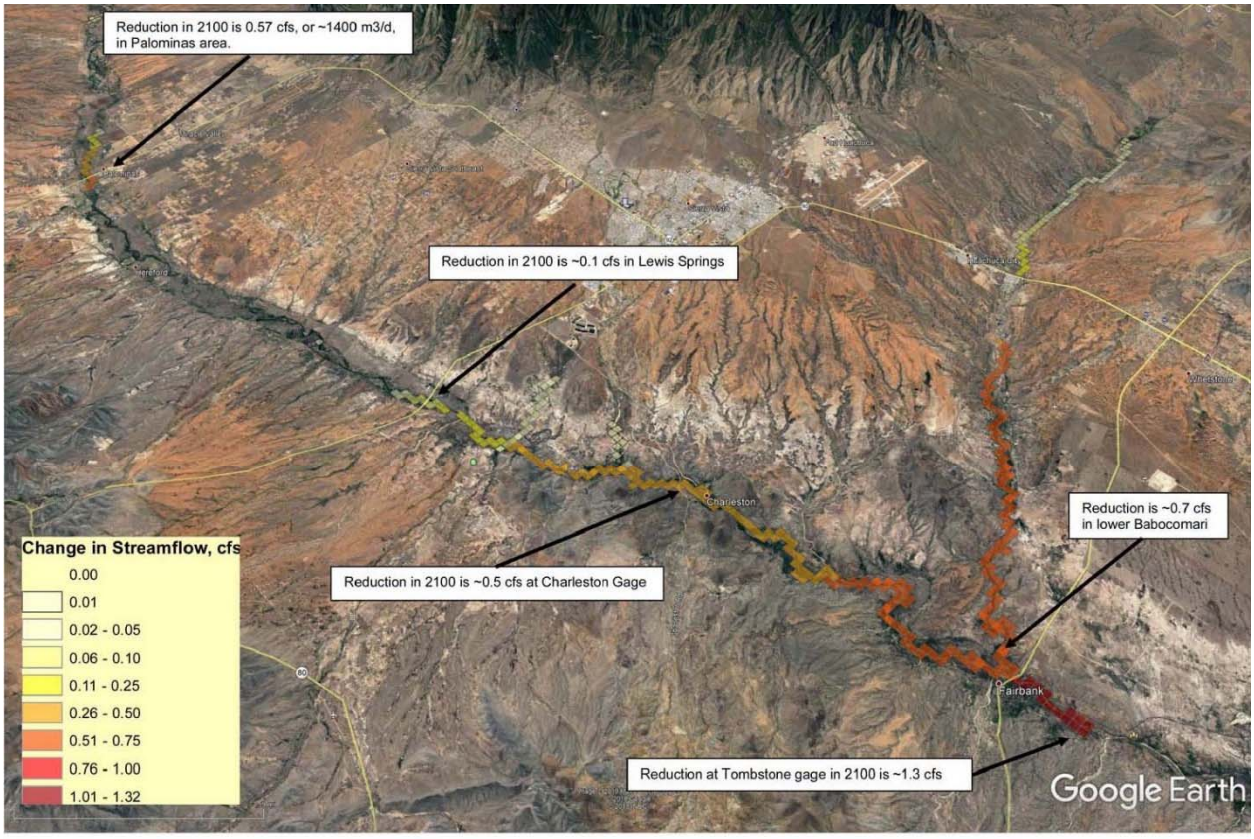

Figure 16. Change in Winter Streamflow (cfs) at Year 2100 due to Fort-Attributable Groundwater Pumping and Recharge (Southern SPRNCA Area). Positive values indicate streamflow decreases, and Negative values indicate streamflow increases. 24

In addition to the above three major findings that have compelled us to initiate these legal proceedings, we have identified multiple examples of clear violations of law by Fort Huachuca and FWS.

The Endangered Species Act ("ESA") requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize the survival and the recovery of federally protected endangered species and their essential habitat.[21] The consultation must be based on the best available scientific information.[22] If, after a consultation, significant new information becomes available, a new consultation must take place.[23] In addition, the Administrative

[20] Ibid., pages 4-5.

[21] 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

[22] 16 U.S.C. § 1536(a)(2).

[23] 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16; 50 C.F.R. § 402.14(g).

Procedure Act requires that federal decisions are not "arbitrary, capricious, or an abuse of discretion."[24]

All federal activities at Fort Huachuca are currently authorized by the March 31, 2014, FWS Biological Opinion on ongoing and future military operations and activities occurring or programmed to occur at or near Fort Huachuca between 2014 and 2024, amended May 16, 2014 ("BiOp").[25] The BiOp is based on information provided to FWS by Fort Huachuca in the November 13, 2013, Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca ("PBA").[26] Species representing and dependent on the San Pedro River evaluated in the BiOp include Huachuca Water Umbel, Jaguar, Chiricahua Leopard Frog, Mexican Spotted Owl, Lesser Long-nosed Bat, Ocelot, and Sonora Tiger Salamander.

The BiOp currently authorizing Fort Huachuca activities is no longer valid for three reasons: (1) the BiOp failed to use the best available scientific information and arrives at its conclusions in an arbitrary and capricious manner, (2) the BiOp has not been reexamined as required with subsequent new San Pedro River related listings, and (3) the BiOp has not been reexamined as required as new information has become known.

Based on a failure to use the best available scientific information, the BiOp wrongly concludes that the Fort's operations will not jeopardize the continued existence and recovery of federally protected species representing and dependent upon the San Pedro River. The BiOp arrives at its erroneous non-jeopardy conclusion owing to the facts that:

1. The BiOp inappropriately relies upon speculative water-savings credits for "avoided future use" that fail to retire active water uses.;[27]
2. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel that had already ceased pumping in 2004,[28] and had no chance of being restarted because 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years would be captured water that would otherwise supply surface flow to the San Pedro.; [29]
3. The BiOp inappropriately relies upon an arbitrary limitation of the BiOp's analysis time to ten years.;

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[24] 5 USC §706(2)(A).

[25] U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp").

[26] Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

[27] Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow; to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

[28] Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. *See Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget; U.S. Geological Survey, 2014, Table 4, page 8.

[29] *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/ ; See in particular: FIGURE 47.

4. The BiOp fails to include in its hydrological modeling, the fact that the effects of Fort Huachuca's pre-BiOp on post groundwater pumping were already harming the River significantly by 2003,[30] and that even if all groundwater pumping were stopped as of 1988, "the cone of depression … in the Sierra Vista area would not recover completely in 100 years.";[31] and,

5. The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow, in spite of the fact that FWS' concurrence contradicts its own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,[32] Pupfish,[33] Spikedace[34] and Loach Minnow.[35]

These errors, (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [*16 U.S.C. § 1536*(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Since FWS' March 31, 2014, BiOp release, two more species representative of and dependent upon the San Pedro River, Yellow-billed Cuckoo[36] and Northern Mexican Gartersnake,[37] have been added to the federal list of endangered species. When new species are added to the federal list and are affected by federal actions such as Fort Huachuca's groundwater pumping, the law requires that Fort Huachuca consults with FWS to ensure that the Base's activities will not jeopardize survival and recovery of these species.[38] Fort Huachuca has not consulted with FWS as required in spite of the fact that the Base's activities are jeopardizing the survival and recovery of these species. Fort Huachuca's failure to consult with FWS to prevent

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[30] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010, page 3-11.

[31] U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca; August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix., pages 14 & 15.

[32] Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii extimus*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

[33] Desert Pupfish (*Cyprinodon maularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

[34] Spikedace (*Media fulgida*) Recovery Plan, USFWS, September 1991.

[35] Loach Minnow (*Tiaroga cobitis*) Recovery Plan, USFWS, September 1991.

[36] Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

[37] Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

[38] 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

jeopardizing Yellow-billed Cuckoo and Northern Mexican Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Since release of the March 31, 2014, BiOp, new information is now available that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated;[39] (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release; and (4) that Fort Huachuca covered up and failed to provide FWS the report, GeoSystems (2010) for BiOp preparation.

Specifically, since BiOp release, new information includes,

1. On-post stormwater recharge has provided 60% less recharge for the last four years than anticipated in the BiOp.;[40]
2. On-post effluent recharge has provided 47% less recharge for the last five years than anticipated in the BiOp.;[41]
3. Off-post, the Palominas stormwater recharge project has provided 90% less recharge than anticipated in the BiOp.;[42]
4. Arizona has become both hotter and drier.[43] Climate models project that precipitation and soil moisture in the Southwest will continue to decrease.[44] The recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and "Incidental Recharge" (BiOp at 168) will be diminished even further in the future.;[45]

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[39] Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

[40] Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

[41] Ibid.

[42] Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

[43] National Oceanic and Atmospheric Administration National Centers for Environmental information, City Time Series, published October 2019, retrieved on October 22, 2019 from http://www.ncdc.noaa.gov/cag/ .

[44] Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (p. 217).; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN (pp. 231, 238).

[45] Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose,

5. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area[46] will be increasing by 61.9 % from 1,453 acre-feet per year[47] to approximately 2,325.2 acre-feet per year.[48]; and

6. Fort Huachuca covered up and failed to provide to FWS for BiOp production,[49] GeoSystems (2010)[50] which finds that (a) Fort-attributable groundwater pumping was already causing harm to the San Pedro River by 2003;[51] and that (b) the harm to the San Pedro River from Fort-attributable groundwater pumping's "peak impacts to simulated baseflow occur in 2050."[52]

This new information reveals effects of Fort Huachuca's actions that are affecting the San Pedro River and its dependent endangered species and Critical Habitat to an extent not previously considered. A new consultation and BiOp addressing this new information are now required by law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

In 60 days from the date of this Notice, in accordance with the ESA citizen suit provision, 16 U.S.C. § 1540(g), if Fort Huachuca and FWS fail to correct the multiple violations of law listed above, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, intend to seek judicial remedy.

FACTUAL BACKGROUND

The San Pedro River

The San Pedro River is the last surviving, undammed desert river in the Southwest.[53] In 1988, the U.S. Congress created the San Pedro Riparian National Conservation Area

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D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN.; Seager, R., T. Mingfang , L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. Nature Climate Change 3: 482-486.

[46] Sierra Vista Subbasin

[47] BiOp at 80, 85, 154, and 169.

[48] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[49] Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

[50] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

[51] Ibid., pages 3-10, 11, 12 and 13.

[52] Ibid., page 3-11.

[53] *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; *"Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River, Commission For Environmental*

("SPRNCA") within the Sierra Vista Sub-basin.[54] The U.S. Congress created SPRNCA in recognition of the fact that the San Pedro River, specifically within the Sierra Vista Sub-basin, is one of Arizona's, the Nation's, and the World's environmental crown jewels.[55] In 1993, Life Magazine recognized the San Pedro River as one of America's Last Great Places."[56]

In 1999, the North American Free Trade Agreement's Commission for Environmental Cooperation observed,

> "Every year, millions of songbirds migrate from their wintering grounds in Mexico and Central America to their summer breeding habitats in Canada and the northern United States. In order to successfully cross the desert landscapes of northern Mexico and the southwestern United States, migrating songbirds congregate and travel along a small number of north-south oriented corridors where they are able to find shelter, food, and water. Especially, they travel along the rivers: the Rio Grande/Río Bravo, the Colorado, the Santa Cruz, and the San Pedro.
>
> Over the last century, we have lost much of the riparian habitat upon which many migratory bird species depend. …
>
> Unlike the other rivers listed above [Rio Grande/Rio Bravo, Colorado, and Santa Cruz], the overall health and quality of the upper San Pedro River and its riparian habitat have not declined significantly over the last century. On both sides of the border, the San Pedro River continues to support riparian habitat of exceptional quality and increasing scarcity elsewhere, offering an alternative route for species whose previous migratory pathways have been lost or degraded to the point where they can no longer sustain large populations. Indeed, there is mounting evidence suggesting that more birds use the upper San Pedro now than ever before. However,

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Cooperation, 1999.; *Desertification of the United States*, David Sheridan, Council on Environmental Quality 1981.; "*In Arizona Desert, a Desert Oasis in Peril*," Jon Christensen, New York Times, May 4, 1999.; "*A Special Place, The Patience of a Saint San Pedro River," Barbara Kingsolver, National Geographic*, April 2000.; "We pump too much water out of the ground—and that's killing our rivers, Alejandra Borundo, National Geographic, October 2, 2019.

[54] *Arizona-Idaho Conservation Act, 16 U.S.C. § 460xx(a)*, November 18, 1988.

[55] "*Unique Wildlife Ecosystems, Arizona, Proposed Unique Ecosystem,* Nationally Significant, San Pedro River," U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C., November 6, 1978.; *Assessment of Water Conditions and Management Opportunities in Support of Riparian Values, BLM,* 1987.; "*U.S. Senate Committee on Energy and Natural Resources, San Pedro Riparian National Conservation Area Report*, No. 100-525, 100th Cong., 2d sess., Sep. 7, 1988.; *Arizona-Idaho Conservation Act*, U.S. Congress 1988 (S. 2840), 16 U.S.C. § 460xx(a), U.S. Congress, November 18, 1988.; *San Pedro Riparian Area*," Sam Negri, Arizona Highways Magazine, April 1989.; *Arizona Riparian Inventory and Mapping Project*, Arizona Game and Fish Department, Phoenix, December 1, 1993.; *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.; *"Arizona Riparian Protection Program Legislative Report," ADWR*, July 1994.; *American Birding Association, Inc., "Winging It"*, Volume 7, Number 10, October 1995.; "*Rio San Pedro, One of the last great places*," Robert C. Dyer, Arizona Highways Magazine, May 1996.; "*The Ageless Waters of the San Pedro River*," Roseann Beggy Hanson, Arizona Highways Magazine, November 1998.; *Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat On the Upper San Pedro River*, Commission For Environmental Cooperation, 1999.; "*In Arizona Desert, a Desert Oasis in Peril,*" Jon Christensen, New York Times, May 4, 1999.; *A Special Place, The Patience of a Saint San Pedro River*, Barbara Kingsolver, National Geographic, April 2000.; "*If National Geographic can see the San Pedro as a jewel, can't those of us living here?*" Editorial, Sierra Vista Herald, April 25, 2000.; ; ; "*A treasure at risk, Bill threatens San Pedro River*," Editorial, Arizona Republic, May 23, 2002.; "*Siphoning the San Pedro*," Editorial, Arizona Daily Star, May 26, 2002.; "*Last Great Places, San Pedro River, Miracle in the Desert*, The Nature Conservancy Website, August 20, 2002.; "Riparian *rip-off, A silly rider has popped up in Congress, again – and should die again*," Editorial, Arizona Republic, May 21, 2003.; and "*A river to save, the fate of the San Pedro will rest on McCain's shoulders*," Editorial, Arizona Republic, September 2, 2003.

[56] *This Land Is Our Land, America's Last Great Places – and How They Might Be Saved Forever*," Life Magazine, October 1993.

there has also been growing concern that this valued transboundary ecosystem, and the hydrological system that supports it, may be on an unsustainable course.

As in many regions along the Mexican and US border, the upper San Pedro valley faces one of the most pressing challenges of the next century - water scarcity."[57]

In the Upper San Pedro Basin, groundwater from the deep local aquifer seeps from the banks of the San Pedro River to provide base flow, or surface flow in the River during the driest times of the year.[58] Wells within the sub-basin intercept this groundwater and aquifer water that would otherwise surface or day-light as San Pedro River surface flow. There is no difference between groundwater and surface water in the Sierra Vista Sub-basin. The water is intimately connected. It is the same water.[59]

Hydrological modeling shows that San Pedro River base flow, or stream flow during the driest times of year will cease within the next century. San Pedro River base flow will cease within the next century because the area's excessive, uncontrolled, deficit groundwater pumping intercepts water that would otherwise provide surface flow to the River.[60]

In June 2011, because of the uncontrolled, excessive, local groundwater pumping, hydrologist Dr. Laurel Lacher's modeling concluded "much" of the aquifer-sourced San Pedro River base flow, or stream flow during the dry times of the year "will cease…over the next century." Dr. Lacher's exact quotation (2011) states:

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[57] Ribbon of Life, An Agenda for Preserving Transboundary Migratory Bird Habitat on the Upper San Pedro River, North American Free Trade Agreement Commission for Environmental Cooperation, 1999.

[58] *Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area,* Arizona; Arizona Water Commission, March 18, 1974; *Correspondence; from: Stephen G. Thompson, Director, Fort Huachuca Directorate of Engineering and Housing; to: Dr. Walter S. Patton, Cochise College President*; RE: Response to your request for addressing the water issue in the Upper San Pedro River area.; March 30, 1994.; *SIERRA VISTA SUBWATERSHED HYDROLOGY PRIMER*, produced for the City of Sierra Vista, Bella Vista Water Company, Inc. and Pueblo Del Sol Water Company, ASL Hydrologic & Environmental Services in conjunction with R. Allan Freeze Engineering, Inc., December 1994.; *Upper San Pedro River case study*, Arizona Riparian Protection Program, Legislative Report, Arizona Department of Water Resources, Pages 147-208, July 1994.; *A Groundwater Flow Model of the Sierra Vista Subwatershed of the Upper San Pedro Basin, Southeastern Arizona*, Steven W. Correll, Frank Corkhill, Daryl Lovvik, and Frank Putman, Arizona Department of Water Resources Hydrology Division, Modeling Report No. 10, Phoenix, Arizona December 1996.; *Hydrogeologic Investigations of the Sierra Vista Subwatershed of the Upper San Pedro Basin*, Cochise County, Southeast Arizona, D.R. Pool and Alissa L. Coes, Water-*Resources* Investigations Report 99-4197, USGS, 1999.; *Order, Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al., CIV99-203 TUC ACM*, 198 F. Supp. 2d 1139, April 8, 2002.; *Ground-water flow model of the Sierra Vista Subwatershed and Sonoran portions of the Upper San Pedro Basin*, southeastern Arizona, United States, and northern Sonora, Mexico, D.R. Pool and J.E. Dickinson, U.S. Geological Survey Scientific Investigations Report 2006-5228, 48 p.; *Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; *Order, Center for Biological Diversity et al. v. Kenneth L. Salazar, et al., CV 07–484–TUC–AWT; 2011 WL 2160254 (D.Ariz.)*; May 28, 2011. Correspondence, *from: Julie A. Decker, Deputy State Director, Bureau of Land Management Arizona Resources Division; to: Mr. Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources*; Subject: Designation of Adequate Water Supply (File No. 40-700705, Pueblo Del Sol Water Company) and Water Report (File No. 53-700704, The Oaks); March 16, 2012.

[59] Ibid.

[60] Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

> "In general, the simulations predict that, in the absence of any major water use changes in the basin, much of the San Pedro and Babocomari rivers will cease to have perennial baseflow over the next century due to the widespread impacts of projected groundwater pumping."[61]

Dr. Lacher has since updated this 2011 study and in February 2018, Lacher's conclusion is essentially the same:

> "The capture analysis in this study demonstrates that simulated natural recharge and existing MAR [Managed Aquifer Recharge] are insufficient to meet the net pumping demand in the model area, even at the reduced pumping rates in this study compared with the 2011 model update by Lacher."[62]

In February 2017, the U.S. Geological Survey ["USGS" or "Gungle et al. (2017)] similarly notes:

> "Nonetheless, it should be obvious that a subwatershed perennially in deficit will likely never see an increase in natural groundwater discharge to the river…Even if groundwater pumping were to stop today and the groundwater budget balance was positive for decades to come, the effects of pumping over the past century would eventually capture surface flow from the river (Leake and others, 2005; Barlow and Leake, 2012). According to recent modeling, some capture of surface flow from the San Pedro River is already occurring (Lacher and others, 2014) …
>
> Base flow has been declining at the Palominas, Charleston, Tombstone, and Lower Babocomari gaging stations over the entire period of record…groundwater flow modeling, which can isolate the effects of groundwater pumping, has shown that water levels in the subwatershed have declined since 1902, reducing the groundwater gradients that influence groundwater flow toward the river by as much as 17 percent (Lacher and others, 2014). Water-level declines also reduce the total volume of water that flows to the river…
>
> The expanding cone of depression (as expressed by the declining horizontal hydraulic gradients and decreasing water levels on Fort Huachuca) should be of interest to water managers and to those with an interest in the SPRNCA. Even if pumping were immediately reduced or stopped, the cone would continue to propagate for decades or more (Leake and others, 2005; Barlow and Leake, 2012). Without significant mitigation measures, it is likely too late already to prevent declining water levels from reaching the San Pedro River riparian area from Charleston to Tombstone."[63]

Because of the San Pedro River's rarity and because of the groundwater pumping threat that it faces, many endangered species who represent the River's health depend on the San Pedro

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[61] Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.

[62] Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.

[63] Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

for survival and for recovery. These endangered species include Southwestern Willow Flycatcher,[64] the Western Yellow-billed Cuckoo,[65] the Northern Mexican Gartersnake,[66] Ocelot, Jaguar, Loach Minnow,[67] Spikedace[68] and Huachuca Water Umbel.[69]

FACTUAL BACKGROUND

The History of Fort Huachuca's water problem and the Impact of the Base's Groundwater Pumping

Fort Huachuca's water problem and its vulnerability to "no control…over the drilling of new wells in the privately owned area" off post have been known to the U.S. Army for 50 years.[70] Today, Fort Huachuca's water problem is reaching the point of no return.[71]

A 1966 report by the U.S. Geological Survey and Fort Huachuca, "Water Resources of Fort Huachuca Military Reservation," says,

> "A second well field, if developed in the North Gate-Libby Field area, would partly accomplish the same result [decrease the draft on the ground-water reservoir] by decreasing the heavily concentrated draft on the ground-water reservoir of the Fort Huachuca well field, and by utilizing groundwater that now moves unused

[64] Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii extimus*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

[65] "San Pedro Riparian National Conservation Area…Perhaps 30 percent of the western U.S. population Yellow-billed Cuckoos breed here" from Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine December 2002, Vol. 104, No. 5.; At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River from, Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.: SPRNCA has the largest population of Cuckoos in the western United States. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

[66] Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

[67] Loach Minnow (*Tiaroga cobitis*) Recovery Plan, USFWS, September 1991.

[68] Spikedace (*Media fulgida*) Recovery Plan, USFWS, September 1991.

[69] Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, Final Rule, U.S. Fish and Wildlife Service (USFWS), Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

[70] "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S.Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.; "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970

[71] Simulated groundwater and surface water conditions in the Upper San Pedro Basin 1902-2105 Preliminary Baseline Results, Task 1 Report for December 2010 Contract Prepared for Friends of the San Pedro River and The Walton Family Foundation, Lacher Hydrological Consulting, Tucson, Arizona, June 2011.; Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.; Interim Update to Sierra Vista Subwatershed Pumping and Artificial Recharge Rates in the Upper San Pedro Basin Groundwater Model, Prepared for The Nature Conservancy, Lacher Hydrological Consulting, Tucson, Arizona, February 2018.; Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019.

northeastward to the San Pedro River. … In the East Gate-Fort Huachcua-Sierra Vista area, the cone of depression caused by pumping is readily apparent."[72]

The additional problem for Fort Huachuca of "no control over the rate of pumping nor over the drilling of new wells in the privately-owned area" has been recognized by the Army for almost as long. In July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

> "The ground water in the area of the post well field is overdrawn, and a large cone of depression has been formed in the water table. Water levels in the area of influence (a radius of 1 to 2 miles) have continued to decline and will continue until and unless pumping is reduced. The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately-owned area. …
>
> Increasing the pumping capacity in or near the post well field will aggravate the problem of declining water levels. The water requirements for the base should not be increased until new sources of water have been put on line to lower the pumping rate from the existing well field, and to furnish reserve pumping capacity."[73]

ACOE then commissioned an additional study to confirm the problems that they had identified. On March 18, 1974, the Arizona Water Commission reports on a study requested by ACOE "to prepare a special report evaluating the adequacy of Fort Huachuca's water supply based upon the Commission's regional studies,"

> "The model predicts reductions in the aquifer discharge to the rivers ranging from 20 percent to about 50 per cent for the four runs. This would reduce base flows as well as and probably reduce the water supply available to phreatophytic vegetation along portions of the San Pedro and Babocomari Rivers."[74]

Then, following up on the Arizona Water Commission's report, on March 29, 1974, ACOE again warns of Fort Huachuca's water problem in "Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report,"

> "Two significant cones of depression have developed in the area due to pumping in the Fort Huachuca-Sierra Vista area and the Huachuca City area, which includes the former community of Huachuca Vista…The depression cone in the Fort Huachuca-Sierra Vista area is centered about the military post well field and appears to extend for approximately 4 miles…the cone of depression is approximately 1.5 miles wide. …

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[72] "Water Resources of Fort Huachuca Military Reservation, Southeastern Arizona, Geological Survey Water-Supply Paper 1819-D, S.G. Brown, E.S.Davidson, L.R. Kister, and B.W. Thomsen, U.S. Geological Survey, Prepared in cooperation with the U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, 1966.

[73] "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

[74] *Status Report of a Study of the Adequacy of the Water Supply of the Fort Huachuca Area,* Arizona; Arizona Water Commission, March 18, 1974.

> Heavy pumping in the Huachuca Vista area has apparently reversed the direction of ground-water flow along the reach of the Babocomari River for several miles downstream from Huachuca City…"[75]

Thirty years later, Fort Huachuca's water problem was still making headlines. On February 4, 2006, in "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

> FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.
>
> Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. …
>
> "The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. …
>
> Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.
>
> While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.
>
> What is unrecognized by many is "we didn't do well in some areas," Hunter said.
>
> One area of concern of water…
>
> With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said."[76]

Fort Huachuca obviously realized that the "water conservation clock" was problematic when it covered up GeoSystems (2010)[77] where the Base's own consultant found that,

> "Figure 23 ['Changes in Stream Discharge Due to ON-POST'] shows that, out of these three years, the simulated impact of on-post wells on baseflow in the Babocomari and the San Pedro rivers peaked in 2003, with the greatest impact, depletions of 1 to 2 cubic-feet per second (cfs), occurring at the confluence of the two rivers."[78] …

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[75] Report on Water Supply, Fort Huachuca and Vicinity, Arizona, Main Report, U.S. Army Engineer District, Los Angeles, Corps of Engineers, March 29, 1974.

[76] "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 4, 2006.

[77] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

[78] Ibid., page 3-11.

Figure 24 ['Changes in Stream Discharge Due to All Fort-Attributable Pumping'] shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23 ['Changes in Stream Discharge Due to ON-POST'], those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence."[79]

"…peak impacts to simulated baseflow occur in 2050 [page 3-11] … Figure 27 ['Stream Reaches Pumped Dry by FORT-Related Wells ON- and OFF-Post'] shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping."[80]

And now in 2019, the full extent of Fort Huachuca-attributable groundwater pumping from 2011 to 2100, and the Base-attributable groundwater pumping' harm to the San Pedro River is becoming more apparent. On November 21, 2019, Integrated Hydro Systems finds that at year 2100, modeling simulating the effects of Fort-attributable groundwater pumping on local groundwater levels (or drawdowns)

"… exceed 18 meters in the central high density [Fort Huachuca/Sierra Vista] pumping well area, 2 meters beneath and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."[81]

Even more concerning is Hydro Systems (2019) further conclusion that,

"It should be noted that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011 [where the GeoSystems (2010)] study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."[82]

Predictably, though, "those who share the Sierra Vista Subwatershed," Fort Huachuca, Sierra Vista, Huachuca City, Tombstone, Bisbee, and Cochise County have failed the congressional mandate to bring use and recharge into balance by 2011. Consequently, the words of Fort Huachuca Garrison Commander Colonel Hunter, "[t]he biggest threat to this Southern Arizona Army post is water" now ring more true than ever. The "water conservation clock" has run out.

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[79] Ibid.

[80] Ibid., page 3-15.

[81] Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100), Prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, CO, www.integratedhydro.com, November 21, 2019., page 13.

[82] Ibid., pages 4-5.

ENDANGERED SPECIES ACT LAW

I. ESA requirements

A. Section 7 consultation requirements

The ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). Its purpose is to conserve endangered and threatened species and the ecosystems upon which they depend. 16 U.S.C. § 1531(b). Section 7(a)(2) of the ESA prohibits federal agencies from undertaking actions that are "likely to jeopardize the continued existence" of any listed species or "result in the destruction or adverse modification of" critical habitat. *Id.* § 1536(a)(2). "Jeopardy" results when it is reasonable to expect, "directly or indirectly," that the action would appreciably reduce "the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02. "Adverse modification" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species." *Id.*

To enable compliance with section 7's substantive mandate, the ESA and its implementing regulations impose specific procedural duties on federal agencies, requiring an "action agency"—in this case, the Fort—to consult with FWS before undertaking any "action" that "may affect" a listed species or its designated critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). An "action" includes "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies," in which there is "discretionary Federal involvement or control." 50 C.F.R. §§ 402.02, 402.03. The "may affect" threshold for consultation under section 7(a)(2) is low, and is triggered by "[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character." *Nat'l Parks Conservation Ass'n v. Jewell*, 62 F. Supp. 3d 7, 13 (D.D.C. 2014) (quoting 51 Fed. Reg. 19,926, 19,949–50 (June 3, 1986)). FWS and the action agency must use the best scientific and commercial data available throughout the consultation process. 16 U.S.C. § 1536(a)(2).

As a first step, the Federal action agency prepares a biological assessment ("BA"). 50 C.F.R. §§ 402.02, 402.12. The BA must evaluate the potential "effects of the action" on listed and proposed species and designated and proposed critical habitat within the "action area" and determine whether any such species or habitat are "likely to be adversely affected by the action." *Id.* § 402.12(a), (c). "Effects of the action" are defined as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action." *Id.* § 402.02. "Indirect effects" are those that are "caused by the proposed action and are later in time, but still are reasonably certain to occur." *Id.* "Interrelated actions" are those that are "part of a larger action and depend on the larger action for their justification." *Id.* "Interdependent actions" are those that "have no independent utility apart from the action under consideration." *Id.* Finally, "action area" is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." *Id.*

The type of consultation required is determined by the degree of anticipated effects reported in the BA. Informal consultation is sufficient if the action agency determines, with FWS's written concurrence, that the proposed action "may affect," but is "not likely to adversely affect" the species or its critical habitat. *Id.* §§ 402.13(a), 402.14(b)(1). If informal consultation or the BA conclude that the proposed action "may affect" a listed species or its critical habitat,

the action agency must initiate formal consultation with FWS. *Id.* § 402.14(a). During the consultation process, the action agency may not make any irreversible or irretrievable commitments of resources. 16 U.S.C. § 1536(d). Formal consultation is completed when FWS issues a Biological Opinion determining whether the proposed action, taken together with its cumulative effects, is "likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat." 50 C.F.R. § 402.14(g)(4).

B. Biological Opinions

The BiOp must include a "detailed discussion of the effects of the action on listed species or critical habitat." *Id.* § 402.14(h)(2). The BiOp can either find (1) no jeopardy or no adverse modification; (2) that the action will cause jeopardy or adverse modification but such jeopardy or adverse modification can be avoided by implementing certain reasonable and prudent alternatives to the proposed action as designed; or (3) that jeopardy or adverse modification is unavoidable and thus the action cannot proceed. *Id.* § 402.14(h)(3). The BiOp's finding must be based on FWS's independent analysis of the "action area," the "effects of the action"—including the action's "indirect effects" and effects of "interrelated or interdependent" activities—and the "cumulative effects" on listed species or critical habitat. *Id.* §§ 402.02, 402.14(g). In other words, the BiOp must consider "*all* the impacts . . . which *can be anticipated*" to result from the action "using the best available science." *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002) (emphasis added). This means "[a]n agency may not ignore future aspects of a federal action" by segmenting or cutting off its analysis. *Id.* at 1155.

FWS's jeopardy analysis in a BiOp must consider a species' survival *and* recovery. 50 C.F.R. § 402.02; *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 932 (9th Cir. 2008) (noting survival and recovery are "intertwined needs that must both be considered in a jeopardy analysis"). "This does not mean that a jeopardy or adverse-modification analysis must include the formulation of a specific recovery plan." *Ctr. for Biological Diversity v. Salazar*, 804 F. Supp. 2d 987, 998 (D. Ariz. 2011). Recovery must, however, "be considered explicitly and separately from survival." *Id.* at 999. During this recovery analysis, FWS must identify when a species "will likely pass the tipping point for recovery, and determine whether the proposed action will cause the species to reach that tipping point." *Id.* (citing *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 527 (9th Cir. 2010)). That way, the BiOp "provides some reasonable assurance that the agency action in question will not appreciably reduce the odds of success for future recovery planning, by tipping a listed species too far into danger." *Nat'l Wildlife Fed'n*, 524 F.3d at 936.

If FWS issues a BiOp that does not adequately evaluate the effects of the action and cumulative effects on listed species and critical habitat—considering both survival and recovery—then FWS's "opinion on whether the action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat" is factually and legally flawed. *See* 50 C.F.R. § 402.14(h)(3). In such instances, the BiOp would fail to adequately assess whether the proposed action was likely to jeopardize listed species. *See Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988).

Any ESA violation—including a legally flawed BiOp—is subject to judicial review under the ESA's citizen suit provision. 16 U.S.C. § 1540(g)(1)(A).

In assessing jeopardy, each agency shall use the best scientific and commercial data available. *16 U.S.C. § 1536*(a)(2). Looking at the best scientific and commercial data available is a standard that requires far less than conclusive proof. *Greenpeace v. National Marine Fisheries Service*, 55 F. Supp. 2d 1248, 1262 (W.D. Wash. 1999). This standard recognizes that better scientific evidence will most likely always be available in the future.

ENDANGERED SPECIES ACT VIOLATIONS

A. The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses.

The BiOp inappropriately relies upon speculative water savings credits for "avoided future use" that fail to retire active water uses. Such reliance betrays the fact that FWS has stated clearly that "[t]o adequately address the overdraft of groundwater in the Upper San Pedro Basin and insure the health of the San Pedro River and the species that depend on it, some current uses of water must cease."[83] "[A]voided future use" contributes nothing to correcting the current deficit groundwater pumping problem.

Even for actual retired groundwater pumping, FWS says that "this water use reduction cannot be used to mitigate future projects and the water use that may occur with those projects."[84] The BiOp at 294 states that "[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."[85] Nonetheless, Fort Huachuca and FWS rely upon "avoided future use" to avoid acknowledging that Fort Huachuca-attributable groundwater pumping jeopardizes the San Pedro River and its representative and dependent endangered species.

B. The BiOp inappropriately relies upon water-savings credits for "retirement" of groundwater pumping from the Preserve Petrified Forest parcel.

The BiOp inappropriately relies upon water-savings credits for "retirement" of agricultural groundwater pumping from the Preserve Petrified Forest parcel that had already ended in 2004.[86]

The Preserve Petrified Forest parcel, sometimes also referred to as the Three Canyons/Palominas parcel, is located only 1.25 miles west of the San Pedro River. Restarting of the agricultural pumping would be capturing 10 - 40 per cent of its pumped water at ten years and 40 - 80 per cent of its pumped water at fifty years from water that would otherwise be

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[83] Correspondence, from USFWS Arizona Field Office Supervisor David L. Harlow; to U.S. Army Intelligence Center and Fort Huachuca Installation Support Director John A. Ruble; RE: Written concurrence from the Serve regarding credits for reduction in water use with the purchase of a conservation easement.; January 25, 2002.

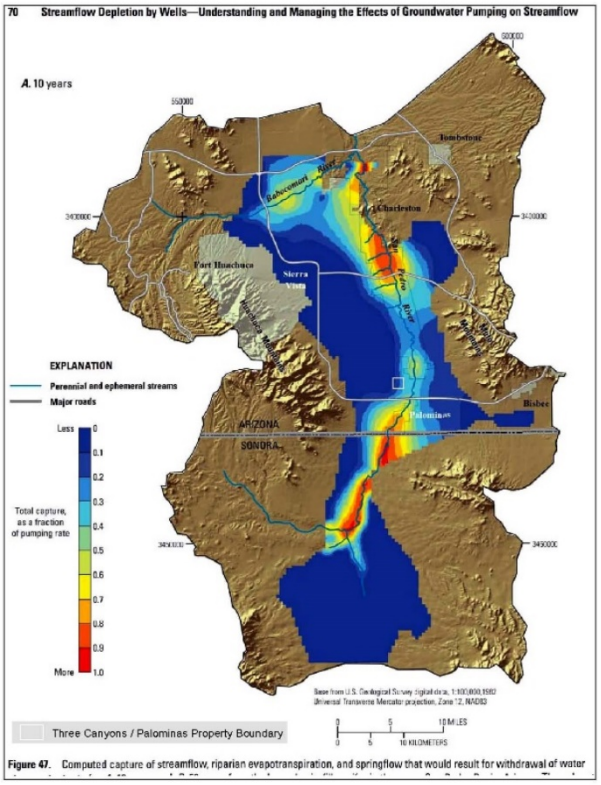
[84] Ibid.

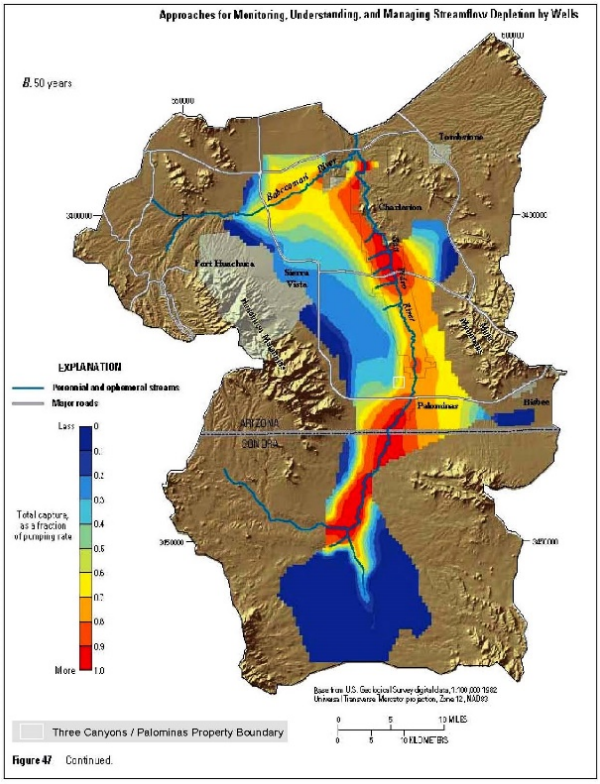
[85] U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

[86] Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. *See Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget; U.S. Geological Survey, 2014, Table 4, page 8.

supplying surface water to the San Pedro.[87] Such an aggressively destructive action would never overcome the legal challenges against the theft of federal water[88] and against the obvious and blatant "taking" that would result from the pumping's jeopardizing the San Pedro River and its representative and dependent federally listed endangered species.[89] The following maps are illustrative of just how clearly "taking" of San Pedro River surface water would be demonstrated in any legal challenge to the parcel's reinstitution of agricultural pumping.

The following maps from U.S. Geological Survey's ("USGS'") 2012, "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow" illustrate the property's location and the resulting percentage of pumped groundwater that would not end up as streamflow.[90] Preserve Petrified Forest parcel is the square northwest of Palominas, and west of the San Pedro on the following maps:





[87] *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/ ; See in particular: FIGURE 47.

[88] Cappaert v. United States 426 U.S. 128 [1976]; Kansas v. Colorado, 115 S. Ct. 1995; Nebraska v. Wyoming, 115 S. Ct. 1033, 1937 (1995).

[89] Section 9 of the ESA and its implementing regulations prohibit the unauthorized "take" of any endangered or threatened species of fish or wildlife. 16 U.S.C. § 1538(a)(1); 16 U.S.C. § 1533(d); 50 C.F.R. § 17.31. "Take" is defined broadly under the ESA to include harming, harassing, trapping, capturing, wounding or killing a protected species either directly or by degrading its habitat. 16 U.S.C. § 1532(19).

[90] *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/ ; See in particular: FIGURE 47.

In addition, before preparation of the BiOp, the fact that the Preserve Petrified Forest property was never going to be used for agriculture again, was established by Preserved Petrified Forest's own marketing efforts to subdivide their property for single homes on four acre lots, and not for future agricultural production. On August 6, 2007, in "Of politics and the river; An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," High Country News reports:

> "Preserve Petrified Forest is now offering to sell the 480 acres for $5.2 million, says Sierra Vista Realtor Beth Wilkerson, the listing agent for the land.
>
> Wilkerson says the land is zoned to build up to 161 homes…"[91]

Even stepping back from the "avoided future use" fallacy, preventing the water use of 161 homes using approximately 40 acre-feet/year,[92] is nothing like sham "retirement" already retired agricultural pumping and receiving credit for "retirement" of 2,558 acre-feet/year. BiOp at 29, 45, and 169. Nonetheless, in spite of the facts that (1) agricultural pumping had already stopped,[93] (2) that any attempt at restarting agricultural pumping would result in significant capture of San Pedro River surface flow,[94] and (3) that at most, the non-corrupt purchase to stop development would result in "avoided future use" of only 161 homes,[95] the BiOp dishonestly credits Fort Huachuca with "immediate" "onset of a 'positive' Fort Huachuca groundwater budget balance…in 2014 or 2015.[96] Specifically, to highlight FWS' dishonest giving the Fort credit in this scam, the BiOp says,

> "The residual, and temporary, reduction in baseflows (modeled to be 0.01 CFS at the most) that may occur before the onset of a "positive" Fort Huachuca groundwater budget balance in 2014 or 2015 [citing "Preserve Petrified Forest conservation measure (C10) in Table HWU2" in BiOp at 169 for 2,558 acre-feet/year beginning in 2014] (wherein a surplus of conservation measure-driven water savings overtakes the influence of Fort Huachuca's water demands on baseflows) will be within the range of conditions experienced by the species and thus, the proposed action is unlikely to result in a contraction of the species occurrence in the San Pedro River…" BiOp at 165.

Earlier, the BiOp at 161, FWS states, equally as dishonestly, that "[i]t is likely…that the relatively large magnitude of net groundwater surplus anticipated to begin to affect the river in 2014 (or later) will ensure the adverse effects will be of short duration, and more than completely ameliorated."

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[91] http://www.hcn.org/issues/351/17143

[92] Using the accepted local standard of approximately 0.25 acre-feet/year per home.

[93] Groundwater pumping on the Preserve Petrified Forest parcel was terminated in 2004. *See Simulated Groundwater and Surface Water Conditions in the Upper San Pedro River Basin 1902-2105, Preliminary Baseline Results*, Laurel J. Lacher, PhD, RG, Lacher Hydrological Consulting, Tucson, Arizona, June 2011, pages 23 and 24.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership and the U.S. Department of Interior U.S. Geological Survey, May 21, 2014, Table 1 – Water-budget; U.S. Geological Survey, 2014, Table 4, page 8.

[94] *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/ ; See in particular: FIGURE 47.

[95] "Of politics and the river; An Arizona congressman and a military base threaten the last free-flowing river in the desert Southwest," John Dougherty, High Country News, August 6, 2007, http://www.hcn.org/issues/351/17143.

[96] Quoting from the footnote (#6) in BiOp at 165: "Again, we note that the Preserve Petrified Forest conservation measure (C10) in Table HWU2 (and Revised PBA Table 5-1) was implemented in 2013, rather than 2014 as anticipated. The effects of the measure will thus occur earlier than initially anticipated (beginning in 2014 rather than 2015)."

C. The BiOp inappropriately limits the BiOp's analysis time to ten years, thus ignoring the adverse effects that will occur beyond that artificial time window.

The BiOp inappropriately relies upon an arbitrary and capricious limitation of the BiOp's analysis time to ten years without any regulatory authority, without basis on FWS' Consultation Handbook,[97] without basis on the legally mandated use of the best available science,[98] and with special treatment inconsistent with all other recent FWS' evaluations of military activities in Arizona.[99] The BiOp's limitation of its analysis time to ten years ignores the facts that (1) the Fort's activities will certainly last longer than 10 years,[100] that (2) the effects of the action will extend well beyond ten years,[101] and (3) most deceitfully, that the Fort failed to disclose the fact

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[97] Endangered Species Consultation Handbook, Procedure for Conducting Consultations and Conference Activities Under Section 7 of the Endangered Species Act, U.S. Fish & Wildlife Service and National Marine Fisheries Service, March 1998; https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

[98] 16 U.S.C. § 1536(a)(2).; *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

[99] For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat; AESO/SE 02-21-95-F-0114R4; August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army national Guard (AZARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station – Yuma, Yuma and Maricopa Counties, Arizona; AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction nand development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SSLI-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

[100] "Rumsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense; September 9, 2004, http://www.defenselink.mil/news/Sep2004/n09092004_2004090909.html.; National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110–181—JAN. 28, 2008 [$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110–417—OCT. 14, 2008 [$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111–84—OCT. 28, 2009 [$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114–92—NOV. 25, 2015 [$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114–328—DEC. 23, 2016 [$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115–91—DEC. 12, 2017 [$30,000,000].

[101] SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of· Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.; Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, U.S. Fish and Wildlife Service; January 6, 1997, page 665.; U.S. Fish and Wildlife Service, Biological Opinion concerning impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca, Arizona. #AESO/ES 2-21-02- F-229 August 23, 2002, page 205.; Leake, S.A., Hoffmann, J.P., and Dickinson, J.E., 2005, Numerical ground-water change model of the C aquifer and effects of ground-water withdrawals on stream depletion in selected reaches of Clear Creek, Chevelon Creek, and the Little Colorado River, northeastern Arizona: U.S. Geological Survey Scientific Investigations Report 2005–5277, 29 p., https://pubs.usgs.gov/sir/2005/5277/.; "Ground Water Development – The Time to Full Capture Problem," j. Bredehoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x; 2009.; Groundwater Hydrology of the San Pedro Basin, Robert Mac Nish, Kathyrn J. Baird, and Thomas Maddock III, Chapter Fifteen in Ecology and Conservation of the San Pedro River, Edited by Juliet C. Stromberg and Barbara Tellman, University of Arizona Press, Tucson, 2009, page 299.; "Calculation of

that its own contractor, GeoSystems Analysis, found that Fort Huachuca-attributable groundwater pumping "peak impacts to simulated baseflow occur in 2050."[102]

The BiOp's arbitrary and capricious evaluation window limitation is dramatized by FWS' special treatment of Fort Huachuca differently from FWS' treatment of other military bases. From 1996 – 2017, FWS' Arizona Ecological Services Office has consulted on the activities of multiple other military bases in Arizona;[103] however, only Fort Huachuca has had its consultation evaluation period limited to such an artificially narrowed time period. None of these other military activities evaluations were similarly limited by the BiOp's nonsensical rationale that the evaluation must be limited because of "uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process." BiOp at 20 and 158.

None of these other FWS' Arizona Ecological Service Office Biological Opinions are similarly limited with such an artificial time constraint because such a limitation is not legal. It is illegal to piecemeal the evaluation of an agency's actions.[104]

In addition, specific to Fort Huachuca, on April 8, 2002, the Court addressed the illegality of Fort Huachuca's attempt at narrowing its evaluation window to piecemeal FWS' consultation:

> "Courts have consistently held that [**39] a biological opinion has to "analyze the effect of the entire agency action," Conner v. Burford, 848 F.2d 1441, 1453 (9th Cir. 1988), cert. denied, Sun Exploration & Production v. Luganm 489 U.S. 1012, 103

Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/.; Gungle, B., J. B. Callegary, N.V. Paretti, J.R. Kennedy, C.J. Eastoe, D.S. Turner, J.E. Dickinson, L.R. Levick, and Z.P. Sugg, 2017. Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, Scientific Investigations Report 2016-5114, Version 1.2, February 2017, U.S. Geological Survey.

[102] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010; page 3-11.

[103] For example: Biological Opinion and Conference Opinion For Existing and Proposed Activities by the Marine Corps Air Station - Yuma in the Arizona Portion of the Yuma Training Range Complex, AESO/SE 2-21-95-F-114, April 17, 1996.; Biological Opinion on the proposed and ongoing activities by the Marine Corps Air Station -Yuma (MCAS-Yuma) in the Arizona apportion of the Yuma Training Range Complex (YTRC) on the Barry M. Goldwater Range (BBGR), Yuma and Maricopa counties, and its effects on the endangered Sonoran pronghorn and endangered lesser long-nosed bat; AESO/SE 02-21-95-F-0114R4; August 6, 2003.; Biological Opinion on Camp Navajo Army Depot Firing Range Expansion Project concerning the possible effects on the proposed Arizona Army national Guard (AZARNG) Camp Navajo Army Depot Firing Range Expansion Project, AESO/SE 02-21-04-F-0008; February 15, 2005.; Biological Opinion, West Coast Basing of the MV-22 and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station – Yuma, Yuma and Maricopa Counties, Arizona; AESO/SE 22410-1995-F-0114-R005; October 21, 2009.; Biological Opinion, West Coast Basing and Operations of the F-35B Joint Strike Fighter and Reinitiation of Formal Section 7 Consultation on Ongoing Activities at the Barry M. Goldwater Range by the Marine Corps Air Station -Yuma, Yuma and Maricopa Counties, Arizona, AESO/SE 22410-1995-F-0114-R006, September 17, 2010.; Biological Opinion concerning the possible effects of the proposed construction and development of new ranges, training areas, and improvements to existing ranges at Camp Navajo, Coconino County, Arizona, AESO/SE 22410-2009-F-0126; July 14, 2011; Biological Opinion on Activities and Operations at the United States Army Garrison Yuma Proving Ground, AESO/SE 02EAAZ00-2014-F0161, September 9, 2014.; Biological Opinion for Arizona Army National Guard, Camp Navajo, on the possible effects of the proposed construction nand development of new ranges, training areas, and improvements to existing ranges; AESO/SE 22410-2009-F-0126-R001, 02EAAZ00-2014-SSLI-0291, May 27, 2015.; Biological Opinion on impacts resulting from the proposed Extended Range Cannon Artillery (ERCA) Test Program on Barry M. Goldwater Range (BMGR) East and West, Yuma and Maricopa Counties, Arizona, AESO/SE 02EAAZ00-2017-F-0039, May 3, 2017.

[104] Conner v. Burford, 848 F.2d 1441, 1453 (9th Cir. 1988).; *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al., CIV99-203 TUC ACM*, 198 F. Supp. 2d 1139, April 8, 2002.

L. Ed. 2d 184, 109 S. Ct. 1121 (1989) (emphasis added), including all indirect and cumulative effects of the action on threatened and endangered species, 50 C.F.R. § 402.14(g)(3); 50 C.F.R. § 402.02. An agency may not ignore future aspects of a federal action by segmenting that action into phases. In fact, in Conner, the Court held that all phases of oil and gas leasing had to be evaluated for potential impacts at the leasing stage, even though the final phase -construction of oil and gas wells - was uncertain to occur. Conner, 848 F.2d at 1453-1458; See also North Slope Borough v. Andrus, 206 U.S. App. D.C. 184, 642 F.2d 589, 608 (D.C. Cir. 1980 (agency may not deal exclusively with one stage of the project).

In Conner, the FWS issued a biological opinion only with regard to the leasing stage because it did not have sufficient data to render a comprehensive [**40] opinion beyond the initial leasing phase. Instead of issuing a comprehensive biological opinion the FWS concluded that the leasing phase did not jeopardize endangered species. The FWS envisioned an "incremental-step consultation approach, with additional biological evaluations prior to subsequent activities. The court rejected this. The fact that insufficient evidence was available did not excuse the FWS from rendering a comprehensive opinion on the entire agency action. The court explained, as follows:

Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available ... We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. Conner, 848 F.2d at 1453-1454."

Looking specifically at Conner, FWS' disregard for the law and legal precedent in the BiOp becomes even more offensive:

"Appellees argue that the FWS failed to prepare biological opinions based on the best data available. We agree. The FWS took the position that there was insufficient information on post-leasing activities to prepare comprehensive biological opinions. Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available. For example, appellees point out that three-fourths of the area studied in the forests had been designated "essential" or "occupied" habitat for protected species. See Appellees' Exhibit 11. Indeed, the environmental assessments prepared by the Forest Service contained detailed information on the behavior and habitats of the species, and discussed the likely impact of various stages of oil and gas activities. See Threatened and Endangered Species Biological Evaluation (Flathead EA, Appendix G) (E.R. at 260-87); Biological Evaluation (Gallatin EA, Appendix B) (E.R. at 311-95); see also Gallatin Biological Opinion at D7 (E.R. at 401). We agree with appellees that incomplete information about post-leasing activities does not excuse the failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available. 16 U.S.C. Sec. 1536(a)(2). With the post-leasing and biological information that was available, the FWS could have determined whether post-leasing activities in particular areas were fundamentally incompatible with the continued existence of the species. Indeed, by recommending the exclusion of areas

where leasing would conflict with the conservation of protected species, the FWS implicitly admitted that even minimal exploration and development would be incompatible with the conservation of the species in some areas that can be identified before any agency action is taken.30 Gallatin Biological Opinion at D7 (E.R. at 401). With the information available, the FWS could also have identified potential conflicts between the protected species and postleasing activities due to the cumulative impact of oil and gas activities. For example, species like the grizzly and the gray wolf require large home ranges making it critical that ESA review occur early in the process to avoid piecemeal chipping away of habitat. See id.

Furthermore, although the FWS justified the decision to delay completing comprehensive biological opinions on the inexact information about post-leasing activities. Congress, in enacting the ESA, did not create an exception to the statutory requirement of a comprehensive biological opinion on that basis. The First Circuit, for example, has recognized that the Secretary may be required to make projections, based on potential locations and levels oil and gas activity, of the impact of production on protected species. See Roosevelt Campobello Int'l Park Comm'n v. EPA, 684 F.2d 1041, 1052-55 (1st Cir.1982) (EPA must prepare "real time simulation" studies of low risk oil spills despite the fact that study will only produce informed estimate of potential environmental effects).

In light of the ESA requirement that the agencies use the best scientific and commercial data available to insure that protected species are not jeopardized, 16 U.S.C. Sec. 1536(a)(2), the FWS cannot ignore available biological information or fail to develop projections of oil and gas activities which may indicate potential conflicts between development and the preservation of protected species. We hold that the FWS violated the ESA by failing to use the best information available to prepare comprehensive biological opinions considering all stages of the agency action, and thus failing to adequately assess whether the agency action was likely to jeopardize the continued existence of any threatened or endangered species, as required by section 7(a)(2). To hold otherwise would eviscerate Congress' intent to "give the benefit of the doubt to the species."31 [Footnote 31: H.R.Conf.Rep. No. 96-697, 96th Cong., 1st Sess. 12, reprinted in 1979 U.S.Code Cong. & Admin.News 2572, 2576.]…""[105]

Further, the idea that DOD is not intending to fund Fort Huachuca indefinitely is absurd. Former Defense Secretary Donald Rumsfeld addressed the long-term nature of military planning in 2004:

"The secretary wouldn't hazard a guess on how long the war on terror might last. The answer, he said, is as long as it takes. He said that if any world leaders at the end of World War II had tried to guess how long the Cold War would last, they likely would have been wrong. …

Rumsfeld said he didn't know how long it would take to defeat terrorism. He noted it took more than four decades and perseverance on the part of presidential

[105] In its April 8, 2002, Order in *Center for Biological Diversity et al. v. Donald H. Rumsfeld, Secretary of Defense, et al., CIV99-203 TUC ACM*, 198 F. Supp. 2d 1139, April 8, 2002, pages 12-13.

administrations from both political parties to succeed in bringing down the Soviet Union."[106]

Consistent with the fact that the Army has no intentions of limiting its activities at Fort Huachuca to ten years, the Army has lobbied for and secured $208,877,000 in the last ten years alone for "Authorized Army Construction and Land Acquisition Projects" for Fort Huachuca.[107] Obviously, the Army is not investing almost $209 million in construction and acquisition projects at Fort Huachuca merely for just a ten year stay. The Army is investing almost $209 million at Fort Huachuca over the last ten years because it us planning on using the Base for a long time.

The BiOp's Programmatic Biological Assessment ("PBA")[108] rationalizes narrowing the consultation's evaluation to ten years because "[a]fter ten years, the uncertainty in predicting federal government programs due to federal fiscal laws and the nature of the budget process becomes considerably more difficult and uncertain." But then to rationalize this statement, the PBA says,

> "However, planners in Arizona generally project water supplies and demands out to twenty years to plan for capital investments in water infrastructure to supply future population growth with water. The State of Arizona requires community water systems to develop System Water Plans that project water supplies and demands from 2010 to 2030 (ADWR 2011). In addition, modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River." [Pages G-13-14.]

Fort Huachuca's using of the State of Arizona's water policy for community water systems as rationale for an artificially narrowed evaluation window is sinister and particularly disingenuous. In fact, it is a lie by omission.

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[106] "Rumsfeld: Ending Terrorism Could Take Long Time," Kathleen T. Rhem, American Forces Press Service, U.S. Department of Defense; September 9, 2004, http://www.defenselink.mil/news/Sep2004/n09092004_2004090909.html.

[107] National Defense Authorization Act for Fiscal Year 2008, PUBLIC LAW 110–181—JAN. 28, 2008 [$129,600,000]; National Defense Authorization Act for Fiscal Year 2009, PUBLIC LAW 110–417—OCT. 14, 2008 [$13,200,000]; National Defense Authorization Act for Fiscal Year 2010, PUBLIC LAW 111–84—OCT. 28, 2009 [$27,700,000]; National Defense Authorization Act for Fiscal Year 2016, PUBLIC LAW 114–92—NOV. 25, 2015 [$3,884,000]; National Defense Authorization Act for Fiscal Year 2017, PUBLIC LAW 114–328—DEC. 23, 2016 [$4,493,000]; Defense Authorization Act for Fiscal Year 2018, PUBLIC LAW 115–91—DEC. 12, 2017 [$30,000,000].

[108] Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona, Contract No. W91278-09-D-0099, Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, Prepared by Leidos, November 2013.

Fort Huachuca misrepresents the State of Arizona's water policy prowess knowing that (1) the State of Arizona requires that its developers provide proof that water will be available for 100 years in order to secure a permit to supply groundwater for their developments,[109] and (2) the State of Arizona does not follow the laws of physics and hydrology in evaluating the effects of the permitted wells' groundwater pumping on connected surface water when granting well permits for developers.[110] FWS is well aware of these facts as well; yet, in the BiOp, FWS never questions the Base's cherry picking of an irrelevant State of Arizona policy in the PBA as the basis for Fort Huachuca's artificially narrowed evaluation window in the BiOp.

In addition, FWS' allowing Fort Huachuca to limit its analysis window to ten years, also ignores the Court's April 11, 2002, finding of fact on the short-term efficacy of a significant portion of the Base's claimed recharge mitigation credit, the City of Sierra Vista's wastewater treatment plant or the Environmental Operations Plant ("EOP"). BiOp at 168. On April 11, 2002, the Court found as a finding of fact that,

> "This recharge project [the City of Sierra Vista's wastewater treatment plant] is not intended to compensate for or mitigate the effects of groundwater pumping. The project is designed to create a "mound" of groundwater between the cone of depression and the river that will, in theory, prevent baseflow from the San Pedro from flowing back into the groundwater during the next twenty years. (Admin. Rec. Ex. 5: Planning Aid Memorandum at 10.) [**38] This will delay and mask the effects of the deficit groundwater pumping, (Admin. Rec. Ex. 2: Final BO at 121), but this is not a mitigating factor in relation to the Army's ten-year plan."[111]

The reason Fort Huachuca arbitrarily limited its analysis window to ten years is obvious when the Fort's hydrological footprint is examined objectively and beyond such an artificial window. The BiOp cites a GeoSystems Analysis (2010) study, "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca."[112] The BiOp, at 71 and 102, says,

> "Recent groundwater modeling (GeoSystems Analysis 2010) suggests that effects from historical groundwater withdrawals in the regional aquifer (1940 to 2003; PBA Section 3.5.6) would result in reduced flows in the Babocomari River. Since the

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[109] A.R.S. 45-108 Evaluation of subdivision water supply, definition … I. For the purposes of this section, "adequate water supply" means both of the following: 1. Sufficient groundwater, surface water or effluent of adequate quality will be continuously, legally and physically available to satisfy the water needs of the proposed use for at least one hundred years.

[110] Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Opinion in the Supreme Court of the State of Arizona, Robin Silver, M.D.; United States of America, U.S. Department of the Interior, Bureau of Land Managements; and Patricia Gerrodette, Plaintiffs/Appellees, v. Pueblo Del Sol Water Company, an Arizona Corporation; Thomas Buschatzke, in his Official Capacity as Director of the Arizona Department of Water Resources; Arizona Department of Water Resources, an Agency of the State of Arizona, Defendants/Appellants.; No. CV=16-0294-PR, filed August 9, 2018.

[111] Center for Biological Diversity, et al., Plaintiffs, v. Donald H. Rumsfeld, Secretary of Defense, et al., Defendants, Coalition of Arizona/New Mexico Coalition of Counties for Stable Economic Growth, Defendant-Intervenors, CIV 99-203 TUC ACM, UNITED STATES DISTRICT COURT FOR THE DISTRICT OF ARIZONA; 198 F. Supp. 2d 1139; 2002 U.S. Dist. LEXIS 7419; 54 ERC (BNA) 1391; 32 ELR 20640, April 8, 2002, Decided; April 11, 2002, Filed.

[112] "Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca," prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010.

Babocomari River contributes flow to the San Pedro River upstream of the Tombstone gaging station, there is the potential that declines in Babocomari River baseflow could account for some portion of the declines in winter baseflow observed at the San Pedro River at the Tombstone gage."

GeoSystems Analysis (2010) is similarly cited in the BiOp, (at 293), in the Yellow-billed Cuckoo section, regarding the fact that "groundwater pumping has already negatively affected the Babocomari River flow." In addition, the BiOp, at 102, includes from GeoSystems Analysis (2010) a figure ("EB19") of "[s]imulated changes in stream discharges due to pumping from all wells in the upper San Pedro Basin."

Review of GeoSystems Analysis (2010), which was never given to FWS,[113] however, reveals the primary and deceitful reason that Fort Huachuca and FWS limit the BiOp's evaluation window. GeoSystems Analysis (2010) shows that on-post and Fort-attributable groundwater pumping off-post are already and will into the future have negative effects on the San Pedro.

From GeoSystems Analysis (2010):

> "Results reveal that simulated cumulative (1902-2105) on-post pumping comprises only 5% of basin-wide pumping, but it is responsible for 31% of baseflow capture, 3% of ET capture, and 4% of total storage depletion in the basin. All simulated Fort-attributable pumping (on and off post) comprises 19% of basin-wide pumping, and accounts for 65% of total baseflow capture, 7% of ET capture, and 21% of all storage depletion in the basin by 2105.
>
> Simulated stream depletions related to Fort-attributable pumping are concentrated at the confluence of the Babocomari and San Pedro rivers, as well as several miles upstream on each river. Simulated stream depletions from on-post pumping only peak in the mid-21st Century, and including two 250-meter (820-foot) stream reaches that were "pumped dry" on the Babocomari in 2050. Total simulated Fort-related pumping (on- and off-post) dried out of a maximum of five stream reaches (1025 meters, 3363 feet) in 2050, and three reaches by the end of the simulation period in 2105." [Pages i-ii]
>
> While simulated Fort-attributable pumping accounts for only 19% of total basin pumping from 1902-2105, the Fort's simulated impact on baseflow capture is again large relative to its total pumping, as indicated in Figure 17. The capture simulations estimate that 186,237 AF out of a total of 293,383 AF, or 63%, of captured baseflow in the USPB is caused by Fort-attributable pumping during the period 1902-2105. [Page 3-5]
>
> Aquifer storage is by far the most important source of water for all simulated Fort-attributable pumping, both on and off post. Simulated on-post wells derive approximately 63% of all their pumped water from aquifer storage, 32% from stream baseflow capture, and 5% from ET capture (Figure 19). Roughly 79% of all simulated Fort-attributable pumping derives from aquifer storage, while 17% comes from stream baseflow capture, and 4% from ET capture (Figure 20). [Page 3-7]
>
> In order to understand the spatial impacts of simulated Fort-attributable baseflow capture, pumping-induced changes in stream discharge (baseflow) were

[113] Confirmed by FWS to the Center for Biological Diversity via Email on October 17, 2019.

mapped for three discreet points in time: 2003, 2050, and 2105 (figures Figure 23 through Figure 25). … [Page 3-10]

Figure 24 shows simulated stream baseflow depletions attributable to all on- and off-post Fort-attributable pumping in the years 2003, 2050, and 2105. Compared with the graphics in Figure 23, those in Figure 24 reveal a much more pronounced impact on the lower reaches of the Babocomari River (likely due to Fort-attributable pumping in Huachuca City), and several impacted reaches upstream on the San Pedro near the border with Mexico. Again, out of these three years, peak impacts to simulated baseflow occur in 2050, but depletions of 2 to 3 cfs at the confluence of the Babocomari and San Pedro Rivers persist out to 2105, with a significant portion of both rivers showing depletions in the range of 1 to 2 cfs upstream from the confluence.

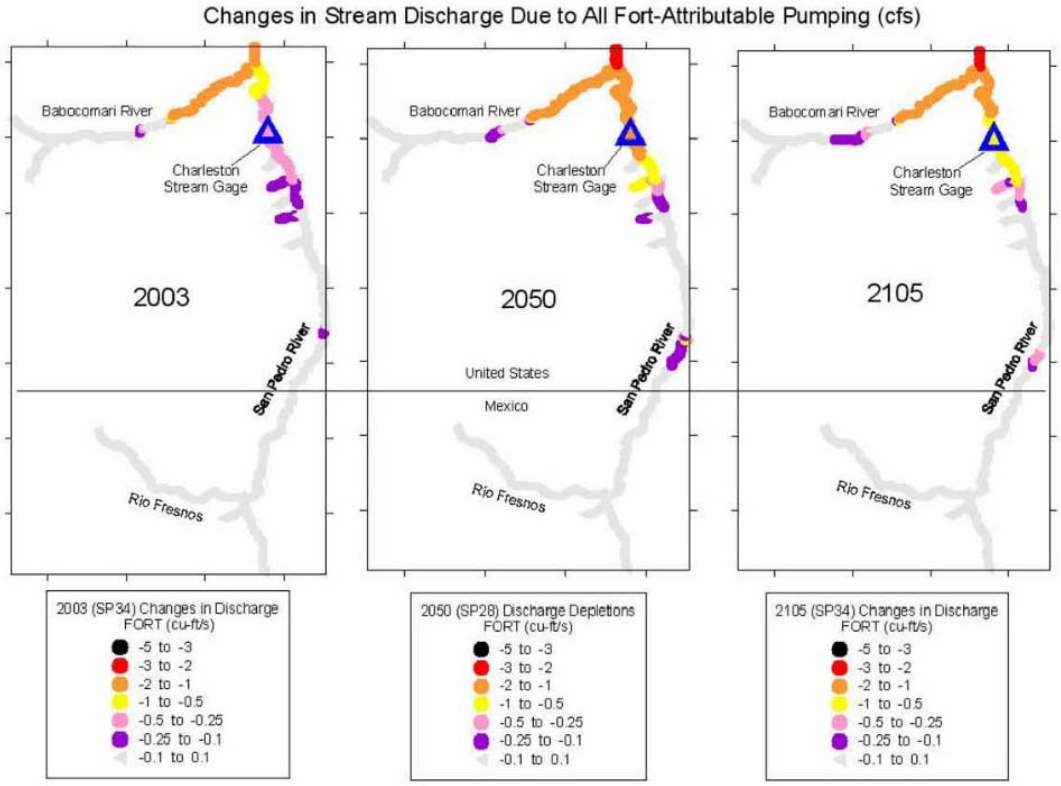

Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

… Figures 26-28 map the stream reaches that were simulated as having gone dry as a result of groundwater extractions from on-post wells, from all Fort-attributable pumping, and from all USPB wells, respectively. Figure 26 shows that in 2050, two reaches in the Babocomari were simulated as being "pumped dry" by on-post wells. …

Figure 27 shows a similar pattern of peak number of pumped-dry reaches in 2050 resulting from all Fort-attributable pumping. In this case, simulated Fort-attributable pumping produced two dry reaches in 2003, five in 2050, and three in 2105. …" [Page 3-15][114]

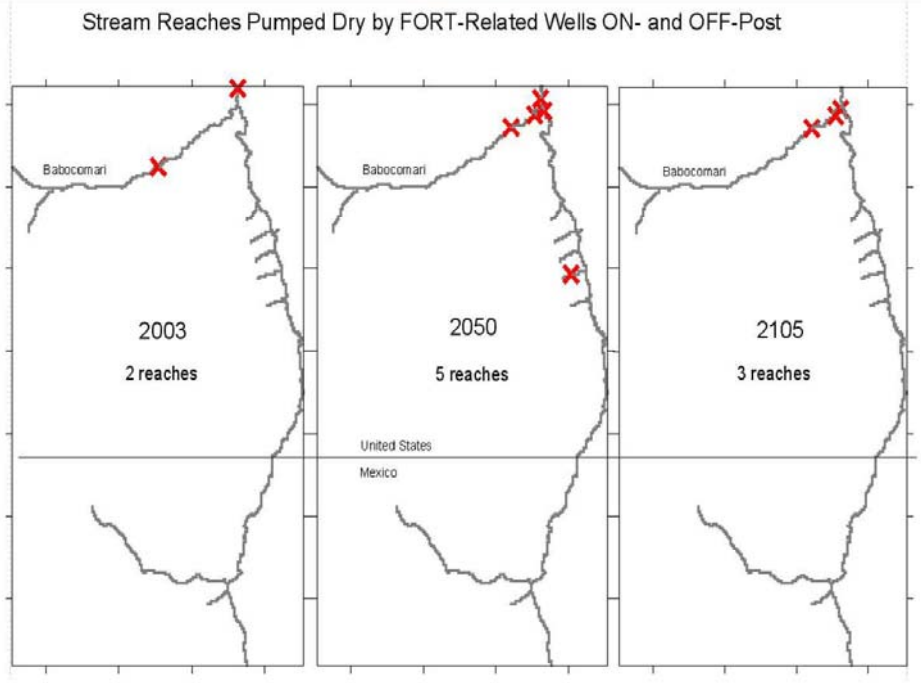

Figure 27. Stream Reaches Simulated as Being Pumped Dry by Fort-attributable Pumping On and Off post.

Opening of the evaluation window only to 2050 here reveals the Fort Huachuca-attributable damage to the San Pedro River and its Babocomari River tributary and the resulting jeopardy for the endangered species representative of and dependent on the San Pedro.

[114] Ibid.

The dishonesty of narrowing the BiOp's evaluation window to 2012 – 2024 is further graphically illustrated by Integrated Hydro (2019). The BiOp illustrates its "no effect" finding in Figure 10 of PBA Appendix G:

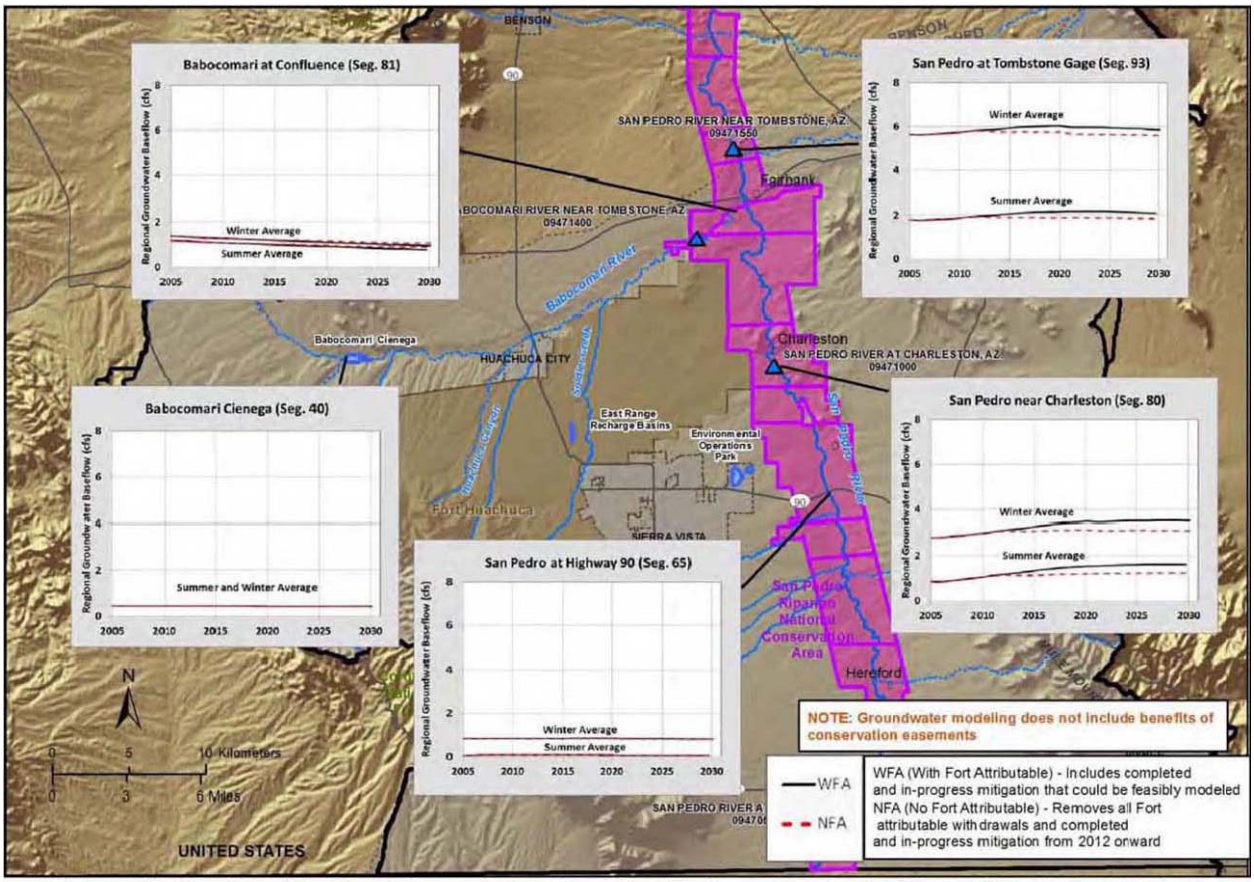

Figure 10. Simulated Regional Groundwater Baseflow for Locations in the Sierra Vista Subwatershed

Note how there is no negative change to 2030 in Figure 10 of the BiOp's PBA Appendix G.

But when Integrated Hydro (2019) opens the evaluation window beyond 2030, exposure of the resulting reduction in streamflow is dramatic at all four gaging stations:

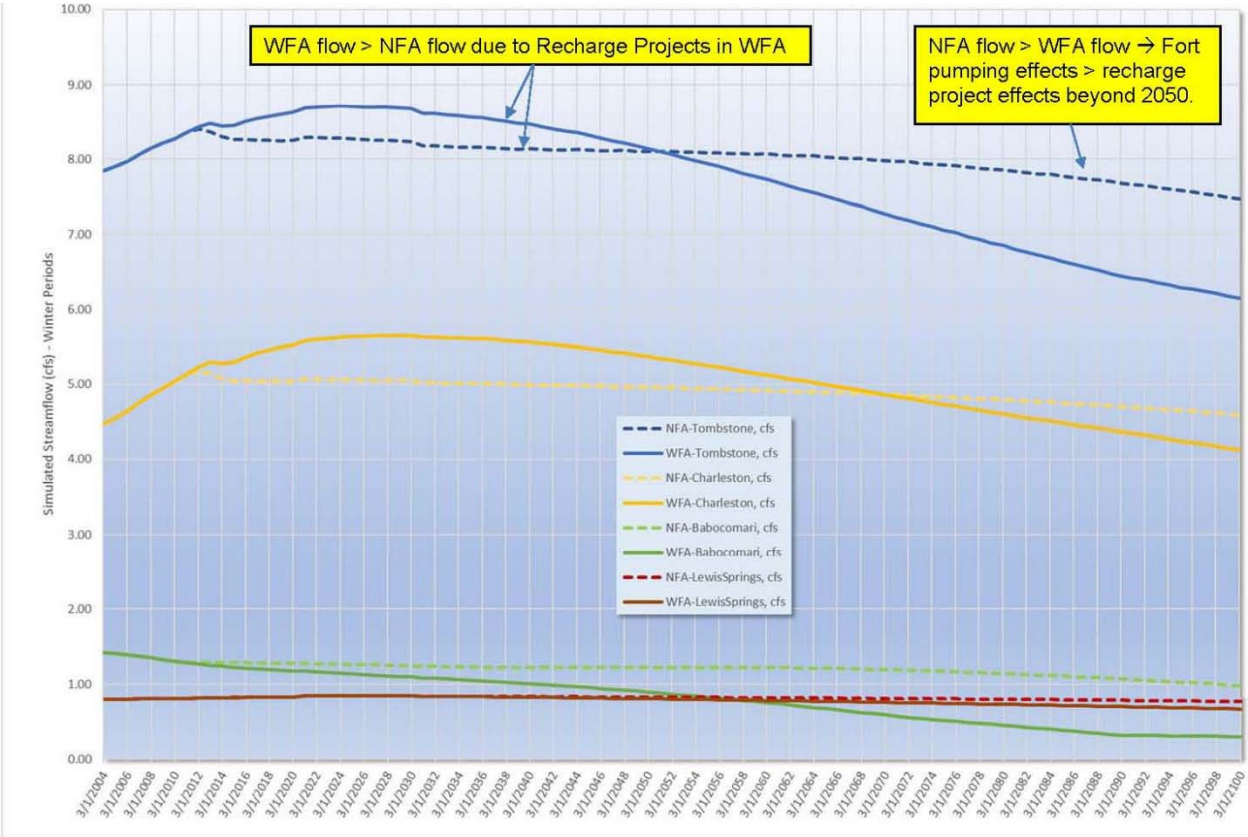

Figure 18. Simulated Streamflow and Change in Streamflow at Key Surface Flow Gages (see Figure 16 for locations).

Note that at the Tombstone gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052; at the Charleston gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2070; at the Babocomari gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2006; and at the Lewis Springs gage, negative effects from Fort-attributable groundwater pumping on stream flow start in approximately 2052.

Please also note that Integrated Hydro (2019) further qualifies its results noting "that this evaluation does not evaluate effects of the long-term, non-negligible Fort-Attributable pumping prior to 2011. This is an important consideration described further in a study referenced in the 2014 PBA, App-G study (i.e., *GeoSystems Analysis, Inc (GSA). 2010a. Calculation of Pumping-Induced Baseflow and evapotranspiration Capture Attributable to Fort Huachuca. Prepared for Environmental and Natural Resources Division, Fort Huachuca. Collaborated with Vernadero Group Inc. November 2010*). Figure 13 in the GSA, 2010a study suggests more than 300,000 ac-ft of groundwater was removed by Fort-attributable pumping (both on- and off-post). If this pumping were considered in this study, the total Fort-Attributable pumping impacts on the San

Pedro River baseflow discharge would be much greater than just considering projected impacts from 2011 to 2100."[115]

In terms of diminishing water levels (drawdown) from Fort Huachuca-attributable groundwater pumping, Integrated Hydro (2019) concludes,

> "Simulated Fort-Attributable drawdown of groundwater levels (or drawdown) at year 2100 … [d]rawdowns exceed 18 meters in the central high density pumping well [Fort Huachuca/Sierra Vista] area, 2 meters beneath, and north of the central Babocomari River, and nearly 2 meters beneath portions of the southern extent of the SPRNCA, south of Lewis Springs."[116]

It is obvious why Fort Huachuca not only covered up GeoSystems (2010), but why the Base and FWS narrowed the BiOp's evaluation window to 2014 – 2024 so as to avoid having to acknowledge Fort-attributable jeopardy to the San Pedro River and its representative and dependent endangered species.

D. <u>The BiOp fails to include the effects of Fort Huachuca's pre-BiOp, attributable groundwater pumping in its hydrological modeling.</u>

The BiOp fails to include the effects on the San Pedro River of Fort Huachuca's pre-BiOp attributable groundwater pumping. The amount of pre-BiOp Fort Huachuca groundwater pumping is graphically illustrated in GeoSystems (2010):

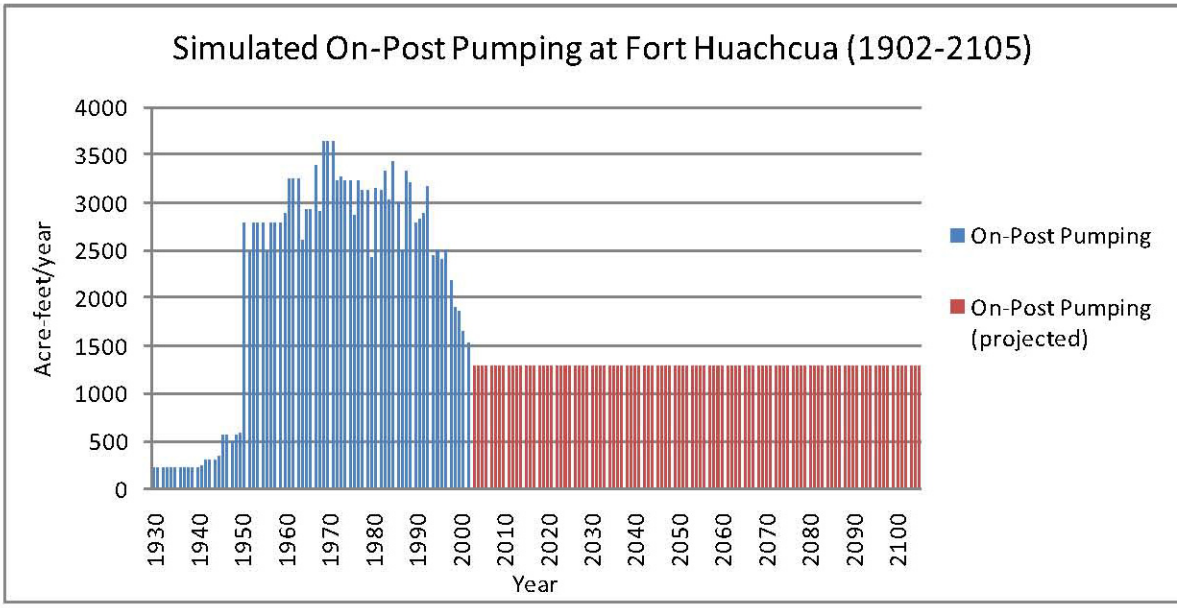

Figure 3. Simulated On-post Pumping at Fort Huachuca 1902-2105 (af/yr).

[115] "Evaluation of Impacts of Fort Huachuca Long-term Well Pumping and Recharge on San Pedro River Stream Flow (from 2011 to 2100)" prepared by Robert H. Prucha, PhD, PE, Integrated Hydro Systems, LLC, Boulder, Colorado, www.integratedhydro.com , November 21, 2019.; pages 4-5.

[116] Ibid., page 13.

From GeoSystems (2010) Figure 3, the on-post groundwater pumping alone from 1950 – 2002 totals approximately 150,090 acre-feet cumulatively. The pre-BiOp numbers in GeoSystems (2010) come from Pool and Dickinson (2007)[117] but Figure 3 does not include the total off-post Fort Huachuca-attributable groundwater pumping.

Total off-post Fort Huachuca-attributable groundwater pumping can be estimated from GeoSystems (2010) Figure 13 where off-post Fort-attributable groundwater pumping was estimated by GeoSystems (2010) from "estimated Fort-attributable population."[118]

GeoSystems (2010) Figure 13 shows "Simulated Cumulative Fort-attributable Pumping in USPB [Upper San Pedro Basin], 1902-2105.":

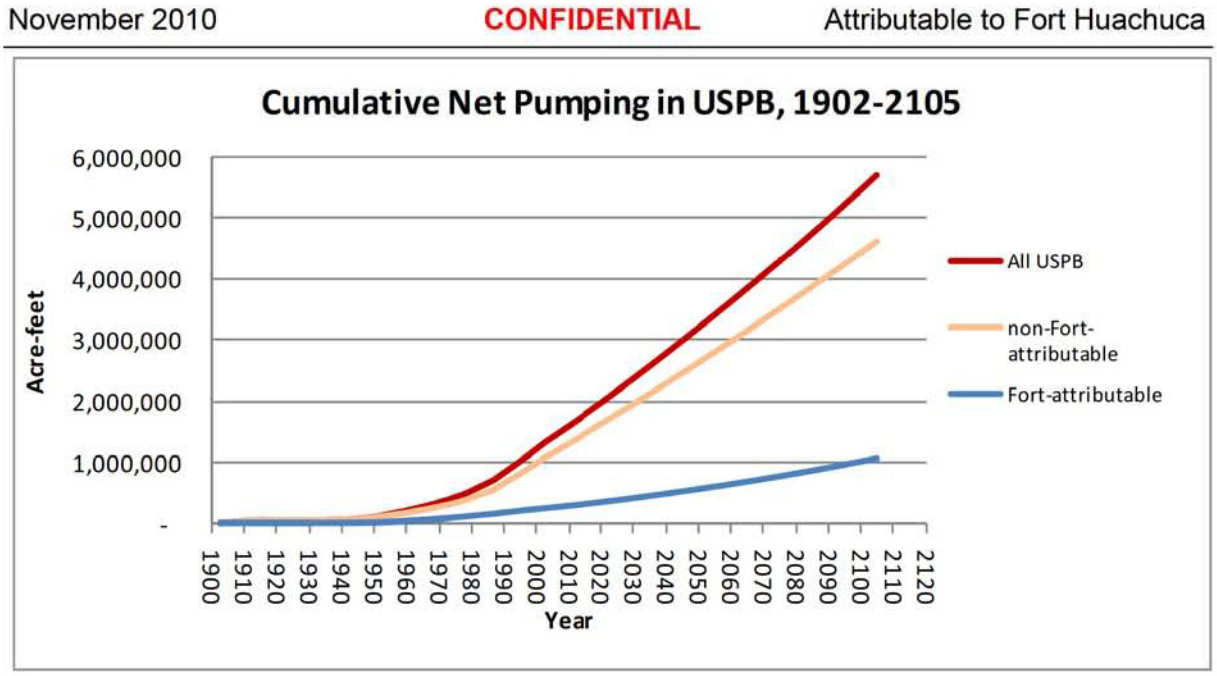

Figure 13. Simulated Cumulative Fort-attributable Pumping in USPB, 1902-2105.

From GeoSystems (2010) Figure 13, the cumulative Fort-attributable groundwater pumping debt in 2002 is approximately 300,000 acre-feet.

The BiOp should have included these cumulative totals in their models to fairly evaluate Fort Huachuca's effects on the San Pedro River and its representative and dependent endangered species as the detrimental effects of groundwater pumping continue long after the pumping stops.

But the BiOp does not include these cumulative totals in its models in spite of FWS' own words,

> "Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

[117] GeoSystems (2010) on page I, 1-1, and 1-4 cites Pool and Dickinson (2007) for "on post-pumping from 1902-2003: "Ground-Water Flow Model of the Sierra Vista Subwatershed and Sonoran Portions of the Upper San Pedro Basin, Southeastern Arizona, United States, and Northern Sonora, Mexico, in coop. with the Upper San Pedro Partnership and U.S. Bureau of Land Management," Pool, D.R. and J.E. Dickenson, U.S. Dept. of Interior, U.S. Geological Survey Scientific Investigations Report 2006-5228, 2007.

[118] GeoSystems (2010), page i.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."[119]

To make the BiOp's failure to include the pre-BiOp pumping even more nefarious, GeoSystems (2010) also found that Fort Huachuca's deleterious pre-BiOp attributable groundwater pumping's effects were already apparent in 2003.[120] The BiOp does not reflect this GeoSystems (2010) finding.

GeoSystems (2010) Figure 24 for 2003 illustrates Fort Huachuca's pre-BiOp groundwater pumping effects:

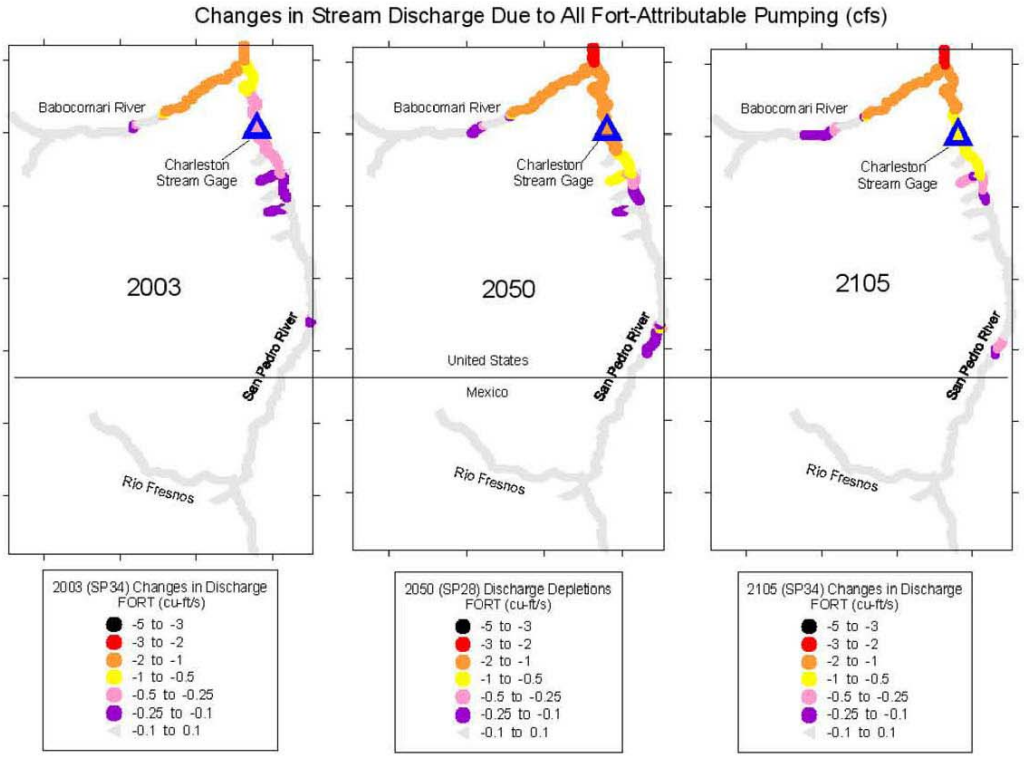

Figure 24. Simulated Pumping-induced Changes in Stream Discharge from All Fort-attributable Pumping, 1940-2105.

[119] Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665. Water and Environmental Systems Technology, Inc. 911994) is: SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of· Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994.

[120] Calculation of Pumping-induced Baseflow and Evapotranspiration Capture Attributable to Fort Huachuca, Prepared for Environmental and Natural Resources Division Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona; prepared by GeoSystems Analysis, Inc. November 2010; page 3-11 and 3-13.

Further, even if all groundwater pumping were stopped abruptly, the effects of the Fort Huachuca/Sierra Vista groundwater pumping does not stop.[121] Specific to Fort Huachuca-attributable groundwater pumping, pre-BiOp effects will continue to negatively affect San Pedro River baseflow through the year 2088.[122] The obvious reason that Fort Huachuca and FWS chose not to include the Fort's pre-BiOp attributable groundwater pumping in the BiOp evaluation is to artificially minimize and to obscure the true extent of Fort Huachuca's detrimental impact on the San Pedro River and its representative and dependent endangered species.

In spite of the fact that pre-BiOp Fort Huachuca-attributable groundwater pumping continues to harm the San Pedro River into the future through the year 2088,[123] the BiOp's hydrological modeling starts with data from 2003, while the BiOp's analysis of potential effects starts in 2011. The fact that the BiOp's hydrological modeling starts from 2003 is found in the BiOp's Biological Assessment Appendix G at G13 and G14:

> "…to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [With Fort-attributable simulation] and the NFA [No Fort-attributable] simulations use the modeling period from 2003-2030." [124]

In an attempt to hide even more of Fort Huachuca's harmful effects, the time window of the BiOp's evaluation of the effects of Fort Huachuca's effects on the San Pedro is narrowed even further in the PBA at 5-11 and in the BiOp at 20, 168 and 169:

> "Analysis of the potential effects from Fort-attributable groundwater use was conducted using groundwater demand accounting of the Fort Huachuca activities in 2011. … this consultation covers 2014 to March 31, 2024."

Ignoring the effects of Fort Huachuca's pre-BiOp pumping is arbitrary and capricious. It is not as if FWS didn't know already that Fort Huachuca's pre-BiOp groundwater pumping continues to capture groundwater that would otherwise end up as San Pedro River surface flow. FWS' January 6, 1997, Final rule of the Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico, USFWS states:

> "Water and Environmental Systems Technology, Inc. (1994) estimated that even if all pumping stopped in the Sierra Vista/Fort Huachuca area, the cone of depression

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[121] Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/.

[122] U.S. Fish and Wildlife Service (FWS). 1997. Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.; Biological Opinion, 2-21-02-F-229, 2-21-98-F-266, on Impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca; August 23, 2002; citing Water and Environmental Systems Technology, Inc. (WESTEC). 1994. San Pedro hydrologic system model, US Bureau of Reclamation scenarios, November 1994. Report to the Bureau of Reclamation, Phoenix.

[123] Ibid.

[124] Programmatic Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona Contract No. W91278-09-D-0099 Task Order No. 24; Environmental and Natural Resources Division, Directorate of Public Works, U.S. Army Garrison, Fort Huachuca, Arizona, November 2013 ("PBA"); Appendix G, Groundwater Modeling Report at G-13 and G-14.

would continue to spread toward the river as it flattened out and river flows would continue to decline through the year 2088."[125]

And FWS' August 23, 2002, Biological Opinion on Fort Huachuca's activities states,

"Interestingly, even if all groundwater pumping in Sierra Vista and Fort Huachuca ceased and agricultural pumping rates were fixed at 1988 levels, modeling showed that average annual flows would still decline at Charleston, Fairbank, and at Benson Narrows (WESTEC 1994). This would occur because over time the cone of depression is expected to flatten out, even if the volume of the cone is decreasing. As it flattens out, it could capture the base flow of the San Pedro River (C. Rovey, WESTEC, pers. comm., 1995). This indicates that balancing water use and water supply may not be enough to prevent capture of river base flow by the cone of depression." [page 95]

Table 9. Summary of groundwater and other modeling efforts in the upper San Pedro River basin, Arizona, that predicted future river flow or extent of riparian vegetation. … Source … *WESTEC (1994): This effort used the MODFLOW model with modifications by the authors. Outputs are annual average flows, which lump flood flows with base flows. Flows are modeled from 1988-2088.;* Scenario … No pumping at the Fort/Sierra Vista after 1988, pumping in rural/agricultural areas at 1988 rates… Effects on upper San Pedro River flows or riparian vegetation … Annual average flows decline at Charleston (42.7 cfs in 1988 to 41.5 cfs in 2088), at Fairbank (44.8 cfs in 1988, 43.6 cfs in 2088), at Benson Narrows (42.0 cfs in 1988 to 39.6 cfs in 2088) [page 97] …

Even if enough conservation measures are implemented so water supply equals or exceeds water use, the cone of depression is expected to continue its lateral expansion as it flattens out and could dewater portions of the San Pedro River (see scenario 1 of WESTEC 1994, Table 9) [page 130][126]

"WESTEC 1994" is "San Pedro Hydrologic System Model, U.S. Bureau of Reclamation Scenarios by Water & Environmental Systems Technology, Inc. Specifically, WESTEC (1994) says,

"Scenario FWO-l assumed there is no future pumping in the Sierra Vista/Fort Huachuca area after 1988. … This scenario predicts that even if all Sierra Vista area pumping were stopped, the cone of depression that is currently developed in the Sierra Vista area would not recover completely in 100 years.

River flows, however, continue to decline from an annual average of 42.7 cfs at Charleston in 1988 to 41.5 cfs in 2088. At Fairbank the modeled 1988 flow was 44.8 cfs compared with 43.6 cfs in 2088. …"[127]

---

[125] Final rule. Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register, Vol. 62, No. 3, Monday, January 6, 1997, page 665.

[126] Biological Opinion on impacts that may result from activities authorized, carried out, or funded by the Department of the Army at and near Fort Huachuca (Fort), Arizona.; AESO/SE 2-21-02-F-229, 2-21-98-F-266, U.s. Fish and Wildlife Service, August 23, 2002.

[127] SAN PEDRO HYDROLOGIC SYSTEM MODEL, U. S. BUREAU OF RECLAMATION SCENARIOS; Submitted to: U. S. Bureau of· Reclamation; Submitted by: Water & Environmental Systems Technology, Inc., Denver, Colorado 80211; November 1994; pages 13-14.

Graphs from WESTEC 1994 dramatically illustrate the fact that even if all groundwater pumping is stopped, the lowering of the water table continues towards the San Pedro River continuing the capture of groundwater that would otherwise supply surface water to the River:

Figure B-1

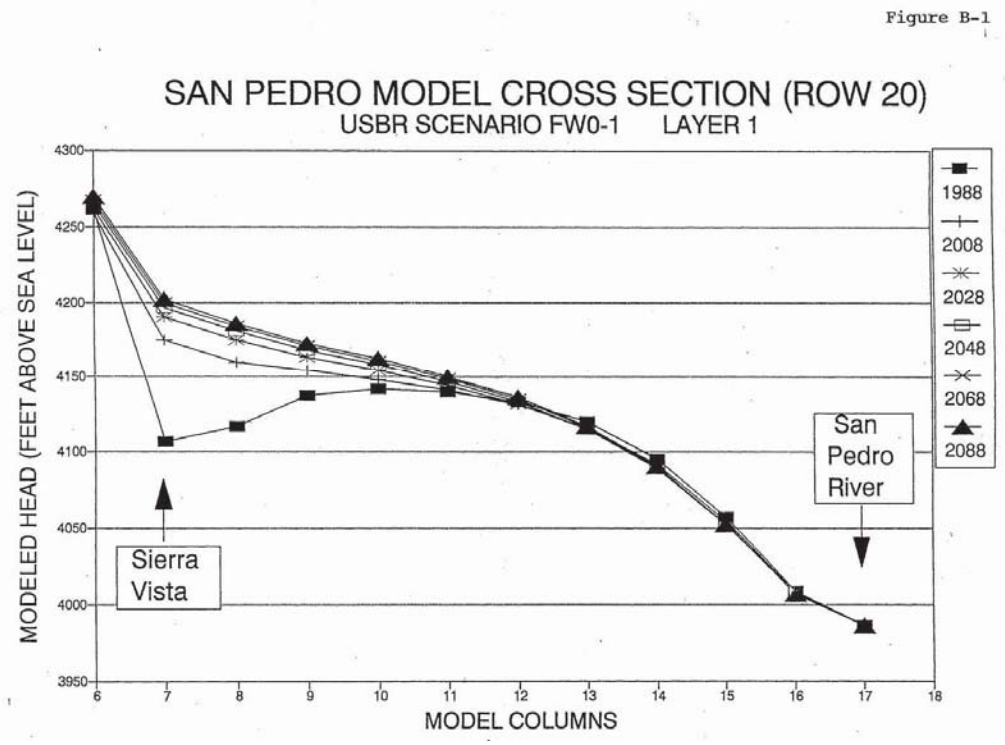
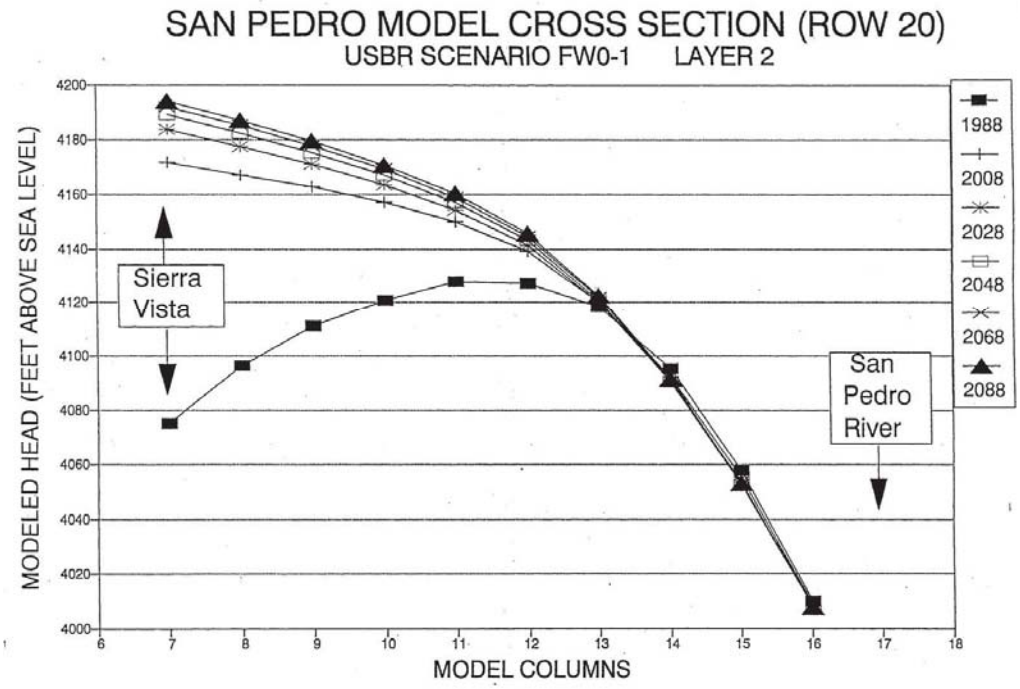


Figure B-2



The BiOp does tangentially mention pre-BiOp pumping effects,

> "…groundwater withdrawals from all wells in the Upper San Pedro Basin from 1940 to 2003 are estimated to have caused the regional groundwater part of baseflow to decline 1 to 2 cfs in the Babocomari River. Declines in the regional groundwater component of baseflow in the Babocomari would have downstream effects in the San Pedro River at the Tombstone gage (PBA Section 3.5.3). The modeled San Pedro River baseflow at the Tombstone gage is calculated to have declined by 2 to 3 cfs due to groundwater withdrawals. …" BiOp at 76.

The BiOp, however, does not assign pre-BiOp numbers and Fort Huachuca-attributable ownership to the withdrawals that caused the regional groundwater part of the baseflow to decline in the Babocomari and San Pedro Rivers.

In 2009, prior to production of the BiOp, Bredehoeft and Durbin (2009) address the phenomenon of the effects of groundwater pumping even after the pumping has been terminated. Bredehoeft and Durbin's "Ground Water Development – The Time to Full Capture Problem," says,

> "The maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops. This is especially true if the monitoring is some distance away from the pumping. In addition, ground water systems will be very slow to recover to their predevelopment state once pumping is stopped. …
>
> If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."[128]

Bredehoeft and Durbin (2009) are mentioned in the BiOp's PBA, but the PBA at G-13-14 attempts to deceptively use Bredehoeft and Durbin (2009)'s acknowledgement of "time-lag" to justify an artificially, and inappropriately abbreviated twenty-year planning and modeling period "for federal government activities":

> "…modeling past a ten year planning period for federal government activities is important because it is well-documented that there is a time-lag for groundwater systems between changes in pumping patterns and the effects on regional groundwater component of baseflow in streams (Bredehoft [sic] and Durbin 2009). Therefore to estimate the impacts of future and on-going operations at the Fort on the regional groundwater component of baseflow in the San Pedro River, the WFA [with Fort-attributable] and the NFA [not Fort-attributable] simulations use the modeling period from 2003-2030. While federal activities and funding can only be projected out to 10 years with reasonable confidence, it is important to model out to 2030 to account for the time lag between when changes in pumping or recharge initially would occur and when they may have an effect on the regional groundwater component of baseflow in the San Pedro River."

We addressed the fallacy of basing anything on a State of Arizona policy earlier; however, here we will address the BiOp's deceptive, intentional, misinterpretation of Bredehoeft

[128] "Ground Water Development – The Time to Full Capture Problem," j. Bredehoeft and T. Durbin, Ground Water, doi: 10.1111/j.1745-6584.2008.00538.x; 2009.

and Durbin (2009). Simply said, what Fort Huachuca conveniently fails to disclose is that the "time-lag" from Bredehoeft and Durbin (2009) is VERY long, not 18 years.

To illustrate from Bredehoeft and Durbin (2009) that "[t]he maximum impacts are larger than those observed at the time pumping stops, and they occur sometime after the pumping stops," Bredehoeft and Durbin include Figure 9:

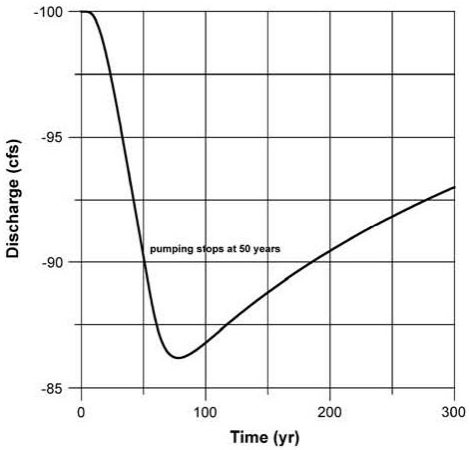


Figure 9. Predicted spring flow from a hypothetical aquifer (Figure 1 with phreatophytes in area 1 replaced by a spring). Pumping ceases after 50 years when the spring flow drops to 90 cfs.

Describing Figure 9, Bredehoeft and Durbin say,

> "Figure 9 shows the discharge of our spring vs. time; pumping stopped in area 1 in approximately 50 years when the spring discharge dropped to 90 cfs. The minimum spring flow occurs at approximately 75 years, 25 years after we stopped pumping. The reduction in flow is 13 cfs—larger than what it was when we stopped pumping. The maximum drawdown at the spring, created by the pumping, takes 25 years after pumping stops to work its way through the system. We also see that the system does not recover readily to its predevelopment state even though the spring discharge equaled the recharge and was 100 cfs. Perhaps this is best understood if we look at the water removed from storage by the pumping and the rate at which it is replenished. During the period of pumping, the spring flow drops more or less linearly from 100 to 90 cfs. The amount of water removed from storage during this period averages approximately 95 cfs. The reduction in spring discharge averaged 5 cfs over the 50-year period—the capture of spring discharge averaged 5 cfs over the period. In other words, 95% of the ground water pumped during the 50 years of pumping came from storage. During the remaining 250 years since pumping stopped, the spring discharge averaged approximately 90 cfs. During that period, we are putting back in storage, on average, 10 cfs. This means that during the 250 years since the pumping ceased, we have restored just more than 50% of the water that was removed from the storage during the pumping period. You can easily see that this simple system will take approximately 500 years to return to its original state.
>
> This hypothetical model illustrates the monitoring problem. If the monitoring point is some distance removed from the pumping, there will be (1) a time lag between the maximum impact and the stopping of pumping and (2) the maximum impact will be greater than what is observed when pumping is stopped (unless one has reached a

new equilibrium state during the pumping period). The time for full recovery of the system will be long, even in the case where one has not reached the new equilibrium.

The real world is more complex. Those that advocate monitoring seldom envision totally stopping the pumping; rather, they imagine changes in the development that minimize damages. Stopping the pumping is a management action of last resort and we showed that it has problems. Less stringent management actions have a correspondingly lesser beneficial impact and even more problems."

Bredehoeft and Durbin (2009) use the Southern Nevada Water Authority's ("SNWA's") desire to pump groundwater in eastern Nevada as the subject of their report. In their final discussion, Bredehoeft and Durbin (2009) say,

"We do not think that the SNWA development in Nevada is all that unique nor do we think that this is typically only a western problem. Large aquifer systems exist throughout the country and the world. The response time problem is typical of large systems; there are other developments where the hydrologic boundaries where capture can take place are far from the pumping. Long times will be involved before the system can reach a new equilibrium …"

Bredehoeft and Durbin (2009) conclude,

"Some ground water systems in which a new equilibrium state that includes pumping can be achieved may take a long time to reach the new equilibrium. This is especially true where the discharge from the system that can potentially be captured by the pumping is a long distance away from the pumping center. Such a system may take more than a millennium, some more than two millennia, to reach the new equilibrium state. … If a water manager allows more pumping than the pumping can capture, then sooner or later the pumping must be curtailed or a new equilibrium can never be reached and the system will be depleted."

A "millennium" is quite a bit longer than the BiOp's PBA excerpting from Bredehoeft and Durbin (2009) "that there is a time-lag for groundwater systems" as justification for an extra 18 years of modeling as the BiOp's "simulations use the modeling period from 2003-2030."

In 2012, USGS authors Barlow and Leake discuss the time lag of the effects of groundwater pumping after stopping the pumping in even more detail. In "Stream flow depletion by wells – Understanding and managing the effects of groundwater pumping on streamflow," Barlow and Leake state:

"Common Misconceptions about Streamflow Depletion

An understanding of the basic concepts of streamflow depletion is needed to properly assess the effects of groundwater withdrawals on connected surface water and areas of evapotranspiration. Important concepts relating to depletion are available throughout this report and also in other literature, beginning with the paper, “The Source of Water Derived from Wells,” by Theis (1940). In spite of these sources of information, misconceptions regarding factors controlling depletion are sometimes evident in analyses of depletion. This discussion highlights the following common misconceptions related to streamflow depletion. …

Misconception 3. Depletion stops when pumping ceases. …

Depletion after Pumping Stops

When a well begins to pump, water is removed from storage around the well, creating a cone of depression. As discussed previously, the cone of depression expands and can increase recharge to and discharge from the aquifer. If a well pumps groundwater for a period of time and then pumping ceases, groundwater levels will begin to recover and the cone of depression created by the pumping will gradually fill, with water levels eventually reaching positions that existed before pumping started (fig. 32). During the time that the cone of depression is filling, groundwater that otherwise would have flowed to streams instead goes into aquifer storage; thus, streamflow depletion is ongoing, even though pumping has ceased. The factors that control the rate of recovery are the same as those that affect the rate of groundwater-level declines in response to pumping—the geology, dimensions, and hydraulic conditions along the boundaries of the groundwater system, including the streams; and the horizontal and vertical distance of the well from the stream. …

Some key points relating to depletion from a well or wells that pump and then stop pumping are as follows:

1. Maximum depletion can occur after pumping stops, particularly for aquifers with low diffusivity or for large distances between pumping locations and the stream.

2. Over the time interval from when pumping starts until the water table recovers to original pre-pumping levels, the volume of depletion will equal the volume pumped.
…

6. In many cases, the time from cessation of pumping until full recovery can be longer than the time that the well was pumped. …"

Conclusions …

Streamflow depletion after pumping stops: Streamflow depletion continues after pumping stops because it takes time for groundwater levels to recover from the previous pumping stress and for the depleted aquifer defined by the cone of depression to be refilled with water. The time of maximum streamflow depletion often may occur after pumping has stopped. Eventually, the aquifer and stream may return to their pre-pumping conditions, but the time required for full recovery may be quite long and exceed the total time that the well was pumped. Over the time interval from when pumping starts until the system fully recovers to its prepumping levels, the volume of streamflow depletion will equal the volume of water pumped. …"[129]

Besides inappropriately narrowing the evaluation window by deliberately misrepresenting the "time-lag" from Bredehoeft and Durbin (2009), the BiOp completely ignores that "the volume of depletion will equal the volume pumped," and "the volume of streamflow depletion will equal the volume of water pumped" from Barlow and Leake (2012). The BiOp fails to present and evaluate the total amount of pre-BiOp groundwater pumping attributable to Fort Huachuca that is still negatively impacting the San Pedro.

[129] *Streamflow depletion by wells - Understanding and managing the effects of groundwater pumping on streamflow*, P.M. Barlow and Leake, S.A., U.S. Geological Survey Circular 1376, 2012, https://pubs.usgs.gov/circ/1376/.

In addition to GeoSystems (2010) pre-BiOp pumping documentation and modeling ignored in the BiOp discussed above, Fort Huachuca had other information documenting the amount of pre-BiOp groundwater pumping. Fort Huachuca's own "Statement of Claimant Form for Other Uses Amendment Superior Court of Maricopa County Federal Reserved Water Rights" says,

> "Well pumpage from 1963 to 1984 has averaged 2,762 acre-feet per fiscal year. From 1982 to 1989 well production has averaged 2,830 acre-feet per calendar year"[130]:

TABLE 5-58

FORT HUACHUCA
WELL PRODUCTION
(ACRE-FEET)

FISCAL YEAR		CALENDAR YEAR	
1963	2,887	1982	2,736
1964	2,471	1983	2,876
1965	2,636	1984	3,071
1966	2,703	1985	2,986
1967	3,021	1986	2,898
1968	2,909	1987	2,273 (excludes December)
1969	3,262	1988	3,021
1970	3,319	1989	2,601 (excludes October-December)
1971	3,174		
1972	3,148		
1973	2,781		
1974	3,351		
1975	2,597		
1976	2,766		
1977	2,871		
1978	2,327		
1979	2,624		
1980	2,836		
1981	2,996		
1982	2,597		
1983	2,928		
1984	3,105		

Source: Fort Huachuca letter concerning statements of claimant 39-10774 and 39-10775. October 17, 1989, enclosure 6, revised figures.

As we presented and discussed in the preceding section, Fort Huachuca's contractor, GeoSystems (2010) showed that the cumulative debt amount of pre-BiOp Fort-attributable on-post groundwater pumping 1950-2002 totals approximately 150,090 acre-feet[131] and the on-post and off-post Fort-attributable groundwater pumping debt in 2002 totals approximately 300,000 acre-feet.[132] This cumulative groundwater debt is not addressed and is not included in the BiOp

[130] Statement of Claimant Form for Other Uses' Amendment; Claimant Name: U.S. Army Intelligence Center and Fort Huachuca; Federal Reserved Water Rights; January 16, 2002.

[131] GeoSystems (2010), Figure 3.

[132] GeoSystems (2010), Figure 13.

evaluation. This omission from the BiOp violates the legal mandate to use the best available science.[133]

E. The BiOp inaccurately concurs with Fort Huachuca's assessment that the Base's activities will have no effect on Southwestern Willow Flycatcher, Desert Pupfish, Spikedace and Loach Minnow.

Such a concurrence fails to note FWS' own Recovery Plans regarding the importance of the San Pedro River to the recovery of Flycatcher,[134] Pupfish,[135] Spikedace[136] and Loach Minnow.[137]

Loach Minnow (*Tiaroga cobitis*) © Robin Silver

FWS' Recovery Plan for Loach Minnow states,

> "Loach minnow is endemic to the Gila River basin of Arizona and New Mexico… Distribution in Arizona included the … San Pedro River … plus major tributaries…
>
> Among streams from which loach minnow have been extirpated, Eagle Creek and San Pedro River, Arizona, represent those most amenable to reestablishment of the species. … San Pedro River is the type locality for loach minnow (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for

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[133] 16 U.S.C. § 1536(a)(2).; *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz. 2002).

[134] Final Recovery Plan, Southwestern Willow Flycatcher (*Empidonax Traillii extimus*); USFWS Southwestern Willow Flycatcher Recovery Team Technical Subgroup, August 2002.

[135] Desert Pupfish (*Cyprinodon maularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

[136] Spikedace (*Media fulgida*) Recovery Plan, USFWS, September 1991.

[137] Loach Minnow (*Tiaroga cobitis*) Recovery Plan, U.S. Fish and Wildlife Service, September 1991.

loach minnow; certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) also have potential for reestablishment of the species."[138]

Spikedace (*Meda fulgida*) © Robin Silver

FWS' Recovery Plan for Spikedace states,

> "The species was abundant in the San Pedro River, Arizona … Among streams from which spikedace have been extirpated, the San Pedro River system, Arizona, probably represents the most amenable, for several reasons, to its reestablishment. San Pedro River is the type locality for spikedace (Girard 1857), but it and 10 other native fishes were extirpated as a result of drastic habitat destruction, plus introduction of exotic fishes, over the last 100 years (Eberhardt 1981, Minckley 1987). Not only the mainstream San Pedro may be readily amenable to restoration for spikedace, but also certain perennial reaches of major tributaries (e.g., Redfield Canyon, Babocomari River) may have potential for reestablishment of the species. …"[139]

[138] Ibid.

[139] Spikedace, Meda fulgida, Recovery Plan, prepared by Paul C. March, Arizona State University, Temp, Arizona for Region 2, U.S. Fish and Wildlfe Service, Albuquerque, New Mexico, September 30, 1991.

Desert Pupfish (*Cyprinodon macularius*) © Robin Silver

FWS' Recovery Plan for Desert Pupfish states,

> "Desert pupfish historically occupied the Gila River basin below about 1,500 meters (m) elevation in Arizona and Sonora, including the Gila, Santa Cruz, San Pedro, and Salt Rivers…
>
> Re-established populations in Arizona will be located in the … San Pedro…
>
> The San Pedro River (BLM Riparian National Conservation Area, Cochise County, Arizona) should be considered a priority re-establishment site (as already recommended by Minckley (1987) for desert pupfish plus other extirpated native fishes), because it has high potential and is the type locality for the species. …"[140]

[140] Desert Pupfish (*Cyprinodon macularius*) Recovery Plan, Prepared by Paul C. Marsh, Arizona State University and Donald W. Sada, Bishop, California for Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico, September 1993.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) © Jim Burns

FWS' Recovery Plan for Southwestern Willow Flycatcher states,

> " The historical range of the flycatcher in Arizona included portions of all major watersheds (H. Brown 1902 unpubl. data, Willard 1912, Swarth 1914, Phillips 1948, Unitt 1987). … All of Arizona's major rivers and their tributaries where southwestern willow flycatchers were known to have bred have changed, often dramatically (Tellman et al. 1997). Rivers such as the Colorado, Gila, Santa Cruz, San Pedro, and Verde rivers have suffered extensive dewatering, and loss and fragmentation of riparian habitats. …
>
> Specific river reaches, within Management Units, where recovery efforts should be focused. Substantial recovery value exists in these areas of currently or potentially suitable habitat … San Pedro River from international border to St. David (AZ) …"[141]

It is not logical to conclude that Fort Huachuca will have no effect on species dependent upon the San Pedro for recovery when Fort Huachuca itself and its Base-attributable deficit groundwater pumping are jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

[141] Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup, Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico; August 30, 2002.

F. Fort Huachuca has failed to reinitiate consultation and FWS has failed to adopt its conference opinions following the listing of the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo.

Since release of the BiOp, the Northern Mexican Gartersnake has been added to the federal list of endangered species. On July 8, 2014, the Northern Mexican Gartersnake was added to the federal list of endangered species.[142]

Northern Mexican Gartersnake (*Thamnophis eques megalops*) © Andy Holycross

FWS' Listing Notice for Northern Mexican Gartersnake states,

> "Records documenting northern Mexican gartersnake exist within the following subbasins in Arizona: … San Pedro River …
>
> Despite the loss or modification of aquatic and riparian habitat, large reaches of the … San Pedro …, as well as several of their tributaries, remain functionally suitable as physical habitat for either gartersnake species [both the Northern Mexican Gartersnake and the Narrow-headed Gartersnake were listed in the same Notice]. …
>
> The arid southwestern United States is characterized by limited annual precipitation, which means limited annual recharge of groundwater aquifers; even modest changes in groundwater levels from groundwater pumping can affect above-ground stream flow as evidenced by depleted flows in the … San Pedro … as a result of regional groundwater demands (Stromberg *et al.* 1996, pp. 113, 124–128; Rinne *et al.* 1998, p. 9; Voeltz 2002, pp. 45–47, 69–71; Haney *et al.* 2009 p. 1). Groundwater

[142] Endangered and Threatened Wildlife and Plants, Final Rule, Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, USFWS, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

> demands are expected to reduce surface water flow in … Babocomari River … [and] San Pedro River … over the next several decades (Haney *et al.* 2009 p. 3, Table 2) …
>
> Further south in Arizona, portions of the once-perennial San Pedro River are now ephemeral, and water withdrawals are a concern for the San Pedro River (USGS 2013, p. 3). …
>
> Along the upper San Pedro River, Stromberg *et al.* (1996, pp. 124–127) found that wetland herbaceous species, important as cover for northern Mexican gartersnakes, are the most sensitive to the effects of a declining groundwater level. Webb and Leake (2005, pp. 302, 318–320) described a correlative trend regarding vegetation along southwestern streams from historically being dominated by marshy grasslands preferable to northern Mexican gartersnakes, to currently being dominated by woody species that are more tolerant of declining water tables due to their deeper rooting depths. The cone of depression associated with regional groundwater pumping is expected to continue expanding its influence on surface flow in the San Pedro River over the next several decades, which is expected to further reduce surface flow in the river and negatively affect riparian vegetation (Stromberg *et al.* 1996, pp. 124–128).
>
> In our evaluation of the effect of groundwater pumping on gartersnake habitat, we found several references that discuss the known hydrological connection between groundwater and surface flow in southwestern streams. This is an established concept in the scientific community and the basis for widespread public concern in several areas of Arizona with respect to surface flows including the Verde and San Pedro Rivers. …"[143]

The law requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize survival and recovery of the Northern Mexican Gartersnake.[144] Fort Huachuca has not done so in spite of the fact that the Base's activities are jeopardizing the survival and recovery of this species. Fort Huachuca's failure to consult with FWS to prevent jeopardizing the Northern Mexican Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Since production of the BiOp, the Yellow-billed Cuckoo has been added to the federal list of endangered species. On October 3, 2014, the Yellow-billed Cuckoo was added to the federal list of endangered species.[145]

[143] Final rule. Endangered and Threatened Wildlife and Plants: Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, Federal Register, Vol. 79, No. 130, Tuesday, July 8, 2014.

[144] 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

[145] Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

Yellow-billed Cuckoo (*Coccyzus americanus*) © Robin Silver

The largest population of Yellow-billed Cuckoo in the western United States.[146] "Perhaps 30 percent of the western U.S. population of Yellow-billed Cuckoos breed" in the San Pedro Riparian National Conservation Area."[147] At least 25% of Arizona's Yellow-billed Cuckoo population nests on the Upper San Pedro River.[148]

FWS' Listing Notice for Yellow-billed Cuckoo states:

> "Upper San Pedro River—This site has had the largest yellow-billed cuckoo population in Arizona. …
>
> The San Pedro Riparian National Conservation Area (NCA) encompasses approximately 40 mi (64 km) of the upper San Pedro River meanders. It was designated by Congress in 1988 with its primary purpose to protect and enhance the desert riparian ecosystem as an example of what was once an extensive network of similar riparian systems throughout the American Southwest. It contains nearly 57,000 ac (23,077 ha) of public land between the international border with Mexico and St. David, Arizona, and supports one of the largest western yellow-billed cuckoo populations in Arizona. However, continually increasing demands for water use within the basin threatens future flow in the upper San Pedro River. The 2011 District of Arizona case, *Center for Biological Diversity, et al.* v. *Kenneth Salazar, et al.,* CV 07–484– TUC—AWT, ruled that the 2007 plan by the U.S. Army and U.S. Fish and Wildlife Service failed to protect the upper San Pedro River or properly analyze Fort

[146] Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.; Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule, Federal Register, Vol. 79, Page 59962, October 3, 2014.

[147] National Audubon's Introduction to Important Bird Areas, Frank Graham, Jr., Audubon Magazine, Vol. 104, No. 5; December 2002.

[148] Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report, Arizona Game and Fish Department, March 10, 2000.; Survey and Life History Studies of the Yellow-billed Cuckoo: Summer 2001, Bureau of Reclamation, Prepared by Murrelet Halterman, August 13, 2002.

Huachuca's ground water pumping effect on the ecosystem's endangered species and critical habitat."[149]

The proposal for Critical Habitat for Yellow-billed Cuckoo says:

> "This unit [Upper San Pedro River] has one of the largest remaining breeding groups of the western yellow-billed cuckoo and is consistently occupied by a large number of pairs. The site also provides a movement corridor for Western yellow-billed cuckoos moving farther north."[150]

The law requires that Fort Huachuca consult with FWS to ensure that the Base's activities will not jeopardize survival and recovery of the Yellow-billed Cuckoo.[151] Fort Huachuca has not done so in spite of the fact that the Base's activities are jeopardizing the survival and recovery of this species. Fort Huachuca's failure to consult with FWS violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Section 7(a)(4) mandates that an action agency "confer" with FWS on any action that is "likely to jeopardize the continued existence" of any "species proposed to be listed" or is "likely to result in the destruction or adverse modification of critical habitat proposed to be designated for such species." 16 U.S.C. § 1536(a)(4); 50 C.F.R. § 402.10. Although not required, agencies can request that the conference "be conducted in accordance with the procedures for formal consultation." 50 C.F.R. § 402.10(d). The final product of such a conference is called a conference opinion. Consultation Handbook at 6-4.

If a proposed species is later listed, or its critical habitat is formally designated, the action agency has two options. First, it can request in writing that FWS adopt the conference opinion as a BiOp. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-6. However, FWS may only adopt the opinion so long as "no significant new information is developed . . . and no significant changes to the Federal action are made." If the opinion is adopted as a BiOp, any incidental take statement that was provided with the conference opinion may take effect—but not before then. 50 C.F.R. § 402.10(d); Consultation Handbook at 6-4. If FWS does not adopt the conference opinion as a BiOp, the action agency *must* pursue its second option and reinitiate consultation pursuant to 50 C.F.R. § 402.16(d) (requiring reinitiation of formal consultation if a "new species is listed or critical habitat designated that may be affected by the identified action"); *see also* BiOp at 369 (noting "reinitiation of formal consultation is required where . . . a new species is listed or critical habitat designated that may be affected by this action"). Either way, formal consultation is not concluded until FWS issues a BiOp. 50 C.F.R. § 402.14(l)(1).

Here, when FWS issued the Fort Huachuca BiOp and Conference Opinion on May 16, 2014, the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo were proposed for listing, and FWS had proposed critical habitat for the Gartersnake. FWS incorporated conference opinions for these species into its BiOp, along with a provisional incidental take statement for the gartersnake. BiOp at 252, 276–80. Less than two months later, FWS published a final rule listing the gartersnake as threatened. Endangered and Threatened Wildlife and

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[149] Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule, U.S. Fish and Wildlife Service, Federal Register Vol. 78 Page 61622, October 3, 2013.

[150] Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo; Proposed Rule; U.S. Fish and Wildlife Service; Federal Register Vol. 79 Page 48548.

[151] 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14(g).

Plants; Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake, 79 Fed. Reg. 38,678 (July 8, 2014). Shortly thereafter, FWS also listed the western distinct population segment of the Yellow-billed Cuckoo as threatened. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (Coccyzus americanus), 79 Fed. Reg. 59,992 (Oct. 3, 2014).

By the end of 2014, the Fort requested that FWS adopt the conference opinions for the Gartersnake and Cuckoo as a BiOp. Phone call with FWS Tucson Field Office (July 16, 2019). But although the Consultation Handbook gives FWS 45 days after an action agency's request to adopt a conference opinion as a BiOp, here FWS has not acted in nearly five years. Consultation Handbook at 6-6. Enough time has passed since the Fort's request for FWS confirmation—roughly 1,800 days— that FWS can no longer be certain that "no significant changes have occurred in the proposed action or the information used in the conference." *Id*.; *see also* Alex Devoid, *A rancher and an ecologist hike the desert, hunting for water and common ground on the San Pedro River*, Arizona Republic, Jan. 7, 2019[152] (reporting a long-term drought in the San Pedro region, making 2018 one of the three driest rivers for the Babocomari since mapping began in 2007). Moreover, the Fort never reinitiated consultation pursuant to 50 C.F.R. § 402.16(d), as it should have based on the length of time that has passed since the species were listed. A new interagency consultation for the Gartersnake and Cuckoo is the only way to assess the Fort's impacts to these species' continued existence. *See id.*

In sum, the agencies have failed to complete formal consultation on an action which the Fort already recognized may adversely affect both the Northern Mexican Gartersnake and the Western Yellow-billed Cuckoo. PBA at 5-28, 5-39. Moreover, because the 2014 conference opinions were never confirmed, the provisional incidental take statement issued for the gartersnake never took effect. *See* BiOp at 276–79; 50 C.F.R. § 402.10(d). This means the Fort has been operating for five years in a manner FWS already recognized would likely result in the take of ten Northern Mexican Gartersnakes over the course of the 10-year action period. *See* BiOp at 276 (issuing provisional incidental take statement for ten Northern Mexican Gartersnakes over the 10-year life of the project due to baseflow reductions in the lower Babocomari). Even assuming the Fort has not already violated section 9's take prohibition, the Fort's failure to consult violates section 7 of the ESA, 50 C.F.R. § 402.10(d), and 50 C.F.R. § 402.16(d).

G. Recharge Basins are not providing as much water as anticipated in the BiOp. New Climate Change science since release of the BiOp means that even less recharge can be anticipated. This new information requires Reinitiation of Consultation.

Fort Huachuca claims credit from a series of on-post recharge basins in the BiOp (at 168) for Stormwater Capture ("C2") and East Range recharge ("C3") (BiOp at 168), and claims credit off-post for the Palominas Pilot Stormwater Recharge Project ("F2") (BiOp at 169); however, the recharge basins are not providing the amount of recharge as planned.[153] The BiOp

[152] Available at https://www.azcentral.com/story/news/local/arizona-environment/2019/01/07/looking-common-ground-ailing-san-pedro-river-arizona/2447483002/.

[153] Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date

at 168 claims 108 acre-feet per year from 2013 – 2022 for on-post Stormwater Capture ("C2"); however, Fort Huachuca's Annual Reports show totals of 61.6, 59, 27, and 27 acre-feet per year respectively for years 2015, 2016, 2017, and 2018.[154] This represents 60% less recharge for the last four years than anticipated in the BiOp for on-post credit for Stormwater Recharge.

The BiOp at 168 claims 368 acre-feet per year for on-post East Range Recharge ("C3") from 2013-2022; however, Fort Huachuca's Annual Reports show totals of 185, 187, 209, 155, and 246 for years 2015, 2016, 2017, and 2018, respectively.[155] This represents 47% less recharge for the last five years than anticipated in the BiOp for on-post East Range Recharge credit.

The BiOp at 30 and 169 counts the off-post Palominas Pilot Stormwater Project ("F2") for 98 acre-feet per year starting in 2015; however, the June 19, 2019, Cochise Conservation and Recharge Network report to the USPP Technical Committee reveals that the Palominas Recharge facility recharged only 9.7 and 10.2 acre-feet per year respectively in years 2017 and 2018.[156] This represents 90% less recharge for the two years for which data is available than anticipated in the BiOp for the Palominas Recharge facility.

According to the best available climate, the recharge credits claimed by Fort Huachuca (BiOp at 168 and 169) and mentioned here, and ultimately, also "Incidental Recharge" claimed by the Base (BiOp at 168), will be diminished further in the future.[157] The American Southwest is getting hotter and drier.[158] Climate models project that precipitation and soil moisture in the

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unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.; Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

[154] Fort Huachuca Threatened and Endangered Species Report for 2014, April 1, 2015.; Fort Huachuca Threatened and Endangered Species Report for 2015, June 8, 2016.; Fort Huachuca Threatened and Endangered Species Report for 2016, date unknown.; Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures- 2017, February 13, 2018.; and Fort Huachuca Threatened and Endangered Species Annual Review, Implementation of Conservation and Mitigation Measures – 2018, date unknown.

[155] Ibid.

[156] Cochise Conservation and Recharge Network (CCRN), Ephemeral Streamflow, Groundwater, and Palominas Facility Monitoring, Presentation to Upper San Pedro Partnership (USPP) Technical Committee, June 19, 2019.

[157] Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45.; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN.; Seager, R., T. Mingfang , L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. Nature Climate Change 3: 482-486.

[158] Vose, R.S., D.R. Easterling, K.E. Kunkel, A.N. LeGrande, and M.F. Wehner. 2017. Temperature changes in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 185-206, doi: 10.7930/J0N29V45 (pp. 186-190).; Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (pp.231, 238).

Southwest will continue to decrease.[159] Global warming driven by rising greenhouse-gas concentrations is expected to cause a steady drop in precipitation over the American Southwest by 2040 leading to declines in surface water availability.[160]

Arizona generally has already become both hotter and drier.[161] Specifically, in nearby Tucson, where substantial data is available, year-round temperatures are increasing and precipitation is diminishing.[162]

H. Fort Huachuca-attributable, San Pedro River-damaging, deficit groundwater pumping in the Fort Huachuca/Sierra Vista area[163] will be increasing by 61.9 % since the BiOp from -1,453 acre-feet per year[164] to approximately -2,325.2 acre-feet per year.[165] This new information requires reinitiation of consultation.

Fort-attributable, San Pedro River-damaging deficit groundwater pumping has significantly increased since the BiOp. Since production of the BiOp, the San Pedro's vulnerability and risk of harm from the Base's pumping has increased dramatically as Fort Huachuca-attributable, unmitigated, deficit groundwater pumping is now 1,172 acre-feet per year greater, 61.9% greater, than the amount assumed in the BiOp.[166] BiOp at 141, 160, 163, 169, and 304.

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[159] Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner. 2017. Precipitation change in the United States. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC (p. 217).; Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 231-256 doi: 10.7930/J0CJ8BNN (pp. 231, 238).

[160] Seager, R., T. Mingfang , L. Cuihua, N. Naik, B. Cook, J. Nakamura, and H. Liu. 2013. Projections of declining surface-water availability for the southwestern United States. Nature Climate Change 3: p. 482.

[161] National Oceanic and Atmospheric Administration National Centers for Environmental information, City Time Series, published October 2019, retrieved on October 22, 2019 from http://www.ncdc.noaa.gov/cag/ .

[162] Ibid.

[163] Sierra Vista Subbasin

[164] BiOp at 80, 85, 154, and 169.

[165] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000), Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[166] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 1126th, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.; Wells 55 Registry, downloaded from

The BiOp bases its water budget upon a net yearly Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) This deficit of 4,600 acre-feet/year comes from the Upper San Pedro Partnership ("USPP") report from 2013.[167] BiOp at 141 and 160.

USPP is "[a] consortium of agencies and organizations working together to meet the long-term water needs of the Sierra Vista Subwatershed by achieving sustainable yield of the regional aquifer to: 1) preserve the San Pedro Riparian National Conservation Area (SPRNCA), and 2) ensure the long-term viability of Fort Huachuca."[168] Fort Huachuca is a USPP member.

In 2003, USPP promised to "balance the local water budget by 2011"[169] in order to secure a special legislative environmental law exemption for Fort Huachuca[170] to protect the base from downsizing in the 2005 Base Realignment and Closure round. The legislative exemption was necessary at the time because, in Fort Huachuca's lawyer's own words,

> "Development over the last decade has overburdened water resources. The region is now facing an escalating groundwater deficit, with underlying aquifer being drained beyond its capacity for recharge. Declining water levels are adversely affecting critical habitat and several endangered species in the San Pedro Riparian Area. …
>
> In 1998, the USFWS issued a draft BO, which preliminarily concluded that the Army's proposed action (Fort Huachuca's ongoing and programmed activities and accompanying conservation measures), were "likely to jeopardize" the existence of the Huachuca Water Umbel, the Southwestern Willow Flycatcher and "likely to adversely modify" the critical habitat of the Flycatcher [Yellow-billed Cuckoo, and Northern Mexican Gartersnake were not yet listed as endangered]. …
>
> On 11 April 2002, the U.S. District Court, District of Arizona, issued an order granting CBD's motion for summary judgment/declaration judgment, finding the absence of a factual and rational basis to support the no-jeopardy BO ("The Defendants [Army and USFWS] admit that even if all of the mitigation measures included in the Final BO, are taken together and under the best case scenario, water use in the aquifer will exceed supply and result in continuing growth in the already very large cone of depression under Fort Huachuca and Sierra Vista, until groundwater pumping is balanced in the region." (Court's Opinion at pages 16-17). The court ruled that the USFWS must address the regional water deficit and impose specific mitigation measures (Reasonable and Prudent Alternatives) on Fort Huachuca designed to achieve a no-jeopardy situation. …
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> Representative Renzi's amendment to H.R. 1835 proposes to limit the consideration of civilian, off-post water in future ESA consultations conducted by

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https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[167] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.

[168] http://uppersanpedropartnership.org/mission-goals/

[169] "USPP's resolution called a 'bold step;' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

[170] Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

military installations. It is unclear whether the scope of this amendment is broad enough to preclude the consideration of "cumulative effects, "which are future state and private activities, not part of the federal action that are reasonably certain to occur. Having to consider and mitigate for cumulative effects under the ESA continues to be a major problem for Fort Huachuca."[171]

With Senator John McCain's help,[172] Representative Rick Renzi was able to secure passage of the special legislative environmental law rider exemption for Fort Huachuca so that the Base would not have to consider the surrounding area's environmental baseline in any evaluation of Fort Huachuca's activities.[173] But as a quid quo pro for passage of the legislative exemption, USPP, including Fort Huachuca, promised to "balance the area's water deficit by 2011.[174]

The September 13, 2003, Sierra Vista Herald's "USPP's resolution called a 'bold step;' Group pledges to help balance water deficit" reports:

> "In the resolution, the group, which is a consortium of federal, state and local agencies, businesses and environmental groups, says its members will balance the area's water deficit by 2011… The object of the resolution is to ensure the fort has the support it needs to survive the next Base Realignment and Closure round.
>
> "Strain [Sierra Vista mayor pro tem Bob Strain], the chairman of the partnership's Advisory Commission, said that can only be done with a commitment by the off-post communities to be part of the water use solution."

Fort Huachuca's Garrison Commander stressed the importance of balancing the area's water deficit by 2011 in the Sierra Vista Herald on February 4, 2006. In "Garrison commander says water is a threat to fort," the Sierra Vista Herald reports,

> "FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.

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[171] "INFORMATION PAPER; SUBJECT: District Court Decision on Fort Huachuca's Biological Opinion; Purpose: To provide information on the 11 April 2002, U.S. District Court decision regarding the U.S. Fish and Wildlife Service's (USFWS) Final Biological Opinion (BO) on Fort Huachuca's activities and water usage."; Colonel Teller, JALS-EL 12 May 2003.

[172] Op Ed: "Republicans should save environment," John McCain, November 27, 1996:

"Public skepticism that Republican share Americans' environmental values raise an important question. Have Republicans abandoned their roots as the party of Theodore Roosevelt, who maintained that government's most important task, with the exception of national security, is to leave posterity a land in better condition than they received it?

The answer must be no. But if we are to restore the people's trust and retain the privilege of serving as the majority party, we better start improving it. … Too often the public views Republicans as favoring big business at the expense of the environment … killing the patient is a lousy way to treat the disease and squanders our credentials as reformers while adding substance to our critics' accusations of extremism. … our nation's continued prosperity hinges on our ability to solve environmental problems and sustain the natural resources on which we all depend."

Press Release, "Statement of Senator John McCain Bill to Authorize Two Base Realignment Closure Rounds to Occur in 2003 and 2005," Senator John McCain, August 23, 2002 and November 4, 2002:

"I urge my colleagues to join us in support of this critical bill and to work diligently throughout the year to put aside local politics for what is clearly in the best interest of our military forces.";

[173] Section 321. Cooperative Water Use Management Related to Fort Huachuca, Arizona, and Sierra Vista Subwatershed, Public Law 108-136, National Defense Authorization Act for Fiscal Year 2004, November 24, 2003.

[174] "USPP's resolution called a 'bold step;' Group pledges to help balance water deficit," Sierra Vista Herald, September 13, 2003.

Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. …

"The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. …

Within five years [by 2011], those who share the Sierra Vista Subwatershed, which includes the fort, Sierra Vista, Huachuca City, Tombstone, Bisbee, and other unincorporated areas [Cochise County], face a congressional mandate to bring use and recharge into balance.

While people think the fort came off good in the most recent BRAC round because it was not on the closure list, looking at the statistics that showed the post as being 21 in the lineup of important installations "means there were some issues with Fort Huachuca," the colonel said.

What is unrecognized by many is "we didn't do well in some areas," Hunter said.

One area of concern of water…

With 2011 drawing nearer, decisions on meeting the mandate [to erase the water budget deficit] from Congress are closer. "The water conservation clock is running," the colonel said."[175]

USPP reiterated its promise in its 2005 through 2011 reports:

"...the Secretary of the Interior shall prepare, in consultation with the Secretary of Agriculture and the Secretary of Defense and in cooperation with the other members of the Partnership, a report on water use management and conservation measures that have been implemented and are needed to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011."[176]

[175] "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 6, 2004.

[176] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2004 Report to Congress, Upper San Pedro Partnership, March 30, 2005.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2005 Report to Congress, Upper San Pedro Partnership, 2006.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2006 Report to Congress, Upper San Pedro Partnership, 2007.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2007 Report to Congress, Upper San Pedro Partnership, 2008.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2009 Report to Congress, Upper San Pedro Partnership, May 2011.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2010 Report to Congress, Upper San Pedro Partnership, May 2012.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2011 Report to Congress, Upper San Pedro Partnership, 2013.; Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

Predictably, though, the Upper San Pedro Partnership, including Fort Huachuca, failed to keep its promise to "balance the local water budget by 2011." In their 2012 report (USPP 2014), USPP admits:

> "…the Partnership has fallen short of the goal set by Congress to achieve sustainable yield (defined by the Partnership as erasing the water budget deficit) by September 30, 2011."[177]

The BiOp states that "[t]he Fort is no longer contributing to the groundwater deficit." (BiOp p. 166, 275.) This statement is false.

The Fort-attributable, unmitigated, deficit groundwater pumping in the BiOp is -1,453 acre-feet per year for 2011 (BiOp at 80,85, 154, and 169). And this inappropriately includes 299 acre-feet per year credit for "avoided future pumping" for the Babocomari Area Conservation Easement (BiOp at 28, 168) The new Fort-attributable deficit since the BiOp is now approximately 2,325.2 acre-feet per year. [178] This is now -1,172 acre-feet per year greater than the amount assumed in the BiOp,[179] (BiOp at 141, 160, 163, 169, and 304) which is an increase of at least 61.9% in unmitigated, deficit groundwater pumping since production of the BiOp.

The BiOp assumes a Sierra Vista Subwatershed deficit of 4,600 acre-feet/year. (BiOp at 141, 160, 163, and 304.) The BiOp subsequently arrives at its Fort-attributable deficit groundwater pumping of -1,453 acre-feet per year (BiOp at 80,85, 154, and 169). The BiOp's total of -1,453 acre-feet per year, however is not accurate as the BiOp inappropriately assigns the Base credit for 299 acre-feet per year from "avoided future pumping" for the Babocomari Area Easement. BiOp at 169 and Biological Assessment ("BA") Appendix D Mitigation Measures Plan at 2. The BiOp credits Fort Huachuca with the 299 acre-feet per year for the Babocomari Area as it is from "avoided future pumping" for the Babocomari Area Easement in spite of the fact that the BiOp at 294, itself, states that "[w]e acknowledge that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."[180] Consequently, the correct 2011, Fort-attributable, unmitigated groundwater pumping should have been -1,752 acre-feet per year in the BiOp. (1,453 + 299 = 1,752). The new Biological Opinion will need to correct this error.

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[177] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

[178] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[179] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.; Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.; Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017..

[180] U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

USPP (2014) reports that the area's total aquifer overdraft is -5,100 acre-feet per year.[181] This is higher than the BiOp's total aquifer overdraft of -4,600 acre-feet per year from USPP (2013). The BiOp's hydrological data is from "2011, 2012, and preliminary numbers from 2013." (BiOp at 4.) The USPP report (2014) is based on data through 2012.

In addition, since release of USPP (2014), an additional 3,302.35 acre-feet per year of future groundwater extraction for the build out of the proposed 7,000 house, Pueblo del Sol Tribute development in Sierra Vista has been approved by the City of Sierra Vista and the Arizona Department of Water Resources ("ADWR");[182] and an additional 369 new non-monitoring wells have been permitted in the Sierra Vista Subbasin by ADWR from January 1, 2012 through November 11, 2019.[183]

Approximately forty percent of all off-post deficit groundwater pumping in the area is attributable to Fort Huachuca. (BiOp at 28, 153, 154 and 156.) We calculate new Fort Huachuca-attributable San Pedro River-killing deficit groundwater pumping of -2,325.2 acre-feet per year since production of the BiOp by (1) using 40% of the latest deficit figure from USPP (2014) of -5,100 acre-feet per year which equals -2,040 acre-feet/acre; (2) by using 40% of the new -3,302 acre-feet per year approved by the City of Sierra Vista and ADWR for the Pueblo del Sol development which equals -1,321 acre-feet per year; and (3) and by assigning 40% of the 93 acre-feet per year of groundwater pumped by 369 new non-monitoring Sierra Vista subwatershed wells permitted from January 1, 2012 through November 11, 2019 by ADWR. We calculate the 37.2 acre-feet/year of groundwater from the new wells by assuming one home per well and by using the USGS average use per well value of 0.252 acre-feet per year [184] (369 x 0.252 = 93, 93 x .40 = 37.2). We note that of these 369 newly permitted wells, 40 are permitted as "non-exempt" wells to pump which may pump more than 35 gallons per minute ("gpm") or more than 56 acre-feet per year. These are obviously not for single home use and will pump much more than the less than 35 gpm each for the permitted exempt wells. An exact new groundwater pumping total will need to be calculated, adjusted, and added to Fort-attributable, deficit groundwater pumping in the new Biological Opinion to account for the newly added non-exempt groundwater pumping wells. We reduce the Fort's attributable deficit by 1,073 acre-feet of actual retired groundwater pumping from the Clinton Drijver farms (BiOp at 169). We do not give the Fort credit for their "avoided future" pumping consistent with FWS' own policy "that conservation easements do not result in an increase in flows in adjoining streams unless an active water use is retired."[185]

Specific to the newly permitted, unmitigated deficit groundwater pumping by the Pueblo del Sol Tribute development, the callousness and the arrogance and lack of concern for Fort

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[181] Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona – 2012 Report to Congress, Upper San Pedro Partnership, May 21, 2014.

[182] Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as Having an Adequate Water Supply (No. 40-700705.0000); Thomas Buschatzke, Assistant Director, Arizona Department of Water Resources, July 23, 2012.; Designation or Modification of Adequate Water Supply Application to the Arizona Department of Water Resources Office of Assured and Adequate Water Supply; 40-700705.0000; Rick Coffman, General Manager, Pueblo del Sol Water Company, January 24, 2012.

[183] Wells 55 Registry, downloaded from https://new.azwater.gov/gis on November 11, 2019; and Arizona Department of Water Resources, "Groundwater Subbasin", Downloaded from http://gisdataazwater.opendata.arcgis.com/ on March 17, 2017.

[184] Hydrological Conditions and Evaluation of Sustainable Groundwater Use in the Sierra Vista Subwatershed, Upper San Pedro Basin, Southeastern Arizona, U.S. Department of the Interior U.S. Geological Survey, Scientific Investigations Report 2016-5114, Version 1.3, April 2019, page 30.

[185] U.S. Fish & Wildlife Serv., *Final Biological and Conference Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Cochise County, Arizona* (Mar. 31, 2014); Amended May 16, 2014. ("BiOp"), page 294.

Huachuca is epitomized by the November 29, 2012, testimony, under oath, of Richard S. Coffman, Senior Vice President of Castle & Cooke Arizona, owner of Pueblo Del Sol Water Company and the Tribute Development in Sierra Vista. Even though approximately 40% of the inhabitants of the Tribute development are Fort Huachuca-attributable employees, retirees and or contractors, the lack of concern for Fort Huachuca's water problem is gripping:

> "Q. Okay. And you testified that there are plans built into the master plan for harvesting and reuse of water. Is it correct that those plans include using most of that water for watering the landscaping with the subdivision?
>
> A. Yes.
>
> Q. And that water is - - and that water therefore would not be available for recharge to the aquifer?
>
> A. That's correct, except insofar as there is some incidental recharge through the landscaping efforts. … "[186]

We harken back to ACOE's July 1970 prophetic observation that in July 1970, in "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona," U.S. Army Corps of Engineers ("ACOE"), says,

> "… The private wells in the Sierra Vista area interact with the post well field in forming the cone of depression of the ground water table. There is no control over the rate of pumping nor over the drilling of new wells in the privately owned area. …"[187]

And Fort Huachuca Garrison Commander Hunter's observations on February 4, 2006, in the Sierra Vista Herald's "Garrison commander says water is a threat to fort,"

> FORT HUACHUCA – The biggest threat to this Southern Arizona Army post is water, the fort's garrison commander said.
>
> Col Jonathan Hunter said it is critical to bring groundwater pumping and aquifer recharge into balance to protect the San Pedro River. "The future of Fort Huachuca lies with the future of the San Pedro (River)," Hunter said. …
>
> "The biggest challenge before any future BRAC [Base Realignment and Closure] (for the fort) will be the water issue. Fort Huachuca can do everything (within the gates) but zero balance could still not be met," Hunter said. …""[188]

Because the City of Sierra Vista, Cochise County, the State of Arizona, ADWR, and local developers like Castle & Cooke have failed to sufficiently help Fort Huachuca in controlling the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, alone and abandoned, must now remove the Fort-attributable the jeopardy facing the San Pedro River and its representative and dependent endangered species by Fort Huachuca.

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[186] In the Matter of the Decision of the Director to Grant Pueblo Del Sol Water Company's Application for Designation as having an Adequate Water Supply No. 40-700705.0000.; Docket No. 12A-AWS001-DWR; Pueblo Del Sol Hearing Volume IV 11-29-2012 Transcribed from an Audio Recording pages 694-5.

[187] "Summary of Ground Water Supply Conditions, Fort Huachuca, Arizona, Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, July 1970.

[188] "Garrison commander says water is a threat to fort," Bill Hess, Sierra Vista Herald, February 4, 2006.

CONCLUSION

The BiOp's (1) inappropriate reliance on speculative "avoided future use" water-saving credits, (2) inappropriate reliance on Preserve Petrified Forest parcel "retirement" water-saving credits, (3) inappropriate limitation of its analysis time to ten years, (4) failure to account for the effects of Fort-attributable pre-BiOp groundwater pumping, and (5) failure to pay heed to its own Recovery Plans violate the Endangered Species Act mandate that "each agency shall use the best scientific and commercial data available" [*16 U.S.C. § 1536*(a)(2)]; and the Administrative Procedure Act where an agency's action must not be "arbitrary, capricious, or an abuse of discretion." 5 USC §706(2)(A).

Fort Huachuca's failure to consult with FWS to prevent jeopardizing Yellow-billed Cuckoo and Northern Mexico Gartersnake violates the law. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.

Fort Huachuca's and FWS' violate the law because of their failure to reinitiate consultation based on new information available since the BiOp that (1) Fort Huachuca claims water mitigation credit for recharge that has proven much lower than anticipated, (2) that climate change will increasingly amplify Fort Huachuca caused San Pedro River harm and will further diminish the Fort's anticipated recharge credits; and (3) that Fort Huachuca-attributable groundwater pumping has increased dramatically since BiOp release. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.16.

Because the City of Sierra Vista, Cochise County, the State of Arizona and local developers have failed to help Fort Huachuca with control of the Base's attributable, off-post groundwater pumping, Fort Huachuca, itself, must take responsibility for the fact that the Base is jeopardizing the survival of the San Pedro River and its representative and dependent endangered species.

In sixty days, the Center for Biological Diversity, Maricopa Audubon Society, and the Grand Canyon Chapter of the Sierra Club, represented by Earthjustice, will seek judicial relief as well as attorney fees and costs, if you have not taken corrective action to stop the multiple violations of law documented in this Notice. 16 U.S.C. § 1540(g)(2)(A)(i).

If you have any questions, please contact, Dr. Robin Silver, via MAIL: Center for Biological Diversity, P.O. Box 1178, Flagstaff, AZ 86002; PHONE: (602) 799-3275; or EMAIL: rsilver@biologicaldiversity.org.

Sincerely,

Robin Silver, M.D.
Co-Founder and Board Member