

Grazed to Death:

Livestock Production Adversely Modifying Majority of Drought-Stricken Western Yellow-Billed Cuckoo Critical Habitat on Public Lands in Arizona and New Mexico



Center for Biological Diversity



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Summary - Livestock grazing has adversely modified at least 57% of designated critical habitat of western yellow-billed cuckoo ("cuckoo") within public lands grazing allotments in Arizona and New Mexico. In those states the U.S. Fish and Wildlife Service ("FWS") has designated 55,550 acres of critical habitat for cuckoo within grazing allotments managed by the U.S. Forest Service ("FS") and Bureau of Land Management ("BLM"). From 2021-2023, Center for Biological Diversity field biologists surveyed 39,170 (70%) of those acres for adverse modification from livestock grazing immediately prior to, or during, the cuckoo nesting and breeding season. Surveys found moderate to significant impacts and adverse modification across 31,509 acres, which is 80% of critical habitat surveyed, and 57% of the critical habitat within public lands grazing allotments in Arizona and New Mexico.

Many bird species associated with cottonwood trees (*Populus fremontii*) are rare or endangered in the Southwest.^{1,2} Among them is the western yellow-billed cuckoo (“cuckoo”), a tropical bird that migrates from South America to the western United States ahead of summer monsoons to build nests and raise chicks. Cuckoo have disappeared throughout most of their former breeding range due to habitat loss.^{3,4} Following dramatic population declines in California, southeastern Arizona now supports the largest remaining breeding population of cuckoo in the United States, although steady decline continues throughout their range.⁵

In 2014 the U.S. Fish and Wildlife Service (“FWS”) listed the cuckoo as a threatened species under the Endangered Species Act⁶ due to precipitous population declines that directly paralleled decline of its preferred breeding and nesting habitat, cottonwood-willow riparian forest.^{7,8} Despite the extraordinary ecological and biodiversity values of riparian ecosystems, upon which most desert species directly depend for survival, these places are among the most disturbed and degraded land type in the western United States.⁹

Optimal cuckoo breeding habitat consists of riparian woodlands with an overstory, a subcanopy, and contiguous patches of vegetative understory adjacent to intermittent or perennial watercourses.^{10,11} In arid Arizona, even ephemeral (xeroriparian) drainages can serve as cuckoo nesting habitat if they support higher vegetation volume and diversity, proportionally higher moisture content, and higher potential for prey abundance than surrounding uplands.¹² These specific habitat components help maintain high prey densities and higher relative humidity, which are important criteria for cuckoos as they arrive in May and June to select nest locations. Nesting site selection is based on the foraging potential of the immediate vicinity,¹³ where food

¹ Johnson, R.R., Haight, J.T., Simpson, J.M. 1977. Endangered Species vs. Endangered Habitats: A Concept. *In* Importance, Preservation, and Management of Riparian Habitat: A Symposium, Tucson, Arizona, July 9, 1977 (Vol. 43). Rocky Mountain Forest and Range Experiment Station, Forest Service, US Department of Agriculture.

² Engel-Wilson, R.W. and Ohmart, R.D., 1978. Floral and Attendant Faunal Changes on the Lower Rio Grande Between Fort Quitman and Presidio, Texas.

³ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021.

⁴ Biological Opinion on Ongoing Grazing on the Coronado National Forest, Graham, Cochise, Pima, Pinal, and Santa Cruz Counties, Arizona and Hidalgo County, New Mexico. AESO/SE, 2-21-98-F-399, 2-21-98-F-399R1, 02EAAZ00-2019-F-0867, September 30, 2021, p. 174.

⁵ Krzysik 2014. Western Yellow-billed Cuckoo Critical Habitat in Arizona. Technical Report. Prescott, AZ 12 October 2014.

⁶ Rules and Regulations. Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*), Federal Register, Vol. 79, No. 192. October 3, 2014.

⁷ Wallace, C.S., Villarreal, M.L. and van Riper III, C., 2013. Influence of monsoon-related riparian phenology on yellow-billed cuckoo habitat selection in Arizona. *Journal of Biogeography*, 40(11), pp.2094-2107.

⁸ USFWS. 2013. Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule. 50 CFR Part 17. Federal Register, Vol. 78, No. 192, Part V. 3 October 2013. Pages 61621-61666.

⁹ Bock, C.E., Saab, V.A., Rich, T.D. and Dobkin, D.S., 1993. Effects of livestock grazing on neotropical migratory landbirds in western North America. *Status and management of Neotropical migratory birds. USDA Forest Service, General Technical Report RM-229*, pp.296-309.

¹⁰ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021, page 20939.

¹¹ Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River Valley. Univ. Arizona Press, Tucson, AZ. 416pp.; Johnson, M.J., S.L. Durst, C.M. Calvo, L. Stewart, M.K. Sogge, G. Bland, and T. Arundel. 2008. Yellow-billed Cuckoo Distribution, Abundance, and Habitat Use Along the Lower Colorado River and its Tributaries, 2007 Annual Report. USGS, Open File Report 2008-1177. 274pp.

¹² Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021, page 20815.

¹³ Wallace, C.S., Villarreal, M.L. and van Riper III, C., 2013. Influence of monsoon-related riparian phenology on yellow-billed cuckoo habitat selection in Arizona. *Journal of Biogeography*, 40(11), pp.2094-2107.

availability such as macroinvertebrates and amphibians¹⁴ is ensured and provided by monsoonal rains and an intact vegetative community.^{15,16}

Despite the known importance of understory vegetation and ground cover in cuckoo breeding grounds, especially as cuckoo chicks are hatched and raised at the hottest time of year, beef cattle production on national forests, national conservation lands, and other public lands removes and degrades these vital habitat components in riparian ecosystems throughout the arid Southwest.¹⁷

Cattle consumption of herbaceous plants in riparian drainages rapidly reduces vegetative cover important for temperature amelioration, humidity, and insect production.^{18,19} Cattle remove riparian seedlings and saplings, precluding young cohorts of trees from developing into future riparian gallery forest. Chronic plant removal and trampling ultimately leads to increased erosion, channel incision, and ecological type changes. These damages occur at a broad spatial scale, and riparian drainages specifically and legally set aside for protection and recovery of cuckoos (i.e., designated “critical habitat”) are no exception.

Grazing at any intensity can impact riparian habitat, according to FWS,²⁰ which defines overgrazing as “grazing activity [that] degrades riparian habitat attributes and prevents long-term health and persistence of these systems.”²¹ Or, specifically in the context of cuckoos, grazing that “reduces quality and quantity of breeding habitat.”²² Overgrazing in riparian (and xeroriparian) habitat has been identified by the agency as an ongoing threat to 97% of cuckoo critical habitat units.²³

¹⁴ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Proposed Rules, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register, Vol. 79, No. 158, August 15, 2014, page 48552.

¹⁵ *Id.*, page 48551.

¹⁶ Johnson, M.J., S.L. Durst, C.M. Calvo, L. Stewart, M.K. Sogge, G. Bland, and T. Arundel. 2008. Yellow-billed Cuckoo Distribution, Abundance, and Habitat Use Along the Lower Colorado River and its Tributaries, 2007 Annual Report. USGS, Open File Report 2008-1177. 274pp.

¹⁷ Bock, C.E., J.H. Bock, L. Kennedy, and Z.F. Jones. 2007. Spread of non-native grasses into grazed versus ungrazed desert grasslands. *Journal of Arid Environments* 71:229-235; Bock, C.E., V.A. Saab, T.D. Rich, and D.S. Dobkin. 1993. Effects of livestock grazing on Neotropical migratory land birds in Western North America. Pages 296-309 in *Status and Management of Neotropical Migratory Birds*. D.M. Finch and P.W. Stangel, editors. USDA, Forest Service, GTR RM-229. 422pp.; Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. *Conservation Biology* 8:629-644.; Krueper, D.J. 1993. Effects of land use practices on Western riparian ecosystems. Pages 321-330 in *Status and Management of Neotropical Migratory Birds*. D.M. Finch and P.W. Stangel, editors. USDA, Forest Service, GTR RM-229. 422pp.

¹⁸ Skovlin, J.M. 1984. Impacts of grazing on wetlands and riparian habitat: a review of our knowledge. p. 1001-1103. In: *Developing strategies for range management*. Westview Press, Boulder, CO.

¹⁹ Krueper, D.J., 1996. Effects of livestock management on Southwestern riparian ecosystems. Shaw, DW, and Finch, DM, tech. coords. *Desired future conditions for southwestern riparian ecosystems: bringing interests and concerns together*. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, pp.281-301.

²⁰ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021, page 20813.

²¹ *Id.*

²² *Id.*, page 20853.

²³ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Proposed Rules, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register, Vol. 79, No. 158, August 15, 2014, page 48558.

Surveys for Adverse Modification of Critical Habitat by Livestock Grazing

In Arizona and New Mexico, approximately 55,550 acres of designated critical cuckoo breeding habitat overlaps with public lands cattle grazing allotments, managed by the U.S. Forest Service (“FS”) and Bureau of Land Management (“BLM”). Following designation of cuckoo critical habitat in 2021,²⁴ the Center for Biological Diversity began systematically surveying and quantifying cattle impacts to designated cuckoo critical habitat on public lands in Arizona and New Mexico. The rationale for this effort was 1) the well-known negative effects of livestock grazing on cuckoo habitat, and 2) the fact that neither BLM nor FS systematically surveys and assesses the public lands they manage for the health of riparian ecosystems in the context of the habitat needs of threatened and endangered species.

On an annual basis, professional field biologists document livestock impacts to standing waters, riparian vegetation, soils, and streambanks within designated critical habitat and examine protective fencing where applicable. Using a standardized protocol, surveyors record 1) severity of grazing impacts on herbaceous vegetation and grasses, 2) severity of browsing impacts on streamside woody regeneration, 3) severity and 4) extent of ground disturbances from trailing, trampling, and wallowing, and 5) severity and 6) extent of streambank degradation. Multiple georeferenced photo points are taken along each segment to document evidence of livestock impacts.

Each survey is broken down into ¼- ½ mile field-delineated segments of cuckoo critical habitat based on topography, access, and trends in severity of adverse modification. At each segment endpoint, a condition score is recorded for each of the six impact categories along a range of 0 to 4 based on the severity and extent of the impact. A segment is rated 0 for a particular category if no evidence of impact is observed, 1 if impacts are limited, 2 if impacts are light and scattered, 3 if impacts are moderate and widespread, and 4 if impacts are severe and pervasive. Following field surveys of cuckoo-designated stream reaches, each segment’s “overall impact level” (defined as absent, light, moderate or significant) is calculated. To determine overall impact level, the condition severity scores for each segment endpoint are collated and weighted.

Linear critical habitat survey segments were used to clip yellow-billed cuckoo critical habitat polygons using a buffer (avg=600m). Buffer-clipped critical habitat polygons were then joined with survey impact attributes to generate polygons of impact class. Impact class polygons were used to characterize acres of critical habitat surveyed and acres for each impact class. Surveys were prioritized by most recent year where survey years overlapped.

From 2021-2023, the Center surveyed approximately 70% of cuckoo designated acreage for cattle impacts (39,170 acres). Of the total acres surveyed, 80% (31,509 acres) were found to have moderate to significant adverse modification immediately prior to, or during, cuckoo nesting and breeding season.

The Center’s assessments of cuckoo critical habitat on public lands in Arizona and New Mexico consistently reveal that sufficient riparian vegetation is lacking from most grazing allotments, and at a critical time when cuckoo arrive to select nesting sites. Cattle consistently

²⁴ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021, page 20808.

concentrate in riparian zones, often leaving bare, denuded ground and polluted, fecal-laden water. Survey results reasonably fit FWS's own definition of overgrazing or poorly managed grazing, where cattle have created conditions that compromise or eliminate habitat structure required for successful cuckoo reproduction.

Surveys conducted on Coronado and Tonto national forests, Gila Box Riparian National Conservation Area, San Pedro Riparian National Conservation Areas, Agua Fria National Monument, and several other important public land riparian areas managed by the BLM have all led to subsequent litigation over the state and quality of cuckoo breeding habitat as affected by cattle grazing. Even on lands specifically designated by Congress to protect riparian values, the majority of streamside habitat showed significant damage from livestock.

The following figures, with photographic examples, demonstrate the vast extent of cattle damage to designated cuckoo critical habitat across Arizona. Publicly available interactive maps are also available at the following website:

<https://center.maps.arcgis.com/apps/instant/basic/index.html?appid=52860d7317bb4148ad2a9ac5a90ab118>.

Figure 1. Cattle impacts on cuckoo critical habitat on public land in eastern Arizona and southwestern New Mexico

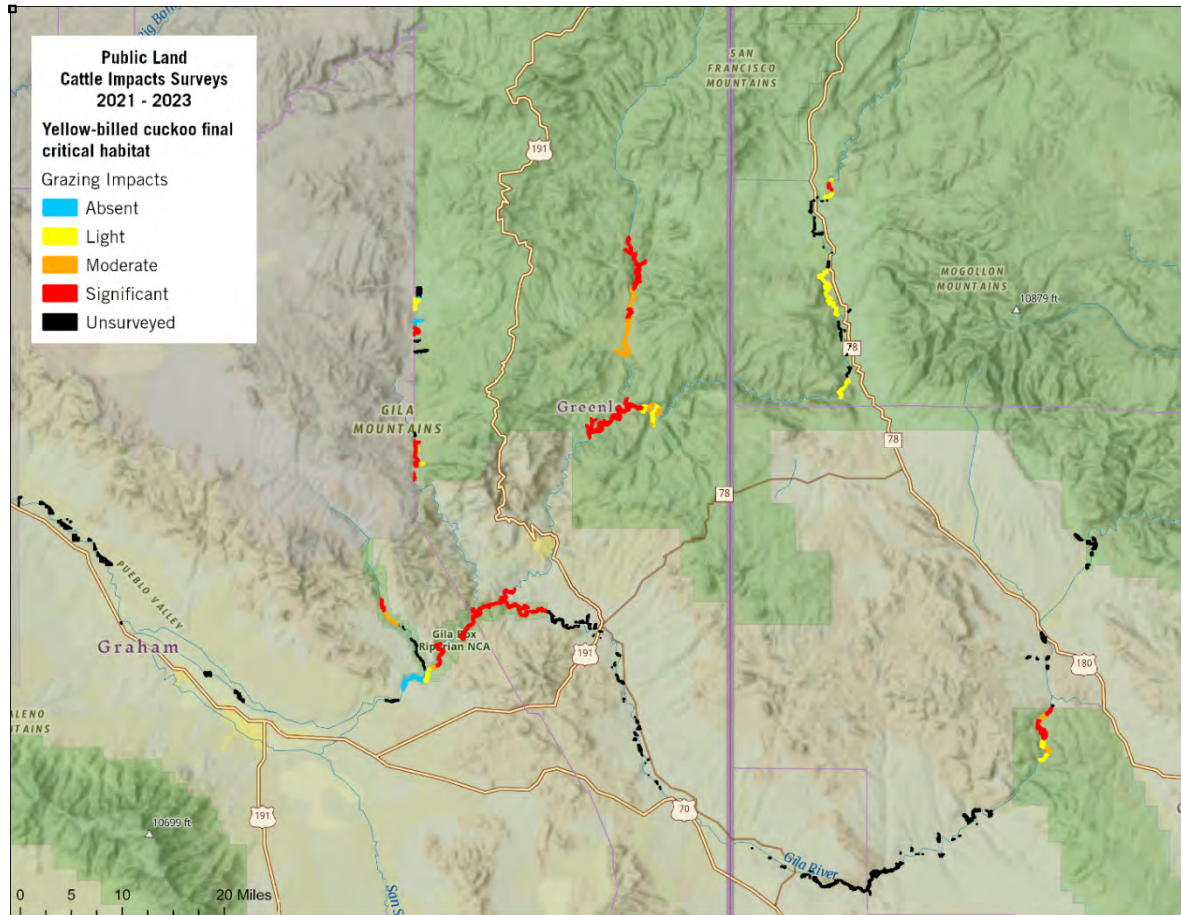


Figure 2. Designated yellow-billed cuckoo critical habitat in the Gila Box Riparian National Conservation Area, where no cattle grazing is allowed. 33.010634, -109.555424, June 1, 2021 (1); 32.972224, -109.350014, March 4, 2024 (2)



**Public Land
Cattle Impacts Surveys
2021 - 2023**

**Yellow-billed cuckoo final
critical habitat**

Grazing Impacts

- Absent
- Light
- Moderate
- Significant
- Unsurveyed

Map labels: Casas Adobes, Tucson, Green Valley, Las Alamos, Santa Cruz, Nogales, Sierra Vista, Bisbee, Saguaro National Park, Buenos Aires National Wildlife Refuge, 9152 ft, 9473 ft, I-10, I-19, I-86, SR-90, ARIZONA VALLEY, COLORADO SPRINGS, CO.

Scale: 0 5 10 20 Miles

Figure 5. Cattle impacts on cuckoo critical habitat on public land in central Arizona

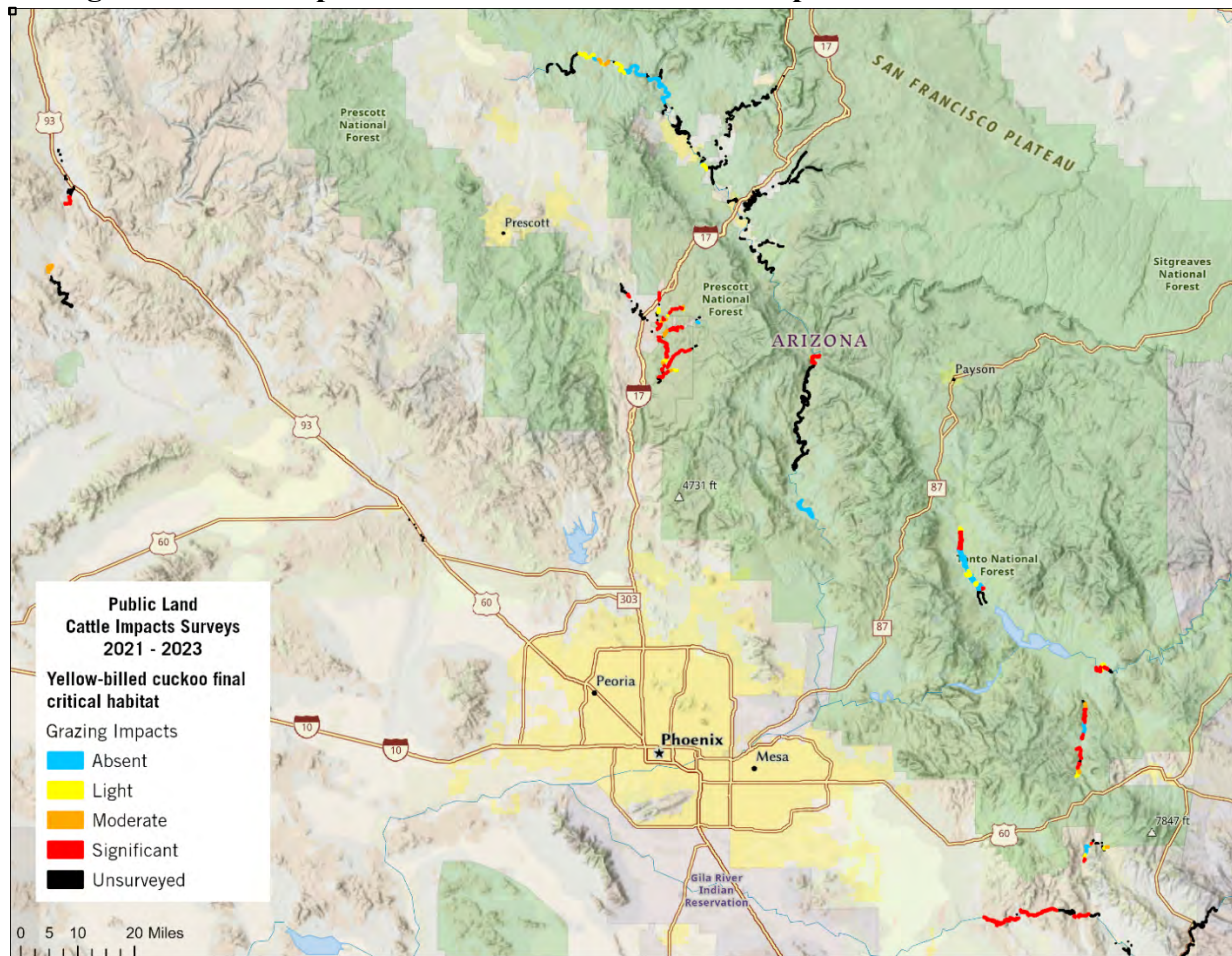


Fig. 6. Grazed yellow-billed cuckoo critical breeding habitat along Little Ash Creek, 34.361028, -112.061924, March 29, 2023 (1); and along the Agua Fria River, 34.240435, -112.06380, April 6, 2023 (2) in Agua Fria National Monument



Discussion

FWS designates critical habitat pursuant to the Endangered Species Act (“ESA”) so that such habitat can be managed with the primary goal of recovering threatened and endangered species. The law requires that each federal agency “shall ... insure that any action authorized, funded, or carried out by such agency ... is not likely to ... result in the destruction or adverse modification” of critical habitat.²⁵ For cuckoo, according to FWS, “managing grazing so that native riparian trees and shrubs will regenerate on a regular basis is especially beneficial.”²⁶ In designating their critical habitat, the agency stated that “[b]ecause the western yellow-billed cuckoo is listed as threatened, all the units [that] are occupied during the breeding season and habitat would need to be protected during the nonbreeding season, the majority of actions necessary to conserve the species would be required based on the listing of the western yellow-billed cuckoo.”²⁷ Finally the agency stated that “habitat in Arizona needs to be conserved to enable western yellow-billed cuckoos to produce young that may eventually disperse to other parts of the DPS’s range.”²⁸

Despite these conclusions Center survey data show adverse modification and destruction of critical habitat from BLM and Forest Service-managed livestock grazing in most designated cuckoo habitat within livestock grazing allotments. In violation of the ESA and other laws, federal agencies continue to authorize cattle grazing in cuckoo critical habitat, often without any enforceable measures of protection and with no numeric limits on the amount of “take” (harm or death) to cuckoos. Despite the quoted statements above, FWS supervisors routinely conclude that cattle grazing does not meaningfully conflict with cuckoos’ resource needs. The agency reasons that since cuckoo have not been completely extirpated from livestock-degraded areas, there is no real harm. In a recent Biological Opinion from 2021, it stated that “the cuckoo is currently widespread throughout its range and in the action area, where ongoing livestock grazing has occurred for many decades and continues.”²⁹ A more accurate statement is that livestock grazing has occurred for many decades and continues,³⁰ resulting in cuckoo now being listed under the ESA, due primarily to habitat loss,³¹ and rare throughout their range.³²

The majority of grazed western riparian areas are already grossly deficient of willow understory and nearly devoid of overstory cottonwood.^{33,34} Foraging cattle continue to reduce the density of willow and other shrubs, eliminate cottonwood and willow reproduction by feeding on

²⁵ 16 U.S.C. § 1536(a)(2).

²⁶ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Proposed Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register, Vol. 79, No. 158, August 15, 2014, page 48555.

²⁷ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021, page 20831.

²⁸ *Id.*, page 20813.

²⁹ Biological Opinion on Ongoing Grazing on the Coronado National Forest, Graham, Cochise, Pima, Pinal, and Santa Cruz Counties, Arizona and Hidalgo County, New Mexico. AESO/SE, 2-21-98-F-399, 2-21-98-F-399R1, 02EAAZ00-2019-F-0867, September 30, 2021, p. 188.

³⁰ *Ibid.*

³¹ Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo Final Rule, DEPARTMENT OF THE INTERIOR Fish and Wildlife Service, Federal Register Vol. 86, No. 75, Wednesday, April 21, 2021.

³² Diebolt, S., Chief, A.B. and Diebolt, D.M., 2018. Fish and Wildlife Service Arizona Ecological Services Office.

³³ Fleischer, T.L., 1994. Ecological costs of livestock grazing in western North America. *Conservation biology*, 8(3), pp.629-644.

³⁴ Stromberg, J.C., 1993. Fremont cottonwood-Goodding willow riparian forests: a review of their ecology, threats, and recovery potential. *Journal of the Arizona-Nevada Academy of Science*, pp.97-110.

and trampling seedlings, and modify habitat through soil compaction and other means.^{35,36,37,38,39} This ecological impact has resulted in doomed stands of riparian forest where old cottonwood trees in the overstory are dying with no new recruitment to replace themselves.^{40,41,42,43}

Ecological conditions on western public lands have worsened recently⁴⁴ mainly due to reduced productivity caused by livestock production in conjunction with a changing climate and an historically unprecedented “megadrought.”^{45,46} Using public lands for livestock production is known to exacerbate the effects of climate change and has a disproportionately negative effect on rare riparian ecosystems.⁴⁷ Within the past 100 years, an estimated 95% of riparian habitat in the West has been destroyed;⁴⁸ as we demonstrate, this destruction is ongoing. There is no evidence to suggest that climate trends will suddenly change.⁴⁹

FWS recognizes this predictable and escalating climate problem but has failed to take meaningful action to mitigate it. FWS has confirmed that “[w]here tree regeneration and survival are lacking, suitable cuckoo habitat may cease to exist or may support fewer cuckoos when mature trees die.”⁵⁰ In addition FWS has concluded that the cuckoo’s habitat may be reaching a tipping point: “humidity, important for prey production and cuckoo nesting in southeastern Arizona, will decline and temperature and evapotranspiration will increase as habitat declines and fragmentation increases. These factors may reach a threshold in which cuckoos may no longer breed or may breed in reduced densities in some reaches.”⁵¹ The agency has even stated, regarding the Coronado National Forest in Arizona, that “we also anticipate that climate change

³⁵ Glinski, R.L., 1977, July. Regeneration and distribution of sycamore and cottonwood trees along Sonoita Creek, Santa Cruz County, Arizona. In Johnson, RR, and Jones, DA, tech. coords. Importance, preservation and management of riparian habitat: a symposium. Gen. Tech. Rep. RM-43. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station (pp. 116-123).

³⁶ Belsky, A.J., Matzke, A. and Uselman, S., 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. *Journal of Soil and water Conservation*, 54(1), pp.419-431.

³⁷ Reichenbacher, F.W., 1984. Ecology and evolution of southwestern riparian plant communities [The relationship between the distributions of plants in the floodplain and a set of physical site factors, Trout Creek, Mohave County Arizona; USA]. *Desert Plants*.

³⁸ Fleischner, T.L., 1994. Ecological costs of livestock grazing in western North America. *Conservation Biology*, 8(3), pp.629-644.

³⁹ Taylor, D. M., and C. D. Littlefield. 1986. Willow flycatcher and yellow warbler response to cattle grazing. *American Birds* 40:1169-1173.

⁴⁰ Klebenow, D.A. and Oakleaf, R.J., 1984. Historical avifaunal changes in the riparian zone of the Truckee River.

⁴¹ Reichenbacher, F.W., 1984. Ecology and evolution of southwestern riparian plant communities [The relationship between the distributions of plants in the floodplain and a set of physical site factors, Trout Creek, Mohave County Arizona; USA]. *Desert Plants*.

⁴² Stromberg, J.C., 1993. Fremont cottonwood-Goodding willow riparian forests: a review of their ecology, threats, and recovery potential. *Journal of the Arizona-Nevada Academy of Science*, pp.97-110.

⁴³ Taylor, D. M., and C. D. Littlefield. 1986. Willow flycatcher and yellow warbler response to cattle grazing. *American Birds* 40:1169-1173.

⁴⁴ Donahue, D.L., 2006. Federal rangeland policy: perverting law and jeopardizing ecosystem services. *J. Land Use & Envtl. L.*, 22, p. 299.

⁴⁵ Beschta, R.L., Donahue, D.L., DellaSala, D.A., Rhodes, J.J., Karr, J.R., O’Brien, M.H., Fleischner, T.L. and Williams, C.D., 2013. Adapting to climate change on western public lands: addressing the ecological effects of domestic, wild, and feral ungulates. *Environmental Management*, 51(2), pp.474-491.

⁴⁶ Williams, A. P., Cook, B. I., & Smerdon, J. E. (2022). Rapid intensification of the emerging southwestern North American megadrought in 2020–2021. *Nature Climate Change*, 12, 232–234. <https://doi.org/10.1038/s41558-022-01290-z>

⁴⁷ Stromberg, J.C., Setaro, D.L., Gallo, E.L., Lohse, K.A. and Meixner, T., 2017. Riparian vegetation of ephemeral streams. *Journal of Arid Environments*, 138, pp.27-37.

⁴⁸ Krueper, D.J., 1996. Effects of livestock management on Southwestern riparian ecosystems. Shaw, DW, and Finch, DM, tech. coords. *Desired future conditions for southwestern riparian ecosystems: bringing interests and concerns together*. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, pp.281-301.

⁴⁹ Large contribution from anthropogenic warming to an emerging North American megadrought, A. Park Williams, et al.; *Science* 368, 314-318; April 17, 2020.

⁵⁰ April 28, 2016, Amended Final Reinitiated Biological and Conference Opinion for the Rosemont Copper Mine, Pima County, Arizona, p. 244.

⁵¹ *Id.*

will degrade habitat to the point of being incapable of supporting the occurrence of yellow-billed cuckoos.”⁵²

If climate change alone could eliminate cuckoo from their current strongholds, as FWS suggests, federal agencies that continually authorize known negative stressors such as cattle grazing in critical breeding habitat will hasten extinction, particularly when grazing is well known to exacerbate and amplify the effects of drought and climate change. A good rain year cannot compensate for decades of drought and livestock impacts.

Recommendations

Despite dire climate projections forecasted for the southwestern United States, the U.S. Forest Service, Bureau of Land Management, and Fish and Wildlife Service continue to authorize status quo livestock grazing on federal public lands with no practical or meaningful revisions to protect riparian habitat or the imperiled cuckoo. Instead, management strategies are implemented that provide short-term benefits for livestock permit-holders at the cost of continual ecosystem degradation and removal of what little cover is available for wildlife, including birds that require vegetative structure for nesting success such as yellow-billed cuckoo.

According to the U.S. Department of Justice, “[i]t’s well settled that cattle and riparian areas do not mix.”⁵³ To ensure recovery of cuckoo populations, as the law mandates and as FWS appears to grudgingly admit, critical habitat requires protection from livestock grazing year-round.

Based on federal land managers’ and livestock permit-holders’ inability to prevent continued degradation of riparian habitat on the vast majority of habitat surveyed, the Center recommends that agencies exclude livestock from cuckoo habitat in Arizona and New Mexico. Livestock exclusion is also the best way to mitigate climate change and aridification. Seedlings of riparian trees tend to recover rapidly after exclusion of livestock grazing,^{54,55,56} removal of

⁵² *Id.*, page 242.

⁵³ Environment and Natural Resources Division Senior Trial Attorney Andrew A. Smith. New Mexico Cattle Growers’ Association, et al. v. United States Forest Service, et al., Case 1:23-cv-00150-JB-GBW, Albuquerque, NM, February 1, 2024, page 126; [Hearing Transcript](#).

⁵⁴ Stromberg, J.C., 1993. Fremont cottonwood-Goodding willow riparian forests: a review of their ecology, threats, and recovery potential. *Journal of the Arizona-Nevada Academy of Science*, pp.97-110.

⁵⁵ Smith, J.J., 1990. Recovery Of Riparian Vegetation on An Intermittent Stream Following Removal of Cattle. In *California Riparian Systems Conference*, p. 217.

⁵⁶ Rucks, M.G., 1984. Composition and trend of riparian vegetation on five perennial streams in southeastern Arizona. In *California Riparian Systems* (pp. 97-108). University of California Press.

cattle grazing has been correlated with dramatic increases in dense willow thickets, necessary for cuckoo and other riparian species to survive an uncertain future.^{57,58,59,60, 61,62}

Only eliminating livestock access to ephemeral, intermittent, and perennial drainages will allow tree and shrub seedlings to grow and survive. While the effects of climate change are difficult to control, we can greatly improve riparian habitat on public lands in the Southwest by excluding livestock from these areas, thus reducing the habitat destruction, trampling, erosion, and soil compaction that accompany grazing and thereby actively promoting recovery of native ecosystems.

⁵⁷ Cannon, R.W. and Knopf, F.L., 1984. Species composition of a willow community relative to seasonal grazing histories in Colorado. *The Southwestern Naturalist*, 29(2), pp.234-237.

⁵⁸ Reichenbacher, F.W., 1984. Ecology and evolution of southwestern riparian plant communities [The relationship between the distributions of plants in the floodplain and a set of physical site factors, Trout Creek, Mohave County Arizona; USA]. *Desert Plants*.

⁵⁹ Klebenow, D.A. and Oakleaf, R.J., 1984. Historical avifaunal changes in the riparian zone of the Truckee River.

⁶⁰ Taylor, D. M., and C. D. Littlefield. 1986. Willow flycatcher and yellow warbler response to cattle grazing. *American Birds* 40:1169-1173.

⁶¹ Szaro, R.C. and Pase, C.P., 1983. Short-term changes in a cottonwood-ash-willow association on a grazed and an ungrazed portion of Little Ash Creek in central Arizona *Populus fremontii*, velvet ash, *Fraxinus velutina*, Goodding willow, *Salix gooddingii*. *Rangeland Ecology & Management/Journal of Range Management Archives*, 36(3), pp.382-384.

⁶² Response of breeding birds to the removal of cattle on the San Pedro River, Arizona, Krueper, D. J., J. L. Bart, and T. D. Rich. 2003. *Conservation Biology* 17(2): 607-615.