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24-84
Sonoran
Pronghorn, General

January 13, 1998

Bruce Babbitt, Secretary
Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Jamie Clark, Director
Fish and Wildlife Service
1849 C Street, N.W.
Washington, D.C. 20240

**Re: Violations of Section 4(f) and 7(a)(1) of the Endangered
Species Act with respect to the 1998 Revised Sonoran
Pronghorn Recovery Plan**

Dear Secretary Babbitt and Director Clark:

We are writing on behalf of Defenders of Wildlife ("Defenders") to provide notice that the Fish and Wildlife Service ("Service") is in violation of the Endangered Species Act ("ESA"), 16 U.S.C. § 1531, *et seq.*, with regard to the recently issued Final Revised Sonoran Pronghorn Recovery Plan ("Revised Plan"). Because Defenders served a Notice Letter which addressed the illegalities of the most recent draft of this Recovery Plan on November 6, 1998 -- a copy of which is attached and should be considered incorporated by reference -- additional notice pursuant to Section 11(g) of the ESA is not legally required. 16 U.S.C. § 1540(g). However, Defenders sends this letter because, as discussed in detail below, the final Revised Plan violates Section 4(f) and 7(a)(1) of the ESA, and, when combined with all the ongoing military and other agency activities which are adversely impacting this species -- additional violations of the ESA enumerated in Defenders' November 6, 1998 Notice Letter -- will hasten the extinction of, rather than recover, this critically imperilled species. 16 U.S.C. §§ 1533(f), 1536(a)(1).

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BACKGROUND

The ESA was designed to do more than just ensure those minimum efforts necessary to protect a species from extinction. The mandate set forth in the Act is that all agencies "conserve" endangered species, 16 U.S.C. § 1531(c)(1), which means using "all methods and procedures which are necessary to bring any endangered species . . . to the point at which the measures provided pursuant to this chapter are no longer necessary." *Id.* at § 1532(3) (emphasis added). Thus, Section 7(a)(1) mandates that the Service "shall" utilize its authority to carry "out programs for the conservation of endangered species . . ." 16 U.S.C. § 1536(a)(1) (emphasis added).

In addition to this general statutory mandate, the ESA provides a specific mechanism by which the Service is to "conserve" -- *i.e.*, recover -- listed species: Recovery Plans. Under Section 4(f), the Service "shall develop and implement" recovery plans designed to recover listed species. *Id.* at § 1533(f). The ESA also provides that in "developing and implementing" such a plan, the Service "shall, to the maximum extent practicable," ensure that the plan includes (1) "a description of such site-specific management actions" needed to conserve the species; (2) "objective, measurable criteria" by which the species will be considered recovered; and (3) "estimates of the time required and the cost involved to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal." *Id.* at 1533(f)(1)(B). Moreover, before "final approval" of any new or revised recovery plan, the Service must provide an opportunity for, and consider, public comments. *Id.* at § 1533(f)(4).

DISCUSSION

The Sonoran pronghorn (*Antilocapra americana sonoriensis*) has been listed as an endangered species since 1967. *See* 32 Fed. Reg. 4001. Thus, for over thirty years the species has been "in danger of extinction throughout all of a significant portion of its range." 16 U.S.C. § 1532(6). Indeed, current population estimates suggest that as few as 130 animals may remain in the United States. As explained in detail in the attached Notice Letter, recent fawn and adult mortality has been high, suggesting a continued and precipitous decline.

In the meantime, as also detailed in the accompanying Notice Letter, numerous federal agencies are engaged in activities which are accelerating this decline. Military bombing, strafing, and other ordnance delivery occurs in pronghorn habitat. The military and other agencies fly jets, planes, and helicopters at low levels, harassing animals already frail from other stressors, including drought and increasingly fragmented habitat. Moreover, numerous agencies engage in on the ground activities, from troop maneuvers to border patrol activities, which further disrupt the species. In short, the pronghorn is being attacked from all sides, with no relief in sight.

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The Service did not issue its first Sonoran Pronghorn Recovery Plan (the 1982 Plan) until fifteen years after the species had been listed. As detailed in Defender's previous Notice Letter, which is attached, that Plan failed to measure up to the requirements of Section 4(f) in numerous respects, and, in any event, was never implemented by the Service.

Now, sixteen years later, the Service has issued a Revised Recovery Plan. Unfortunately, this Revised Plan suffers many of the same deficiencies as did the 1982 Plan.

1. The Revised Plan Lacks Specific Actions to Recover the Species.

Far from containing a specific enumeration of the actions which will be taken to recover the critically imperilled Sonoran pronghorn, the Revised Plan focuses on future studies and investigations, and completely ignores a host of federal activities which are currently adversely impacting pronghorn survival and recovery. Thus, over thirty years after the species was listed, the Service's Revised Plan discusses the need to further study issues such as the impact of overflights on pronghorn, the need for water, the impact of the Marines WTI course, the effects of military activities which take place on and near the tactical ranges, the closure of trails in Cabeza Prieta, and the restoration of habitat.

Certainly some studies are necessary, and have been advocated by Defenders. However, particularly given that thirty years have passed and the species remains on the brink of extinction, such studies can no longer substitute for action. For example, the Revised Plan appears to recognize the obvious adverse impacts that activities such as live bombs have on the pronghorn. Thus, the Revised Plan notes that one of the purposes of the food plot studies will be to explore using such plots "to attract pronghorn away from the tactical ranges where potentially harmful activities occur." Revised Plan at 31 (emphasis added). However, remarkably, the Plan does not call on the military to take any concrete steps whatsoever to protect pronghorn from these "harmful activities," such as temporarily halting them during the critical pronghorn fawning season. See Fund for Animals v. Babbitt, 903 F. Supp. 96, 108 (D.D.C. 1995) (recovery plans must address threats to conservation of species).

2. The Revised Plan Lacks Objective, Measurable Criteria to Determine Recovery.

In addition to lacking concrete steps for recovery, the Revised Plan fails to provide the criteria necessary to determine whether the species is moving toward recovery. The "criteria" for reclassification from endangered to threatened is as follows:

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1. There are an estimated 300 adult Sonoran pronghorn in one U.S. population and a second separate population is established in the U.S. and remains stable over a 5-year period; or
2. Numbers are determined to be adequate to sustain the population through time. If the following actions are completed successfully, downlisting to threatened is anticipated by the year 2005. If adverse conditions prevail through 2005, this recovery goal timetable should be evaluated and restated.

Revised Plan at 34. These criteria are not adequate. As explained in the attached Notice Letter, the 300 number, and five year time period, cannot be supported biologically. Indeed, the second criterion -- when "[n]umbers are determined to be adequate" -- is not a criterion at all.

More importantly, the Revised Plan completely fails to address the five listing factors in considering the criteria for recovery. See Fund for Animals, 903 F. Supp. at 111. Thus, nowhere does the Revised Plan address the criteria which will govern recovery from: (1) the loss of habitat; (2) over-utilization; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting the species. 16 U.S.C. § 1533(a)(1). To the contrary, the Revised Plan does nothing more than call for further study of these factors, and completely fails to account for how the Service will reach its recovery goal.

3. The Revised Plan Fails to Account for The Time and Costs of Recovery.

With a few minor exceptions, the Revised Plan altogether fails to set forth a timetable for steps to recover the Sonoran pronghorn. Thus, while the ESA requires not only "estimates of the time required" for ultimate recovery measures, but also the time necessary to complete "intermediate steps toward that goal," 16 U.S.C. § 1533(f)(1)(B)(iii), the Revised Plan simply provides that tasks are "ongoing," without reference to when they will be completed. Indeed, while the Revised Plan does state that downlisting is anticipated by 2005, the ESA requires that the recovery plan delineate the time needed to complete the specific tasks necessary for recovery. Of course, the lack of adequate tasks in the Revised Plan makes a legitimate timetable impossible in the current plan. However, a legal recovery plan will not only contain specific recovery measures, it will also contain intermediate, and ultimate, time lines by which those measures will be implemented.

In addition, while the Revised Plan estimates the costs of certain activities, no provision is made to ensure adequate funding to carry out these activities. Certainly the Core Working Group is not itself in a position to implement all the measures which have been assigned to it without the provision of adequate funding. Given the responsibility of the Service -- and all other federal agencies -- under Section 7(a)(1), it is incumbent upon the Service, in conjunction

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with the action agencies, to ensure adequate funding to implement a legitimate recovery plan. Id. at § 1536(a)(1).

4. The Service Has Failed To Adequately Consider Public Comments.

Finally, the Service has not adequately considered public comments, as required by the ESA. Id. at § 1533(f)(4). In October 1997, Defenders submitted a detailed Recovery Agenda for the species. See Attachment B. While a few of the items in the agenda were addressed in the Revised Plan, most of the recommendations in that document have neither been incorporated, nor otherwise addressed.

Moreover, while the Revised Plan has been identified as a "final plan," see 63 Fed. Reg. 66,560, the Service's Federal Register notice provides for a comment period, after which the Service "may decide to amend this document" Id. Defenders will be providing detailed comments on the Revised Plan during this comment period. However, by providing a comment period after issuing a final plan, the Service is violating the express terms of the ESA, which requires that the Secretary "shall, prior to final approval of a new or revised recovery plan," provide for, and consider, public comment. 16 U.S.C. § 1533(f)(4) (emphasis added).

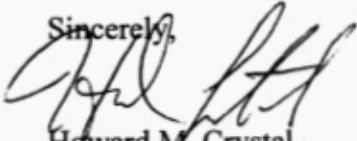
CONCLUSION

As detailed in the attached Notice Letter, there are numerous federal activities occurring right now which are adversely impacting the critically imperiled Sonoran pronghorn. Indeed, under its current, fragmented consultation approach, the Service is permitting up to four pronghorn to be killed, and an unlimited number to be harassed.

Yet, none of these concrete and current impacts are at all ameliorated in the Revised Recovery Plan. To the contrary, the Plan does not call on any agency to take any concrete steps to reduce adverse impacts on the species. To suggest that the pronghorn, a species undergoing a precipitous decline in the face of numerous threats in their own habitat -- threats such as bombs, rockets, and bullets, low level jets and helicopters, ground troop exercises, and unpassable fences -- can recover without the need to modify any of these, or the many other federal activities adversely impacting the species, is the height of arbitrary and capricious agency action. Therefore, unless the Service commits to revising its Recovery Plan to address these deficiencies, Defenders will have no alternative but to seek relief in federal court.

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However, as with the issues addressed in the attached Notice Letter, Defenders would prefer to have these concerns addressed without the need for litigation. To that end, please contact us should the Service be willing to revise its Recovery Plan to conform to the ESA on an expeditious timetable.

Sincerely,

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Katherine A. Meyer

cc:

Laura Thompson-Olais, FWS
Nancy Kaufman, Regional Director, FWS
Mike Coffeen, FWS
John Hervert, AGFD
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November 6, 1998

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**60 DAY NOTICE OF INTENT TO SUE FOR VIOLATIONS OF THE
ENDANGERED SPECIES ACT, WITH RESPECT TO THE
CRITICALLY ENDANGERED SONORAN PRONGHORN**

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ATTACHMENT A

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Pursuant to Section 11(g) of the Endangered Species Act (ESA), 16 U.S.C. § 1540(g), this letter provides notice that Defenders of Wildlife (Defenders) intends to file suit against: (1) the Department of Interior (DOI); (2) the Fish and Wildlife Service (FWS or Service); (3) the Bureau of Land Management (BLM); (4) the National Park Service (NPS); (5) the Department of Defense (DOD); (6) the Navy/Marine Corps (Marines); (7) the Air Force; (8) the Army National Guard (Army); (9) the Department of Justice (DOJ); (10) the Immigration and Naturalization Service/Border Patrol (Border Patrol); and (11) the Bureau of Indian Affairs (BIA) for violations of the ESA. Defenders intends to sue each of these agencies for violating Section 7 of the ESA by failing to take appropriate steps for the protection and recovery of the Sonoran pronghorn, including the failure to prepare and operate under one or more biological opinions which adequately take into account the cumulative impacts of these agency's activities on the species. 16 U.S.C. § 1536. Defenders also intends to sue the FWS for violating Section 4(f) of the ESA for failing to develop and implement a Recovery Plan, and take other recovery steps, to provide for the conservation and survival of the Sonoran pronghorn. 16 U.S.C. § 1533(f).

Given these myriad violations of the ESA, ongoing and proposed activities of each of these agencies on, and over, the Barry M. Goldwater Range, the Cabeza Prieta National Wildlife Refuge, Organ Pipe Cactus National Monument, BLM public lands, and other lands within the Sonoran pronghorn's range in the United States violate the ESA by jeopardizing the continued survival and recovery of the Sonoran pronghorn, 16 U.S.C. § 1536, and resulting in the illegal take of this critically imperilled species. 16 U.S.C. § 1538.

BACKGROUND

Defenders of Wildlife is a national non-profit, public-interest organization with approximately 300,000 members and supporters, 5,000 of whom reside in Arizona. Defenders believes that all wildlife has intrinsic value, and that the conservation of all native species should be the primary goal of wildlife conservation programs. Thus, Defenders works to preserve the integrity and diversity of natural ecosystems, prevent the decline of native species, and restore threatened habitats and wildlife populations.

Defenders is concerned about the fate of the Sonoran pronghorn (*Antilocapra americana sonoriensis*) (hereafter "pronghorn"). Although the pronghorn has been listed as an endangered species since 1967, see 32 Fed. Reg. 4001, current population estimates indicate that the population in the United States remains as low as 130 animals or less.¹ Given these extremely low numbers, the Fish and Wildlife Service has explained that "a combination of factors could act in a way to reduce the numbers further to a point where the species cannot recover." Mar. 27, 1997 Letter from FWS to the Air Force (emphasis added). In fact, for a large land mammal,

¹ Statement by John Hervert, Sonoran Pronghorn Expert, Arizona Game and Fish Department (AGFD), Core Working Group Meeting, 9/8/98.

these low numbers indicate an unsustainably small population, with an increased risk of extinction through the impact of human activity, as well as through disease, drought, and other natural factors.²

According to a recently conducted Population Viability Analysis (PVA) of the pronghorn, the most significant factor for the long-term survival of this species is recruitment -- i.e., the number of newborn fawns who survive. Attachment ("Att.") A (Defenders of Wildlife, PVA Workshop for the Endangered Sonoran Pronghorn in the United States, April 1998). Unfortunately, there has been incredibly little recruitment into the pronghorn population in recent years. In 1995, for example, the recruitment rate was the low ratio of 12 fawns per 100 doe. Id. In 1996, the recruitment rate dropped even further, and no fawns survived. Id. In 1997, again, no fawns survived. The recruitment levels of 1998 appear to have improved, we suspect because of record level of rains, final numbers are expected in December. See Att. B.

Adult mortality has also been very high. The PVA indicates that even the loss of one pronghorn per year is a significant loss to the species, detrimentally affecting fecundity -- i.e., the ability of the species to reproduce. Att. C at 20. However, half of the 16 previously radio-collared adult pronghorn have perished in the period between November 1995 and June 1996. Just this summer, two more radio-collared adults died. Attachment B at 2. Thus, as John Hervert, a recognized expert on Sonoran pronghorn, has testified, "there is [] [a] high probability of the species going extinct in the next fifty years or possibly sooner." Att. C (Deposition in Defenders of Wildlife v. Sheila Widnall, CA 96-2117 (TPJ), Nov. 25, 1996 at 114). In short, these critically low fawn and adult numbers demand proactive, timely steps to protect the dwindling Sonoran pronghorn population in the United States.

The adverse effects of human activity in remaining pronghorn habitat is especially acute because pronghorn habitat has been so reduced from the species' historic range. Currently, pronghorn habitat is limited to south of the Gila River, east of the Gila and Tinajas Atlas Mountains, west of Highway 85, and extending into Sonora, Mexico to about Caborca. Use of the Sonoran habitat is limited to the Mexican population, as the fenced border and a highway restrict the ability of the US population to range that far South. Consequently, the available habitat is limited primarily to the Barry M. Goldwater Range,³ the Organ Pipe Cactus National

² Although there is another population of pronghorn in Mexico, the two populations are isolated from each other. Moreover, the Mexican population itself is at risk of extinction, with a population which may be as low as 200-300.

³ The Yuma Training Range Complex ("YTRC") is a military training facility composed of the Chocolate Mountain Aerial Bombing and Gunnery Range, the Barry M. Goldwater Air Force Range (Goldwater Range), and approximately 10,000 square miles of air space in Arizona and California designated for military use. The entire Cabeza Prieta National Wildlife Refuge and Wilderness is within military air space use designation. Management of the land, airspace, and use of the YTRC is shared among the Air Force, Marines, FWS, and the BLM. However, the Air Force "has primary jurisdiction over the land and air-space of

Monument, and the Cabeza Prieta National Wildlife Refuge, and occasionally BLM managed public lands.⁴ Thus, while pronghorn require large ranges of undisturbed desert habitat to survive -- ranging from 40 to 1200 square kilometers per pronghorn -- their current range is severely limited, with fencing and geographic barriers on all sides. Critically, the species' known range is now limited exclusively to federal lands.

Despite 30 years of endangered status, the species is not recovering, and in fact, is slipping toward extinction, due primarily to an increasingly inhospitable environment and a lack of adequate home range. Military training activities in pronghorn habitat are a significant factor in this decline. These activities include air and ground maneuvers, bombing, strafing, artillery fire, and low-level overflights, all of which have adverse effects on pronghorn. The Border Patrol also flies extremely low overflights in helicopters, and maintains drag roads in pronghorn habitat. In addition, cattle ranching in pronghorn habitat degrades the natural environment, and allows the introduction of non-native vegetation species. Fencing is also restricting pronghorn movements. Similarly, impassable roads and highways prevent the species from seeking more vigorous territory. As the FWS has explained, because the species "lives in an extremely harsh desert environment that is subject to extended drought," pronghorn are especially "sensitive to environmental and stochastic events," Consultation No. 2-21-94-F-192, Five Grazing Allotments at 7, Dec. 3, 1997. Consequently, there can be no doubt that these human-caused impacts are speeding the species toward extinction.

DISCUSSION

Sections 4 and 7(a)(1) of the ESA require that the FWS and action agencies take appropriate steps to ensure the conservation of endangered species. 16 U.S.C. §§ 1533(f), 1536(a)(1). In addition, the consultation provisions of Section 7(a)(2) require that the FWS prepare, and the action agencies, operate under, one or more Biological Opinions which take into account the cumulative impact of all of the agencies' activities on the species. As explained below, in the case of the Sonoran Pronghorn, the FWS and the action agencies are violating these critical provisions of the ESA.

Goldwater Range." Revised Biological Assessment for Sonoran Pronghorn on the Barry M. Goldwater Range, U.S. Air Force, June 12, 1997 (Revised BA) at 1; see P.L. 99-606 § 1(c) (Goldwater Range "lands are reserved for use by the Secretary of the Air Force"). Furthermore, by letter of agreement between the USAF and the U.S. Navy, the Goldwater Range is divided into the Gila Bend (eastern) segment and the Yuma (western) segment. Id. Under this agreement, the western segment is utilized by the Marines.

⁴ Specifically, the BLM lands are five grazing allotments: Childs, Cameron, Coyote Flat, Sentinel and Why.

I. The FWS is Violating Section 4(f) of the ESA.

Recovery efforts for the Sonoran pronghorn officially began in 1975, with the creation of a Recovery Team. The team issued a Sonoran Pronghorn Recovery Plan in 1982, after which the Team disbanded. In 1991, a new group was formed, the Core Working Group (CWG), which was tasked with revising the 1982 Plan. The Core Working Group is comprised of federal officials representing the action agencies in pronghorn range, as well as Arizona representatives.⁵

The FWS released a new draft Recovery Plan for public comment in 1994. However, to date, the new Recovery Plan has not been issued. Given both the fifteen years which have passed since the first Recovery Plan, as well as the deficiencies of that Plan -- a Plan which has not aided the recovery of the species -- the FWS is presently violating Section 4(f) of the ESA, 16 U.S.C. § 1533(f), which provides that the FWS "shall develop" such recovery plans for the conservation of endangered species.⁶

Moreover, even aside from the failure to complete a revised Recovery Plan, the FWS is in violation of the ESA by failing to implement the existing, 1982 Recovery Plan. Thus, the ESA also provides that "[t]he Secretary shall ... implement [recovery] plans...for the conservation and survival of endangered species" 16 U.S.C. § 1533(f) (emphasis added). However, numerous specific recovery measures in the 1982 plan have never been implemented. Instead, the FWS simply restates the need for these measures in the new draft Recovery Plan, fifteen years later.

For example, the 1982 Plan provided that measures would be taken to: (1) increase the existing population (No. 2, 22); (2) determine pronghorn habitat requirements such as water and food needs (No. 21, 42); (3) increase the species' food supply (No. 22, 12); and (4) reestablish historic habitat (No. 23). However, no progress has been made on any of these measures. In addition, only minimal progress has been made on: (1) retiring grazing leases (No. 1331); (2) modifying fences (No. 2342); (3) working with the Mexican population (No. 1, 12); and (4) protecting and managing known habitat (No. 13).

As currently written, the 1994 draft revised Recovery Plan is also illegal. The ESA requires that a Recovery Plan incorporate "a description of site specific management actions as may be necessary to achieve the plans' goal for conservation and survival of the species," as well

⁵ Currently, no public groups or members of the scientific community are voting members of the CWG, which is managed by the staff at Cabeza Prieta, the FWS Phoenix Field Office, and participating agencies.

⁶ Defenders has been actively following the progress of the new Recovery Plan, and has submitted several comments concerning the Plan. See Comments of Nov. 29, 1994; Aug. 1, 1995; Oct. 27, 1997 (Att. D).

as "objective, measurable criteria which, when met, would result in a determination . . . that the species" is recovered." 16 U.S.C. § 1533(f)(1)(B)(i)-(ii). However, while the 1994 draft contains much more recent scientific evidence related to the Sonoran pronghorn, the recovery measures listed in the draft are neither specific nor comprehensive, and the proposed Plan does not provide legal criteria for determining when the species is in fact recovered. See Fund for Animals v. Babbitt, 903 F. Supp. 96 (D.D.C. 1995).

Indeed, the recent 1998 draft, that was not released for public comment, is also deficient.⁷ With regard to the number of animals needed for the species to be recovered, the draft 1998 Plan states that the appropriate number is the number "that the habitat can support (self-sustaining) for a minimum of five years while maintaining present populations." 1998 Draft at 8. However, this five year standard is completely arbitrary, and unsupported with any biological or ecological basis. Indeed, five years is obviously not enough time to monitor the recovery of a species which has a life span of up to 10 years. Moreover, such a standard would permit the delisting of a population which may be unviable genetically, or which could be extinguished by ecological factors such as El Nino and climate change.

Further, the draft 1998 Plan entirely fails to address many of the factors which are leading to the pronghorn's extinction. Instead, each Recovery Plan and draft simply sets forth plans to conduct further investigations and studies, without calling on agencies to modify their activities to protect the species. For example, the draft notes that the depletion of the Gila River is adversely impacting the Pronghorn. However, in identifying recovery steps, the draft Plan simply notes this issue as something to "investigate." Plan at 22, 33. Similarly, the draft Plan cites fencing as a factor limiting pronghorn movements, but fails to set an implementation goal of removing or modifying such fencing. *Id.* at 15, 17. The draft Plan discusses barriers to pronghorn passage to other habitat and to the Mexican population, yet fails to identify any solutions. *Id.* at 15, 32. In order for the Plan to truly lead to recovery, at some point, action must be taken.

Moreover, at present it is not even possible to implement the revised 1998 Plan, because recovery measures are not specific enough and they are not tied to funding sources to ensure that they are implemented. Indeed, all of the implementation measures are assigned to the CWG, which has no funding for recovery efforts. In short, unless the revised Recovery Plan is significantly revised before completion, the FWS will continue to be in violation of its Section 4 mandatory duties.

In order to develop and implement a new Recovery Plan which will effectively recover the species, Defenders urges the Service to establish a formal Recovery Team for the Sonoran pronghorn, pursuant to Section 4(f)(2) of the ESA. 16 U.S.C. § 1533(f)(2). Creation of a formal Team would bring the pronghorn into focus as an institutional priority, and could include members of the scientific community, as well as experts on the Sonoran pronghorn who are unaffiliated with any particular agency. The CWG does not serve this critical role, since it has

⁷ FWS circulated the 1998 Draft plan among CWG members.

no funding, and is made up of representatives with a vested interest in continuing activities that are harmful to the recovery of the species.

II. Each of These Federal Agencies Are Violating Section 7 of the ESA.

A. Violations of Section 7(a)(1)

Section 7(a)(1) of the ESA requires that “[a]ll federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of the endangered species . . .” 16 U.S.C. § 1536(a)(1) (emphasis added). The ESA defines conservation to mean “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary.” *Id.* § 1532(3). Thus, conservation goes beyond mere avoidance of “take” and “jeopardy.” *See id.* at §§ 1536(a)(2); 1538(a). Rather, Section 7(a)(1) requires that each agency develop and implement an affirmative conservation program to protect and recover the Sonoran pronghorn.

The only way to effectively carry out this mandate is for the FWS, and all the action agencies in the Pronghorn's remaining habitat, to consider the cumulative impacts of agency actions on the species, and to take actions that will not only avoid such adverse impacts, but will also aid the species' overall recovery. At present, this is not occurring. Thus, although some agencies, such as the Air Force and Marines, are taking, or plan to take, limited recovery measures in order to meet the terms of agency-specific Biological Opinions, none of the agencies are in fact taking into account the effects that all of these activities as a whole are having on the species. Nor are they taking concrete steps which will recover the species. Indeed, some agencies, such as the Army and INS, do not even attend Core Working Group meetings where recovery is discussed.

Given the multiple agency activities taking place in pronghorn habitat, and the high degree of coordination among the agencies with respect to most of these activities, the ESA demands programmatic, multi-agency consultation in which the agencies consider the cumulative impacts of agency activities in the context of developing a plan to ensure the species protection and recovery. Indeed, because the species' habitat is all on federal land, the Service has a unique opportunity to take the proactive and progressive step of consulting on a range-wide basis to ensure the conservation of this species. Unfortunately, to date the FWS has refused to take this step. Thus, when the NPS made a specific request for multi-agency consultation, the FWS refused to comply with the request. *See* Aug. 26, 1996 Letter from Organ Pipe National Monument to FWS at 5 (Att. E).

Instead, at present, each federal agency separately consults with the FWS on a piecemeal basis, and the Service issues separate biological opinions for each agency. However, none of these opinions adequately account for the impacts of the other agencies in order to determine the overall adverse impacts of all of these activities combined. This is precisely the reason a multi-agency consultation is needed.

Moreover, the FWS itself has an additional statutory obligation programmatically to consult on the pronghorn. Section 7(a)(1) provides that, "The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this chapter." 16 U.S.C. § 1536(a)(1) (emphasis added). Therefore, since the agency's consultation obligations are a "program" administered by it, the FWS must carry out its consultation function in a way that furthers the conservation of this species. This situation, this requires the FWS to engage all action agencies in multi-agency, range-wide consultation on the Sonoran pronghorn in order to assess the cumulative impacts of agency activities, and ensure the recovery of this critically endangered species.

B. Violations of Section 7(a)(2)

Section 7(a)(2) of the ESA provides that "[e]ach federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species . . ." 16 U.S.C. § 1536(a)(2). Where an agency seeks such consultation, the FWS is required to render a Biological Opinion (BO) detailing the effects of the activity on the species, and the reasonable and prudent measures needed to avoid jeopardizing the species, including the specific terms and conditions which must be satisfied to implement the measures needed to avoid jeopardy. *Id.* at 1536(b), 1536(d). In order for this BO to meaningfully assess the impact of agency activity on a species, and the degree to which the "incidental" take of the species may be permitted, it must include consideration of all other past, present, and reasonably foreseeable future activities of other agencies which will also impact the species.

As explained in detail below, the FWS and the action agencies have failed to comply with this requirement. Several agencies are engaged in activities which adversely impact the pronghorn without any BO at all -- a clear violation of Section 7. Moreover, the BOs the FWS has prepared violate the requirements of the Act since they fail to take into account all past, present and foreseeable future impacts on the pronghorn.

1. The Fish and Wildlife Service

The ESA's implementing regulations require that in preparing a BO, the FWS must consider the effects of the agencies' action, which is explicitly 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." 50 C.F.R. § 402.02 (emphasis added). This necessarily includes the past, present and reasonably foreseeable future impacts of all other agencies in the action area. *Id.*; see also § 402.14(c) (requiring consideration of the action as a whole).

The Service's current approach to addressing activities in pronghorn habitat is to issue a separate biological opinion (BO) for each agency's activities. However, each of these BOs is fundamentally deficient, because each fails to take into account the cumulative impacts on the pronghorn of other agencies' past, present, and reasonably foreseeable future activities.

Thus, for example, the Service has issued a BO to the BLM which permits the BLM to kill one pronghorn, and harass another, every 15 years. Consultation No. 2-21-94-F-192, Five Grazing Allotments, BO at 11. The Service has also issued a BO to the Marines, in which it permits that agency to kill one pronghorn every ten years, and to harass -- with low-flying aircraft -- an "undeterminable" additional number of pronghorn. Yuma Training Range Complex, BO, Consultation No. 2-21-95-F-114. Furthermore, the Service's BO for the Air Force permits that agency to kill one pronghorn every ten years and harass two more. BO for the Use of Ground-Surface & Airspace for Military Training on the Barry M. Goldwater Range Which may Affect the Endangered Sonoran Pronghorn. 2-21-96-F-094. Thus, at present the FWS has authorized three pronghorn deaths and an untold amount of takes of pronghorn by harassment. Yet, none of these BOs address, or even mention, the cumulative impacts of these activities on the species. Indeed, if the FWS has concluded that the killing of more than one pronghorn in the next ten years by the Marine Corps would cause jeopardy, it defies logic to conclude that three such deaths by federal agencies will not cause jeopardy. The devastating effects of this lack of coordination become even more apparent in light of the fact that these BOs address only some of the action agencies -- i.e., other agencies' activities, which also adversely effect and even "take" additional pronghorn -- have not been addressed in any BO.

Particularly in light of the extremely low number of pronghorn remaining, and the abysmal record of fawn mortality in recent years, it could not be more evident that unless these cumulative impacts are addressed, these continued agency activities will result in the extirpation of the Sonoran pronghorn.

Therefore, to meet its obligation to assess all the impacts on this critically endangered species, Defenders recommends that the FWS initiate a multi-agency consultation on the pronghorn. In addition to the ESA itself, the FWS's authority to engage in such consultation is set out in a Memoranda of Understanding (MOU) between the FWS and other agencies. MOU between Federal Agencies on Implementation of the Endangered Species Act (Sept. 28, 1994). This MOU requires signatories (including the Service, the Department of Defense and the Bureau of Land Management), to "coordinate agency actions and create opportunities, and overcome barriers, to conserve [listed] species and the ecosystems upon which they depend." at E-5. Therefore, through this MOU, as well as its authority under the ESA, the FWS can -- and must -- engage all the relevant agencies in a programmatic consultation, in order to meaningfully assess the cumulative impacts of these activities on the pronghorn. Alternatively, to meet its obligation under Section 7(a)(2), the FWS could continue to issue separate BOs for each action agency, but each such BO must comprehensively evaluate the particular agencies' activities in conjunction with the cumulative impacts of all other agencies' activities on the pronghorn. However, unless and until the FWS proceeds under one of these alternative courses of action, it will continue to violate Section 7 of the ESA.

2. The Department of Defense

Several agencies within the Department of Defense ("DOD") are engaged in activities which have serious adverse impacts on the pronghorn. The Section 7(a)(2) violations of those particular agencies -- the Air Force, the Marines, and the Army

National Guard -- are detailed further below.

However, in addition to the responsibility of each of these subparts of the Department of Defense to comply with the ESA, the DOD itself must comply, since Section 7 applies to "each federal agency," which includes "departments." 16 U.S.C. § 1532(7). Indeed, given the high degree of coordination necessary to permit the Air Force, Marines and Army to all utilize the Goldwater Range, it is incumbent upon the DOD itself to consult with the FWS to ensure that present, and proposed increases in DOD activities are not jeopardizing the pronghorn. In Defenders' view, the most effective way to fulfill this statutory responsibility would be for DOD to participate in a multi-agency, programmatic consultation. However, at a minimum, it must consult with the FWS with respect to all new and continuing activities undertaken by each of its branches.

Indeed, the entire Goldwater Range is used by an array of different entities within the Department of Defense. In 1995, a total of 17,379 flight groups composed of 50,074 sorties (one flight by one aircraft) flew over the eastern segment. alone These flights included aircraft from the Air Force, Air National Guard, U.S. Army National Guard, Marine Corps and Navy Units throughout the continental United States, Hawaii, and the Atlantic and Pacific fleets; numerous transient military units from northern locations during winter months; and allied nations. In addition, several branches of the military use the TAC areas of the Goldwater Range, including the "high explosive" (H.E.) hills, where bombs are dropped, and rockets and bullets fired, in known pronghorn habitat.

Therefore, the use of the Goldwater Range is necessarily highly coordinated among the branches. If the DOD can coordinate these activities, certainly it can coordinate consultation on the pronghorn among its branches, and with other relevant agencies, in order to assess the cumulative impacts of these activities on the pronghorn.

In short, the arbitrary and capricious piecemeal manner in which the military branches have consulted to date on the increased use of the Goldwater Range has constrained DOD, and the FWS, in their ability to develop reasonable and prudent alternatives and measures to avoid jeopardizing the pronghorn, in violation of Section 7(a)(2). 16 U.S.C. §1536(a)(2). Once again, programmatic consultation would allow DOD and the FWS to consider the interrelated and cumulative effects of all DOD and other agency activities on the species.

a. The Air Force

In September 1996, Defenders sued the Air Force for violations of the ESA, due to the frequent presence of pronghorn in areas where Air Force pilots drops bombs, and shoots bullets and rockets. These areas, known as North-TAC and South-TAC, each contain an H.E. Hill where these activities are focused. However, studies of pronghorn movements have revealed that the animals are often found on and near these hills. Given that the Air Force had not even consulted with the FWS concerning these activities, Defenders sued the Air Force for the failure to comply with both Sections 7 and 9 of the ESA. 16 U.S.C. §§ 1536, 1538.

As a result of this suit, the Air Force for the first time entered formal consultation with the FWS concerning the impacts of these activities on the pronghorn. The Air Force also put into place a monitoring protocol for both the North and South-TAC ranges whereby bombing runs are canceled if biologists spot pronghorn on or near the H.E. Hills.⁸

In April 1997, the FWS issued an "interim" Biological Opinion on Air Force activities. Eventually, the FWS issued a final BO, which purported to set forth the steps necessary to avoid jeopardy. However, this BO entirely fails to take into account the cumulative impact of Air Force activities in combination with activities of all other action agencies. Thus, for example, while the BO permits the Air Force to kill one pronghorn in ten years, and harass two more, it completely ignores whether this level of "take" will jeopardize the species, given the incidental take permitted other agencies. Indeed, the BO does not address other agency's activities at all. Consequently, as explained above, the BO violates the ESA and its implementing regulations. 16 U.S.C. § 1536; 50 C.F.R. § 402.14.

The BO is also flawed with respect to its assessment of adverse impacts caused only by Air Force activities. First, the BO permits the Air Force to continue to always keep two of the TAC ranges open at any given time. Although the Air Force has never provided any adequate explanation for needing two ranges open at the same time, by permitting such use of the TAC-Ranges, the BO ensures that at least one of the TAC ranges in which pronghorn are frequently found -- either South-TAC or North-TAC -- will be open for bombing and other military activity during the pronghorn fawning season, the very time of year that has been determined to be critical for pronghorn survival and recovery.

Second, the BO contains a measure for the Air Force to carry out a long-term, noise monitoring study. Currently in its second year, this two year study attempts to correlate pronghorn activity with the amount of noise present by making observations in the TAC ranges. The second year of the study will also attempt to measure the effect of noise on fawns. However, under current procedures Air Force bombing on the TAC ranges is prohibited if pronghorn are in the vicinity. Therefore, the study will not enable the Air Force to meaningfully assess the adverse impacts of its activities on the species.

Again, the better approach-- and one that is more consonant with Section 7 -- is for the Air Force to participate in a multi-agency consultation regarding the impacts of all agency activities on the pronghorn. Alternatively, at a minimum, the Air Force's BO must adequately assess the impacts of Air Force activities in combination with the impacts of activities of other federal agencies operating in pronghorn habitat.

⁸ Because South-TAC was closed for ordnance removal at the time the parties entered into their Settlement Agreement, that Agreement only instituted this protocol for North-TAC. However, in order to avoid a new lawsuit once South-TAC reopened, the Air Force subsequently agreed to implement the monitoring protocol on South-TAC as well.

b. The Marine Corps

The FWS issued a Biological Opinion for the Marine Corps activities on the YTRC in April 1996. April 17, 1996 BO. Subsequently, the Marine Corps issued its Final Environmental Impact Statement ("EIS") for the Yuma Training Range Complex, Arizona and California. Like the Air Force BO, however, this Marine Corps Opinion violates the ESA and its implementing regulations by failing to take into account Marine Corps activities in conjunction with the activities of all these other agencies. 16 U.S.C. § 1536; 50 C.F.R. § 402.14. Moreover, the BO grants an "undeterminable" -- i.e., unlimited -- amount of "take" of the pronghorn. BO at 52. This is illegal, since it does not meet the FWS's duty to "specify the impact" of the incidental take. See 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14 (i)(1)(i).

Defenders submitted extensive comments on the EIS, and the Marine Corps and Defenders have had a number of meetings regarding the Record of Decision. Aside from the failure to consider cumulative impacts, Defenders' primary concern with Marine Corps activities is the Weapons Training Instructor (WTI) course, which occurs each year in pronghorn habitat during the critical pronghorn fawning season. The WTI course involves both low-level flights and ground movements over and in pronghorn habitat, including activities in the TAC ranges.

Unfortunately, the Marine Corps is unwilling to even change the timing of this course to move it out of the pronghorn fawning season, when the already fragile newborn pronghorn fawns are most vulnerable to disturbance. The Marine Corps claims it is unable to effect this change because of the high degree of coordination required among all defense agencies, coordination which the Marines claims cannot be achieved.⁹

However, this concern only highlights the necessity for multi-agency consultation and coordination for the protection of the pronghorn. Indeed, if the only impediment to the Marine Corps rescheduling its WTI course to avoid the pronghorn fawning season is the need for cooperation from other agencies, it is evident that the most effective way to address this issue is for the agencies to work together on these matters.¹⁰

⁹ The Marines BO states, "Because the MCAS- Yuma does not manage these ranges and the WTI courses represent only a small part of the overall use of them, an analysis of the effects of ordnance delivery at North and South tactical ranges would be more appropriately addressed in a consultation with Luke Air Force Base."

¹⁰ In discussions with Defenders, the Marine Corps has committed to initiate studies on the effects of Marine Corps activities on pronghorn, such as testing the effects of noise on pronghorn, studying the effects of watering holes, and assisting the Mexican government in efforts to protect the population of pronghorn in Sonora, Mexico. However useful these measures may be, however, they are no substitute for the Marine Corps' obligations under the ESA.

Defenders has previously detailed to the Marine Corps the illegality of the April 1997 BO. Att. F. The Marines have made it clear, however, that they will not reinstate consultation. However, through range-wide, multi-agency consultation these concerns could be adequately addressed. At a minimum, however, as explained above, the Marine Corps must operate under a BO which takes into account the cumulative impacts of all action agencies' activities.

c. The Army National Guard

The Western Army National Guard Air Training System (WAATS) has proposed substantial increases in its use of East-TAC, the TAC range on the far eastern portion of Goldwater Range. Although pronghorn have not been documented in this area recently, the increased use of East-TAC will necessarily impact the ability of other military users to shift their activities from South-TAC or North-TAC, where pronghorn are frequently found, particularly during the critical fawning season when it is absolutely essential that the military refrain from bombing and strafing in these areas. Therefore, the WAATS activities adversely impact the pronghorn, since they prevent other branches of DOD from taking measures that are necessary to protect the species.

To date, however, the Army National Guard has not initiated Section 7 consultation with the Service on the impacts of expanded use of East-TAC on pronghorn. The failure to consult with the FWS concerning the adverse impacts of this expansion on the pronghorn is in direct violation of Section 7(a)(2) of the ESA. 16 U.S.C. § 1536(a)(2). Again, in Defenders' view the most effective way to conduct such a consultation would be in coordination with all other action agencies. At a minimum, however, like the other agencies, the Army National Guard must operate under a BO which takes into account the cumulative impact of all agency activities in order to be in compliance with Section 7(a)(2). *Id.*

3. The Border Patrol

The Border Patrol, an agency within the Department of Justice, is engaged in a number of activities which also adversely impact the pronghorn. In particular, the Border Patrol flies daily helicopter overflights below 200 feet over the Barry M. Goldwater Range and Cabeza Prieta National Wildlife Refuge, within the range of the pronghorn. This type of low-level, very noisy overflight harasses pronghorn -- *i.e.*, "takes" them within the meaning of the ESA. 16 U.S.C. § 1532(19).

Additionally, the Border Patrol maintains 75 miles of roads on the BLM land. These "drag roads" are dirt or gravel roads which are regularly scraped so that human footprints will be visible indicating an illegal border crossing. The heavy human presence required to maintain these roads also harasses the pronghorn.

Although the Border Patrol initiated consultation with the FWS sometime in early 1997, no BO has yet been issued. This failure to render a timely BO violates the ESA. 16 U.S.C. § 1536(b). Defenders recommends that the Border Patrol work together with all other action agencies to ensure that the Border Patrol's activities are considered in conjunction with the

cumulative impacts of other agency activity on the pronghorn. Once again, however, at a minimum, the Border Patrol must operate under a BO which takes these cumulative impacts into account.

In several prior letters, Defenders has previously notified the agency of these ESA violations. Att. G (Letters of Oct. 31, 1996, selected attachments included; and April 15, 1997). However, another fawning season has come and gone, and the appropriate steps have not been taken.

4. The Department of the Interior

Like the DOD, several agencies within the Department of Interior ("DOI") are engaged in activities which also have serious adverse impacts on the pronghorn. The Section 7(a)(2) violations of those particular agencies -- BLM, FWS (Cabeza National Wildlife Refuge) and National Park Service (Organ Pipe National Monument) -- are detailed further below.

However, like the DOD, in addition to the responsibility of each of these subparts of DOI to comply with the ESA, the DOI itself must engage in consultation. Indeed, taken together these agencies manage most of the land in the range of the Sonoran Pronghorn. However, DOI has failed to create a pronghorn recovery program in violation of Section 7(a)(1) of the ESA, and has never consulted with the FWS at a departmental level, in violation of Section 7 (a)(2). 16 U.S.C. §§ 1536(a)(1) and (a)(2). Once again, programmatic consultation would allow DOI, in conjunction with the FWS and other action agencies, to consider the interrelated and cumulative effects on the species of all DOI and other agency activities in pronghorn habitat.

a. The Bureau of Land Management

The Sonoran pronghorn's remaining habitat is extremely inhospitable. There has been a serious drought in recent years, and the cumulative effects of all these agencies' activities are undoubtedly taking their toll. However, in addition to these problems, the pronghorn's available range is increasingly limited as well. Among the critical restraints on the ability of pronghorn to travel are fences on BLM land.

These fences are meant to constrain the movements of privately owned cattle on BLM grazing allotments. However, BLM telemetry data has shown pronghorn crowding at the fences. Thus, were the fences removed, pronghorn would undoubtedly have more available habitat -- additional habitat which could be critical to the survival of the species. In addition, entanglement is a direct threat.

Another BLM activity which has devastating long-term and immediate impacts on the pronghorn is the cattle grazing permitted in these desert allotments. Grazing destroys and removes vegetation essential to pronghorn, and encourages the proliferation of non-native plants. Less forage increases the competition between pronghorn for resources, including food and water, as well as eliminating necessary cover for fawns. Taxed nutritionally, pronghorn are less successful in breeding. Moreover, fawns are particularly susceptible to environmental stresses.

In addition, cattle may spread diseases to pronghorn. Taken together, these impacts jeopardize the continued existence of the species.

Defenders has previously notified the BLM of violations of Sections 7 and 9 of the ESA with regard to these activities. Att. H. (Letter of May 15, 1998). Although the FWS issued a BO for five grazing allotments in the vicinity of Ajo, Arizona, that BO violates the ESA in numerous respects. As with the other BOs the FWS has issued related to the pronghorn, the BLM BO entirely fails to consider the cumulative impacts of BLM activities in conjunction with the activities of other action agencies. Once again, Defenders recommends that BLM participate in a multi-agency consultation to address these cumulative impacts.

In addition, the BO's Reasonable and Prudent Alternatives, which the BLM must follow to avoid jeopardy, are patently deficient. These alternatives should include removing the fencing in order to allow the species to expand its range, increase its ability to forage, and meet its nutritional needs. They should also include removing cattle from these areas to ensure adequate ground cover for fawns, and eliminate any conflicting resource requirements. At the very least, the alternatives must include replacing the fencing with "pronghorn friendly" fencing and keeping the cattle off the allotments during pronghorn fawning and rearing season. However, the BO contains none of these measures.

Furthermore, even though the BLM has consulted on other actions that affect the pronghorn, this is the only consultation document that the Service has issued to the BLM that mentions the species. Thus, for example, the Biological Evaluation the BLM submitted to the FWS concerning the Lower Gila Resource Management Plan (RMP) addressed pronghorn impacts. However, the BO on the RMP ignored the pronghorn altogether.

Once again, a legal consultation would consider all BLM-related activities, including such additional issues as recreational use and wild horse and burro management, in conjunction with all other agency activity. Defenders recommends BLM participate in a multi-agency consultation to address these matters. At a minimum, however, BLM must also operate under a BO which takes the cumulative impacts of all agencies' activities into account.

b. Cabeza Prieta National Wildlife Refuge

In the recently released Final Programmatic Environmental Assessment for the Future Management of the Cabeza Prieta National Wildlife Refuge and Draft Comprehensive Conservation Plan, the FWS identifies a number of activities on the Refuge which undoubtedly impact the pronghorn. For example, the establishment and maintenance of watering holes affect pronghorn and pronghorn predators and regular road traffic, recreational hikers and campers impact pronghorn and pronghorn habitat.

However, the Refuge has not engaged in consultation regarding these activities, in violation of Section 7. 16 U.S.C. § 1536(a)(2). As with the other agencies, Defenders recommends that the Refuge participate in a multi-agency, programmatic consultation to assess the cumulative impacts of all agency activities on the species. At a minimum, however, the

Refuge must operate under a BO which takes these cumulative impacts into account.

c. Organ Pipe National Monument

Activities in the Organ Pipe Cactus National Monument are also impacting the pronghorn. The monument is frequented extensively by tourist and because many of the pronghorn reside on the Monument ongoing research is conducted on the subspecies. These activities affect Pronghorn, thus it must be determined if that effect is positive, negative and the cumulative effects.

Although Organ Pipe has received a BO for some of its activities, this BO suffers from the same deficiency as the others -- i.e., it completely ignores other agencies' activities, and their cumulative impacts. Consultation No. 2-21-89-F-078 (Organ Pipe Cactus National Monument General Management Plan). As with the other agencies, Defenders recommends that Organ Pipe participate in a multi-agency, programmatic consultation to assess the cumulative impacts of all agency activities on the species. At a minimum, however, Organ Pipe must operate under a BO which takes these cumulative impacts into account.

d. Bureau of Indian Affairs

Several Native American tribes, in particular the Tohono O'odham, once inhabited the same lands that the Sonoran pronghorn now occupy. As such, the pronghorn is a trust resource that the federal government has a duty to protect under the trust doctrine. Accordingly, the BIA should integrate pronghorn recovery into its agency programs. BIA should also be involved in the suggested programmatic consultation because all of the agency actions affect the pronghorn, and thus, tribal interests.

Indeed, range-wide consultation offers the Service the opportunity to include the Native American Nations as Departmental policy requires. Secretarial Order 3206: American Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, June 5, 1997, at App. Sec. 3(C). Thus the Appendix to the Secretarial Order makes it clear that Section 7 consultation between FWS and any DOI agency, on a proposed action that may affect tribal rights or tribal trust resources, requires the FWS to "notify the affected Indian tribe(s) and provide for the participation of the BIA." App. Sec. 3(C)(3)(a). Formal consultations with other federal agencies, such as the Department of Defense, Navy, and Justice require the FWS to notify the affected tribe, and "encourage the action agency to invite the affected tribe(s) and the BIA to participate in the consultation process." App. Sec. 3(C)(3)(c).

Furthermore, if FWS were to make the Sonoran pronghorn an institutional priority, the Service could also provide technical assistance to the Tribe as required (App. Sec. 2(D)), in the form of funding and assistance in monitoring and surveying the pronghorn on tribal lands. This will allow the tribe to fully participate in the consultation process (App. Sec. 3(C)), and ensure much-needed tribal representation on recovery teams for the species (App. Sec. 3(E)). This would also enhance any Section 7(a)(1) conservation program undertaken by BIA.

III. RELIEF REQUESTED

To avoid a lawsuit over the agencies' failure to protect and recover the Sonoran pronghorn, the federal agencies must take the following steps, all of which are critical to the survival of the species.

A. Development and Implementation of an Effective Recovery Plan

The FWS must commit to a schedule to complete and implement an effective Recovery Plan which ensures the survival and recovery of the Sonoran Pronghorn. 16 U.S.C. § 1533(f). The Plan must detail the specific measures to be taken to protect and recover the species, and set forth the criteria by which the Service will determine when the species is recovered. To assist in developing this Plan, the Service should create a formal Recovery team under Section 4(f) of the ESA. 16 U.S.C. § 1533(f). This Team should be independently funded and supervised by the Regional Office.

B. Development of One or More Biological Opinions Which Take Into Account the Cumulative Impacts of All Agencies' Activities on the Pronghorn

Defenders believes it is vital to pronghorn recovery for the Service to engage all of the action agencies in programmatic consultation. In such a consultation, cumulative effects could be comprehensively assessed, and one or more BOs could be issued which take into account all of the impacts on the species. The participants in such a multi-agency process must include (1) the Bureau of Land Management, who is responsible for managing the Barry M. Goldwater Range and adjoining range land; (2) the agencies acting on the Goldwater and surrounding areas, which include the Department of Defense, Air Force, Navy - Marines, and Army National Guard; (3) the Department of Justice-Office of Immigration and Naturalization/Border Patrol; (4) the Department of the Interior; (5) the National Park Service, representing Organ Pipe Cactus Monument; (6) the Tohono O'odaham Nation; (7) the Bureau of Indian Affairs; and (8) the Fish and Wildlife Service, including both the Cabeza Prieta National Wilderness Refuge and Ecological Services. In order to avoid a lawsuit, the FWS and these agencies must commit to a schedule by which such a consultation will take place, and the resulting BO, or BOs, will be issued

C. Immediate Steps to Protect the Pronghorn

1. TAC-Ranges and Low-Level Flights

The adverse impacts of bombs, rockets and bullets on the pronghorn are obvious. However, during the critical fawning season it is simply not enough to monitor the H.E. Hills to ensure that no pronghorn are present before these activities commence. Rather, in order to protect the pronghorn in the short-term, the Air Force must agree to stop using both North-TAC and South-TAC during the pronghorn fawning season. In addition, no low-level flights below 1,500 feet above ground level, should occur over Sonoran Pronghorn habitat during fawning season, at least until the full effects of noise on pronghorn are determined.

2. BLM Impacts

Until the effects of cattle grazing and other public land uses have been sufficiently analyzed by the Service and BLM and the full effects on pronghorn are known, cattle should be removed from BLM land within the range of the Sonoran pronghorn. Interior and exterior fences on the Cameron, Sentinel, Coyote Flat, Why and Childs grazing allotments do not have antelope passes, nor are the bottom strands at least 18" above the ground, as required to permit pronghorn to get under them. Although Defenders believes these fences should be removed altogether, at this point these fences must, at a minimum, be made "pronghorn-friendly" by allowing the animals to pass under or around them. Any other fences on the Goldwater Range which are not pronghorn-friendly must also be modified.

D. Other Relief

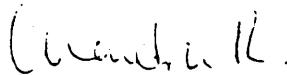
There may be other relief which is appropriate or could be appropriate in this case.

CONCLUSION

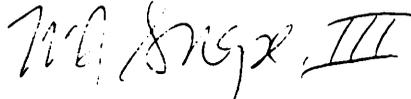
This notice of intent to sue complies with the requirements of section 11(g) of the ESA and applicable implementing regulations. 16 U.S.C. § 1540(g). If the Service, DOD, DOI, DOJ, BIA, Air Force, Marines, Army, BLM, NPS, FWS (Cabeza and Ecological Services), and Border Patrol do not correct the above described violations of the ESA within sixty days, Defenders of Wildlife intends to file suit seeking declaratory judgment, injunctive relief, and litigation costs on behalf of themselves, their members and other interested parties. In particular, if forced to file suit, Defenders may seek immediate injunctive relief to force these agencies to stop all activities adversely impacting the pronghorn until those impacts have been adequately addressed as required by the ESA. Defenders has retained the law firm of Meyer & Glitzenstein to represent them in this matter.

Defenders would much prefer, however, to work with the agencies toward the systematic protection and conservation of this magnificent species. We are hopeful that such an approach, rather than litigation, can be achieved. To that end, please contact me or Howard Crystal at Meyer and Glitzenstein to apprise us whether the agencies are willing to take the steps we have outlined in order to put pronghorn conservation on the right track.

Sincerely,



Chandra Rosenthal
Associate Counsel



William J. Snape, III
Legal Director

cc: Laura Thompson-Olais, FWS
John Hervert, AGFD
Thomas McCall, Lt. Col. Kul, Bruce Eilerts, USAF
Jim Omans, Ron Pearce, USMC
Tim Tibbitts, OPCNM
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Edward Manuel, Johnson Jose, Tohono O'odham Nation
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MEMORANDUM

TO: Domenick Ciccone, FWS, Albuquerque
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Lorena Wada, FWS, Phoenix
Don Tiller, Refuge Manager, Cabeza Prieta
Laura Thompson Olais, Cabeza Prieta
Mike Taylor, Phoenix Field Office Manager-BLM
Gail Acheson, Yuma Field Office Manager-BLM
Nilda Mesa, USAF, DC
Colonel White, Luke Air Force Base, USAF
Colonel Peace, Chief of Ranges and Airspace, DOD
Duane Shroufe, Director, AGFD
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Celia Piguerón Wirz, Directora de ANP región norte
Deborah Hood, INS
Ted Zukowski, Land and Water Fund
Gayle Hartman, Sierra Club
Bill Broyles, Friends of Cabeza

FROM: John Fritschie, Defenders of Wildlife

DATE: October 27, 1997

RE: **Sonoran Pronghorn recovery and related management forums (DOI/SEMARNAP letter of intent to cooperate on border natural area conservation and the Barry M. Goldwater Air Force Range renewal process)**

Defenders of Wildlife has made recovery of the Sonoran pronghorn an institutional priority and over the past few years has sought to raise awareness of the plight of the species. Defenders has particularly focused on the impact that military training activities on the Barry M. Goldwater Air Force Range have on the short-term survival of the species. The Range is in the process of developing a legislative environmental impact statement to guide Congress in making a decision on whether or not and in what form and with what conditions to renew the withdrawal of the Range from the public lands for military use. Defenders has also challenged the impact that military activities, and proposed expansions, are currently having on the continued survival and recovery of the Sonoran pronghorn.

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Defenders submits the attached document entitled "Defenders of Wildlife's Sonoran Pronghorn Recovery Agenda" as 1) scoping comments on the LEIS process; 2) as part of its continuing dialogue with the military on working towards a common goal of recovering the pronghorn; 3) as input towards the in progress Sonoran pronghorn recovery plan revision; and 4) as follow-up to the DOI/SEMARNAP letter of intent to cooperate on border natural area protection. Obviously there are many more details that need to be worked out by the federal and state agencies, and Defenders hopes to participate in that process and to be able to be of assistance.

**DEFENDERS OF WILDLIFE'S
SONORAN PRONGHORN RECOVERY AGENDA**

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I. Population Demographics/Habitat Suitability

The current population of Sonoran pronghorn (*Antilocapra americana sonoriensis*), a subspecies of pronghorn antelope listed as endangered under the Endangered Species Act, is likely less than 500 total animals (FWS 1997a). The Sonoran pronghorn exists in two isolated populations, one in the U.S. and one in Mexico. The U.S. population numbers between 80 to 160 individuals, while the Sonora, Mexico population is approximately 300. At the low end of recent population estimates the U.S. population is at or approaching levels where it is in danger from "demographic stochasticity," i.e. extinction that can occur in small populations due to random high death rates or low birth rates (Gilpin and Soulé 1986). The tendency to strong demographic stochasticity in the Sonoran population is likely to be perpetuated and exacerbated by the historic, drastic decline in available habitat quantity and "environmental stochasticity," i.e. random changes in environmental quality (Ibid).

Notably extremely high mortality of collared Sonoran pronghorn (50%) occurred between November 1995 and June 1996 and there has been little to no recruitment into the population in the past three years with recent droughts being a major factor (FWS 1997b). A recent Population Viability Analysis indicates that female fawn mortality exceeding 60% is "catastrophic event" and a significant factor in determining the likelihood of extinction (FWS 1997a). In 1995, productivity was between 1 and 1.4 fawns per doe but the recruitment rate ended up being only 12 fawns per doe (Ibid). In 1996, productivity was a mere 0.33 fawns per doe and the recruitment rate was zero (Ibid). Indeed, the foremost expert on the U.S. population has concluded that there is an unacceptably high risk of extinction of the species in this country (Hervert pers. com. 1997).

There are a number of factors which led to the decline of the species including loss of habitat to cattle and agricultural conversion, the diversion of the waters of the Gila, poaching, and natural factors such as drought. Today the Sonoran pronghorn

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persists in the U.S. almost exclusively in areas off limits to most human activities, Organ Pipe Cactus National Monument, Cabeza Prieta Wildlife Refuge and Wilderness, and the Barry M. Goldwater Air Force Training Range. The military activities in conducting air and ground training over the BMG along with low-level flight training over Cabeza Prieta, are a primary source of impacts on Sonoran pronghorn in the U.S. While the existence of the BMG has protected the pronghorn's remaining territory from a wide range of other human impacts and the mere cessation of military activities would not be sufficient to recover the pronghorn, the short-term survival of the species depends upon mitigating the impacts of military activities on the Sonoran pronghorn, especially during the critical fawning season (FWS 1997a, FWS 1997b, FWS 1997c, Maher 1996, Hosack 1996).

The almost complete lack of recruitment into the U.S. population over the past few years, combined with high adult mortality from a combination of factors such as harsh droughts and a few possible instances of capture myopathy, is the primary cause of the current critically dire state of the Sonoran pronghorn. The lack of recruitment also precludes other options for active management which could lead to recovery of the population, such as establishing additional populations. **Assuring the most favorable conditions possible for successful recruitment in the upcoming fawning season and future years is the overriding priority of Defenders of Wildlife.** This will require the nearly complete elimination of adverse impacts of military training and other human activities during fawning season, and likely some limited artificial management.

A. Objectives

1. Minimize/Eliminate Disturbance During Fawning Season
2. Maximize Habitat Suitability During Fawning Season

B. Tasks

1. Close South-TAC and North-TAC to live and inert ordnance deliveries and low-level flights below 1500 agl during the period of March 1 to April 15, the height of fawning season. Restrict low level flights over Cabeza Prieta during this period as well to above 1500 agl.

2. Additionally, close South-TAC to other human disturbances such as explosive ordnance disposal (EOD) during the period of March 1 to April 15.

3. Schedule EOD for South-TAC during the period of April 15 to June 30, thereby precluding live and inert ordnance delivery during the period when fawns are likely to still be on South-TAC.

4. Restrict motorized public access to high pronghorn use areas of Cabeza Prieta and BMG during the period of March 1 to May 1.

5. Initiate public education campaign on the need to avoid the harassment of pronghorn, including border patrol agents.

6. Control of exotic species/habitat restoration.

7. Reclaim administrative "trails" in Cabeza Prieta.

8. Retire artificial waterholes of no known benefit to pronghorn or bighorn sheep to decrease associated traffic from refilling and maintenance and unauthorized use of administrative trails.

9. Limited experimental watering of desert to promote vegetation growth in pronghorn habitat -- away from active targets and outside of the Wilderness -- during the early summer to determine benefit to fawn survival in drought years.

10. Limited retention of some artificial waters, realigned to maximize potential, but unproven, benefit to pronghorn and minimize adverse effects on Wilderness values.

C. Related Concerns

1. Rigorous scientific evaluation of artificial management activities must occur.

2. Actions to recover pronghorn through the minimization of human impacts must not wait for additional research -- the benefit of the doubt must go to the pronghorn.

3. In the Cabeza Prieta Wilderness area, wilderness values must be respected and impacts to wilderness must be minimized.

4. Artificial waters can be predator "traps" increasing mortality of pronghorn.

II. Connectivity/Population Genetics

The long-term viability of the Sonoran pronghorn cannot be assured if the species continues to consist of two small isolated populations due to genetic and stochastic vulnerability. Even within the US population there is further fragmentation by fences, highways, and other human activities (Ockenfels, et al 1996). Fragmentation of a species into isolated populations has profound impacts on survival as the probability of extinction of a isolated population varies inversely with the size of that population. (Gilpin and Soule 1986). Fragmentation also can dramatically lower

the "effective population size" of a species, with a resulting reduced ability to adapt to a changing environment (Ibid). Gilpin and Soulé describe a "vicious cycle" in which decreasing effective population in turn causes increased fragmentation as marginal habitats become submarginal due to loss of fitness (Ibid.). Significantly, the Sonoran pronghorn in the U.S. appears to already be limited to largely marginal habitats, as evidenced by low recruitment rates over a number of years.

The effective population size is often estimated to be 25% of the total population size (Schafer 1990). Therefore, using the 50/500 rule of thumb for genetic fitness indicates that the U.S. population of Sonoran pronghorn is below the 200 total individuals generally considered to be genetically viable in the short-term and that even a connected U.S./Mexico population is well below the approximately 2000 individuals generally considered to be genetically viable over the long-term.

A. Objectives

1. Promote interchange between the U.S. and Mexico pronghorn populations.
2. Eliminate or mitigate barriers to movement within the U.S. population.

B. Tasks

1. Complete new survey of Sonora, Mexico population in late 1998 or early 1999.
2. Identify potential movement corridors across U.S./Mexico border.
3. Modification of border patrol operations and facilities along the border to accommodate protection of Nation's borders and recovery of pronghorn and other transborder species.
4. Increased international cooperation in recovery of the pronghorn and other current or historic transborder species such as the jaguar, marguay, ocelot, jaguarundi, wolf, Yuma clapper rail, southwestern willow flycatcher, flat-tailed horned lizard, desert pupfish, razorback sucker, bonytail chub, and migratory waterfowl.
5. Modification/mitigation/elimination of fencing and highway barriers to movement within the U.S. population range.
6. Memorandum of Agreement/Cost Sharing Agreement between the Fish and Wildlife Service, Border Patrol, Arizona Game and Fish Department, Bureau of Land Management, Department of

Defense, and Mexico for implementation of border modifications and connectivity improvement measures, including law enforcement.

C. Related Concerns

1. U.S. population of pronghorn must be maintained and effects of cross-border movement must be monitored to ensure that either country does not become a "sink" for the other country's pronghorn. The U.S. population cannot be considered an expendable peripheral population, both for legal and scientific reasons. First the ESA requires the conservation of the Nation's biological diversity whether or not a species may be more numerous elsewhere. Defenders of Wildlife v. Babbitt, 958 F.Supp. 670 (D.D.C. 1997). Second, recent research indicates that imperilled species' range collapse is not always, or even generally, toward the center of its historic range, but that sites at the periphery of the historic range represent critical refugia for many endangered species (Lomolino and Channell 1995).

2. International cooperation must be in place to ensure that poaching is not a problem on either side of the border.

III. Metapopulation

Beyond establishing connectivity and genetic interchange between the current U.S. and Mexico populations, basic principals of conservation biology indicate the need to establish a metapopulation to protect against stochastic extirpation of single populations through catastrophic event such as disease or natural disaster. A metapopulation consists of many subpopulations in habitat, continuous or fragmented, on a landscape scale.

A. Objective

1. Establish a recovered metapopulation of Sonoran pronghorn.

B. Tasks

1. Identify three sites -- two in Arizona and one in California -- as potential reintroduction sites.

2. Assess habitat suitability of potential reintroduction sites.

3. Complete feasibility analysis of reintroduction including costs of captive breeding program, if necessary, source of breeding or translocation stock, potential risks to pronghorn survival, and the minimum population level at which it would be prudent to remove individuals from current range for reestablishment purposes.

4. Memorandum of Agreement/Cost Sharing Agreement between the Fish and Wildlife Service, Arizona Game and Fish Department, Bureau of Land Management, Department of Defense, and other relevant agencies for implementation of reintroduction.

C. Related Concerns

1. Current populations levels are so low that any mortality from capture of pronghorn for use in a breeding program or translocation could be disastrous.

IV. Recovery

The ultimate goal of the Endangered Species Act is the recovery of listed species to the point where the protections of the Act are no longer required. 16 U.S.C. §§ 1531(b), 1532(3). The ESA seeks to recover imperilled species both through the amelioration of human induced mortality factors as well as the protection of the ecosystems upon which the species depends. The ESA charges the Secretary of the Interior with developing and implementing recovery plans for listed species which contain site-specific management actions and measurable, objective criteria for recovery. *Id.* at 1533(f). Recovery criteria must address each of the relevant factors which led to the listing of the species, including population declines, human mortality, and habitat loss where applicable. Fund for Animals v. Babbitt, 1995 U.S. Dist. LEXIS 14742 (D.D.C. Sept. 29, 1995).

A. Objectives

1. Establish biologically based population target for recovery, including criteria for productivity, recruitment, and adult mortality.

2. Establish habitat criteria for amount and quality of habitat with sufficient carrying capacity to support a recovered population.

3. Identify site-specific management actions for recovery of the pronghorn.

B. Tasks

1. Determine parameters for acceptable risk of extinction, in terms of a certain probability of extinction over the course of a certain number of years, for both upgrading to threatened status and removal from list. Common values for determining viability over the mid to long-term are a 95% likelihood of survival over 100 to 1000 years (Schafer 1990). These values could be used for uplisting and delisting respectively.

2. Through population viability analysis determine population levels for upgraded and recovered populations.

3. Determine carrying capacity of current and potential habitat.

4. Develop criteria for amount and quality of current and potential habitat which is necessary to support a recovered population.

5. Identify additional site-specific management actions for recovery of the pronghorn which deal with threats from grazing, motorized vehicle access in pronghorn habitat, habitat fragmentation from fencing and highways, diversion of waterways, canals, etc.

CONCLUSION

The Sonoran pronghorn is among the most critically endangered land mammals in North America. It persists in a region of the U.S. with one of the highest rates of imperilled species in the Nation. Since the species was listed in 1978 little has been done to recover the Sonoran pronghorn. Generation after generation of existence at such small population levels has a "cumulative effect" driving a species toward extinction (Gilpin and Soulé 1986). Until substantial recovery of the population has occurred any human activities which adversely affect the species must be considered to jeopardize the continued existence of the species as that term is used in implementing the ESA.

Three ongoing processes must be the focus for a substantial effort to recover the Sonoran pronghorn. First, there must be a biologically sound recovery plan revision that has objective criteria for recovery that include scientifically grounded population goals and habitat criteria. Second, the Barry M. Goldwater Range Legislative Environmental Impact Statement and Renewal process should be considered an important vehicle for highlighting the dire situation facing the pronghorn and obtaining additional resources for its recovery. Third, international cooperation in the recovery of the pronghorn can be fostered through the implementation of the letter of intent to work on border natural areas signed by Secretaries Babbitt and Carabias.

LITERATURE CITED

Fish and Wildlife Service. 1997a. Biological Opinion For "Use of Ground-Surface and Airspace For Military Training on the Barry M. Goldwater Range Which May Affect the Endangered Sonoran Pronghorn." U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office. Phoenix, Arizona.

- Fish and Wildlife Service. 1997b. Interim Biological Opinion For "Use of Ground-Surface and Airspace For Military Training on the Barry M. Goldwater Range Which May Affect the Endangered Sonoran Pronghorn." U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office. Phoenix, Arizona.
- Fish and Wildlife Service. 1997c. Biological Opinion For Organ Pipe Cactus National Monument General Management Plan. U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office. Phoenix, Arizona.
- Hosack, Dennis, A. 1996. Biological Assessment for Sonoran Pronghorn on the Barry M. Goldwater Range. Defenders of Wildlife. Unpub.
- Gilpin, Michael E. and M. E. Soulé. 1986. Minimum viable populations: Processes of Species Extinction. In Conservation Biology The Science of Scarcity and Diversity. Soulé ed. Sinauer Associates Inc., Sunderland, Massachusetts.
- Lomolino, Mark V. and R.C. Channell. 1995. Splendid isolation: patterns of geographic range collapse in endangered mammals. J. Mamm. 76(2):335-347.
- Maher, Christine, R. 1996. Review of Air Force's Biological Assessment for Sonoran Pronghorn on the Barry M. Goldwater Air Force Range. Montana State University. Unpub.
- Ockenfels, R.A., W.K. Carrel, J.C. de Vos Jr., and C.L. Ticer. 1996. Effects of highways and railroads on pronghorn movements in Arizona. Joint Annual Meeting of the Arizona-New Mexico Chapter of the American Fisheries Society and Arizona and New Mexico Chapters of the Wildlife Society. Sierra Vista, Arizona.
- Schafer, Craig L. 1990. Nature Reserves: Island Theory and Conservation Practice. Smithsonian Institute Press. Washinton, DC.