

Effects of Clean Water Act Permits on the Cactus Ferruginous Owl *Glaucidium brasilianum* in Arizona

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ABSTRACT

The endangered Cactus Ferruginous Pygmy-owl ranges from western Mexico north to southern Arizona, U.S.A., where it occurs in Sonoran desertscrub and semidesert grassland communities. Habitats include ephemeral drainages with Saguaro or other columnar cacti, large trees, and a well-developed shrub layer. In response to a lawsuit filed in 1997 and subsequent Arizona District Court order issued in 1999, a GIS-based impact assessment was completed in 2002 of Clean Water Act (CWA) permits issued in areas considered suitable pygmy-owl habitat in southern Arizona from 1994-2000. Recent aerial photography, permit databases, procedural safeguards, historical and recent pygmy-owl sightings, and local planning data were used to evaluate causal effects of impacts authorized by CWA permits on pygmy-owls and designated critical habitat. The assessment revealed that most impacts to pygmy-owls and their habitat are facilitated by factors outside Federal CWA regulatory control; permit mitigation requirements effectively minimize habitat impacts; and the indirect effects of low-density residential development may not adversely impact pygmy-owls and their habitat in all cases.

INTRODUCTION

The U.S. Army Corps of Engineers regulates certain activities in waters of the United States in accordance with section 404 of the Clean Water Act (33 U.S.C. 1344). Waters of the U.S. include, but are not limited to, the territorial seas, lakes, rivers, streams, wetlands, sloughs, prairie potholes and playa lakes. The objective of the Clean Water Act (CWA) and its amendments passed in the 1970s, was to restore and maintain the chemical, physical and biological integrity of the nation's waters. The Corps of Engineers' legal authority applies to all regulated activities in jurisdictional waters regardless of land ownership.

Depending on the nature and extent of the activity, individual or general permits are available to applicants to authorize their work. Nationwide permits (NWP) are one type of general permit that authorize a category of specified activities nationwide that have minimal individual and cumulative adverse effects on the aquatic environment. The NWP programme consists of 43 permits that cover a range of activities and are designed to regulate with little, if any, delay or paperwork.

In 1997 Defenders of Wildlife and the Southwest Center for Biological Diversity sued the Corps of Engineers under the citizen suit provisions of the Endangered Species Act of 1973 (16 U.S.C. 1540) and Administrative Procedure Act (5 U.S.C. 702) alleging the Corps of Engineers had failed properly to consult with the U.S. Fish & Wildlife Service and evaluate the effects of the NWP programme on the endangered Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* (pygmy-owl hereafter) in southern Arizona. In 1999 the Arizona District Court agreed with the plaintiffs, ordering the Corps of Engineers to complete a regionally based, programmatic impact assessment and to engage in section 7 (of the Endangered Species Act) consultation with the Fish & Wildlife Service regarding the effects of the NWP programme on the pygmy-owl and its habitat.

Pygmy-owls nest in holes in trees and cacti and, historically, were reported most commonly in Arizona in cottonwood (*Populus spp.*)-mesquite (*Prosopis spp.*) forest and mesquite woodlands (Karalus & Eckert 1974; Johnsgard 1988; Millsap & Johnson 1988; Voous & Cameron 1989; Glinski 1998; Cartron & Finch 2000; Proudfoot & Johnson 2000; Vezo & Glinski 2002). Mesic riparian forests and the associated mesquite woodlands have been nearly eliminated in southern Arizona over the last 100 years, and the reduction of these forests and woodlands is thought to have caused a decline in pygmy-owls during that period. Remaining pygmy-owls in Arizona generally occupy xeroriparian and upland areas densely vegetated with trees and Saguaro cacti (*Carnegiea gigantea*) (USFWS 2003a).

In 1992 the Fish & Wildlife Service was petitioned to list the pygmy-owl as an endangered species under the Endangered Species Act. In 1994 the Fish & Wildlife Service proposed to list the pygmy-owl as endangered with critical habitat in Arizona and threatened in Texas. In the final rule the Arizona population was listed as endangered without critical habitat while the Texas population was not listed (USFWS 1997).

In response to a Federal District Court order, the Fish & Wildlife Service designated 296,240ha as pygmy-owl critical habitat in southern Arizona (USFWS 1999). In another lawsuit the District Court vacated the critical habitat designation, ordering the Fish & Wildlife Service to complete an economic analysis of the effects of designation. The economic analysis was completed and the Fish & Wildlife Service proposed to designate 488,863ha as critical habitat (USFWS 2002). A draft recovery plan for the pygmy-owl was recently released for public comment (USFWS 2003a).

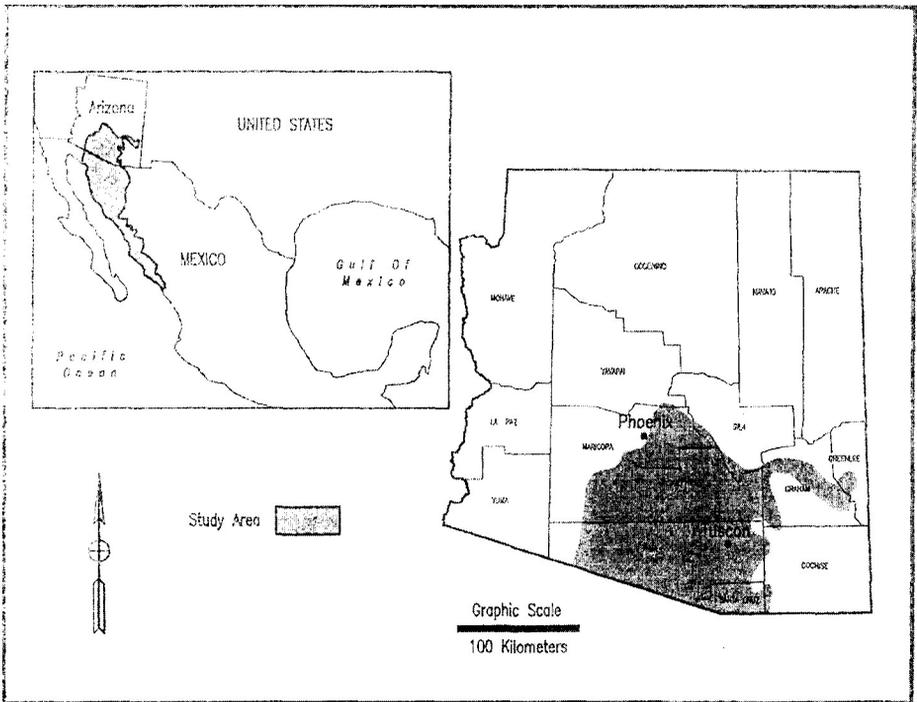
Herein I report on the Corps of Engineers' effort to comply with the Court order and programmatically assess the effects of the NWP programme on the endangered pygmy-owl in southern Arizona.

METHODS

Study Area

In 1999 the Judge ordered the inclusion of all designated pygmy-owl critical habitat in Arizona and within Pima and Pinal counties to all lands below 1,200m mean sea level (msl), excluding tribal lands and urban Tucson. Accordingly, our geographic scope of analysis (GSOA) included 5,055,600ha of private, state and federal land in Maricopa, Pima, Pinal, Santa Cruz, Graham and Cochise counties, including the seven critical habitat units designated by the Fish & Wildlife Service in 1999 (Figure 1). Portions of pygmy-owl survey zones 1-3 [as defined by the Fish & Wildlife Service (2000)] below 1,200m msl were also included.

Figure 1. Study area and historical range of the Cactus Ferruginous Pygmy-owl in southern Arizona, U.S.A and northern Mexico.



Survey zone 1 is located within portions of Pima and southern Pinal counties and encompasses all recent pygmy-owl locations. This zone includes areas within the current range of the pygmy-owl with a high potential for occupancy. Survey zone 2 includes the currently known range of the pygmy-owl within Pima and southern Pinal counties, excluding those areas designated as zone 1, with a moderate potential for occupancy. Survey zone 3 includes portions of Santa Cruz, Gila, Graham, Maricopa, Cochise and Pinal counties, and includes areas within the historical range of the pygmy-owl with a low potential of occupancy (USFWS 2000).

Tribal lands excluded from the GSOA included those of the Tohono O'odham, Pascua Yaqui and Gila River Indian and Salt River-Maricopa Indian communities. The urban areas of Tucson and Phoenix, as defined by the Fish & Wildlife Service (2000), were excluded from the GSOA, as well as portions of pygmy-owl survey zones 1-3 above 1,200m msl.

Analyses & data

The programmatic assessment of the NWP programme on pygmy-owls and their habitat was completed in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347). NEPA is the broadest environmental law in the U.S.A., and applies to all Federal agencies and most of the activities they manage, fund or regulate that affect the quality of the environment. NEPA requires agencies to disclose and consider the environmental implications of their actions.

Six alternatives of implementing the NWP programme were selected for detailed analysis, including a no action alternative of not applying the NWP programme in the Court-defined GSOA. In Arizona we maintain a database on the use of NWP's and other permits. Permit data (number, type, location) were used from 1994, when the pygmy-owl was first proposed for listing as endangered, through 2000, as well as data from county planning departments on development impacts from building permits.

From December 1994 to December 2000, the Corps of Engineers issued 565 NWP verifications in the GSOA. The NWPs were placed in groups based on frequency of use, from never used (Group A) to frequently used (Group D). The area of impact was estimated for each group within each Fish & Wildlife Service survey zone.

We estimated the area (ha) of waters of the U.S. under CWA jurisdiction in the GSOA using aerial photography and GIS extrapolation of ordinary high water polygons along waters of the U.S. The lateral limits of CWA jurisdiction extend to the ordinary high water mark in non-tidal waters, such as the ephemeral and intermittent streams (dry washes) found in southern Arizona.

Arizona Game & Fish Department and Fish & Wildlife Service data collected from pygmy-owl sightings recorded from 1933-2001 (N = 84) provided information on pygmy-owl distribution in Arizona. Recent surveys documented 41 adult pygmy-owls in 1999, 34 adults in 2000 and 36 in 2001. Most of these were distributed in north-west Tucson, Organ Pipe Cactus National Monument, and the Altar Valley.

Procedural safeguards associated with the NWP programme, including general conditions related to water quality, endangered species, notification, mitigation, and critical resource waters, as well as regional conditions specific to Arizona, other mitigation requirements, and discretionary authority, were also considered.

Assumptions

Several assumptions were made to evaluate the direct, indirect and cumulative effects of implementing the six NWP programme alternatives on pygmy-owls in Arizona. Importantly, there is rarely sufficient Federal control on a private development that warrants expanding the Corps of Engineers

scope of analysis to upland areas outside CWA jurisdiction. Also, the 2001 ruling by the 9th Circuit Court of Appeals in *Arizona Cattle Growers' Association v. U.S. Fish & Wildlife Service* further limited Endangered Species Act control over certain projects and Federal actions. The Court ruled that a listed endangered species must occupy the habitat in question for it to be subject to Fish & Wildlife Service review under the Endangered Species Act. Prior to the ruling the Fish & Wildlife Service was consulting with Federal agencies on projects in habitat it considered "suitable" for endangered species, but not currently occupied.

RESULTS

Clean Water Act impacts

The area under CWA jurisdiction (waters of the U.S.) and Corps of Engineers regulatory control in Fish & Wildlife Service survey zones 1-3 was <3% of the GSOA (Table 1). The Fish & Wildlife Service survey zones are based on the degree of risk for a private or Federal entity to "take" (e.g., kill, harm or harass) a pygmy-owl, and is directly correlated with the number of recent, and historical, pygmy-owl records in each zone. The greatest potential risk of "take" and most pygmy-owl records are in zone 1 and lowest risk and fewest records in zone 3 (Figure 1).

Table 1. GIS-estimated waters of the United States within Cactus Ferruginous Pygmy-owl survey zones in southern Arizona.

Zone	Size (ha)	Waters of US (ha)	% of Zone	90% C.I. (ha)
1	284,000	8,107	2.85	+/- 1,920
2	2,272,000	40,393	1.78	+/- 11,713
3	2,499,600	89,260	3.57	+/- 85,513
Total	5,055,600	137,760	2.72	+/- 86,333

Survey zones 2 and 3 experienced the majority of physical impacts to waters of the U.S. within the GSOA, while zone 1, which contains habitat considered most important to pygmy-owls, experienced the least (Table 2). This suggests the indirect development impacts associated with CWA permits are occurring in areas within the GSOA that are least likely to affect the areas most important to pygmy-owls (USACE 2002).

Table 2. GIS-estimated impacts (ha) to waters of the United States from Nationwide Permits (NWP) authorized within Cactus Ferruginous Pygmy-owl survey zones in southern Arizona, December 1994 to December 2000.

NWP use group	Zone 1	Zone 2	Zone 3	Total
B (rarely)	2.0	6.6	5.2	13.8
C (occasionally)	1.0	2.9	1.6	5.5
D (frequently)	8.2	35.1	27.3	70.6
Total	11.2	44.6	34.1	89.9

Other impacts

Several factors potentially impacting pygmy-owls and their habitat in southern Arizona are outside Corps of Engineers regulatory control, such as the designation of critical habitat by the Fish & Wildlife Service and Pima County's development of a regional, multi-species habitat conservation plan. Arizona state legislation and the development of guidelines for special management areas identified in the pygmy-owl draft recovery plan are outside CWA control (USFWS 2003a).

There are many private, residential developments in southern Arizona with no Federal control, including "wildcat" subdivisions or sprawling tracts of land divided by a succession of owners in a way that leaves them exempt from basic county building requirements, such as building roads, sewers and sidewalks. In 1999, four out of 10 new homes in Pima County were built on "wildcat" lots and the phenomenon has spread to Pinal and Santa Cruz counties (USACE 2002).

About 3,560,000ha (70%) of the GSOA are subject to cattle grazing and public lands recreation, two historic and current land uses that have a significant potential to contribute to impacts on pygmy-owls and their habitat. These lands are managed by the U.S. Forest Service, Bureau of Land Management, and National Park Service, as well as the Arizona State Lands Department (USACE 2002). Heavy grazing is widely recognized as a common cause of degradation of watersheds and riparian habitat in Arizona, and likely affects the habitat characteristics critical to pygmy-owls.

Tribal lands excluded from the Court-defined GSOA, and designation of critical habitat by the Fish & Wildlife Service, include most of the pygmy-owl historic range in Arizona.

Groundwater pumping in the Tucson basin, at least historically, probably affected pygmy-owls and their habitat. Significant volumes of groundwater have been and are currently pumped for municipal and private water supplies, agriculture and mining. To the degree that mesquite woodlands (bosques) and cottonwood-willow (*Salix spp.*) forests historically provided habitat for pygmy-owls, groundwater pumping and the draw down of the water table has in the past and continues to represent a threat to these habitats (USACE 2002).

DISCUSSION

The indirect and cumulative impacts of land development and human disturbance in general are probably having the greatest negative impact on pygmy-owls and their habitat in southern Arizona, and are mostly facilitated by factors outside Federal CWA regulatory control.

The Fish & Wildlife Service has recently suggested that pygmy-owls can live and breed successfully in areas that have undergone at least some degree of low-density human development (USACE 2002). Based on a limited sample of six breeding sites, the Fish & Wildlife Service estimated that pygmy-owls could tolerate some vegetation disturbance (21%) from roads, buildings, corrals, pastures and parking lots. For non-breeding pygmy-owls, the amount of vegetation disturbance within their home range averaged 39%, suggesting that unpaired, single pygmy-owls may be able to tolerate higher levels of development and more marginal habitats than breeding pygmy-owls.

Also, since the notification threshold for most NWP's has been reduced (0.04ha) there are few projects the Corps of Engineers will not be reviewing in southern Arizona, and many project proponents (>87%) request proposal reviews by the Corps of Engineers even if not required by regulation (USACE 2002).

Based on the programmatic analysis, the Corps of Engineers decided to implement all 43 NWP's and their 27 general conditions within the GSOA. Several regional conditions were also implemented, including the requirement that applicants submit recent, pre-impact colour photographs of their project site, and a prohibition on the use of NWPs in special aquatic sites, such as wetlands. Applicants are required to inform the Corps of Engineers if any listed threatened or endangered species or designated critical habitat might be affected or is in the vicinity of their project. If they fail to do so, their activity is unauthorized. The Corps of Engineers has the responsibility to make the effect determination on listed species, including pygmy-owls, on a case-by-case basis. The Corps of Engineers generally limits their Endangered Species Act scope of analysis to the permit area unless there is a physical effect on threatened and endangered species outside the permit area, or if the project could not otherwise be built without the CWA permit.

To further comply with the 1999 Court order, the programmatic assessment (USACE 2002) was used to consult informally with the Fish & Wildlife Service pursuant to section 7 of the Endangered Species Act. At the conclusion of the consultation, the Fish & Wildlife Service concurred with the Corps of Engineers' assessment and determination that implementation of the NWP programme in Arizona was not likely to adversely affect the endangered pygmy-owl, provided certain guidelines were followed (USFWS 2003b).

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ADDENDUM

In August 2003, the 9th Circuit Court of Appeals ruled in *National Association of Home Builders v. Norton* that the Fish & Wildlife Service must reconsider its 1997 decision to list the pygmy-owl as endangered. The court concluded the Fish & Wildlife Service's designation of the pygmy-owl population in Arizona as a distinct population segment was arbitrary and capricious, failing to show that the population was important, because its loss would create a significant gap in the range of the pygmy-owl or because it differed markedly in its genetic characteristics from pygmy-owls in northwestern Mexico.

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