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# Federal listing of prairie grouse: lessons from the Attwater's prairie-chicken

by Michael E. Morrow, Terry A. Rossignol,  
and Nova J. Silvy

**Abstract** Considerable controversy has often surrounded proposals to confer official status (i.e., list) species under the authority of the Endangered Species Act (ESA) of 1973 as amended or its precursors. Recent proposals to list the lesser prairie-chicken (*Tympanuchus pallidicinctus*), the western sage grouse (*Centrocercus urophasianus phaios*), and the Gunnison sage grouse (*C. minimus*) were met with strong opposition by those concerned with prospects of an increased regulatory environment associated with such an action. The Attwater's prairie-chicken (*T. cupido attwateri*) was one of the first species listed under The Endangered Species Conservation Act of 1966, the first federal effort to specifically protect endangered species. Federal listing benefited the Attwater's by raising awareness of its status and by authorizing additional sources of funding for its management. While concern over an increased regulatory environment associated with the endangered status of the Attwater's probably has always existed among property owners and land managers, conflicts involving this bird have been few and local in scope. Maintaining good working relationships and respect for all affected interests, including property owners and land managers, has been paramount in Attwater's recovery efforts. However, these efforts at times have been hampered by "lightning-rod" issues pertaining to other species. Despite 35 years of ESA protection, the Attwater's prairie-chicken remains perilously close to extinction. Based on these experiences, federal listing should be viewed neither as a panacea nor as a demon, but rather as a tool in species recovery.

**Key Words** Attwater's prairie-chicken, Endangered Species Act, listing, recovery, *Tympanuchus cupido attwateri*

**P**rairie grouse have experienced substantial declines in population and distribution in historic time. The heath hen (*Tympanuchus cupido cupido*) is extinct, the Attwater's prairie-chicken (*T. c. attwateri*) is listed as federally endangered (32 FR 4001), and other species are

listed as threatened or endangered at the state or provincial level. The Gunnison sage grouse (*Centrocercus minimus*), the western sage grouse (*C. urophasianus phaios*), and the lesser prairie-chicken (*T. pallidicinctus*) are currently petitioned for listing under the Endangered Species

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Act (ESA) of 1973. While the purposes of conserving endangered and threatened species and their ecosystems as stated in the ESA are noble, considerable controversy has surrounded ESA implementation (e.g., Peterson and Horton 1995, Ruckelshaus 1998, Czech and Krausman 2001). As a result of such controversy, proposals for listing the Gunnison and western sage grouse and the lesser prairie-chicken have been met with considerable apprehension. As listing of these prairie grouse is contemplated, it would be helpful to examine experiences from the Attwater's prairie-chicken, the only prairie grouse listed under the ESA to date. We will provide an historical overview of Attwater's populations and conservation efforts before and after its listing to provide background for an examination of the impacts of listing on the recovery of this species. We also will examine the impacts on Attwater's conservation efforts of implementing the primary mechanisms for accomplishing ESA purposes: regulation, provision of funding, and raising awareness.

## Background

### *Population and habitat*

Historically, Attwater's prairie-chicken populations approached 1 million individuals on an estimated 2.4 million ha of prairie along the Gulf of Mexico (Lehmann 1941, 1968). By 1937 populations declined to an estimated 8,700 individuals (Lehmann 1941) and have continued to decline since (Attwater Prairie Chicken National Wildlife Refuge [APCNWR], unpublished data; Figure 1). Today, <50 free-ranging individuals remain in 2 isolated populations (Figure 2). Both of these populations have been supplemented with captive-reared birds since 1996 to reduce extirpation risks.

Loss and fragmentation of the prairie ecosystem brought about by agricultural conversion, urban and industrial expansion, overgrazing, and invasion of prairies by woody species have been the ultimate factors influencing decline of Attwater's prairie-chicken (Lehmann 1941, Jurries 1979, Lawrence and Silvy 1980, McKinney 1996). From 1952–1990 grassland acreage in a 56,000-ha area encompassing the APCNWR decreased from 52% to 17% of total land use (McKinney 1996, Morrow et al. 1996). Smeins et al. (1991) estimated that <1% of the Attwater's coastal prairie ecosystem remains in relatively pristine condition. Hypothetical proximate contributors to range-wide population declines since 1987

include stochastic weather events (Morrow et al. 1996), reduced genetic variability (Osterndorff 1995), parasites (Peterson 1994, Purvis 1995), disease (Peterson et al. 1998), and red imported fire ants (*Solenopsis wagneri*) (Mueller et al. 1999). All these factors possibly have contributed to reduced survival and reproductive output (Peterson 1994, Peterson and Silvy 1996).

Including a rancher with prairie-chickens on the Attwater's Prairie Chicken Recovery Team provided valuable insight and respectability for the team. Additionally, the general philosophy taken by biologists has been one of respect for landowners and their positions while seeking areas where both groups could work together.

### *Conservation efforts*

Prior to the late 1960s, Attwater's prairie-chicken conservation efforts consisted of life-history research (Lehmann 1941), periodic population surveys (Lehmann 1941, Lehmann and Mauermann 1963, Lehmann 1968), and protection from hunting (since 1937) (Lehmann 1941, Jurries 1979). From 1967 through the present, a multitude of research projects have been conducted, primarily at Texas A&M University, on topics including habitat management (Chamrad 1971, Chamrad and Dodd 1972, Kessler 1978, Morrow 1986), life history (Cogar et al. 1977, Horkel 1979, Horkel and Silvy 1980, DiMare 1991), predator management (Lawrence 1982), genetics (Ellsworth 1991, Maltbie 1992, Osterndorff 1995), limiting factors (Peterson 1994, Purvis 1995, McKinney 1996), captive breeding (Watkins 1971, Drake 1994, Griffin 1998), and population supplementation (Lockwood 1998). The Texas Parks and Wildlife Department (TPWD) initiated a series of research projects in 1969 that were funded in part by federal aid made available through the Federal Aid in Wildlife Restoration (Pittman-Robertson) Act. These research projects, which

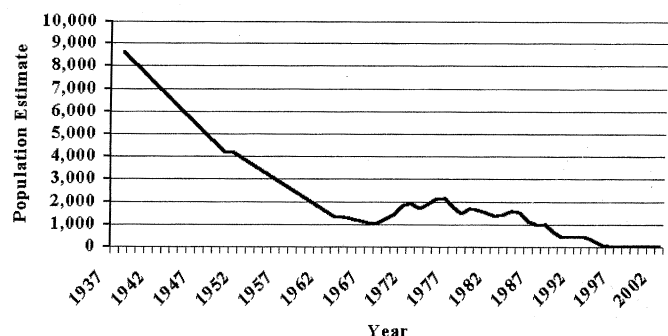


Figure 1. Attwater's prairie-chicken population trends in southeast Texas, USA, 1937–2002.

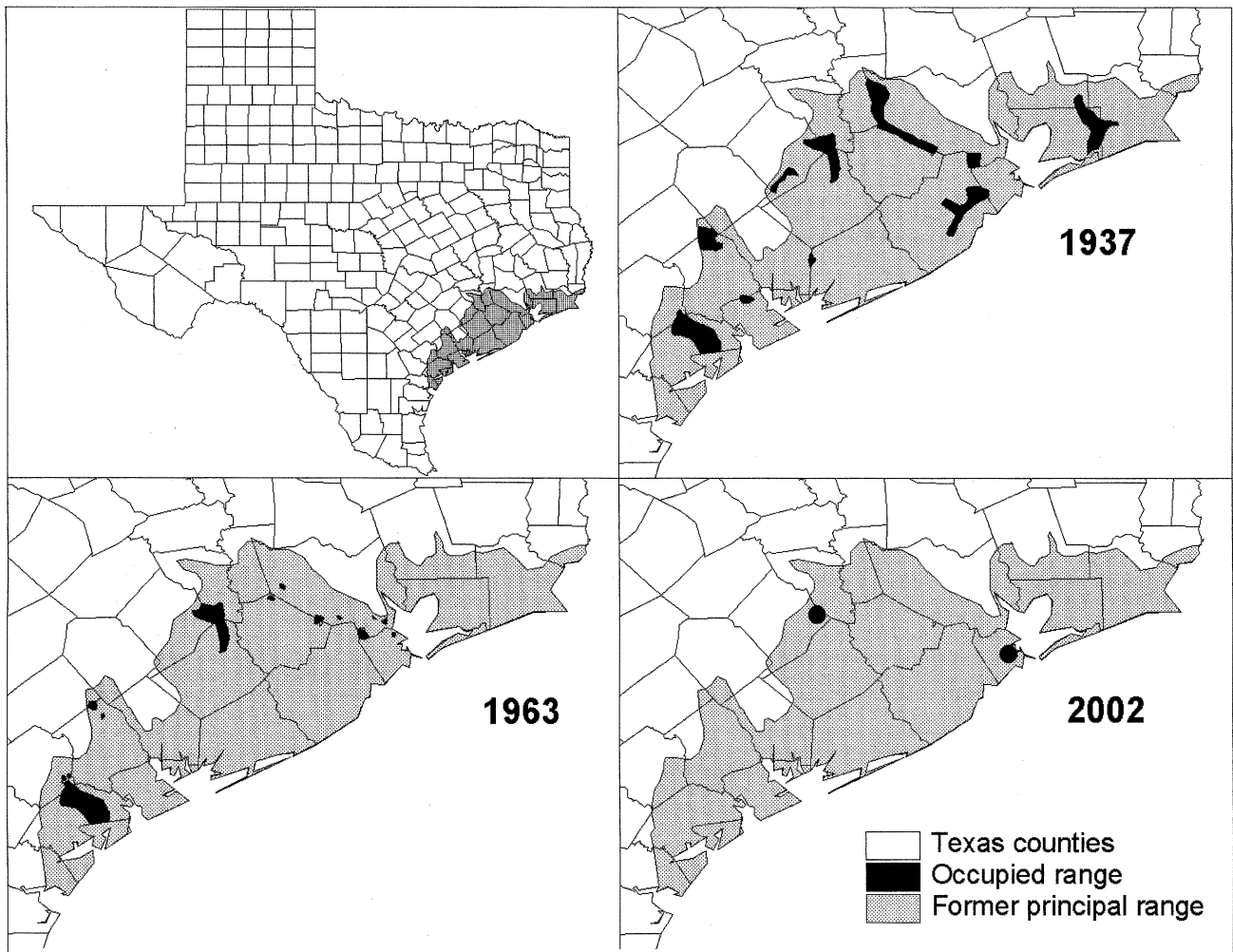


Figure 2. Approximate distribution of Attwater's prairie-chicken in southeast Texas, USA historically (Lehmann and Mauermann 1963), 1937 (Lehmann 1941), 1963 (Lehmann and Mauermann 1963), and 2002.

addressed a range of basic life history and population inventory issues, continued through the late 1970s, culminating in a monographic work on the Attwater's prairie-chicken (Jurries 1979).

The APCNWR was established in 1972 under the authority of the Endangered Species Conservation Act of 1969 to protect and enhance the severely diminished prairie habitat of the Attwater's. As of 2003, APCNWR contained 4,150 ha, including 910 ha added in the last 5 years. Most of the recently acquired lands formerly were in rice production and are in need of restoration if they are to provide optimal prairie-chicken habitat. Attwater's populations on APCNWR have ranged from an estimated 25 when the refuge was established to 222 in 1987 (APCNWR, unpublished data). The refuge population has declined since 1987, corresponding to range-wide population declines (Figure 1). Morrow et al. (1996) discussed factors affecting the refuge decline, stating that refuge population changes were correlated with off-

refuge population changes, rainfall parameters, annual acreage burned within the refuge's core habitat, and variability in grassland structure.

Even though recovery plans (United States Fish and Wildlife Service [USFWS] 1983, 1993) emphasized the need for habitat protection and restoration in geographically separate areas, little habitat protection or management was accomplished, other than at APCNWR, until approximately 1990, when the population dropped below 1,000. Since then considerable effort and funds have been spent in cooperative private-lands projects. Initially, these efforts were spearheaded by TPWD, with federal aid made available through Section 6 of the ESA. Beginning in 1995, an initiative was undertaken with the primary mission of restoring native prairie grasslands within the Attwater's former range. This initiative, now known as the Coastal Prairie Conservation Initiative (CPCI), is a partnership effort involving primarily private landowners, local soil and water conservation districts,

the USFWS, the Sam Houston Resource Conservation and Development Board, The Nature Conservancy of Texas (TNC), and the United States Natural Resources Conservation Service (NRCS). To date, the bulk of funding for this effort has been provided by the USFWS, TNC, and private landowners through cost-share agreements. Integral to the CPCI has been incorporation of Safe Harbor Agreements into management plans where desired by cooperators. Safe Harbor Agreements are voluntary pacts whose purpose is to promote voluntary management for listed species on private property while assuring landowners that no additional future regulatory restrictions will be imposed if listed species colonize or increase in numbers as a result of management activities. As of 2003 approximately 28,340 ha have been enrolled under Safe Harbor Agreements for Attwater's management, with cost-share assistance provided on approximately 17,800 ha. Texas Parks and Wildlife Department and NRCS landowner assistance agreements have been implemented on an additional 7,700 ha for the purpose of restoring the Attwater's coastal prairie habitat, including several projects initiated prior to development of Safe Harbor Agreements.

TNC took ownership of the Texas City Prairie Preserve (TCPP) in 1995 through a donation from Mobil Oil Corporation. Since 1985 the Attwater's population on this site has numbered <50 individuals (APCNWR, unpublished data). Texas City Prairie Preserve and APCNWR currently contain the last remaining Attwater's populations. Both of these populations have been supplemented with releases of captive-reared birds since 1996. The most recent attempt at Attwater's captive breeding was initiated in 1992. To date, this captive breeding effort has involved 7 private, municipal, or state institutions. During 1996–2001, a total of 438 individuals was released at APCNWR and TCPP. Numbers released each year have ranged from 35–113 ( $\bar{x}=73$ ). Annual survival estimates of released birds have been highly variable, ranging from 8–35% ( $\bar{x}=19\%$ ). Attwater's populations at both APCNWR and TCPP undoubtedly would have become extinct in the absence of releases.

### Attwater's prairie-chicken and the ESA

The Attwater's was listed as endangered in March 1967 under the Endangered Species Preservation Act of 1966. An Attwater's Prairie Chicken Recovery Team was formed in 1979, and a recovery plan was approved in 1983. Endangered Species Act listing has influenced conservation of the Attwater's and its coastal prairie ecosystem through 3 primary mechanisms: 1) making additional funding available, 2) raising awareness of its

imperiled status, and 3) impacting the regulatory environment where Attwater's populations existed.

### Raising awareness and funding

Attwater's prairie-chicken conservation expenditure data before and after listing are not readily available. Expenditures from funds directly authorized by the ESA and its precursors include acquisition of APCNWR, which was purchased with Land and Water Conservation Fund monies and a limited amount of federal aid dollars for habitat management and research in the early to mid-1990s as authorized by ESA Section 6. No formalized habitat management activities occurred prior to listing. In recent years monies appropriated for endangered species management have been used primarily to fund Attwater's captive propagation and population supplementation efforts. Increased funding also has been realized from sources other than the ESA since the Attwater's has been listed, possibly due in part to the increased awareness of conservation needs resulting from listing. For example, only 3 studies were published on the Attwater's prior to its listing, compared to 19 after. Thirteen of these studies were funded from sources other than monies appropriated for endangered species activities (Table 1). Even the captive breeding program, which

Table 1. Unique studies conducted on the Attwater's prairie-chicken 1894–2003. When studies involved graduate research projects, only the thesis reference was cited (papers resulting from theses were not listed).

Study	Type	Endangered species \$ <sup>a</sup>
Bendire (1894)	Paper	No
Lehmann (1941)	Monograph	No
Lehmann and Mauermann (1963)	Paper	No
Watkins (1971)	Thesis	No
Chamrad (1971)	Dissertation	No
Kessler (1978)	Dissertation	No
Horkel (1979)	Dissertation	No
Lutz (1979)	Thesis	No
Cogar (1980)	Dissertation	No
Lawrence (1982)	Thesis	No
Morrow (1986)	Dissertation	Yes
DiMare (1991)	Dissertation	No
Ellsworth (1991)	Dissertation	No
Maltbie (1992)	Thesis	No
Drake (1994)	Thesis	Yes
Peterson (1994)	Dissertation	Yes
Osterdorff (1995)	Thesis	Yes
Purvis (1995)	Thesis	Yes
McKinney (1996)	Thesis	No
Morrow et al. (1996)	Paper	No
Griffin (1998)	Dissertation	Yes
Lockwood (1998)	Thesis	No

<sup>a</sup> Indicates whether or not monies appropriated for endangered species activities were used to fund the study.

is funded in part by endangered species monies, receives significant funding from participating facilities and private donations.

### *Regulatory environment*

Unlike other endangered species, the Attwater's has generated little controversy over implementation of ESA provisions. Delays in new power- and water-line construction through Attwater's habitat necessary to minimize impacts to the bird met with some local concern, but expression of these concerns abated with the ultimate completion of these projects. This is not to say that landowners were completely at ease with the Attwater's listed status. High-profile controversies surrounding species such as the golden-cheeked warbler (*Dendroica chrysoparia*) and the northern spotted owl (*Strix occidentalis caurina*) (e.g., Peterson and Horton 1995, Czech and Krausman 2001) have created an atmosphere of mistrust and concern. A TPWD biologist who has worked with landowners on Attwater's recovery issues for >25 years made this observation about the change in landowner trust:

[Y]ou never heard neighbors say they were worried about having Attwater's prairie-chickens on their property. Now some landowners are concerned about USFWS and TPWD as a result of high-profile controversies with endangered species that have occurred in other areas. Trusting relationships with landowners develop through time, but can be destroyed instantly. (R. Jurries, TPWD, Columbus, Tex., personal communication).

Despite this diminished trust, Attwater's recovery programs continue to move forward with little contention. For example, open houses were conducted during 1997 at 3 locations within Attwater's current or former range to provide information on USFWS proposals for land acquisition and Attwater's reintroduction and to hear concerns or comments from the public. No major issues surfaced from these scoping meetings, and a program to acquire additional property for APCNWR (from willing sellers only) has been implemented without incident. Another indication of the relative lack of concern over the Attwater's listed status was apparent with the CPCI. Despite the fact that priority for cost-share projects was given to properties where landowners were willing to have Attwater's released, more requests for participation in the program have been received than there were monies available to fund. Furthermore, several landowners were looking forward to future releases on their properties (T. Anderson, USFWS, Corpus Christi, Tex., per-



Two male Attwater's prairie-chickens (*Tympanuchus cupido attwateri*) face off. Photo by Markus J. Peterson.

sonal communication). However, use of Safe Harbor Agreements in conjunction with the CPCI has helped allay landowner concerns about the Attwater's listed status.

The relative lack of controversy over implementation of recovery actions for the Attwater's was attributable in part to the approach taken by those responsible for implementing those actions. Including a rancher with prairie-chickens on the Attwater's Prairie Chicken Recovery Team provided valuable insight and respectability for the team. Additionally, the general philosophy taken by biologists has been one of respect for landowners and their positions while seeking areas where both groups could work together. "Managers (of APCNWR) cooperate with neighbors—not run over them" (R. Jurries, TPWD, Columbus, Tex., personal communication). For example, invasion of the Attwater's prairie habitat by native and exotic brush species is a serious problem for both prairie-chickens and ranching operations. Therefore, cooperative projects often focused on managing invading brush, resulting in benefits for both the Attwater's and ranching interests. Peterson and Horton (1995) discussed the importance of a conservation approach that stressed common values and interests of ranchers and USFWS personnel. These authors also stressed the importance of maintaining open dialogue between landowners and regulators.

### **Lessons learned—a summary**

1. Even though the Attwater's prairie-chicken was one of the first species listed as endangered under ESA authority, its populations currently face imminent risk of extinction. Therefore, ESA listing does not guarantee that progress toward recovery will occur.



2. As evidenced by the increase in research activity and establishment of APCNWR soon after listing, ESA listing can result in increased conservation funding, including from sources other than those appropriated under ESA authority.
3. Conservation needs must be addressed before populations reach critically low levels. Lehmann (1941: 62) recognized the need for “ample reservations for the species...” 26 years before the Attwater’s was listed. While one could debate whether the reservations that Lehmann (1941) referred to should be in public or private ownership, the point is that habitat was identified as a need >60 years ago. The APCNWR was established in 1972 to partially meet this need. However, little attention was placed on habitat protection and management at the landscape scale until Attwater’s populations crashed in the late 1980s.
4. Listing has brought different federal, state, and private entities together to work toward a common goal to recover the species.
5. Endangered Species Act listing does not have to set up an adversarial environment with conservationists and regulators pitted against land managers and property owners. However, maintaining an open dialogue and fostering respect among all participants is crucial to maintaining a productive relationship for all concerned, especially the listed species.

Based on these observations, we conclude that the ESA was neither a panacea nor a demon, but should be viewed as a tool in species recovery. Obviously, maintaining populations at healthy levels is far more preferable from both biological and political perspectives. However, in the event that populations decline to the point that listing becomes necessary, the ESA provides valuable resources to facilitate recovery. Further, resources and tools made available through the ESA can be used without creating a political firestorm.

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