



# PROGRESS or EXTINCTION?



A Systematic Review of the U.S. Fish and Wildlife Service's  
Endangered Species Act Listing Program 1974-2004



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# EXECUTIVE SUMMARY

**T**HE ENDANGERED SPECIES ACT requires the U.S. Fish and Wildlife Service (FWS) to make “expeditious progress” in placing imperiled plants and animals on the endangered species list. To determine if the agency is doing so, we reviewed over 2,500 listing determinations produced by FWS between 1974-2004, candidate notices of review dating back to 1975 and budgetary information from 1997-2004.

## FINDINGS

**T**HE NUMBER OF SPECIES listed per year steadily increased from the Ford/Nixon administration through the Clinton administration. It then precipitously declined during the current Bush administration to the lowest rate in the history of the Endangered Species Act. The average annual listing rates have been: Ford/Nixon (15), Carter (38), Reagan (32), Bush Sr. (59), Clinton (65) and Bush Jr. (7).



**White fringeless orchid, *Platanthera integrilabia*:** This orchid has dwindled to only 53 locations and has awaited protection for 30 years. It grows in wetlands in the Blue Ridge Mountains and Alabama's coastal plain. Only one in 100 plants produces seeds. It is threatened by residential construction, herbicides and competition from invasive species.

*Photo by David R. McAdoo*

Judged by a definition of expeditious progress proffered by the Inspector General of the U.S. Department of Interior, the listing program made expeditious progress only during the Bush Sr. and Clinton administrations.

On average, the 286 species on the federal waiting (i.e. candidate) list have been waiting for protection for 17 years. Many have been on the list for over 25 years. Listing delays contributed to the extinction of 42 species including the Amak Island song sparrow, Virgin Islands screech owl, Texas Henslow sparrow, Breckenridge Mountain salamander and Valdina Farms salamander.

At the current listing rate, it will take over 40 years to protect the 286 species on the candidate list. During this time, it is likely that many others will become imperiled. Unfortunately, it is also likely that many will become extinct before being protected.

The current administration asserts that it is unable to speed the listing process because litigation has diverted resources from the listing program. The Clinton administration, however, also experienced significant litigation. The primary difference is that the Bush administration has been dragging its feet listing species, listing far fewer species per million dollars than the previous administration. The rate of species listings per million dollars independent of critical habitat dropped from 22 species in 2000 under the Clinton administration to just two species in 2003 and six species in 2004. These differences cannot be explained by inflation, or any other difference in the cost of producing listing determinations.

The Bush administration has also failed to request funding to complete non-court ordered listing determinations. During the second term of the Clinton administration, FWS made 390 listing determinations, of which 188 (48 percent) were non-court ordered. In contrast, the Bush administration has only made 98 listing determinations, of which only 6 (6 percent) were non-court ordered.

## RECOMMENDATIONS

**POLITICAL OPPOSITION, INADEQUATE BUDGETING,** and cost overruns have caused the listing program to sink to the lowest level in the history of the Endangered Species Act. To break the logjam, the U.S. Fish and Wildlife Service needs to make its current program more efficient and develop and fully fund a special “listing SWAT team” to process the current backlog of 286 candidate species within five years.



**Pacific fisher, *Martes pennanti*:** Fur-trapping and logging of old-growth forests drove the fisher from a formerly widespread distribution in forested regions of California, Oregon and Washington to just two disjunct populations with one found in Northern California and extreme southwestern Oregon and the other in the southern Sierra.  
Photo by: Pacific Biodiversity Institute

The standard listing program should be funded at \$25 million per year. The listing SWAT team should have a separate budget of \$153 million over five years. All listing decisions have been subject to peer review since 1996. To increase the peer review capacity over the next five years, the National Academy of Sciences should be funded to manage the peer review program for the listing SWAT team. Finally, the Department of Interior should adopt a policy that no species should remain on the candidate list for more than two years.



**Sonoyta mud turtle:** In the United States, this aquatic turtle evolved in one of North America's driest regions. In the United States, this turtle's range is reduced to a single semi-natural pond. It eats insects, crustaceans, snails, fish, frogs and plants. Its greatest threats include loss of natural water flow from the Quitobaquito spring that feeds its pond, groundwater pumping, livestock grazing and pesticides.  
Photo by Jim Rorabaugh

# INTRODUCTION

**L**ISTING OF SPECIES AS THREATENED or endangered has been called the keystone of the U.S. Endangered Species Act because it is only after species are listed that they receive the substantial protections provided by the Act. Lengthy delays in listing species known to warrant protection and political interference in listing of species have been persistent problems in implementation of the listing program by the U.S. Fish and Wildlife Service (FWS). The consequences of delayed protection are severe, allowing species to decline, making recovery more costly and difficult, and in a number of cases resulting in species extinction. Indeed, at least 42 species have become extinct during a delay in the listing process (Table 1).<sup>1</sup>

In response to lack of progress in listing of imperiled species, Congress amended the Act in late 1982 to include mandatory timelines for listing species. Under these timelines, FWS is required to determine whether a species should be listed as threatened or endangered within two years of receiving a petition from a concerned citizen or organization. FWS was given one exception to this deadline. It may delay listing of lower priority species if it is making “expeditious progress” in listing higher priority species. Congress emphasized, however, that the exception should not be used to justify the “foot-dragging efforts of a delinquent agency.”<sup>2</sup>

There are currently 286 plants and animals on the FWS waiting (i.e. candidate) list.<sup>3</sup> Delaying protection of these species has been justified by the congressional exception, and thus can only be legal if expeditious progress is being made in processing the backlog of imperiled but unprotected species. On its face, the candidate list would suggest otherwise: 78 percent of the species (224) have been on the list for 10 or more years, 26 percent (73) have been on the list for 25 or more years. On average, candidate species have been waiting for protection for over 17 years. Clearly, species are experiencing substantial delays on the path to protection.

To determine if FWS is making expeditious progress listing species under the Act, we determined the number of species listed per year 1974-2004 by creating a detailed database of the listing history of all species listed under the Endangered Species Act. We obtained this information from an extensive search of the Federal Register. We further determined the number of listing determinations, both negative and positive, made by FWS from 1997-2004 based on an online database maintained by the agency. We calculated the number of listings per dollar from fiscal years 2000-2004 based on tables created by FWS of the cost of all listing findings during this period. To extend the record back in time, we compared the number of listings per dollar between 1997-1998 and 2002-2004 based on the congressional appropriation for listing. We did not include the years 1999-2001 because spending on critical habitat and listing could not be separated during this period. During these two periods, we also compared the total number of determinations per dollar, because final listings are just one part of FWS’ efforts to add species to the threatened and endangered list.



**Oregon spotted frog, *Rana pretiosa*:** *The Oregon spotted frog has awaited protection since 1991. It was formerly abundant in California, Oregon, Washington and British Columbia, but has disappeared from California, is barely hanging on in Washington and Oregon, and was the first species listed as endangered — on an emergency basis — by the Canadian government.*  
*Photo by Washington Department of Fish and Wildlife*

Common Name	Scientific Name	Range	Listing Initiated	Last Seen	Delay (Years)
(none)	<i>Carex wahuensis</i> ssp. <i>herbstii</i>	HI	1990	1994	4
Achatinellid land snail	<i>Newcombia cinnamomea</i>	HI	1970	1975	2
Amak Island song sparrow	<i>Melospiza melodia amaka</i>	AK	1980	1988	8
Bishop's 'O 'o	<i>Moho bishopi</i>	HI	1982	1986	4
Blood tetramolopium	<i>Tetramolopium consanguineum</i> var. <i>kauense</i>	HI	1975	1980	5
Cahaba pebblesnail	<i>Clappia cahabensis</i>	AL	1971	1976	5
Four-angled pelea	<i>Melicope quadrangularis</i>	HI	1975	1991	16
Guam bridled white-eye	<i>Zosterops conspicillatus conspicillatus</i>	Guam	1979	1983	4
Guam broadbill	<i>Myiagra freycineti</i>	Guam	1979	1984	5
Guam cardinal honey-eater	<i>Myzomela cardinalis saffordi</i>	Guam	1979	1984	5
Guam rufous fantail	<i>Rhipidura rufifrons uraniae</i>	Guam	1981	1984	3
Guam white-throated ground dove	<i>Gallicolumba xanthonura xanthonura</i>	Guam	1979	1986	7
Haha	<i>Cyanea truncata</i>	HI	1990	1994	4
Haleakala stenogyne	<i>Stenogyne haliakalae</i>	HI	1975	1984	9
Hoffman jewelflower	<i>Streptanthus glandulosus</i> var. <i>hoffmanii</i>	CA	1975	1984	9
Keeled sideband	<i>Monadenia circumcarinata</i>	CA	1968	1984	11
Lake Tahoe benthic stonefly	<i>Capnia lacustra</i>	CA, NV	1984	1994	10
Lined pocketbook	<i>Lampsilis binominata</i>	AL, GA	1968	1976	3
Little Mariana fruit bat	<i>Pteropus tokudae</i>	Guam	1978	1979	1
Marshall's pearly mussel	<i>Pleurobema marshalli</i>	AL, MS	1971	1980	9
Mottled coqui	<i>Eleutherodactylus eneidae</i>	Puerto Rico	1989	1990	1
Narrow-leaved hoary pea	<i>Tephrosia angustissima</i> var. <i>angustissima</i>	FL	1975	1985	10
Neal's melicope	<i>Melicope nealiae</i>	HI	1975	1979	4
Oahu 'Akepa	<i>Loxops coccinea wolstenholmii</i>	HI	1970	1976	6
Oahu tree snail bellula	<i>Achatinella bellula</i>	HI	1970	1981	8
Oahu tree snail lorata	<i>Achatinella lorata</i>	HI	1970	1974	1
Oahu tree snail phaeozona	<i>Achatinella phaeozona</i>	HI	1970	1974	1
Oahu tree snail pupukanioe	<i>Achatinella pupukanioe</i>	HI	1970	1980	7
Oahu tree snail swiftii	<i>Achatinella swiftii</i>	HI	1970	1976	3
Oahu tree snail taeniolata	<i>Achatinella taeniolata</i>	HI	1970	1978	5
Oahu tree snail turgida	<i>Achatinella turgida</i>	HI	1970	1974	1
Oahu tree snail viridans	<i>Achatinella viridans</i>	HI	1970	1979	6
Ochlockonee moccasinshell	<i>Medionidus simpsonianus</i>	FL, GA	1971	1993	20
Pupillid land snail	<i>Lyropupa perlonga</i>	HI	1970	1980	7
Saline Valley phacelia	<i>Phacelia amabilis</i>	CA	1975	1985	10
Shortnose cisco	<i>Coregonus reighardi</i>	IL, IN, MI, NY, WI	1982	1985	3
Southern acornshell	<i>Epioblasma othcaloogensis</i>	AL, GA, TN	1971	1974	1
Stirrup shell	<i>Quadrula stapes</i>	AL, MS	1971	1984	11
Texas Henslow's sparrow	<i>Ammodramus henslowii houstonensis</i>	TX	1982	1983	1
Upland combshell	<i>Epioblasma metastrata</i>	AL, GA, TN	1971	1988	15
Valdina farms salamander	<i>Eurycea troglodytes</i> ssp.	TX	1977	1987	10
Virgin Islands screech owl	<i>Otus nudipes newtoni</i>	Virgin Islands	1975	1980	5

**Table 1.** Forty two species that went extinct during a delay in the listing process as determined by Suckling et al. (In prep.)

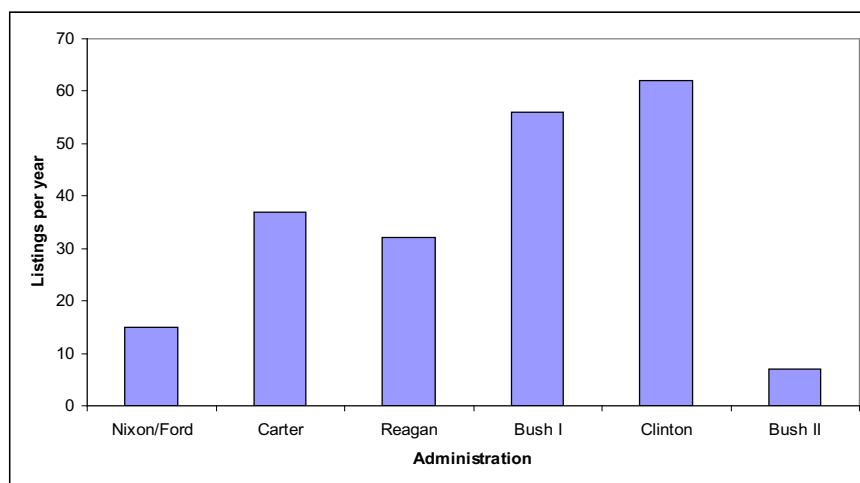
## EXPEDITIOUS PROGRESS WAS ATTAINED BY THE BUSH SR. & CLINTON ADMINISTRATIONS, BUT IS NOT CURRENTLY BEING ACHIEVED

**T**HE ENDANGERED SPECIES ACT does not specify how many species must be listed to qualify as expeditious progress. In 1990, however, the Inspector General of the Department of Interior audited the FWS endangered species program to determine if it conformed to the law and general standards of efficiency. In the two years prior to the review, FWS listed 46 species per year and promised it would list 50 species per year in the future. Based on the number of species on the candidate list at the time, the Inspector General concluded that a listing rate of 50 species per year would not constitute expeditious progress:

*“Even if the Service meets its goals of listing 50 species per year, it will take 12 years to list the 601 candidate Category 1 species. In addition, based on Service staff estimates of candidate Category 2 species, it appears that approximately 1,300 to 1,800 of the 3,033 species now designated as candidate Category 2 species will eventually qualify for the Act’s full protection. Again, even if the Service meets its goal of listing 50 species per year, it will take an additional 26 to 36 years to list those species currently classified as Category 2 candidates that may eventually need the Act’s protection. Therefore, it may take from 38 to 48 years at current listing rates to list just those species now estimated to qualify for protection under the Act. In the meantime, additional species will likely require the Act’s protection... We believe that this length of time to list and protect endangered species is not indicative of the ‘expeditious progress’ specified in the Act and could likely result in additional extinction of certain plants and animals during the period.”<sup>4</sup>*

The Inspector General thus determined that listing of 50 species per year does not qualify as expeditious progress to the extent that it will not reduce the backlog within a timely manner.

During the Nixon/Ford, Carter and Reagan administrations the agency averaged fewer than this, but it made progress toward the goal by developing an adequate infrastructure and steadily increasing the listing rate (Figure 1). During the Bush Sr. and Clinton administrations the FWS averaged over 50 listings per year. That progress, however, has come to a near halt under the current Bush administration. Between 2001-2004, the administration listed just 30 species which translates into an average of seven per year. This is the fewest number of species and the lowest listing rate in any four-year period in the history of the Endangered Species Act. All of the listings, moreover, were under court order. It is the only administration to make no listings of its own accord.



**Figure 1:** Rate of U.S. Fish and Wildlife Service Endangered Species Act listings by presidential administration.

The current administration’s annual listing rate is also considerably lower than the 45 species per year listed between 1974-2000. The only comparably low period was 1981-1982 following the election of Ronald Reagan and the appointment of James Watt as Secretary of Interior. This period of few listings prompted Congress to amend the Endangered Species Act in 1982 to include mandatory listing timelines.



## FWS IS NOT MAKING EXPEDITIOUS PROGRESS IN REDUCING THE BACKLOG OF CANDIDATE SPECIES

**CURRENTLY, THERE ARE 286** species on the candidate list; 27 more than contained in the 2001 list.<sup>5</sup> If FWS maintains its current rate of listing seven species per year, it will take 41 years to list these 286 species, by which time many others will have been found to similarly require protection and have been added to the candidate species list. This length of time is longer than that determined by the Inspector General in 1990 to not be expeditious progress.

## FWS HAS MADE FAR FEWER DETERMINATIONS OF WHETHER SPECIES WARRANT LISTING AND HAS ISSUED FAR MORE NEGATIVE FINDINGS THAN IN PREVIOUS YEARS

**L**ISTING OF SPECIES INVOLVES a series of determinations that are published in the federal register. Upon receipt of a petition, FWS first issues a finding determining whether the petition presents sufficient information to warrant further consideration. If the determination is positive, FWS has 12 months from the date of the petition to conduct a status review and either propose to list the species, determine listing is not warranted, or designate the species warranted but precluded. If the species is proposed, FWS has 12 months to finalize or withdraw listing.

FWS can also initiate listing by either making a species a candidate, in which case there is no timeline, or simply issuing a proposed rule, requiring them to issue a final rule in 12 months. All of these determinations arguably constitute progress towards listing species as threatened and endangered.

Even if all determinations are considered, the Bush administration is still making far less progress towards listing species. FWS issued far fewer listing determinations and a greater proportion of negative determinations from 2001-2004 than in the previous four years (1997-2000).<sup>6</sup> From 1997-2000, FWS issued a total of 375 listing determinations, for an average of 94 determinations per year, resulting in listing of 192 species. Of these determinations, only 12 percent were negative listing decisions. From 2001-2004, in contrast, FWS issued a total of only 94 determinations, for a rate of 24 per year, 48 percent of which have been negative findings.

A quadrupling in the rate of negative findings is reflective of the administration's stated opposition to protecting species under the Endangered Species Act. Indeed, a number of the negative determinations were reversals of past warranted determinations (e.g. coastal cutthroat trout) or were found to be illegal (e.g. green sturgeon and Yellowstone cutthroat trout). A recent survey of FWS biologists conducted by the Union of Concerned Scientists indicates that administration officials are intervening in endangered species decisions. The survey found that nearly half of all respondents whose work is related to endangered species scientific findings (44 percent) reported that they "have been directed, for non-scientific reasons, to refrain from making jeopardy or other findings that are protective of species."



**Band-rumped storm petrel:** *This Hawaiian petrel has awaited protection since 1991. This bird spends most of its time foraging in the ocean, returning to land at night to nest. Threats include indigestible plastic trash, introduced species such as rats and feral cats and artificial lights which disorient its night flight.*  
Photo by Steve McConnell

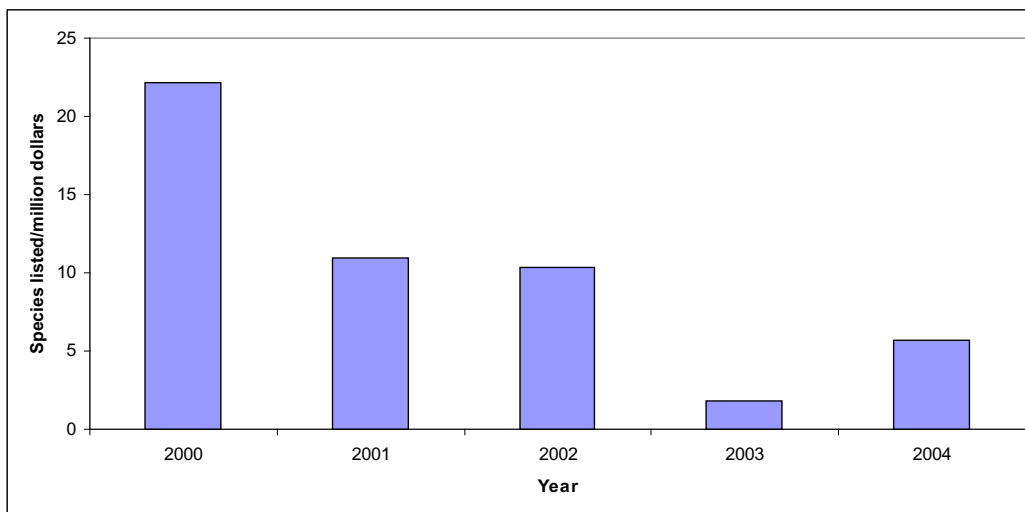
# THE BUSH ADMINISTRATION IS THE ONLY ADMINISTRATION THAT HAS LISTED ZERO SPECIES WITHOUT COURT ORDER

**ALL 30 SPECIES LISTED** under the Bush administration followed court orders forcing the FWS to make a determination, making this administration the only one to not list any species at its own discretion. Indeed, the administration has made very few determinations without court order, particularly when compared to the Clinton administration. During the second term of the Clinton Administration, FWS made 390 listing determinations, of which 188 (48 percent) were non-court ordered. In contrast, during the first term of the Bush administration, FWS only made 98 listing determinations, only 6 (6 percent) of which were non-court ordered.

## IN THE LAST FOUR YEARS, FWS LISTED FAR FEWER SPECIES PER DOLLAR THAN IN THE PREVIOUS FOUR YEARS

**FWS CLAIMS THAT EXPEDITIOUS** progress is a function of whether or not they are using available funding efficiently, stating: “expeditious progress is a function of the resources that are available and the way in which those resources are used.”<sup>7</sup> Even accepting the argument that expeditious progress is determined by the efficient use of funding, FWS is not making such progress. FWS argues that it is listing fewer species because the listing budget has been captured by court ordered critical habitat designations. To determine if FWS is efficiently using its funds specifically allocated for listing and thus is making expeditious progress according to the agency’s own measure, we examined two documents produced by FWS that provide an estimate of the costs of the majority of individual listing findings both court ordered and non-court ordered — made for fiscal years 2000-2004.<sup>8</sup>

According to FWS’ figures, during 2000 FWS spent 1.62 million making listing determinations and listed 36 species for a rate of nearly 22 species per million dollars. From 2001-2004, however, FWS only listed an average of seven species per million dollars, including listing only two species per million dollars in 2003 and six species per million dollars in 2004 (Figure 2).

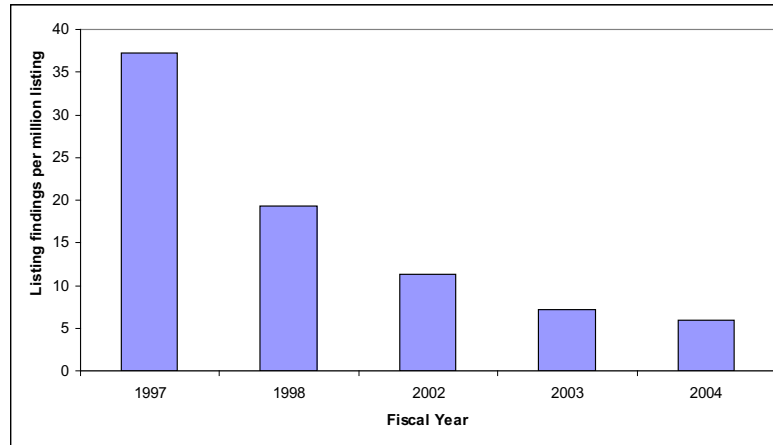


**Figure 2:** *Species listed per million dollars 2000-2004 based on estimated cost of listing findings independent of critical habitat provided by U.S. Fish and Wildlife.*

Further evidence of a drop in the number of listings per dollar spent after 2000 is provided by comparing the number of species listed per million dollars in fiscal years 1997 and 1998 with fiscal years 2002-2004. We chose 1997 and 1998 because FWS proposed critical habitat for only one species in each year and finalized critical habitat for only one species in 1997 and only three species in 1998, meaning that it can be conservatively assumed that the majority of the listing/critical habitat budget was spent on listing

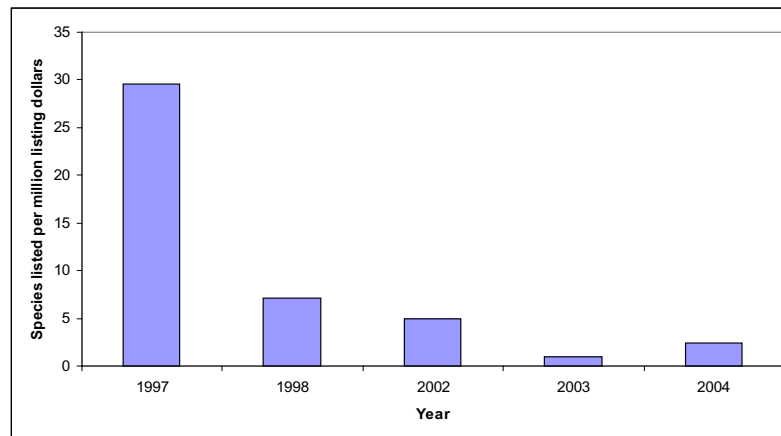
determinations. Beginning in 2002, Congress created a budgetary subcap limiting spending for critical habitat designation to a fixed amount. As a result, it is possible to determine how much money FWS specifically had for listing independent of critical habitat.

Similar to the results above, the number of species listed per million dollars was far less in fiscal years 2002-2004 compared to 1997 and 1998 (Figure 3). Figure 3 shows that in 1997, FWS listed 30 species per million dollars. This rate was lower in 1998, but not nearly so low as 2003 and 2004. Had FWS maintained a listing rate of 30 species per million dollars, it would have listed as many as 270 species during 2002-2004 based on an annual listing budget of \$3 million. Even had they maintained a listing rate of seven species per million dollars as they did in 1998, FWS would have listed 63 species during 2002-2004, compared to the 26 species that it actually listed.



**Figure 3:** Species listed per million dollars of funding specifically for listing for fiscal years 1997, 1998 and 2002-2004.

Not only did FWS issue large numbers of final rules listing species, they also issued a large number of total determinations. Comparing the total number of listing determinations, including 90-day findings, 12-month findings and final listing determinations, between fiscal years 1997-1998 and fiscal years 2002-2004, it is clear that FWS made far fewer listing determinations per million dollars in 2002-2004 than in 1997-1998 (Figure 4).



**Figure 4:** Total number of determinations per million dollars of listing budget independent of critical habitat for fiscal years 1997, 1998, and 2002-2004.

The above data and Figures show that FWS has made fewer total determinations and has listed fewer species per dollar since 2001, demonstrating that FWS is not efficiently using available funds to make expeditious progress.

# MANDATORY DEADLINES ARE AN EFFECTIVE MEANS TO EXPEDITE LISTING

**M**ANDATORY TIMELINES FOR LISTING enacted in 1982 created two processes by which species are listed as threatened or endangered. In the first, listing is initiated by petition from a citizen or organization and the agency is required to determine whether listing is warranted within two years. In the second, listing is initiated at the agency's discretion and there is no fixed deadline by which a listing determination must be made.

The mandatory timelines significantly speeded listing, reducing delays in listing from 14 to four years and resulting in petitioned species being listed in less time than species listed at the agencies' discretion. Citizen enforcement of the timelines through lawsuits also reduced listing delays, decreasing time to proposed rule from seven to 2.4 years and from proposed to final rule from 1.4 to 0.7 years.<sup>9</sup>

The timelines and citizen enforcement also increased the rate of species listings. From 1974-1982, the agencies listed an average of 23 species per year (Figure 1). From 1983-1990 following enactment of the timelines, the agencies listed an average of 40 species per year. Although an increase in the listing rate, many species continued to languish without protection. In response, conservation groups began actively working to enforce the timelines through litigation, resulting in a significant increase in the rate of species listings to 73 per year from 1991-1995.



**Eastern massasauga rattlesnake:** *The eastern massasauga has awaited protection since 1982. It is now extirpated from 40 percent of its historic range, due to wetland losses from urban sprawl, mining and agriculture.*  
*Photo by Mike Connell*

# SUMMARY & RECOMMENDATIONS

**O**VER THE PAST FOUR years, FWS listed the fewest total number of species in the history of the Endangered Species Act, and the fewest species per dollar spent. These factors demonstrate that FWS is not making expeditious progress towards listing species known to require protection, and that have been awaiting ESA protection for an average of 17 years. This has resulted in an increase in the backlog of candidate species, which will continue to grow under the current listing rate. Candidate species receive no protection under the Act, nor are they covered by the mandatory timelines for petitioned species and thus are at risk of extinction. The following actions are necessary to alleviate this situation:

- 1** Create a “Listing Swat Team” to complete listing proposals for the 286 candidate species within the next five years.
- 2** To ensure listing of the 286 species is completed in five years, identify taxonomically related species or species from the same ecosystem for inclusion in multi-species listing rules.
- 3** To expedite the existing peer review process, fund the National Academy of Sciences to form a committee to peer review proposed rules for the 286 species.
- 4** Increase the annual listing budget to \$25 million to ensure FWS does not again develop a backlog.
- 5** Enact mandatory timelines for candidate species requiring listing within two years.



**Round-tailed ground squirrel, *Spermophilus tereticaudus*:** This ground-dwelling squirrel has awaited protection since 1985. It inhabits sandy areas within creosote, mesquite, and alkali sink scrub in the Coachella Valley and is threatened by severe habitat destruction. Photo by Dr. Lloyd Glenn Ingles © California Academy of Sciences

## Endnotes

- <sup>1</sup> Suckling, K., R. Slack, B. Nowicki, Extinction and the Endangered Species Act, Center for Biological Diversity, May 4, 2004.
- <sup>2</sup> House Conference Report No. 97-835, page 22
- <sup>3</sup> Federal Register: May 11, 2005, V. 70, No. 90
- <sup>4</sup> U.S. Department of the Interior Office of Inspector General. 1990, Audit Report: The Endangered Species Program U.S. Fish and Wildlife Service, Report No. 90-98. p. 6.
- <sup>5</sup> Federal Register: October 30, 2001, V. 66, No. 210
- <sup>6</sup> A determination is defined as a decision whether to not list (negative) or list (positive) for an individual species, and includes 90-day, 12-month, proposed and final listing decisions. One listing rule can contain determinations for multiple species.
- <sup>7</sup> Candidate Notice of Review, Federal Register: May 11, 2005, V. 70, No. 90
- <sup>8</sup> These documents were produced by FWS in support of a case over the Montana Fluvial Arctic Grayling (Center for Biological Diversity v. U.S. Fish and Wildlife Service CV 03-1110, U.S. District Court of the District of Columbia).
- <sup>9</sup> Greenwald, D. Noah, K. F. Suckling, M. Taylor Factors. In press. Factors Affecting the Rate and Taxonomy of Species Listings under the U.S. Endangered Species Act. In *The Endangered Species Act at thirty: renewing the conservation commitment*, edited by Dale Goble, J. Michael Scott and Frank Davis, Island Press.

