



# THE BALD EAGLE, DDT, AND THE ENDANGERED SPECIES ACT

## EXAMINING THE BALD EAGLE'S RECOVERY IN THE CONTIGUOUS 48 STATES

by **Brian Seasholes**

**Project Director: Skaidra Smith-Heisters**

### INTRODUCTION

**A**s the national bird of the U.S., the bald eagle is the highest-profile species listed under the Endangered Species Act (ESA). And the delisting, or removal, of the eagle from the endangered list is the highest-profile event in the ESA's history. However, the Endangered Species Act's role in recovering the eagle has been badly distorted. Furthermore, false and misleading claims about the ESA's role in the eagle's recovery are often made without any citations with which the claims can be substantiated. It is high time to examine factors that have contributed towards and detracted from the eagle's conservation and to do so with citations so information can be independently verified.

The picture that emerges is that the ESA's role in conserving the bald eagle has been significantly overstated, the ESA may have done more harm than good, and there are a host of factors key to gaining a fuller picture of the eagle's conservation. These include:

- 1) the bald eagle was never faced with extinction;
- 2) the DDT ban played a paramount role;
- 3) ESA-driven habitat conservation efforts often backfired;
- 4) there was no ESA protection for 70 percent of bald eagles in the contiguous 48 states;
- 5) state and private projects to reintroduce eagles to former habitat worked;
- 6) other laws, the eagle's charisma, and a decline in shooting eagles made ESA protections less relevant;
- 7) banning lead shot for hunting waterfowl that eagles eat was relatively unimportant; and
- 8) bald eagles met the criteria to be taken off the endangered species list in the mid-1990s but only now, in 2007, is the Fish and Wildlife Service doing so.

If many widely accepted claims about the Act's most scrutinized species are false and misleading, then one must look askance at other claims about the ESA.

# THE MANY FACTORS THAT HAVE HELPED AND HURT THE BALD EAGLE'S CONSERVATION

Many factors contributed more to the success of bald eagles than did the ESA.

## A. Were Bald Eagles Threatened With Extinction?

“Picture an America without its greatest national symbol, the bald eagle. But for the Endangered Species Act, it would be extinct,” stated Roger Schlickheisen, President of Defenders of Wildlife.<sup>1</sup> “Can you imagine America without the bald eagle?” asked Robert Perciasepe, Chief Operating Officer, National Audubon Society. “It may sound extreme to suggest that the eagle was on a trajectory that would end in eradication, but that is exactly how it was in the 1970s for our national symbol.”<sup>2</sup> Extreme, indeed. The bald eagle “ha[s] been saved from near extinction by the Endangered Species Act,” according to American Rivers, Center for Biological Diversity, Defenders of Wildlife, Earthjustice, Endangered Species Coalition, Natural Resources Defense Council, National Wildlife Federation, and U.S. PIRG.<sup>3</sup> “There are a number of successes in the Endangered Species Act. The bald eagle...[has] been brought back from the brink of extinction,” said then Senator Dirk Kempthorne, currently Interior Secretary.<sup>4</sup>

---

Contrary to claims by ESA boosters, the bald eagle has never been in danger of extinction.

---

There are two major inaccuracies in all these statements. First, contrary to claims by ESA boosters, the bald eagle has never been in danger of extinction. Instead, at one time, bald eagles were in danger of extirpation, or elimination, from habitat in the contiguous U.S. (the continental states with the exception of Alaska). A healthy population in Alaska and British Columbia (approximately 50,000–75,000 eagles, or 15,000 pairs in Alaska<sup>5</sup> and around the same number in British Columbia)<sup>6</sup> have been maintained, and indeed, have always accounted for the overwhelming majority of the total population.

While this is but a sampling of such statements made about the eagle, it shows clearly how misinformed or misleading many statements about the eagle and the ESA can be. None of these statements points out that the ESA only ever applied to a minor portion of the bald eagle's entire population.



## B. DDT

The banning of the pesticide DDT in 1972, not the passage of the ESA in 1973, is widely acknowledged as the paramount reason for the bald eagle's recovery. “Nearly everyone agrees that the key to the eagle's resurgence—even more so than the Endangered Species Act—was the banning of the use of the insecticide DDT in this country in 1972,” admits the National Audubon Society.<sup>7</sup> DDT, specifically its metabolite DDE, or the form into which it breaks down, caused widespread reproductive failures in raptors like the bald eagle as well as the brown pelican. DDT reduced the amount of calcium in eggshells, which resulted in thin-shelled eggs susceptible to breaking or infertility. DDT came into widespread use after World War II. It proved very effective as a means to control mosquitoes as well as a wide range of insects problematic to the agricultural and forestry industries. The relationship between DDT and the bald eagle's decline and subsequent recovery has been very well established by an authoritative body of peer-reviewed literature.<sup>8</sup>

Despite the paramount importance of the DDT ban, some have tried to diminish its importance. “Under the Endangered Species Act, the U.S. Fish and Wildlife Service (FWS) initiated captive-breeding programs and habitat protection. A 1972 DDT ban also helped,” states the National Wildlife Federation.<sup>9</sup> “Although the federal ban on DDT in 1972 was a major factor in turning around the bald eagle's decline, the Endangered Species Act also played an essential role in its recovery,” stated John Kostyack, Senior Counsel for the National Wildlife Federation.<sup>10</sup> Banning DDT was not a major factor, it was *the* major factor. “In the 1940s, eagles encountered a new threat from the use of pesticides,

including DDT, which weakened their eggs,” observes the Endangered Species Coalition. “Under the ESA, the FWS launched a captive breeding program, monitoring program, habitat protection and nest site protection.” Note how no mention is made of DDT. Tactics to diminish the importance of DDT range from failing to identify when it occurred and the ESA was passed, to conflating the ban with alleged conservation efforts under the ESA, to omitting any mention of the ban altogether.

The DDT ban also spawned a separate group of denials, claiming that DDT had nothing to do with eggshell thinning and, hence, reproductive failure. Led by Steve Milloy and the late Gordon Edwards, these denials conveniently ignore the massive body of peer-reviewed literature on the link between DDT, eggshell thinning and reproductive failure in raptors and pelicans.<sup>12</sup> Unfortunately, it seems that Edwards and Milloy have subsumed their arguments about the effects, or lack thereof, of DDT on raptors and pelicans under their larger point, which is that the banning of DDT has had negative effects on human health, specifically efforts to combat malaria in the third world where the DDT ban has caused tens of millions of deaths.

Notwithstanding all of these crude efforts to minimize the importance of the DDT ban, the fact remains that had DDT not been banned, conservation efforts for the bald eagle in the contiguous states would have failed or been substantially less effective.

### C. Habitat Conservation and Creation

Bald eagles nest and spend the winter near water, especially coastlines, lakes, reservoirs and large rivers. People also like to live and recreate in these areas so there is potential for conflict between people and eagle habitat conservation efforts. The majority of bald eagles in the contiguous states nest on private land, and therefore private lands are the key to successful eagle conservation. The ESA’s role in conserving habitat has typically been misrepresented and simplified. Unfortunately, the ESA may well have done more harm than good for eagles on private land. However, the Act has likely been beneficial on public lands. There are several other issues to consider about habitat conservation: some eagles are relatively tolerant of human activity, human habitat creation has been beneficial, and the warming climate will likely benefit wintering eagles.

### D. More Harm Than Good on Private Land

The ESA may well have caused more harm than good to the bald eagle. Most nesting habitat is privately owned and the Act’s substantial penalties—\$100,000 and/or one year in jail for harming an eagle, egg, or even habitat—devalue property, which encourages landowners to get rid of eagles and habitat. This takes two forms: getting rid of existing eagles and occupied habitat, and making land inhospitable so eagles don’t take up residence in the first place—otherwise known as the “shoot, shovel, and shut-up” and “scorched earth” strategies. “I’ve seen eagle’s nests where people climbed up the trees and knocked them out,” observed Jodi Millar, then FWS bald eagle recovery coordinator.<sup>13</sup> More detrimental, however, is when people make habitat inhospitable to eagles to avoid eagles moving onto their land. Habitat destruction and degradation is the foremost threat to all wildlife, especially since the DDT ban in the case of the bald eagle. “There is, however, increasing evidence that at least some private landowners are actively managing their land so as to avoid potential endangered species problems,” stated Michael Bean of Environmental Defense in comments on the endangered red-cockaded woodpecker that apply to many endangered species. “The problems they’re trying to avoid are the problems stemming from the Act’s prohibition against people taking endangered species by adverse modification of habitat. And they’re trying to avoid those problems by avoiding having endangered species on their property.”<sup>14</sup>

Bald eagles are susceptible to what are known as the “perverse incentives” unintentionally created by ESA land-use regulations for two reasons. First, private landowners are most likely to be aware of what is occurring on their property, especially in the case of something as large and easily identified as the bald eagle. Second, bald eagles occupy vast areas of habitat that are remote and which the FWS and other authorities monitor only sporadically, if at all. The result is that in most cases landowners who want to make their land inhospitable to bald eagles can do so unnoticed by legal authorities.

The likely negative impacts of the ESA on the eagle are, as with all endangered species, a shame because this need not be. Most landowners are proud to have endangered species on their land, especially a species as impressive as the eagle. “The contribution of many private landowners that have willingly retained nest, perch, and screening



trees should not be underestimated,” states the Washington Department of Fish and Wildlife. “Many people appreciate having eagles on their property and have made sacrifices to accommodate them.”<sup>15</sup> With 835 pairs, the fourth-largest bald eagle population in its listed range, there is significant opportunity for the ESA to cause problems for Washington landowners. That it has not for some landowners is testament to their goodwill towards the eagle. This same situation likely exists all over the contiguous U.S. It would happen more often if the penalties for having an eagle on your land were not so severe.



## E. ESA Protections Work on Public Lands

In contrast to private lands, on public lands, which contain a fraction of listed bald eagles, the ESA has likely been beneficial. The eagle was the reason for the creation of four National Wildlife Refuges (Mason Neck and James River in Virginia, Bear Valley in Oregon, and Karl Mundt in South Dakota), as well as an important factor in the creation or expansion of other federal and state protected areas. In addition, it is likely that the ESA’s land-use regulations on federal lands, through Section 7 of the Act, which requires federal agencies to insure that their activities do not jeopardize endangered species, has been beneficial to the bald eagle. For example, if the Army Corps of Engineers wants to dredge a waterway or construct flood control structures, it is required to check with FWS to make sure the proposed activities do not adversely affect, or “take,” endangered or threatened species.

## F. Some Eagles Are Tolerant of Humans

FWS and others often portray the eagle as a wilderness denizen that is very intolerant of human-related activity, and as a result will generally not nest near humans or developed land. In three states with 28 percent of the population in the contiguous U.S. this is not the case; Florida, with the largest population (1,166 pairs), Minnesota, with the second largest (1,132 pairs), and Washington, with the fourth largest (835 pairs).

In Minnesota, “Eagles have proven to be more adaptable to different habitats and human presence levels than previously considered and we do not believe that habitat or the physical presence of humans per se is a limiting factor for the presence of bald eagles in the state of Minnesota,”

state James Grier and Jeremy Guinn, Professor and Ph.D student of biology, respectively, at the North Dakota State University.<sup>16</sup> “A lot of the eagle nests now that are in close contact with human activity, the young birds that grow up in those nests [are] looking down and seeing all the human presence around them,” observed Grier.<sup>17</sup> “As long as people aren’t shooting at them or bothering them, as long as everybody is minding their own business, the eagles basically accept humans are part of the natural environment.” State officials in Minnesota have also taken note. Eagles “have proven us experts wrong,” said Carroll Henderson, wildlife biologist with the Minnesota Department of Natural Resources.<sup>18</sup> “We thought they’d only nest in big white pines on clear northern lakes with lots of fish. But we have them nesting all over the state.”

A similar situation exists in Florida, as a peer-reviewed study has shown. “We detected no differences in nest-site occupancy, nest success, or number of young fledged between bald eagles occupying suburban or rural nest sites,” state the study’s authors.<sup>19</sup> The one main difference the study did find was young rural and suburban eagles had very similar survival rates until they began to disperse from their nests at around 100–150 days of age. Survival to one-year of age turned out to be 17–24% higher for rural eagles, but in subsequent years survival rates for both rural and suburban eagles were very similar, around 84–90%.<sup>20</sup>

In the Puget Sound of Washington a peer-reviewed study also found eagles to be relatively tolerant of humans in the vicinity of their nests. The study compared nests with state-approved management plans to nests without such plans and found that both had virtually the same rates of occupancy and productivity (number of young produced per

occupied nest).<sup>21</sup>

The implications of these three studies are quite important. If some bald eagles are able to exploit successfully what had been regarded as marginal or even unsuitable habitat, then this directly contradicts what many researchers and interest groups have contended for years—that the bald eagle requires large amounts of undeveloped land in order to be successful. “If bald eagles are capable of acclimating to nearby development, the species’ status might be more secure than is generally thought, and relatively simple management actions may be undertaken around suburban nest sites to improve value and permanence,” states the Florida study.<sup>22</sup> “The large buffer [zone] sizes that have been recommended [around nests] in the literature may not be appropriate for the Puget Sound Region,” concludes the study on that region.<sup>23</sup> All three of these studies strongly suggest that instead of applying blanket land-use restrictions, the FWS and other regulatory agencies should take each eagle nest on a case-by-case basis to determine if the eagles are relatively tolerant or intolerant to disturbance. A good deal of land-use control under the ESA, at least in areas with varying amounts of human development, might well have been mistakenly applied in the case of the bald eagle. Given that the ESA’s land-use controls will essentially be continued under the auspices of the Bald and Golden Eagle Protection Act after delisting, it is likely this mistake will continue in the future.<sup>24</sup>

---

Reintroduction programs did a great job of building up eagle populations in some regions, and made important contributions to recovery.

---

### G. People Create Eagle Habitat

Humans have created bald eagle habitat in various parts of the country, most notably the arid southwest and in particular Arizona, which at 43 pairs has virtually all the eagles in the region. Had not water been impounded along rivers in Arizona, primarily the Salt, Verde and Gila, the bald eagle population would almost certainly be significantly smaller than it is today because eagles require relatively large bodies of water, such as reservoirs, lakes and large rivers. Robert Ohmart, a professor of biology at Arizona State University, has searched the historical literature for mentions of bald eagles in order to determine the historic population size. According to him, “the citations in the literature

are few. There were significant scientists in Arizona from the 1900s on. I’m damned sure they [bald eagles] weren’t here. We’re not talking about missing a dinky little sparrow. You can’t believe people wouldn’t see a bald eagle.”<sup>25</sup> The main difference since the early 1900s and today is that many dams have been built along Arizona rivers and shooting mortality has declined.

Water impoundments have also been beneficial in other regions and states as well. “There is a wide agreement that the construction of locks, dams, reservoirs and the creations of wildlife refuges have been beneficial to wintering bald eagles by increasing and concentrating fish and waterfowl, the major food source of these birds,” stated Jon Swenson, biologist with the Montana Department of Fish, Wildlife & Parks.<sup>26</sup> Reservoirs have also benefited bald eagles in South Carolina,<sup>27</sup> Washington,<sup>28</sup> and Oklahoma,<sup>29</sup> and much of the arid Western U.S.<sup>30</sup>

### H. Warming Temperatures

The warming that has taken place over the past several decades seems to have improved habitat and forage for wintering bald eagles by causing open water to be available in more areas and for longer time periods. While warming has made some more arid habitat less hospitable, overall it has allowed bald eagles to fish in more ice-free areas for longer periods of time, which means that wintering bald eagles are more likely to be healthy, and less likely to fall victim to the vagaries of malnutrition, including disease and death. “[I]ncreasing warmer winters...may have resulted in more eagles spending the winter farther north and few migrating south,” according to authors of a peer-reviewed study of wintering bald eagles.<sup>31</sup> “New dams, spillways, and wastewater facilities that keep water from freezing in northern regions also may be enticing an increasing number of eagles to winter farther north and in greater densities at higher latitudes than in the past.”

### I. No Protection North of 40°

For more than four years, from the time of the ESA’s passage at the end of December 1973 until the middle of February 1978, all bald eagles north of 40° N latitude, a region that at the time contained approximately 70% of the entire population in the contiguous states, were not listed under the Act and therefore not afforded the purported

benefit of its protections. North of 40° N latitude is an enormous region of country, stretching from Philadelphia to mid-way between Sacramento and the Oregon border.

That the great majority of bald eagles listed under the ESA benefited little from the Act's protections for over four years has received scant attention. This is surprising because these four years were among the most critical in the bald eagle's existence. Following the DDT-induced population crash, the bald eagle in the contiguous U.S. was near its low point, and, hence, very vulnerable. Yet this was the time period when eagles were supposedly most in need of the ESA so that they did not disappear from the continental U.S. That these eagles were not listed significantly diminishes the ESA's importance to their conservation.

## J. Reintroductions of Eagles to the Wild

The reintroduction of bald eagles to areas from which they had vanished or been substantially reduced has provided substantial boosts to populations in a number of states. However, the difficult and labor-intensive work of reintroducing bald eagles has been largely due to states and private organizations, not the FWS or other federal agencies. In the mid-1970s, states with depleted eagle populations began experimenting with reestablishing or augmenting their populations with eagles from states with robust populations. As of 2006, a total of approximately 1,383 eagles and eggs had been placed the wild, the large majority through "hacking," a technique whereby young eagles are put in enclosures in the wild and released when they become independent. The painstaking work to perfect hacking was done by the Peregrine Fund, a private organization, for release of peregrine falcons. The Fund then transferred the technique to bald eagles, which benefited not only bald eagles but other species. "The reintroduction of Bald Eagles in New York was expanded and continued as it was in many other states and internationally with other eagle species by other private and government organizations," noted Bill Burnham, President of the Peregrine Fund.<sup>32</sup>

Of the approximately 1,383 eagles and eggs placed in the wild, around 80% were from wild nests, with the vast majority from Alaska.<sup>33</sup> Of the other 20% of released eagles, they "have come mostly from wild eggs collected in Florida and hatched in captivity at the Sutton Avian Research Center in Oklahoma," according to Pete Nye, bald eagle coordinator for the New York Department of Environmental Conserva-



tion.<sup>34</sup> Bald eagles from Minnesota, Wisconsin, and some from Canada made up the balance. The FWS produced 124 eagles, or 9% of the total, through captive breeding.<sup>35</sup> However, ESA boosters have exaggerated the relatively insignificant contribution of eagles produced by the FWS.

Funding for reintroduction efforts seems to have come primarily from states and private organizations. For example, most of the funding for efforts by the Sutton Avian Research Center in Oklahoma, which resulted in the release of 275 eagles in Oklahoma, Mississippi, Alabama, Georgia and North Carolina, was raised by Sutton.<sup>37</sup> Contributions by the FWS consisted primarily of in-kind donations of items such as living quarters and working space for people manning hack sites, food for eagles, as well as locations to conduct hacking.<sup>38</sup>

Reintroduction programs did a great job of building up eagle populations in some regions, and made important contributions to recovery.

## K. The Eagle's Charisma and Changing Attitudes

As an iconic symbol, the bald eagle is perhaps this country's most charismatic and easily recognized animal. The bald eagle's status is why Congress passed the Bald Eagle Protection Act in 1940 and it is why individuals, organizations and corporations today are eager to be involved in

conservation projects for the species.

The combination of the eagle’s unique charisma and changing societal attitudes can be seen through the issue of shooting mortality. Unfortunately, shooting bald eagles has been a persistent problem. It has been a significant cause of mortality, but the ESA, specifically the Act’s land-use control provisions, was not necessary to address this problem. It is, however, important to keep in mind that shooting has been a far less significant threat to the bald eagle than DDT and habitat destruction. Shooting mortality has been steadily declining since well before the ESA’s passage, falling by almost half between 1961 and 1972. By their very nature, the effects of DDT and habitat destruction are difficult, if not impossible, to quantify for a number of reasons, one of which is that they tend to be indirect sources of mortality that are rarely observed. Direct mortality, such as shooting, is much more easily observed so long as one has an eagle carcass and that the carcass is not too decomposed to be necropsied.

Time Period	Mortality from shooting
1961-65	62% <sup>39</sup>
1966-68	41% <sup>40</sup>
1969-70	46% <sup>41</sup>
1971-72	35% <sup>42</sup>
1973-74	25% <sup>43</sup>
1975-77	20% <sup>44</sup>
1975-81	18% <sup>45</sup>

In addition to increased legal protection and penalties, shooting also declined considerably due to changing social norms. Shooting magnificent birds like the bald eagle has simply become increasingly unacceptable behavior. Shooting also likely declined due to increased penalties for doing so. While the Eagle Act and the ESA increased penalties, credit for the biggest boost to penalties goes to the 1987 Criminal Fines Improvement Act—\$100,000 and/or 1 year in jail for an individual committing a misdemeanor, \$250,000 for a felony; and for organizations and companies, \$200,000 and/or 1 year in jail for a misdemeanor, and \$500,000 for a felony.<sup>46</sup>

## L. Banning Lead Shot

The federal government banned lead shot for use in waterfowl hunting in 1991 after a five-year phase-in begin-

ning in 1986. The National Wildlife Federation played a key role in pushing for the ban. Lead shot was banned because the FWS determined that it was causing mortality in waterfowl and birds that ate waterfowl, such as bald and golden eagles.<sup>47</sup> Yet lead was a relatively minor cause of eagle mortality. From 1963-1984 of the 1,428 bald eagles necropsied at the National Wildlife Health Center, a federal facility run first by the FWS and then the U.S. Geological Survey, 11% died of poisoning, one cause of which was lead.<sup>48</sup> A more recent estimate is that 10-15% of post-fledgling mortality is due to lead poisoning.<sup>49</sup>

Yet even after lead was banned in 1991, the substance still continued to cause bald eagle mortalities. Between 1980 and 1995, of the 634 injured or sick bald eagles treated at the University of Minnesota’s Raptor Center (50% of which were released back to the wild), lead poisoning was the primary cause of admission for 22%.<sup>50</sup> Notably, the rate at which bald eagles were admitted to the Raptor Center before and after the lead shot ban remained essentially the same, indicating that bald eagles were still acquiring lead from sources other than lead shot, most likely bullets and bullet fragments from deer carcasses and gut piles, and lead weights used for recreational fishing. So while the ban was motivated in part to protect the eagles, it seems to have had little effect.

## CONCLUSIONS

The ESA has been given far more credit than it deserves for the bald eagle’s recovery. This is especially so given that the Act did not save the eagle from extinction, the paramount cause of the eagle’s resurgence—banning DDT—occurred one year prior to the ESA’s passage, and that the Act may have done more harm than good. In addition, a wide range of factors—from people creating new eagle habitat to reintroductions primarily by state and private entities—significantly diminish the importance of the ESA. The bald eagle should have been delisted in the mid-1990s when its population met the recovery goal of around 3,000 pairs. The current population of 11,137 pairs has exceeded the goal by 371 percent. The conservation of the bald eagle has been a nuanced and complex process and credit should be given where it is due, not to the relatively ineffective ESA.



## ABOUT THE AUTHOR

**Brian Seasholes** is an adjunct scholar with Reason Foundation. His research focuses on wildlife and land-use issues, especially the Endangered Species Act, property rights, and wildlife conservation. Mr. Seasholes received his Bachelor's degree, with honors, from Wesleyan University, and his Master's degree in Geography from the University of Wisconsin-Madison, where his research focused on the institutional aspects of wildlife conservation, and his thesis was on the Buzi Conservancy in Zimbabwe. His writings have appeared in the *Christian Science Monitor*, *Houston Chronicle*, *Orange County Register*, *Chattanooga Free Press*, *The Washington Times*, and the *Endangered Species Update*.

## RELATED REASON FOUNDATION STUDIES

Michael De Alessi, *Digging Our Way Out of the ANWR Morass: A Performance-Based Approach to Protecting Habitat and Managing Resources*, Reason Foundation Policy Brief No. 37, March 2005, <http://www.reason.org/pb37.pdf>

Michael De Alessi, *Conservation Through Private Initiative: Harnessing American Ingenuity to Preserve Our Nation's Resources*, Reason Foundation Policy Study No. 328, January 2005, <http://www.reason.org/ps328.pdf>

Michael De Alessi, *Saving Endangered Species Privately: A Case Study of Earth Sanctuaries, Ltd.*, Reason Foundation Policy Study No. 313, August 2003, <http://www.reason.org/ps313.pdf>

## ENDNOTES

1. Roger Schlickheisen. 1996. Don't Gut the Endangered Species Act. *The Plain Dealer*, May 11, 1996, 11B.
2. Robert Perciasepe, "The Endangered Species Act at 30: Why we need the ESA." *San Francisco Chronicle*, December 23, 2003. Accessed on the web <<http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2003/12/23/EDGJ33S6TO1.DTL>> January 18, 2004.
3. American Rivers, California Native Plant Society, Center for Biological Diversity, Center for Native Ecosystems, Defenders of Wildlife, EarthJustice, Endangered Species Coalition, Forest Guardians, Natural Resources Defense Council, National Wildlife Federation, and U.S. Public Interest Research Group. *30 Years of the Endangered Species Act Protecting Our World*. Downloaded from the web <[http://www.earthjustice.org/policy/pdf/ESA\\_30yrs2.pdf](http://www.earthjustice.org/policy/pdf/ESA_30yrs2.pdf)> January 29, 2007.
4. Dirk Kempthorne, 1995. Congress Must Recapture the Original Spirit of the Endangered Species Act. *Roll Call*, April 3, 1995.
5. *72 Federal Register* 31142, June 5, 2007.
6. U.S. Fish and Wildlife Service. 2004. *Bald Eagle Recovery: Questions and Answers*. Downloaded from the web <<http://www.fws.gov/midwest/eagle/recovery/beqanda.pdf>> June 24, 2007.
7. Frank Graham, Jr., 1994 Winged Victory, *Audubon*, July/August, p.37.
8. Krantz, W.C., B.M. Mulhern, G.E. Bagley, A. Sprunt, IV, F.J. Ligas, and W.B. Robertson, Jr. 1970. Organochlorine and heavy metal residues in bald eagle eggs. *Pesticides Monitoring Journal* 4:136-140; Mulhern, B.M., W.L. Reichel, L.N. Locke, T.G. Lamont, A. Belisle, E. Cromartie, G.E. Bagley, and R.M. Prouty. 1970. Organochlorine residues and autopsy data from bald eagles 1966-68. *Pesticides Monitoring Journal* 4:141-144; Anderson, D.W. and J.J. Hickey. 1972. Eggshell changes for certain North American birds. *Proceedings of the International Ornithological Congress* 15:514-540; Belisle, A.A., W.L. Reichel, L.N. Locke, T.G. Lamont, B.M. Mulhern, R.M. Prouty, R.B. DeWolf, and E. Cromartie. 1972. Residues of organochlorine pesticides, polychlorinated biphenyls, and mercury and autopsy data for bald eagles, 1969 and 1970. *Pesticides Monitoring Journal* 6:133-138; Wiemeyer, S.N., B.M. Mulhern, F.J. Ligas, R.J. Hensel, J.E. Mathisen, F.C. Robards, and S. Postupalsky. 1972. Residues of organochlorine pesticides, polychlorinated biphenyls, and mercury in bald eagle eggs and changes in shell thickness 1969 and 1970. *Pesticides Monitoring Journal* 6:50-55; Grier, J.W. 1974. Reproduction, organochlorines, and mercury in northwestern Ontario bald eagles. *Canadian Field Naturalist* 88:469-475; Cromartie, E., W.L. Reichel, L.N. Locke, A.A. Belisle, T.E. Kaiser, T.G. Lamont, B.M.

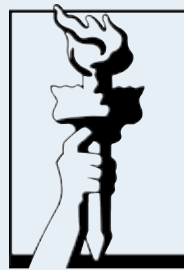


Mulhern, R.M. Prouty, and D.M. Swineford. 1975. Residues of organochlorine pesticides and polychlorinated biphenyls and autopsy data for bald eagles, 1971-72. *Pesticides Monitoring Journal* 9:11-14; Prouty, R.M., W.L. Reichel, L.N. Locke, A.A. Belisle, E. Cromartie, T.E. Kaiser, T.G. Lamont, B.M. Mulhern, and D.M. Swineford. 1977. Residues of organochlorine pesticides and polychlorinated biphenyls and autopsy data for bald eagles, 1973-74. *Pesticides Monitoring Journal* 11:134-137; Kaiser, T.E., W.L. Reichel, L.N. Locke, E. Cromartie, A.J. Krynitsky, T.G. Lamont, B.M. Mulhern, R.M. Prouty, C.J. Stafford, and D.M. Swineford. 1980. Organochlorine pesticide, PCB, and PBB residues and necropsy data for bald eagles from 29 states 1975-77. *Pesticides Monitoring Journal* 13:145-149; Grier, J.W. 1982. Ban of DDT and subsequent recovery of reproduction in bald eagles. *Science* 218: 1232-1235; Wiemeyer, S. N., T. G. Lamont, C. M. Bunck, C. R. Sindelar, F. J. Gramlich, J. D. Fraser, and M. A. Byrd. 1984. Organochlorine pesticide, polychlorobiphenyl, and mercury residues in bald eagle eggs—1969-1979—and their relationships to shell thinning and reproduction. *Archives of Environmental Contamination and Toxicology* 13:529-549; Ian C.T. Nisbet. 1989. Organochlorines, reproductive impairment, and declines in Bald Eagles *Haliaeetus leucocephalus* populations: mechanisms and dose relationships. Pp. 483-489 In *Raptors in the modern world* (B.U. Meyburg and R.D. Chancellor, eds.). World Working Group for Birds of Prey, Berlin, Germany; Grubb, T.G., S.N. Wiemeyer, and L. F. Kiff. 1990. Eggshell thinning and contaminant levels in bald eagle eggs from Arizona, 1977 to 1985. *Southwest Naturalist* 35:298-301; Wiemeyer, S.N., C.M. Bunck, and C.J. Stafford. 1993. Environmental contaminants in bald eagle eggs—1980-84—and further interpretations of relationships to productivity and shell thickness. *Archives of Environmental Contamination and Toxicology* 24:213-227; William Bowerman, John P. Giesy, David A. Best, and Vincent J. Kramer. 1995. A Review of Factors Affecting Productivity of Bald Eagles in the Great Lakes Region: Implications for Recovery. *Environmental Health Perspectives* 103(Suppl 4):51-59; Elliott, J.E., R.J. Norstrom, and G.E.J. Smith. 1996. Patterns, trends and toxicological significance of chlorinated hydrocarbon and mercury contaminants in bald eagle eggs from the Pacific Coast of Canada, 1990-

1994. *Archives of Environmental Contamination and Toxicology* 31:354-367; Elliott, J.E. and R.J. Norstrom. 1998. Chlorinated hydrocarbon contaminants and productivity of bald eagle populations on the Pacific Coast of Canada. *Environmental Toxicology and Chemistry* 17:1142-1153.
9. Susan Milius and Donna Johnson. 1992. Where Would They Be Without the Law? *National Wildlife* 30(3):58.
  10. John Kostyack. 2005. Statement before the U.S. Senate, Committee on Environment and Public Works. Oversight Hearing on the Endangered Species Act, May 19, 2005. Accessed on the web <[http://epw.senate.gov/hearing\\_statements.cfm?id=237916](http://epw.senate.gov/hearing_statements.cfm?id=237916)> January 15, 2007.
  11. Charles Phillips. 2004. The Endangered Species Act after 30 Years. *ESA Today* (newsletter of the Endangered Species Coalition), Winter 2004, p.7.
  12. J. Gordon Edwards. 2004. DDT: A Case Study in Scientific Fraud. *Journal of American Physicians and Surgeons* 9(3):84; J. Gordon Edwards and Steve Milloy. 1999. *100 Things You Should Know About DDT*. Accessed on the web < <http://www.junkscience.com/ddtfaq.html>> June 20, 2007.
  13. Rod Thomson. 1998. Law to Save Species Count Successes, Failures in 25 Years. *Sarasota Herald-Tribune*. December 28, 1998, p.1A.
  14. Michael Bean. 1994. Speech at the U.S. Fish and Wildlife Service's Office of Training and Education Seminar Series, "Ecosystem Approaches to Fish and Wildlife Conservation: 'Rediscovering the Land Ethic'." November 3, 1994, Marymount University, Arlington, VA.
  15. Derek W. Stinson, James W. Watson, and Kelly R. McAllister. 2001. p.40 in *Washington State Status Report for the Bald Eagle*. Washington Department of Fish and Wildlife, Olympia, Washington. Downloaded from the web <[wdfw.wa.gov/wlm/diversty/soc/status/baldeagle/finalbaldeaglestatus.pdf](http://wdfw.wa.gov/wlm/diversty/soc/status/baldeagle/finalbaldeaglestatus.pdf)> January 27, 2007.
  16. James W. Grier and Jeremy E. Guinn. 2003. "Bald Eagle Habitats and Responses to Human Disturbance in Minnesota: Final Report," P.33. Unpublished Report. Minnesota Department of Natural Resources: St. Paul, Minnesota. Downloaded from the web <[http://files.dnr.state.mn.us/ecological\\_services/nongame/projects/consgrant\\_reports/2003/2003\\_grier\\_guinn.pdf](http://files.dnr.state.mn.us/ecological_services/nongame/projects/consgrant_reports/2003/2003_grier_guinn.pdf)> June

- 24, 2007.
17. Dan Gunderson. 2002. Learning About Bald Eagles. *Minnesota Public Radio*, July 4, 2002. Downloaded from the internet <[http://news.minnesota.publicradio.org/features/200207/04\\_gundersond\\_eagleresearch-m/](http://news.minnesota.publicradio.org/features/200207/04_gundersond_eagleresearch-m/)> June 24, 2007.
  18. John Myers. 2007. Bald eagles won't soar without federal protection. *Duluth News-Tribune*, June 2, 2007.
  19. Brian Millsap, Tim Breen, Elizabeth McConnell, Tony Steffer, Laura Phillips, Nancy Douglass, and Sharon Taylor. 2004. "Comparative Fecundity and Survival of Bald Eagles Fledged from Suburban and Rural Natal Areas in Florida," *Journal of Wildlife Management* 68(4):1027.
  20. Ibid, 1029.
  21. Greg Schirato and Wendy Parson. 2006. *Bald Eagle Management in Urbanizing Habitat of Puget Sound*, Washington. *Northwestern Naturalist* 87:138-142.
  22. Millsap et al., 1019.
  23. Schirato and Parson, p.139.
  24. See Seasholes, Brian, *The Bald Eagle is Safe, But Your Land is Not*, Reason Foundation, July 2007.
  25. Ken Nolan. 2004. Do eagles still need protection? *The Arizona Republic*. September 11, 2004. Accessed on the web <<http://www.azcentral.com/specials/special04/articles/0911eagles.html>> March 18, 2005.
  26. Jon E. Swenson. 1983. Is the Northern Interior Bald Eagle Population in North American Increasing? P.29 In *Biology and Management of Bald Eagles and Ospreys*, Ed, David M. Bird. Harpell Press, Ste. Anne de Bellevue, Quebec.
  27. Tom Murphy and Charlotte Hope. ND. *Bald Eagle*. Unpublished document by the South Carolina Department of Natural Resources. Accessed on the web <<http://www.dnr.sc.gov/cwcs/pdf/Baldeagle.pdf>> January 27, 2007.
  28. Derek W. Stinson, James W. Watson, and Kelly R. McAllister. 2001. p.28 in *Washington State Status Report for the Bald Eagle*. Washington Department of Fish and Wildlife, Olympia, Washington. Downloaded from the web <[wdfw.wa.gov/wlm/diversty/soc/status/baldeagle/finalbaldeaglestatus.pdf](http://wdfw.wa.gov/wlm/diversty/soc/status/baldeagle/finalbaldeaglestatus.pdf)> January 27, 2007.
  29. M. Alan Jenkins and Steve K. Sherrod. 2005. Growth and recovery of the bald eagle population in Oklahoma. *Wildlife Society Bulletin* 33(3):810-813.
  30. Jim Enderson. 2005. *Peregrine Falcon: Stories of the Blue Meanie*. P.206. University of Texas Press, Austin, Texas.
  31. Karen Steenhof, Laura Bond, Kirk K. Bates, and Lynda L. Leppert. 2002. Trends in Midwinter Counts of Bald Eagles in the Contiguous United States, 1986-2000. *Bird Populations* 6:30.
  32. The Peregrine Fund. 1999. *1999 Annual Report*, Letter from the President. Boise, Idaho.
  33. Pete Nye. 1990. *A Review of the Natural History of a Reestablished Population of Breeding Bald Eagles in New York*. Paper presented at a symposium, "Bald Eagles in Alaska," November 8-9, 1990, University of Alaska-Southeast, Juneau.
  34. Ibid.
  35. Ibid.
  36. American Rivers, California Native Plant Society, Center for Biological Diversity, Center for Native Ecosystems, Defenders of Wildlife, EarthJustice, Endangered Species Coalition, Forest Guardians, Natural Resources Defense Council, National Wildlife Federation, and U.S. Public Interest Research Group. *30 Years of the Endangered Species Act: Bald Eagle*. Downloaded from the web <<http://uspirg.org/ESA/Baldeagle.pdf>> June 24, 2007..
  37. Alan Jenkins. E-mail to the author, January 16, 2007.
  38. Ibid.
  39. N.C. Coon,, L.N. Locke, E. Cromartie, and W.L. Reichel. 1970. Causes of bald eagle mortality, 1960-1965. *Journal of Wildlife Diseases* 6:72-76.
  40. B.M. Mulhern,,W.L. Reichel, L.N. Locke, T.G. Lamont, A.A. Belisle, E. Cromartie, G.E. Bagley, and R.M. Prouty. 1970. Organochlorine Residues and Autopsy Data from Bald Eagles, 1966-1968. *Pesticides Monitoring Journal* 4(3):141-144.
  41. A.A. Belisle,,W.L. Reichel, L.N. Locke, T.G. Lamont, B.M. Mulhern, R.M. Prouty, R.B. DeWolf, and E. Cromartie. 1972. Residues of organochlorine pesticides, polychlorinated biphenyls, and mercury and autopsy

- data for bald eagles, 1969 and 1970. *Pesticides Monitoring Journal* 6(3):133-8
42. E. Cromartie, W.L. Reichel, L.N. Locke, A.A. Belisle, T.E. Kaiser, T.G. Lamont, B.M. Mulhern, R.M. Prouty, and D.M. Swineford. 1975. Residues of organochlorine pesticides and polychlorinated biphenyls and autopsy data for bald eagles, 1971-1972. *Pesticides Monitoring Journal*. 9(1):11-14.
  43. R.M. Prouty, W. L. Reichel, W. N. Locke, A. A. Belisle, E. Cromartie, T. E. Kaiser, T. G. Lamont, B., M. Mulhern, and D. M. Swineford. 1977. Residues of organochlorine pesticides and polychlorinated biphenyls and autopsy data for bald eagles, 1973-74. *Pesticides Monitoring Journal* 11(3):134-137.
  44. T.E.G. Kaiser, W.L. Reichel, L.N. Locke, E. Cromartie, A.J. Krynitsky, T.G. Lamont, B.M. Mulhern, R.M.S. Prouty, C.J. Stafford, and DM Swineford. 1980. Organochlorine pesticide, PCB, and PBB residues and necropsy data for bald eagles from 29 states 1975-77. *Pesticides Monitoring Journal* 13(4):145-149.
  45. L.N. Locke. 1982. A brief review of bald and golden eagle mortality 1975-1981 with some comments on possible management procedures. *In: Proc. Bald Eagle Days 1982*, T.N. Ingram, ed. 220 pp.
  46. P.L. 100-185 (101 Stat. 1279) Dec. 11, 1987.
  47. T.E.G. Kaiser, W.L. Reichel, L.N. Locke, E. Cromartie, A.J. Krynitsky, T.G. Lamont, B.M. Mulhern, R.M.S. Prouty, C.J. Stafford, and DM Swineford. 1980. Organochlorine pesticide, PCB, and PBB residues and necropsy data for bald eagles from 29 states 1975-77. *Pesticides Monitoring Journal* 13(4):145-149.
  48. David Buehler. 2000. Bald Eagle (*Haliaeetus leucocephalus*). p.21 In *The Birds of North America*, No. 506. (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
  49. Ian J. Fisher, Deborah J. Pain, and Vernon G. Thomas. 2006. A review of lead poisoning from ammunition sources in terrestrial birds. *Biological Conservation* 131(3):421-432.
  50. J.L. Kramer and P.T. Redig. 1997. Sixteen years of lead poisoning in eagles, 1980-1995: An epizootiologic view. *Journal of Raptor Research* 31(4):327-332.



Reason

**REASON FOUNDATION**'s mission is to advance a free society by developing, applying, and promoting libertarian principles, including individual liberty, free markets, and the rule of law. We use journalism and public policy research to influence the frameworks and actions of policymakers, journalists, and opinion leaders.

For more information on Reason Foundation and our environment-related research, please contact the appropriate Reason staff member:

### Government Officials

[Mike Flynn](#)

Director of Government Affairs  
(703) 626-5932  
[Mike.Flynn@Reason.org](mailto:Mike.Flynn@Reason.org)

### Media

[Chris Mitchell](#)

Director of Communications  
(310) 367-6109  
[Chris.Mitchell@Reason.org](mailto:Chris.Mitchell@Reason.org)

### Policy

[Skaidra Smith-Heisters](#)

Policy Analyst  
(707) 321-1249  
[skaidra@Reason.org](mailto:skaidra@Reason.org)

Reason's environment research and commentary is available online at [www.reason.org/environment](http://www.reason.org/environment).