

# SHORTCHANGED

Funding Needed to Save America's  
Most Endangered Species



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## EXECUTIVE SUMMARY

The Endangered Species Act has been tremendously successful, preventing the extinction of 99 percent of species under its protection and putting hundreds of species on the road to recovery. This success is particularly impressive considering the Act has been chronically and severely underfunded. In this report we examined spending on recovery of endangered species by the U.S. Fish and Wildlife Service and other federal agencies and states; we identified major shortfalls in funding for this crucial work. Our key findings:

- Twenty-five percent of species protected under the Act (377) received less than \$10,000 in recovery funding in 2014, the last year for which data is available.
- Forty-three species received less than \$1,000 each.
- The Service's annual budget for recovery of the more than 1,500 species under its care is currently \$82 million per year, which covers not much more than basic administrative functions.
- Based on a detailed analysis of federal recovery plans, we estimate that fully implementing recovery plans for all listed species managed by the Fish and Wildlife Service would require approximately \$2.3 billion per year, about the same amount that's given to oil and gas companies to subsidize extraction of fossil fuels on public lands and a tiny fraction of the roughly \$3.7 trillion federal budget in 2015.

We recommend increasing the Fish and Wildlife Service's annual appropriation for endangered species recovery from \$82 million in 2016 to approximately \$2.3 billion over the next 10 years. Such an increase would allow the Service to establish partnerships with universities, state wildlife agencies and conservation organizations to further endangered species recovery, a primary goal of the agency.

During this interim 10-year period where funding is below the recovery needs for most endangered species, we recommend ramping up funding to "extinction prevention programs," such as existing, successful programs to protect Hawaiian plants and Hawaiian land and tree snails. We recommend expansion of these two existing programs and establishment of three more for southeastern freshwater mussels, desert fish of the Southwest and North American butterflies. Together with Hawaiian plants and snails, these taxonomic groups include some of the most endangered species in the United States. Congress should fund each of these extinction prevention programs at \$25 million per year.

# I. INTRODUCTION

The purpose of the Endangered Species Act is not merely to save species from extinction, but ultimately to recover them to the point that the protections provided by the Act are no longer necessary.<sup>1</sup> For imperiled plants and animals, gaining protection as an endangered species is like getting an ambulance ride to the hospital emergency room. This first step is absolutely crucial to prevent extinction. But after being stabilized in the emergency room, endangered species need longer-term rehabilitation to achieve recovery.

The Endangered Species Act requires the Fish and Wildlife Service (terrestrial and freshwater species) and National Marine Fisheries Service (marine and anadromous species) to develop recovery plans detailing the estimated cost and actions necessary to recover each protected species.<sup>2</sup> Recovery plans, however, do not guarantee appropriation of the funding needed to carry out recovery actions, and lack of funding is often a primary limiting factor to recovery. Several studies have documented that progress toward recovery is directly correlated to recovery dollars.<sup>3</sup>

To determine the adequacy of current recovery funding for the Fish and Wildlife Service, we compared existing funding and expenditures with estimated recovery costs from recovery plans. We obtained information on existing funding from agency budgets and biennial reports to Congress produced by the Service, which detail endangered species expenditures made by all federal agencies and states. We focused primarily on funding for the Service and not the National Marine Fisheries Service because the former has responsibility for all but 87 of the more than 1,600 currently listed species and has been chronically underfunded.

To estimate the amount of funding needed annually to fully recover listed species, we compiled estimated recovery costs from all recovery plans produced in the last 10 years by the Fish and Wildlife Service. Our analysis shows that both appropriations and total expenditures for recovery of endangered species fall far short of what is needed to recover species. Not only must funding be substantially increased if we are to recover more endangered species, but this increased funding should be dedicated specifically to the actions specified in federal recovery plans.

## II. U.S. FISH AND WILDLIFE SERVICE ENDANGERED SPECIES FUNDING

The Fish and Wildlife Service receives annual appropriations from Congress for its endangered species programs to fund the full range of endangered species activities: listing, consultation, recovery, law enforcement and others. In 2016 the Service was allocated \$234 million for the entire endangered species program, including listing, Section 7 consultations, habitat conservation plans, candidate conservation and recovery.<sup>4</sup> This level of funding barely allows the agency to carry out the basic activities required under the Endangered Species Act.<sup>5</sup>

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1 16 U.S.C. § 1532(3) (defining “conservation” as “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary.”).

2 16 U.S.C. § 1533(f)(1)(B).

3 See e.g., Julie K. Miller, et. al., *The Endangered Species Act: Dollars and Sense?* BioScience 52(2) at 163-168, available at <http://bioscience.oxfordjournals.org/content/52/2/163.full> (“[S]pecies that have higher proportional spending have an improved chance of achieving a status of improving or stable... Our current scenario is akin to starving hospitalized patients ... and then grilling the doctors about why more patients are not recovering.”)

4 FY 2017 USFWS BUDGET JUSTIFICATION at BG-1

5 While the Service requested an additional \$6 million for fiscal year 2017 (a total of \$251 million), this represents an increase of only 7 percent from last year for the more than 1500 species the agency is responsible for, including over 200 species having been added to the endangered list in the past five years. This means the Service’s budget continues to be flat or declining. In contrast, the National Marine Fisheries Service is only responsible for 87 domestic species, and requested an additional \$31.2 million for its implementation of the Act.

The agency, for example, has long had a backlog of hundreds of species awaiting listing decisions. Due to lack of staffing, there have also been persistent delays in completion of Section 7 consultations to analyze the impacts of federal actions on listed species.<sup>6</sup> While the endangered species budget has increased since 1995, it peaked in 2010 and has since declined by 18 percent (Figure 1). During this same time frame, the number of listed species overseen by the Service has grown by nearly 50 percent.

Within its overall endangered species funding, the Service does have a specific budget for species recovery, which in 2016 was \$82 million.<sup>7</sup> This funding primarily covers agency staff to coordinate recovery activities, development of recovery plans and recovery tracking, such as production of 5-year reviews. Even for these critical activities, however, the funding level is inadequate and the Service still has not completed recovery plans for 343 (22 percent) of the 1,586 listed species and another 58 have only draft plans. As with overall endangered species funding, the budget for recovery has increased over the past 20 years, but funding peaked in 2010 and has since declined by 10 percent (Figure 1). At current funding levels, there is little capacity for the agency to implement recovery activities, even for the most critically endangered species.

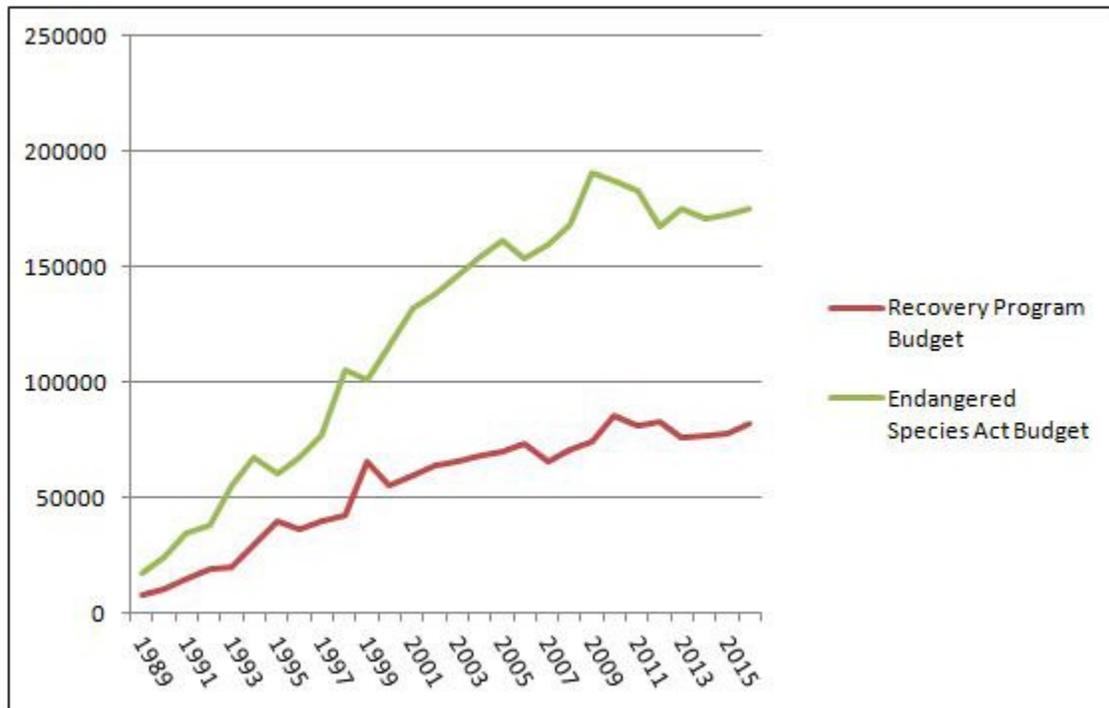


Figure 1. Total U.S. Fish and Wildlife Service endangered species and recovery budgets in thousands of dollars.

### III. EXISTING ENDANGERED SPECIES EXPENDITURES

In 1988 Congress required the Fish and Wildlife Service to annually report “reasonably identifiable” expenditures by federal agencies and states for the conservation of threatened and endangered species.<sup>8</sup> These reports consistently show that a small minority of species receive the majority of endangered species expenditures. It is noteworthy that a large proportion of species that benefit from expenditures by other federal and state agencies are species under the jurisdiction of the National Marine Fisheries Service. As detailed below in greater detail, this disparity in funding illustrates the challenges in moving most of the endangered species managed by the Fish and Wildlife Service toward recovery.

<sup>6</sup> See e.g. *Candidate Notice of Review*, 79 Fed. Reg. 72450 (Dec. 5, 2014) (146 species were added, awaiting listing decisions); Gov’t Accountability Office Report (GAO-09-550), *The U.S. Fish and Wildlife Service Has Incomplete Information about Effects on Listed Species from Section 7 Consultations* (May 21, 2009) (the Service’s lack of a systematic means of tracking monitoring reports and biological consultations is linked to their budget).

<sup>7</sup> FY 2017 USFWS BUDGET JUSTIFICATION at BG-1 .

<sup>8</sup> See An Act to authorize appropriations to carry out the Endangered Species Act of 1973 during fiscal years 1988, 1989, 1990, 1991, and 1992, and for other purposes, P.L. 100-478, 102 Stat. 2306 (Oct. 7, 1988).

In 2014 federal and state agencies spent approximately \$1.3 billion on endangered species, not including land expenditures. More than 60 percent of these dollars, or nearly \$747 million, went to just 35 species, a majority of which are affected by large federal water projects and in many cases under the jurisdiction of the National Marine Fisheries Service. Indeed, of the 50 species that received the most expenditures in 2014, 32 (64 percent) are overseen by the National Marine Fisheries Service. In total the 76 species under National Marine Fisheries Service jurisdiction with reported expenditures in 2014 received 51 percent of all expenditures, leaving the remainder to be split among more than 1,500 species under the Fish and Wildlife Service's jurisdiction. It is thus no surprise that 1 in 4 species received less than \$10,000 in expenditures in 2014.

A primary reason that such a small number of species receive the lion's share of funding is that they are affected by actions carried out or authorized by large federal agencies — agencies that are required by the Act to ensure that their actions do not jeopardize the continued existence of threatened and endangered species.<sup>9</sup> For example, 25 of the 35 species that receive the majority of expenditures are affected by large federal water projects, including 14 species of anadromous fish impacted by the many dams in the Columbia River system (Table 1).<sup>10</sup> Not surprisingly, the Bonneville Power Administration, the operator of the Columbia River dams, and the Army Corps of Engineers, which manages dam operations and other water projects across the country, had the first- and second-highest endangered species expenditures — \$230 million and \$225 million respectively — of any federal agencies in 2014.<sup>11</sup>

The substantial expenditures of the Bonneville Power Administration and Army Corps are as much to provide mitigation and allow the dams and other water projects to stay in place as they are to ensure recovery of impacted endangered species. Nonetheless, such expenditures have accomplished much toward securing a future for these species.<sup>12</sup> In the four states of the Columbia Basin, for example, stream restoration has occurred on more tributary stream miles than the length of the Columbia and Willamette rivers combined, and such efforts have been found to improve salmon numbers.<sup>13</sup> Other endangered species would certainly benefit from expenditure of such substantial resources, particularly if directed toward actions called for in their recovery plans.

In addition to the \$1.3 billion in direct conservation spending in 2014, approximately \$122 million was spent on land acquisition for 219 species.<sup>14</sup> Of this total \$112.4 million dollars was spent by federal agencies (93 percent) and \$9.5 million was spent by states (7 percent).<sup>15</sup> Species that benefited from significant land acquisition dollars in 2014 include the Florida panther, wood stork and Audubon's crested caracara, reflecting the fact that development in Florida is a major threat to endangered species and the cost of acquiring habitat in such areas is very high (Table 2). Within taxonomic groups fish benefited the most from land acquisitions, with nearly \$40 million in land acquisitions. Mussels, insects and flowering plants received the least funding for land acquisition, with these three groups being given just \$5 million despite accounting for more than half of the species protected under the Endangered Species Act.

The species benefiting from land acquisition vary year to year, but an examination of the past several years revealed that a number of species appear to benefit from large land-acquisition expenditures in multiple years.

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9 16 U.S.C. § 1536(a).

10 FY 2014 EXPENDITURES at 80-85.

11 *Id.* at 255, 257.

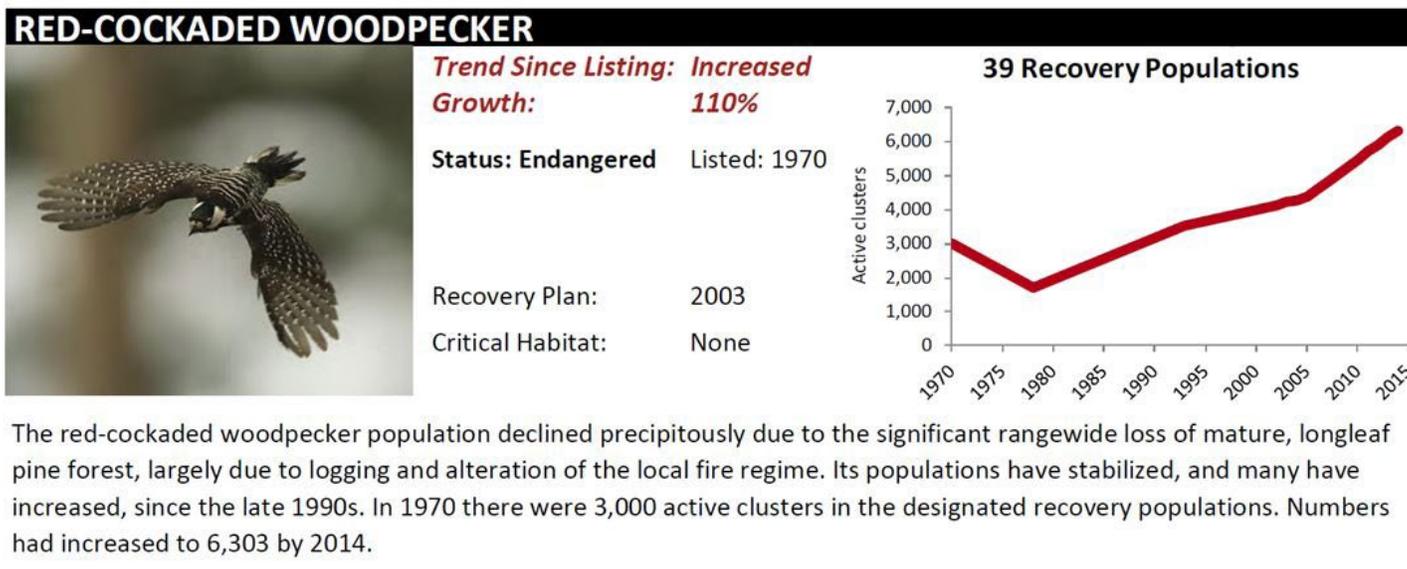
12 The Bonneville Power Administration, for example, spends roughly 3 million dollars per year barging young salmon around dams that block their path to the ocean. See e.g. *Army Corps Decision Against Dam Removal Could Cost Taxpayers Billions and Drive Salmon to Extinction* (Feb. 20, 2002), available at: <http://www.taxpayer.net/library/article/army-corps-decision-against-dam-removal-could-cost-taxpayers-billions-and-d>.

13 Bonneville Power Administration and Bureau of Reclamation. 2013. BENEFITS OF TRIBUTARY HABITAT IMPROVEMENT IN THE COLUMBIA RIVER BASIN RESULTS OF RESEARCH, MONITORING AND EVALUATION, 2007-2012. Available at: <https://www.salmonrecovery.gov/docs/Trib%20Benefits.pdf>

14 FY 2014 EXPENDITURES at 132-142.

15 *Id.*

There can be no question that land acquisition is critical to protecting and recovering endangered species. One of the species that most benefited from land acquisitions in 2013 and 2014, at a combined total of \$5.7 million, was the red-cockaded woodpecker, which because of a combination of land acquisition and active management on the part of a number of federal agencies has been on the increase..



Roughly 5 percent of total expenditures, or just under \$59 million, was allocated by state agencies to the conservation of approximately 380 species in 2014. Much of this funding is likely of federal origin, including dollars that have been passed onto the states as grants pursuant to Section 6 of the Act or via the Pittman Robertson Act. As with federal expenditures, the majority of funds went to a small number of species, with just 30 species receiving 80 percent of state expenditures. The remaining 350 species received just \$12 million dollars in state funding with 225 species receiving \$10,000 or less. More than 1,150 species received nothing at all. Many, if not most, states expend considerably more resources on game species than they do on non-game or endangered species.<sup>16</sup>

In sum, predominantly federal agencies spend more than \$1 billion on endangered species annually, but most of these dollars go toward a relatively small number of species that are affected by large federal projects, and in many cases are directed toward mitigation rather than recovery actions called for in federal recovery plans. Congressional appropriations to the Service for endangered species are not sufficient to allow substantial spending on actions called for in species' recovery plans. These facts highlight the crux of the problem, namely federal recovery plans identify actions needed to recover species, but there is no dedicated funding or personnel to carry out the overwhelming majority of these actions.

#### IV. ESTIMATING FUNDING NEEDED TO FULLY FUND ENDANGERED SPECIES RECOVERY

The Fish and Wildlife Service implements interim guidelines developed for recovery planning in 2004.<sup>17</sup> These guidelines require recovery plans to estimate costs for each recovery action, include costs on an annual basis for the first five years and estimate the total cost of recovery. We analyzed cost estimates contained in all recovery plans the Fish and Wildlife Service has published since issuance of this guidance in order to obtain standardized estimates of the median cost of recovery per species and, ultimately, to provide an estimated annual appropriation needed to implement recovery plans.

From 2005-2015 the Fish and Wildlife Service produced 78 recovery plans covering 150 species. We used the information in

<sup>16</sup> See, for example, <http://www.opb.org/news/article/wildlife-neglected-with-little-support-conservation-efforts-falter-at-oregon-fish-and-wildlife/>

<sup>17</sup> National Marine Fisheries Service and U.S. Fish and Wildlife Service, *Interim Endangered and Threatened Species Recovery Planning Guidance Version 1.3* (October 2004), available at [http://www.fws.gov/ENDANGERED/esalibrary/pdf/NMFS-FWS\\_Recovery\\_Planning\\_Guidance.pdf](http://www.fws.gov/ENDANGERED/esalibrary/pdf/NMFS-FWS_Recovery_Planning_Guidance.pdf).

these plans to obtain a single-year estimate of how much it would cost to implement recovery actions called for in recovery plans for these 150 species. To determine this, we first used the recovery cost estimates for 2015 if the plan included such information. Where such information was not available, we used the average cost estimates for the first 3-5 years of recovery plan implementation. If neither piece of information was available in the plan, we used the total cost of recovery of the species divided by the total number of years estimated for recovery, which is included in each recovery plan.

The median single-year estimate to recover these 150 species was roughly \$1.5 million. Using this figure to extrapolate to all 1,586 listed species, we estimate that an annual appropriation of roughly \$2.3 billion would be sufficient to implement recovery plans for currently listed species. This is a substantial increase over what the Fish and Wildlife Service receives currently, but is a relatively modest sum in terms of federal programs.

The average total cost for fully recovering individual endangered species was roughly \$104 million spread across 10 to 50 years depending on length to recovery specified in plans. Given that the outcome is the survival and recovery of a unique species that once lost, can never be brought back, this, too, is a very modest sum.

## V. RECOMMENDATIONS

Recovery plans provide a readily available source of the best scientific information to determine the funding and resource needs to ensure recovery for all currently listed species. But to date these plans have not been used for this purpose by either the Fish and Wildlife Service or Congress in the annual appropriations process. Instead, the agency routinely requests, and Congress grants, far less than what is needed to implement the Endangered Species Act. The longer a species is in crisis without substantial recovery effort, the more expensive full recovery becomes. Ensuring sufficient funding will make recovery more likely, prevent further species decline and help more species ultimately be delisted.

To rectify this situation, we recommend a dramatic increase in funding over the next 10 years for the Fish and Wildlife Service's recovery program, from \$82 million a year to approximately \$2.3 billion a year. This money should be specifically targeted to implementation of recovery plans.

The Fish and Wildlife Service could use these additional funds both internally to fund staff to update recovery plans and interact with recovery teams and externally to fund universities, state agencies and private conservation organizations to carry out recovery actions, which would serve to build partnerships for endangered species conservation — a long-term goal of the Service. Although it is not likely under the current Congress or incoming administration, we sincerely hope this report will begin a discussion that leads to a substantial increase in funding for recovery of endangered species.

In the interim when funding remains below recovery needs, we recommend that the Service adopt the use of taxon-specific efforts modelled on the Hawaii Plant Extinction Prevention Program. This highly successful and cost-effective program focuses emergency actions, captive propagation and reintroduction efforts on those species closest to the brink of extinction — the 238 Hawaiian plants that have 50 or fewer individuals left in the wild. More than 200 of the rarest plant species in the world receive emergency-room actions under this program, with a highly efficient annual cost of less than \$5,000 per species — though sadly this program has recently been the victim of significant budget cuts.<sup>18</sup> Recently a similar program has also been established for highly imperiled Hawaiian land and tree snails. As many as 90 percent of the 750 endemic Hawaiian snails may have already gone extinct.<sup>19</sup> Congress should fund expansion of these programs and establishment of three additional extinction prevention programs, as described below.



The threatened **Laguna Beach live forever** (*Dudleya stonifera*), a tenacious cliff-dwelling succulent endemic to southwest Orange County, Calif., may not live for much longer if it continues to receive no funding. This species received only \$86 in 2012 and zero dollars in 2013 and 2014. The plant grows exclusively on sandstone cliffs, mostly in coastal sage scrub habitat. It is threatened by urban development, climate change, invasive species and habitat loss. As of 2010 there were only six known populations. Photo by Ron Vanderhoff, California Native Plant Society

18 See Plant Extinction Prevention Program, About Us <http://www.pepphi.org/about-pepp.html> (last accessed October 15, 2016)

19 See State of Hawaii, Division of Forestry and Wildlife, Native Ecosystems Protection & Management <http://dlnr.hawaii.gov/ecosystems/hip/sep/> (last accessed October 15, 2016).

**Southeast freshwater mussels.** North America has the highest diversity of freshwater mussels in the world, but unfortunately much of this diversity is threatened. Freshwater mussels are the most endangered group of organisms in the United States, with nearly 70 percent being at risk of extinction. Pollution and dams have deteriorated water quality and separated mussels from the host fish on which their survival depends. Thirty-eight species of mussel have already gone extinct, and another dozen are likely gone. Many additional species survive only in small isolated populations that will be lost without intensive captive-breeding and reintroduction efforts. The scientific expertise now exists to save these species, but the Service lacks the funding to collect and propagate the surviving individuals of all the species that are spiraling toward extinction. In 2014 total expenditures on 85 species of endangered freshwater mussels was approximately \$11.4 million, or just 0.8 percent of total expenditures, and some critically endangered mussel species received only \$100 in recovery funding.



**The endangered black clubshell** The endangered black clubshell (*Pleurobema curtum*) has remained endangered throughout its range since 1987, with next to no attention from the Service.

Historically this freshwater mussel species was known from the Tombigbee River in Alabama. The species declined due to dams, sand and gravel mining, diversion of water flows for municipal use, water sedimentation and algal blooms. The black clubshell has not been seen since 1991 and immediately needs comprehensive surveys and captive propagation if it still exists. It received only \$100 in funding from the Service in 2014.<sup>20</sup> Photo by Robert Jones, Mississippi Museum of Natural Science.

**North American butterflies.** Of all the endangered species in the United States, butterflies are one of the fastest declining groups, with several species on the verge of extinction. The Mount Charleston blue butterfly, Miami blue butterfly and Lange's metalmark, for example, all have worldwide populations of fewer than 100 individuals. These and other species would benefit from captive propagation and habitat restoration well beyond what is currently occurring. In 2014 total expenditures on the 21 protected butterfly species was only \$5.3 million, or just 0.4 percent of all expenditures.



The endangered **Mount Charleston blue butterfly** (*Plebejus shasta charlestonensis*) is down to just three confirmed locations, totaling fewer than 300 acres of habitat high atop the Spring Mountains outside Las Vegas, Nev. The exact number of butterflies remaining is unknown, but typically surveyors can only find a handful, indicating populations are exceedingly small. The butterfly faces threats from recreational development, fire suppression, collection and climate change. Despite the severity of the situation, the Mount Charleston blue butterfly received only \$700 in 2014 and zero dollars in 2013, the year it was protected under the Act.

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20 IUCN Red List, *Pleurobema curtum*, available at <http://www.iucnredlist.org/details/17666/0>.

# HAWAII'S EXTINCTION PREVENTION PROGRAMS

Hawaii has more endangered species than any other state, including a whopping 386 plants that make up one-quarter of all species protected under the Endangered Species Act. Many of these plants are barely hanging on in remote, difficult-to-reach cliffs and ravines where they are safe from human development and introduced pigs, goats, deer and mouflon sheep cannot reach them. In the 1990s an innovative partnership between the U.S. Fish and Wildlife Service, the state of Hawaii and the University of Hawaii was started to save Hawaiian plants with fewer than 50 individuals remaining in the wild, an unfortunate category that currently includes 238 species. This “Plant Extinction Prevention Program” has already saved dozens of species from extinction and helped reintroduce more than 110 species into native forests. Unfortunately the Fish and Wildlife Service recently cut funding for the program by 31 percent, resulting in a reduction from \$4,750 per species to \$3,300 per species — a cut that will severely reduce efforts to save these unique, at-risk Hawaiian plants.

Recently a similar program has been established to prevent extinctions of another exceptionally at-risk group of species: terrestrial snails. Up to 90 percent of Hawaii's 750 known terrestrial snails have already been lost to extinction. The primary threats to these animals are habitat loss and predation by introduced animals such as rosey snails, rats and chameleons. Modeled after the emergency plant protection program, the Snail Extinction Prevention Program focuses on preventing the extinction of the 50 most at-risk species. This program also utilizes captive propagation, emergency field actions and reintroductions. One species has already been reintroduced into the wild, six populations have been relocated to more secure habitat, and four species are maintained solely in captivity. In 2017 all the remaining wild individuals of four additional species will be brought into captivity.



**Hibiscadelphus woodii**, a member of the hibiscus family known only from the Kalalau Valley rim on the island of Kauai. The last known plant of this species died in 2012, though one immature plant may remain. The primary driver of its extinction was browsing by introduced feral goats. Photo by Ken Wood.



**Oahu tree snail** (*Achatinella fuscobasis*). A highly endangered snail found only on the island of Oahu, Hawaii. The Hawaii Snail Extinction Prevention program is actively working to save this unique species. Photo by David Sischo.

**Southwest freshwater fish.** The unique and highly endemic fish fauna of the Southwest and greater Colorado River Basin have been decimated by a century of habitat degradation and non-native fish introductions. Presently 42 fish species are either endangered or threatened, and most have experienced drastic abundance and range reductions. At least one species is extinct. Non-native fish species dominate most fish communities, and include at least 67 introduced species.<sup>21</sup> Controlling and removing these non-native species, even in just those areas necessary for recovery of the many endangered fish and other aquatic species, would be a massive effort requiring substantially more funds than currently allocated. These introductions have been facilitated by drastic habitat modification, which favors non-native species over native species.<sup>22</sup> A majority of waters in the Southwest are now regulated with associated changes in the hydrograph, channel geomorphology, water temperatures and mineral and sediment concentrations. These changes have been compounded by groundwater pumping and diversion that reduce flows, and habitat altering activities, such as livestock grazing, construction of roads, channelization and mining. Together these factors constitute a massive assault on the integrity of aquatic ecosystems in the Southwest that are imperiling most native fish species, as well as many native amphibians and reptiles, invertebrates and birds dependent on the Southwest's precious desert rivers. In 2014 just \$9.2 million was spent on these 42 fish, or just 0.6 percent of all expenditures. As with total expenditures, a substantial proportion of these expenditures were spent on the small number of fish affected by dams on the Colorado River or other major federal projects. Twenty-one of the species received less than \$100,000 dollars and six received less than \$10,000 dollars.

## CONCLUSIONS

The Endangered Species Act has been successfully protecting and recovering America's most imperiled species for more than 40 years. Thousands of dedicated state, federal and local government employees, conservation organizations, corporations, landowners and concerned citizens have been working tirelessly and — as this report points out — on shoestring budgets to save and restore hundreds of species that are on the brink of extinction. In many cases this hard work has paid off. Most of our protected birds are doing much better now than when they were listed.<sup>23</sup> Much remains to be done, however, to prevent the extinction of hundreds of other species, especially less charismatic plants, snails, mollusks, butterflies and highly endemic freshwater fish. We can save these and other species facing extinction with modest amounts of funding if we make it a conservation priority.

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21 Carlson, C. A. and R. T. Muth. 1989. *The Colorado River: lifeline of the American Southwest*. Proceedings of the international large river symposium, Can. Spec. Publ. Fish. Aquat. Sci. 106.

22 Rinne, J.N., et. al. 1998. *Fish community structure in the Verde River, Arizona, 1974-1997*. Hydrology and Water Resources in Arizona and the Southwest 28:75-80.

23 A Wild Success. <http://www.esasuccess.org/2016/report.html>.

**Table 1.** Species that received more than \$10 million in expenditures in 2014, accounting for more than 60 percent of total endangered species spending (not including land acquisition).

Rank	Species	Status	Species Total	Agency
1	Pallid sturgeon ( <i>Scaphirhynchus albus</i> ) - Entire	E	\$68,778,575	FWS
2	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Snake River Basin DPS	T	\$52,178,312	NMFS
3	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Snake River spring/summer-run ESU	T	\$49,199,036	NMFS
4	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Middle Columbia River DPS	T	\$48,512,887	NMFS
5	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Lower Columbia River ESU	T	\$42,525,708	NMFS
6	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Snake River fall-run ESU	T	\$35,442,077	NMFS
7	Bull trout ( <i>Salvelinus confluentus</i> )	T	\$35,194,738	FWS
8	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Upper Columbia spring-run ESU	E	\$33,836,557	NMFS
9	Desert tortoise ( <i>Gopherus agassizii</i> )	T	\$33,677,623	FWS
10	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Upper Columbia River DPS	T	\$31,683,743	NMFS
11	Steller sea lion ( <i>Eumetopias jubatus</i> ) - Western DPS	E	\$30,472,348	NMFS
12	Red-cockaded woodpecker ( <i>Picoides borealis</i> )	E	\$28,091,150	FWS
13	Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	E	\$23,157,345	FWS
14	Sockeye salmon ( <i>Oncorhynchus nerka</i> ) - Snake River ESU	E	\$22,780,787	NMFS
15	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Puget Sound ESU	T	\$21,124,534	NMFS
16	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) - Upper Willamette River ESU	T	\$17,631,540	NMFS
17	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Lower Columbia River DPS	T	\$15,808,309	NMFS
18	Indiana bat ( <i>Myotis sodalis</i> )	E	\$15,192,756	FWS
19	Coho salmon ( <i>Oncorhynchus kisutch</i> ) - Lower Columbia River ESU	T	\$14,539,618	NMFS
20	Humpback chub ( <i>Gila cypha</i> )	E	\$13,409,098	FWS
21	Northern spotted owl ( <i>Strix occidentalis caurina</i> )	T	\$13,396,766	FWS
22	Coho salmon ( <i>Oncorhynchus kisutch</i> ) - Southern Oregon - Northern California Coast ESU	T	\$12,797,817	NMFS
23	Delta smelt ( <i>Hypomesus transpacificus</i> )	T	\$11,960,799	FWS
24	Piping plover ( <i>Charadrius melodus</i> ) - except Great Lakes watershed	T	\$11,685,179	FWS
25	Chum salmon ( <i>Oncorhynchus keta</i> ) - Columbia River ESU	T	\$11,329,733	NMFS
26	White sturgeon ( <i>Acipenser transmontanus</i> )	E	\$10,544,074	FWS
27	North Atlantic right whale ( <i>Eubalaena glacialis</i> )	E	\$10,207,748	NMFS
28	Razorback sucker ( <i>Xyrauchen texanus</i> )	E	\$9,539,766	FWS
29	Least tern ( <i>Sterna antillarum</i> ) - interior population	E	\$9,334,565	FWS
30	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Puget Sound DPS	T	\$9,321,316	NMFS

31	Rio Grande silvery minnow ( <i>Hybognathus amarus</i> )	E	\$9,223,652	FWS
32	Loggerhead sea turtle ( <i>Caretta caretta</i> ) - Northwest Atlantic Ocean DPS	T	\$8,660,093	NMFS
33	Atlantic salmon ( <i>Salmo salar</i> ) - Gulf of Maine DPS	E	\$8,621,892	NMFS
34	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Upper Willamette River DPS	T	\$8,429,010	NMFS
35	California red-legged frog ( <i>Rana draytonii</i> )	T	\$8,087,462	FWS

**Table 2. 20 species that received the most expenditures on land acquisition in 2014.**

Rank	Species	Status	USFWS Total	Federal Total	States Total	Species Total
1	White sturgeon ( <i>Acipenser transmontanus</i> )	E	\$0	\$12,256,564	\$0	\$12,256,564
2	Wood stork ( <i>Mycteria americana</i> )	T	\$1,149,467	\$9,500,000	\$0	\$10,649,467
3	Louisiana black bear ( <i>Ursus americanus luteolus</i> )	T	\$2,476,836	\$5,102,900	\$0	\$7,579,736
4	Florida panther ( <i>Puma concolor coryi</i> )	E	\$0	\$6,500,000	\$0	\$6,500,000
5	Bull trout ( <i>Salvelinus confluentus</i> )	T	\$71,000	\$4,766,580	\$1,208,617	\$6,046,197
6	Rio Grande silvery minnow ( <i>Hybognathus amarus</i> )	E	\$0	\$6,000,000	\$0	\$6,000,000
7	Audubon's crested caracara ( <i>Polyborus plancus audubonii</i> )	T	\$783	\$5,000,000	\$0	\$5,000,783
8	Indiana bat ( <i>Myotis sodalis</i> )	E	\$1,223,238	\$2,935,700	\$0	\$4,158,938
9	Bog turtle ( <i>Clemmys muhlenbergii</i> )	T	\$653,500	\$3,368,840	\$0	\$4,022,340
10	Steelhead ( <i>Oncorhynchus mykiss</i> ) - Middle Columbia River DPS	T	\$0	\$3,296,683	\$0	\$3,296,683
11	Red-cockaded woodpecker ( <i>Picoides borealis</i> )	E	\$3,046,058	\$2,000	\$21,931	\$3,069,989
12	Piping plover ( <i>Charadrius melodus</i> )	T	\$2,109,189	\$0	\$0	\$2,109,189
13	Sockeye salmon ( <i>Oncorhynchus nerka</i> ) - Snake River ESU	E	\$0	\$2,023,115	\$0	\$2,023,115
14	Everglade snail kite ( <i>Rostrhamus sociabilis plumbeus</i> )	E	\$0	\$2,000,000	\$0	\$2,000,000
15	Delmarva Peninsula fox squirrel ( <i>Sciurus niger cinereus</i> )	E	\$1,005,000	\$770,000	\$0	\$1,775,000
16	Northern spotted owl ( <i>Strix occidentalis caurina</i> )	T	\$0	\$1,264,000	\$366,035	\$1,630,035
17	American alligator ( <i>Alligator mississippiensis</i> )	SAT	\$0	\$1,500,000	\$0	\$1,500,000
18	Desert tortoise ( <i>Gopherus agassizii</i> )	T	\$0	\$0	\$1,400,000	\$1,400,000
19	West Indian manatee ( <i>Trichechus manatus</i> )	E	\$1,302,044	\$0	\$0	\$1,302,044
20	Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	E	\$1,210,434	\$0	\$0	\$1,210,434