

Documenting Success: Recovery of Species From The Endangered Species Act

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Introduction

The Endangered Species Act of 1973 (ESA) is intended to prevent species extinction. Species are listed based on five threat factors: destruction, modification or curtailment of habitat or range; overutilization; disease or predation; inadequacy of regulatory mechanisms; and any other natural or manmade factors (US ESA 1973a & 1973b; US Code 2000). A species may be delisted due to recovery when these threats to its survival are ameliorated such that long-term survival is assured (USFWS 1992). Our objective was to identify the strategies most used in species recovery and to investigate what factors lead to species recovery.

Methods

Delisting documents for species delisted due to recovery, as well as for species still listed under the Endangered Species Act of 1973 (ESA), were obtained from the United States Fish and Wildlife Service's (USFWS) Environmental Conservation Online System (ECOS) website, the United States Federal Register website and from the Database of Threats Impacting Species At Time of Listing (Leu et al., *In Review*). Data were collected for recovered as well as listed and previously-listed species, with species listed under the Endangered Species Act of 1973 (ESA) serving as the control group. We recorded actions that lead to the recovery of a species, population increase, elimination or alleviation of threats, and meeting of recovery plan objectives, as well as legislation protecting organisms and the policies that protect species post-delisting. Factors examined include taxa, the time taken for species to recover, and the number of threats impacting each species at the time of listing. Statistical analysis was conducted using Pearson chi-square and a student t-test. Statistical significance was based on $p < 0.05$.

Results

There have been a total of 39 species delisted due to recovery, or 2% of all species under the ESA. It takes an average of 26 ± 11 years for a species to recover. There was no difference in threats impacting recovered species compared to currently listed species ($X^2=3.21$, $df=5$, $p\text{-value}=0.67$) (Figure 1). However, recovered species suffered from an average of 2.15 threats whereas listed species suffered from 2.94 threats ($t\text{-stat}=2.87$, $df=19$, $p\text{-value}<0.01$). Most recovered species are vertebrates despite being a minority of currently endangered species ($X^2=99.75$, $df=6$, $p\text{-value}<0.01$) (Figure 2). Each recovered species, an average of 1.7 conservation actions were used outside of government protections (Table 1). We found that the average recovered species was a vertebrate that had been listed for decades, suffered from less threats, had recently recovered, lived on public land and benefited from regulations outside of the ESA. The most common laws that contributed to recovery success were the Clean Water Act, Convention on International Trade of Endangered Species, Migratory Bird Treaty Act, banning of DDT and the Marine Mammal Protection Act.

Literature Cited:

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Table 1. Conservation actions and Federal laws most frequently used to protect recovered species. Laws were given as reasons for delisting because they assure the protection of species post-delisting.

| Conservation Action | Number of Recovered Species | Federal Laws | Number of Recovered Species Protected |
|------------------------------------|-----------------------------|---|---------------------------------------|
| Private Landowner Agreements | 16 | Clean Water Act | 10 |
| Habitat Restoration | 11 | Convention of the International Trade of Endangered Species | 7 |
| Research on Population Viability | 10 | Migratory Bird Treaty Act | 6 |
| Translocation | 7 | Banning of DDT | 5 |
| Control of Invasive Species | 6 | Marine Mammal Protection Act | 5 |
| Captive Breeding and Seed Banks | 5 | Rivers and Harbor Act | 4 |
| Banning of DDT | 5 | International Whaling Commission | 4 |
| Purchase of Habitat for Protection | 4 | Wilderness Area Act | 3 |

Discussion

Directions for recovery include increasing incentives for private landowners, redistribution of funding to listed species based on assigned priority, continued maintenance of federal laws protecting delisted species, and collaboration among agencies. We found that birds and mammals were more likely to be recovered than organisms in other taxa. This is consistent with the findings of Restani and Marzluff (2002), who found that mammals and birds were allocated more money for recovery than amphibians and reptiles, and that the amount of funding that goes toward a species' recovery is unrelated to its assigned priority for recovery. Collaboration among agencies would also help to further reduce threats. By interviewing Canadian and American government employees and wildlife officers, Olive (2014) found that Canadian employees have the desire to work with American scientists, but USFWS employees are prevented from traveling based on U.S. government regulations, time constraints, and funding. One American field officer stated that they are not even allowed to travel to other states in the United States as part of their work. The most common conservation action that aided species recovery was private landowner agreements. Eighty-four percent of species have some or all of their habitat on private land (GOA 1994). Landowners get scared away by the regulations they are subject to once a species on their land is listed, and therefore have an incentive to remove the species from their land or destroy its habitat (Wilcove et al., 1996). Habitat restoration and maintenance is also expensive for landowners, and landowners are forced to split up and sell inherited land in order to pay estate taxes. Wilcove and colleagues (1996) suggested tax deductions for landowners who restore habitat and deferral of estate taxes for landowners who sign management agreements with the federal government.



Images:

- Bailey, R. (n.d.). Bald Eagle [Digital image]. Retrieved March 20, 2018, from <http://www.audubon.org/field-guide/bird/bald-eagle>
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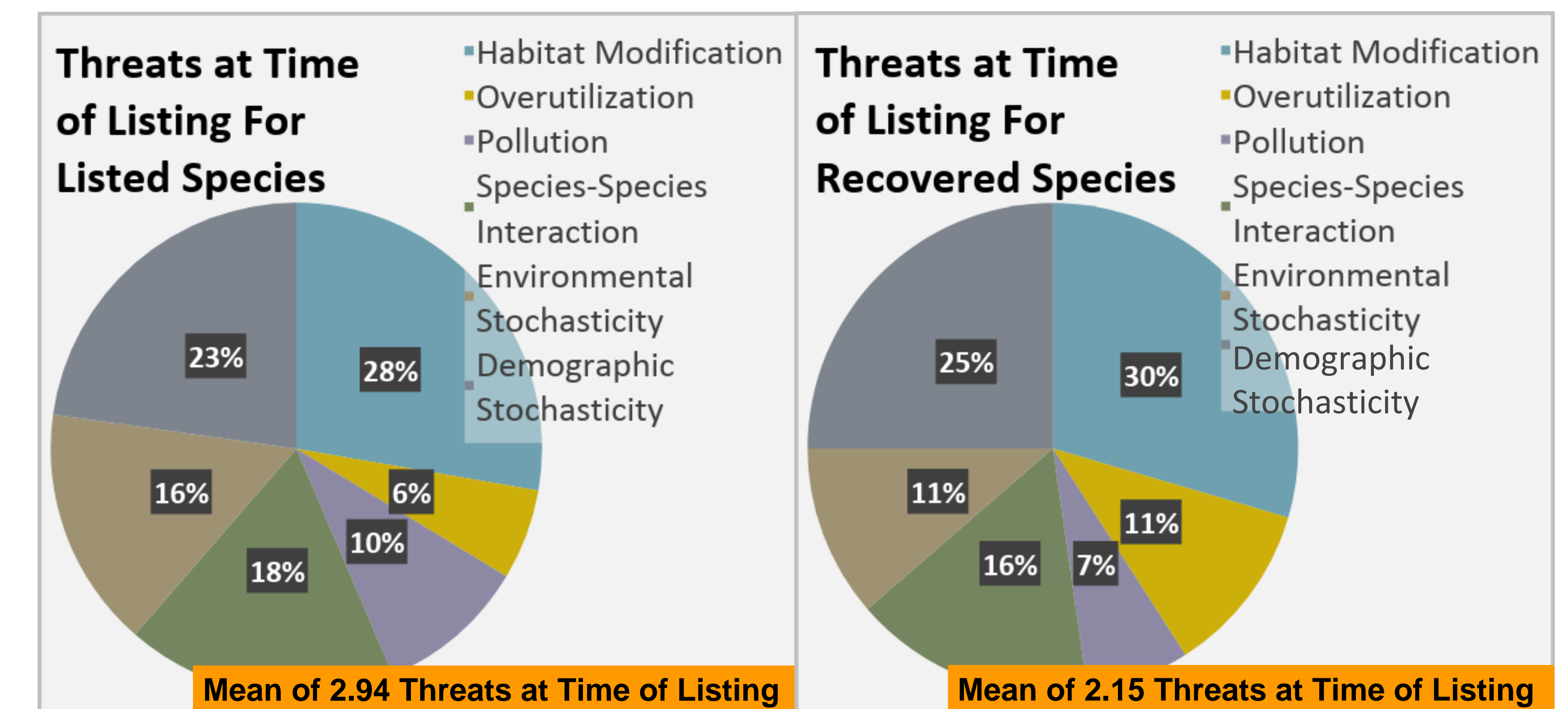


Figure 1. Number and types of threats affecting listed and recovered species. The types of threats for listed species are similar between species that have been listed and species that have been recovered. Recovered species suffered from fewer threats at time of listing than species that are still listed.

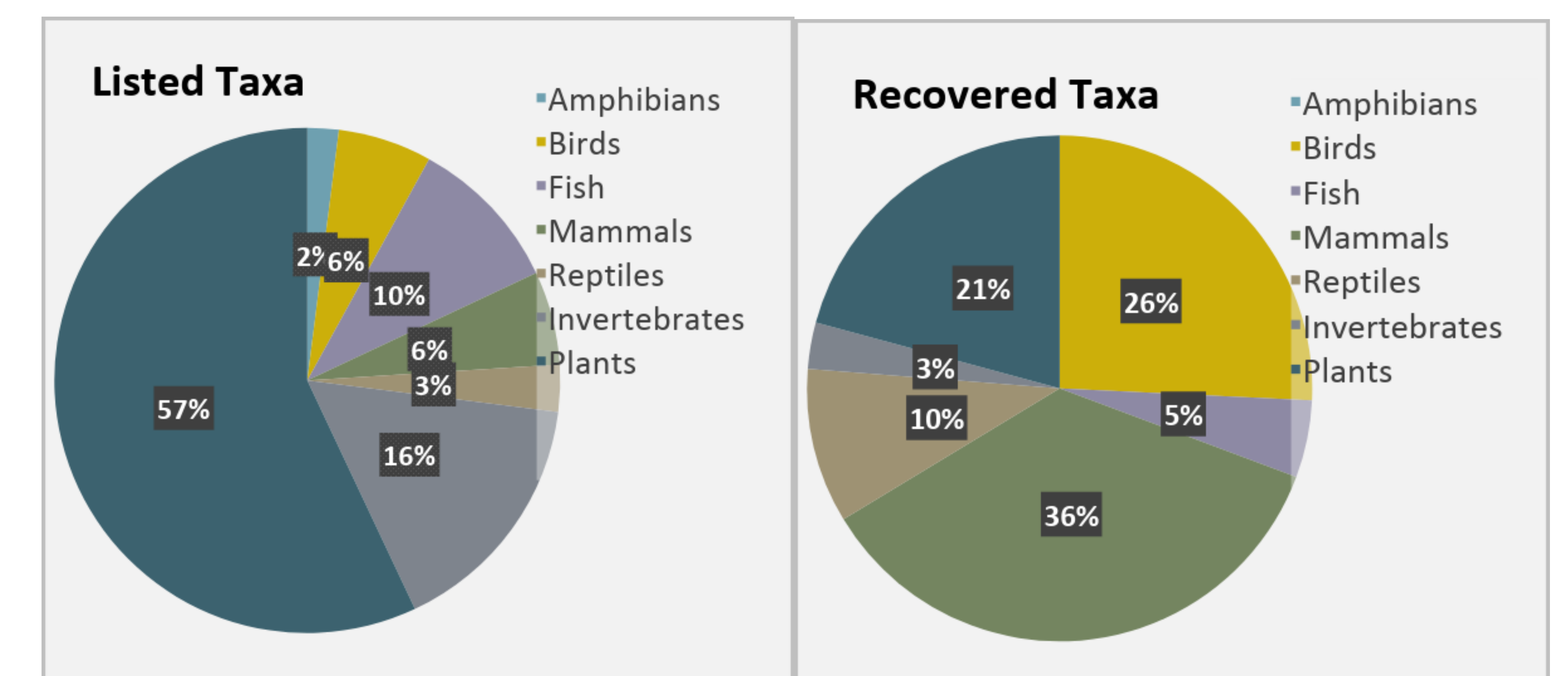


Figure 2. Composition of listed taxa compared to recovered taxa. There is a greater proportion of vertebrates, especially birds and mammals, that have been recovered than the proportion of plants and invertebrates, demonstrating bias towards "charismatic" species.