

Listing Foreign Species under the Endangered Species Act: A Primer for Conservation Biologists

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Nearly 30% of the species currently listed under the US Endangered Species Act (ESA) neither live nor migrate through the United States or the territories under its jurisdiction. Consequently, many of the protections afforded by the ESA, such as the development of species recovery plans and the requirement for federal consultation, are not applied to these “foreign listings.” Overlap between the ESA and other international legislation has created an idiosyncratic patchwork of protections for endangered foreign species, which is further complicated by court rulings that affect the administration of the law. This overview of the historical, legal, and administrative elements of the ESA as have been applied to foreign species aims to provide a straightforward guide for ecologists and conservation biologists on this complex legal issue. We discuss the potential advantages and disadvantages of foreign listings and raise important questions about the practical benefits of listing foreign species under the ESA.

Keywords: CITES, extinction, Lujan, recovery, threatened

The Endangered Species Act (ESA) is one of the United States’ premier pieces of environmental legislation, and although the status of many ESA-listed species has improved through time (Male and Bean 2005, Schwartz 2008), the application of the ESA within the United States has been the subject of an intense public and academic debate over the last three decades (e.g., Kellert 1985, Carroll et al. 1996, Miller JK et al. 2002, Taylor et al. 2005, Schwartz 2008, Doremus 2010, Schiff 2014). Despite its high profile and the fact that nearly one-third ($n = 632$) of all species listed under the ESA neither live nor migrate through the United States or the territories under its jurisdiction (“foreign listings”), the application of the ESA to foreign species has received little attention in the academic literature. Several major reviews of the ESA have examined species with recovery plans (e.g., Tear et al. 1993, Wilcove et al. 1993, Miller G 1996, Hoekstra et al. 2002, Neel et al. 2012) or have relied on the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) Biennial Reports to Congress for species trend assessments, which are limited to species with recovery plans and critical-habitat designations. Because neither recovery plans nor critical-habitat designations have been established for foreign listings (Taylor et al. 2005, Hodges and Elder 2008), these listings have been largely unexamined in the literature.

Several recent ESA status reviews cite climate change as a threat (e.g., US OFR 2007a, 2007b, 2010, 2014), and increased awareness of the threats posed by climate change could generate a sharp increase in foreign species being petitioned. Motivated by this possibility and by the lack of clear information in the conservation literature on the application of the ESA to foreign listings, we review the foreign species listed under the ESA, discuss the role of the foreign-listings program in the context of related international measures, and highlight some of the legal cases that have shaped—and in some cases limited—the application of the ESA to foreign species. Several excellent reviews of the ESA and its history already exist (e.g., Stanford ELS 2001, Bean 2009); here, we focus on those provisions, amendments, and policies specific to foreign listings or germane to the foreign-listings process. Our discussion aims to clarify a complex and actively evolving area of conservation law for ecologists and conservation biologists at the front lines of endangered-species protection.

An overview of the Endangered Species Act and foreign species

Since the turn of the twentieth century, increasing attention has been directed to wildlife management and conservation in the United States, and several pieces of federal legislation have focused on protecting plants and wildlife (e.g.,

the Lacey Act of 1900 and the 1965 Land and Water Conservation Fund Act, NRC 1995). The ESA grew out of two early pieces of legislation aiming to protect species threatened with extinction (Czech and Krausman 2001, Bean 2009). The Endangered Species Preservation Act of 1966 allowed threatened and endangered domestic species to be listed, and it allotted a moderate budget for the acquisition of critical habitat; however, restrictions were only applicable in the National Wildlife Refuge System, and agency cooperation was voluntary (Stanford ELS 2001). In 1969, the act was amended and renamed the Endangered Species Conservation Act, which furthered the protections for species in danger of “worldwide extinction” (Endangered Species Conservation Act of 1969). However, protections for foreign species were limited to the regulation of international commercial trade (Stanford ELS 2001). Partially in response to this legislation, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was drafted in 1972 with the aim of ensuring that international trade of flora and fauna does not threaten species’ survival. Although all CITES signatories (currently 181 nations) are legally bound to implement the convention, CITES provides only a framework for the protection of species; parties to the convention must develop domestic laws to implement the treaty (CITES 2016). In the United States, the ESA is the implementing legislation for CITES, and it was not until the ESA of 1973—and its subsequent revisions—that threatened species were afforded comprehensive federal protections through the limiting of human “takes” (i.e., to harass, harm, pursue, hunt, shoot, etc.) and the protection of critical habitat.

The ESA was passed by Congress with near-unanimous support (390–12 and 92–0 in the House and Senate, respectively; US House of Representatives 1973a, US Senate 1973a), during which time several arguments were made in support of including foreign species. Comments by the Senate Commerce Committee and the House Merchant Marine and Fisheries Committee reflected widespread support for increased control over the trade of endangered species, and discussions emphasized the United States’ leading role spearheading conservation efforts on an international level (US Senate 1973b, US House of Representatives 1973b). The timing of the ESA relative to the development of CITES was critical; congressional discussions reflected a desire to advance the implementation of CITES and set a precedent that other countries might follow.

The inclusion of foreign species within the scope of the ESA is noteworthy. Although laws governing the protection of species exist today in many countries around the globe, as far as we could determine, the ESA is unusual in including protections for foreign species. Australia, Canada, Chile, Costa Rica, Japan, Kenya, New Zealand, and the United Kingdom are among those CITES signatories that have adopted legislation to protect flora and fauna within their borders but do not provide protection for foreign species. For example, Canada’s 2002 Species at Risk Act explicitly

limits consideration to those species “native to Canada” or that have “extended [their] range into Canada without human intervention and [have] been present in Canada for at least 50 years” (Species at Risk Act of 2002). Of these eight countries, four use their endangered species legislation to implement CITES (as in the United States), whereas the other half have enacted separate laws implementing CITES. It is worth noting that the Lacey Act, which was signed into law in 1900, makes it unlawful to “import, export, transport, sell, receive, acquire or purchase” wildlife and, in subsequent amendments, plants and plant products “taken, possessed, transported or sold in violation of US or international law” (Lacey Act of 1900, 2008). Thus, the Lacey Act explicitly provides a mechanism by which the United States can prosecute violations of another country’s wildlife laws, independent of that species’ status under the ESA.

Implementation and administration of the Endangered Species Act. Species can be listed as *threatened* or *endangered* under the ESA in one of two ways, and the ESA includes a legally binding timeline for listing endangered species (domestic and foreign alike) that has important implications for the costs involved (Doremus 1997, Brown and Shogren 1998). Either the USFWS or NMFS can initiate a status review for a particular species, or US citizens or nongovernmental organizations can petition to have species included on the ESA. When a petition to list a species is received, the USFWS or NMFS has 90 days to determine whether listing may be warranted (or whether insufficient information exists), at which point the listing is either denied or a 12-month status review is initiated to assess the species’ status, trends, and threats. A 90-day public comment period follows the status review before a final decision is made. The petition process is particularly relevant to foreign listings, because more than one-third (39.6%) of all foreign listings stem from petitions by nongovernmental organizations (NGOs), and large numbers of species are often proposed for listing in a single petition (e.g., US OFR 1976, 1995a).

Arguably, once a species is listed, the most important sections of the ESA with respect to the protections afforded are sections 7 and 9. Section 7 of the ESA requires that “each Federal agency shall... insure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat.” Current regulations define the scope of the ESA as being “the United States or upon the high seas” and do not require consultations for federal activities authorized, funded, or carried out in foreign countries (ESA of 1973, 50 CFR 402.01). Questions remain, however, regarding the legality of this interpretation (Kellogg 2004). This issue was central to *Defenders of Wildlife v. Lujan*, 20 ELR 21442 (1990) and *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992), in which Defenders of Wildlife and other conservation organizations challenged the limit to section 7 consultations outside US jurisdiction (Schwab 1993). The

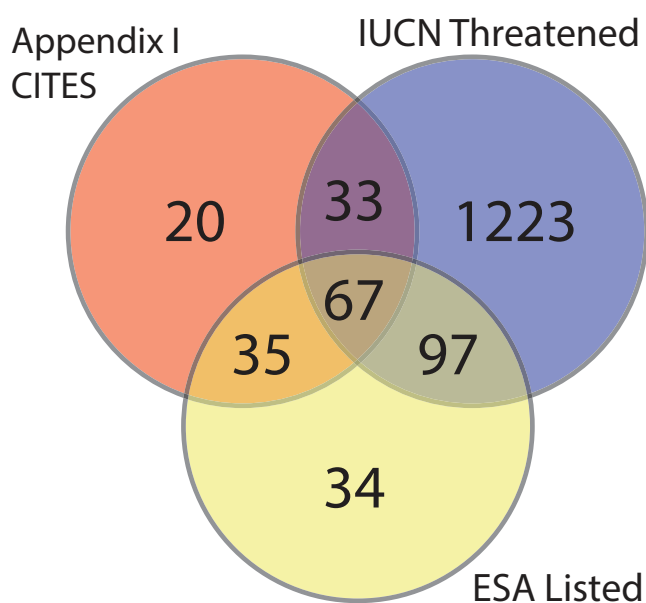


Figure 1. Venn diagram demonstrating the overlap between foreign bird species listed under the Endangered Species Act (ESA), foreign bird species listed under Appendix I of CITES, and foreign bird species in a threatened category as assessed by the IUCN Red List. Of the 34 listings unique to the ESA, 18 are subspecies of species not on CITES appendix I or deemed threatened by the IUCN.

US Supreme Court ultimately dismissed *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992), citing a lack of legal standing (see also *Center for Biological Diversity v. Export-Import Bank of the United States*, C 12-6325 SBA [2014]). To date, the courts have not resolved the larger question as to whether the current regulations restricting section 7 consultation to the United States and high seas violate the law itself.

Section 9 of the ESA prohibits persons subject to US jurisdiction from the import or export of species listed as endangered without a permit, and it prohibits interstate and foreign commercial activities (e.g., “possess, sell, deliver, carry ...”) involving endangered species. However, under the current regulations, the prohibition of takes is not applicable to activities in foreign countries (Buck et al. 2012). In fact, a US citizen can legally hunt an ESA-listed foreign species (assuming doing so would not violate local or international law), although it would be illegal for a US citizen to import a trophy of a listed species without a permit from the USFWS or NMFS. Not only are the ESA’s section 7 and section 9 protections limited for foreign species under current policy, but additional protections including critical habitat designations and recovery plans are also not currently applied to foreign-listed species (Bean 2009).

Despite these limitations, the current ESA policy does offer benefits for foreign-listed species, particularly under section 8 of the ESA, which provides mechanisms specific to international cooperation for species protection. Section 8(a)

authorizes the United States to provide financial assistance to foreign countries to protect foreign species listed under the ESA, but only using “excess foreign currencies” available within the US Treasury Department (ESA of 1973, 2004). Section 8(a) implements CITES and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere and therefore makes violations of these conventions punishable under the ESA (Corn and Alexander 2014). Although this is one of the most important elements of the ESA as it relates to foreign species, it is worth noting that all species listed under CITES are protected through the ESA regardless of whether they are included on the ESA’s Endangered Species List (Alexander 2012). Although the ESA nominally offers a much larger set of protections than CITES for foreign species (the latter of which is solely concerned with trade), its current application is largely restricted to the import and export of listed foreign species. As a result, enforcement of the ESA becomes nearly redundant with CITES for foreign listings, with only a nominal increase (\$500–\$5500) in fines for ESA-listed species compared with fines for species listed only under CITES. One of the major practical differences between foreign listings under CITES and the ESA is that the ESA allows private citizens to initiate the listing process and enforce the law via lawsuits, whereas CITES requires government entities to initiate these actions. It is important to note that the decision to list a species under the ESA can include consideration of other protections and can hinge on the perceived adequacy of existing protections such as CITES. The result of these two parallel processes is that overlap between the two lists is extensive but incomplete and idiosyncratic (figure 1, table 1).

Foreign listings in context. The USFWS has separate branches for foreign and domestic ESA listings, with domestic listings managed according to geographic region. The Branch of Foreign Species deals exclusively with the preliminary assessments and reclassifications of foreign species. The program cites several benefits for listing foreign species, including the regulation of the activities of persons under US jurisdiction and “conservation benefits such as increased awareness of listed species, research efforts to address conservation needs, or funding for in-situ conservation of the species in its range countries” (USFWS 2014). Similarly, NMFS cites that the benefits to foreign species “are primarily realized in the form of restrictions on trade and may include prohibitions on certain activities including import, export, take, commercial activity, interstate commerce, and foreign commerce... [and] listing under the ESA can also increase global awareness of the threats faced by the species, which may fuel conservation efforts... in its range countries” (NOAA 2016). Funding for foreign listings is also separated from domestic listings, but prior to 2004, ESA-related expenditures on foreign species were either excluded from the annual federal endangered species expenditure reports published by the USFWS (prior to 2000) or aggregated with “other expenses” (2001–2003), making it difficult to assess

Table 1. Overlap between ESA foreign-listed species and CITES.

	Threatened (ESA)	Endangered (ESA)	TOTAL
Listed on CITES	40	377	417
Appendix I	(25)	(316)	(341)
Appendix II	(14)	(49)	(63)
Appendix III	(1)	(12)	(13)
Not listed on CITES	16	196	212
TOTAL	56	573	629 ^a

Note: All three of these listings were listed under CITES (two under appendix I/II and one under appendix II). ^aThree ESA listings were not threatened or endangered but were listed because of their similarity of appearance to a threatened taxon.

spending on foreign species in the period during which most of the foreign listings occurred (figure 2d). Since 2004, federal spending on foreign species has increased (from roughly \$525,000 to over \$13 million in 2012) but still represents less than 1% of all federal and state ESA-related spending (USFWS Expenditure Reports 1996–2012). For fiscal year 2013, funding caps on the listing program resulted in a total of \$13,453,000 available for listing domestic candidate species and \$1,498,000 for listing foreign species (Consolidated and Further Continuing Appropriations Act 2013). With a median cost of \$100,690 for preparing and publishing a 12-month finding, this difference in funding between the domestic and foreign listings programs results in a dramatic difference in processing capacity (US OFR 2012).

ESA foreign listings: Who benefits?

The ESA, as written, aims to protect all threatened and endangered plants and animals, although the petitioning process introduces an element of selection bias when it comes to which species are ultimately considered for designation (Metrick and Weitzman 1996, Ando 1999, Black et al. 2001, Takahashi 2011). We assessed the taxonomic, temporal, and geographic distribution of foreign listings and compared this with the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, a database considered to be the premier scientific assessment of global population trends. As of 2014, a total of 632 foreign species and 1561 domestic species are listed under the ESA (USFWS 2014). Early foreign listings were concentrated in Africa and Asia, whereas listings since 2000 have been more heavily concentrated in South America (figures 2a–c). Many foreign listings were included when the ESA was first established, and within the first 3 years of implementation, over 40% of the currently listed foreign species were added to the endangered species list (figure 2d). In contrast, only 7% of the currently listed domestic species were listed within the first 3 years of the ESA's existence. When compared with those on the IUCN Red List, the top 10 most highly represented families of ESA foreign listings (table 2a) do not include any of the top 10 most represented families of IUCN threatened species (table 2b). In fact, of the 10 families most represented on the IUCN Red List, only one

family, Cyprinidae (carps and minnows), had any species on the ESA foreign species list. Although 10,184 plant species are listed as threatened by the IUCN and 314 plant species are listed in appendix I of CITES, only 3 foreign plant species were listed as endangered or threatened by the ESA as of 2014 (IUCN 2014, USFWS 2014), highlighting the program's underrepresentation of less charismatic species.

Are foreign listings effective in furthering species recovery? One of the challenges of assessing the efficacy of listing foreign species on the ESA is that the US government provides little information on the trends and population status of foreign species. The USFWS Recovery Reports include only domestic listings, stating that “the Service has no authority to implement recovery programs for species outside US jurisdiction and the status of foreign populations is not discussed” (USFWS 1994). The NMFS Biennial Reports to Congress likewise include only domestic species, noting that “[a]lthough the ESA does not differentiate between domestic and foreign species [in the development and implementation of recovery plans], specific management actions are often not feasible for species whose range is either totally or primarily outside of US jurisdiction... Therefore, NMFS has focused recovery plans to those species primarily under US jurisdiction” (NOAA 1998).

Of the 632 foreign species that have been listed under the ESA, 7 species have recovered, representing a recovery rate of 1.10%. At first glance, this is comparable to the recovery rate of domestic species at 1.28% (20 recovered out of 1561 listed). Further examination, however, suggests that this recovery rate is actually inflated. Three of the recovered foreign species—the Palau ground dove (*Gallicolumba canifrons*), the Palau fantail flycatcher (*Rhipidura lepida*), and the Palau owl (*Pyroglaux podargina*)—were originally listed on the basis of incomplete survey information; their delistings should have been attributed to errors in the original data (Gordon et al. 1997, Doremus and Pagel 2001). In addition, Palau was governed by the United States at the time of listing and recovery and was therefore more similar to domestic listings in terms of legislative reach. Removing all Palau species from consideration (three recovered plus one currently endangered) yields a recovery rate of only 0.63%. Although

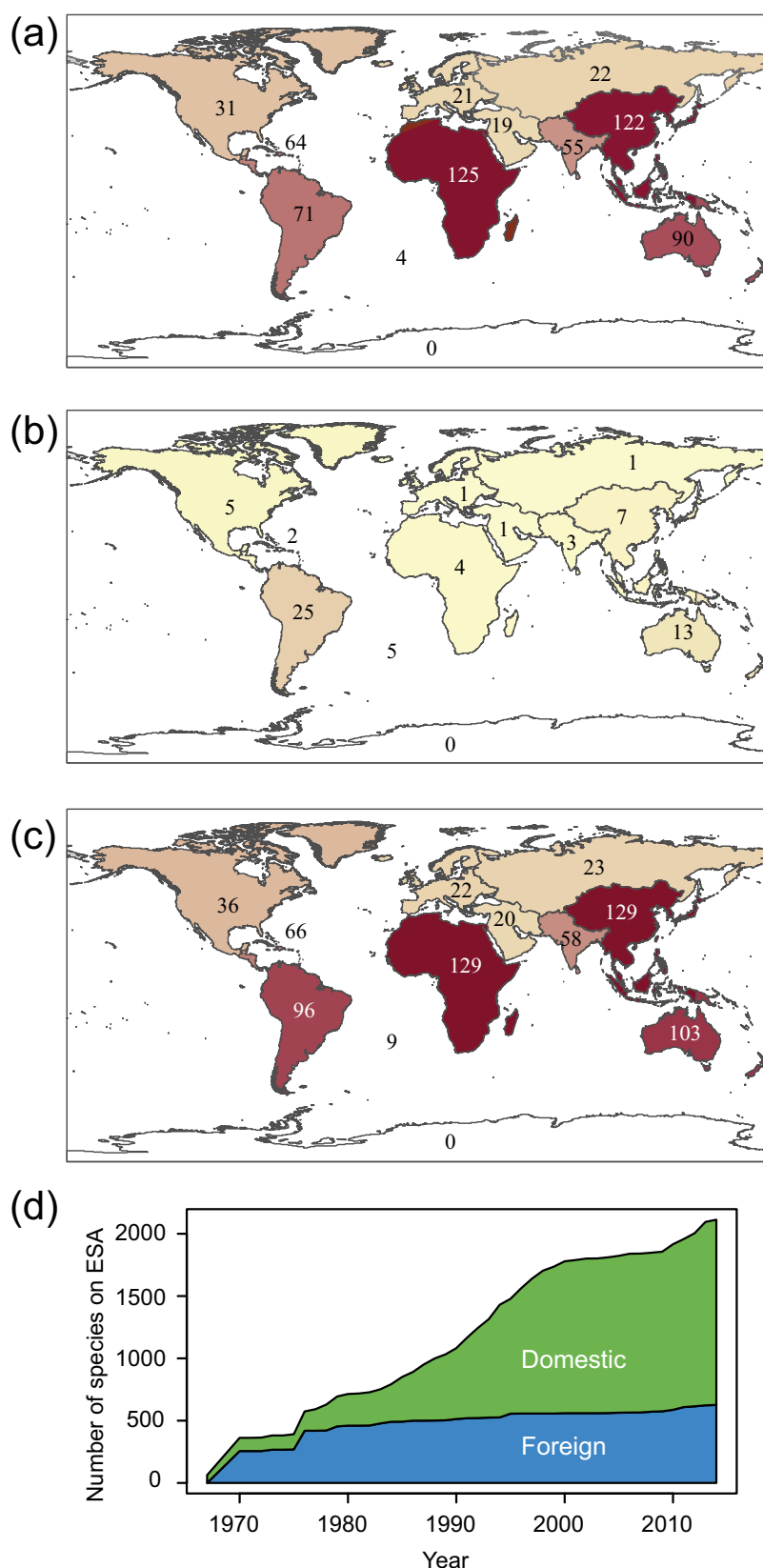


Figure 2. Map of Endangered Species Act (ESA) foreign listings by region in the periods (a) 1979–1999, (b) 2000–2014, and (c) 1979–2014. (d) The cumulative distribution of foreign (blue area) and domestic (green area) listings under the ESA, including those originally listed under the Endangered Species Preservation Act of 1966 and the Endangered Species Conservation Act of 1969. Note that foreign species listed as North American are native to Canada or Mexico.

Table 2a. The top 10 most represented families among foreign-listed species according to the ESA (IUCN 2014, USFWS 2014).

Family	ESA			
	ESA listed	Percentage ESA foreign listings	IUCN threatened	Percentage IUCN threatened
Bovidae	47	7.39	54	0.24
Cercopithecidae	31	4.87	73	0.33
Psittacidae	31	4.87	123	0.56
Cervidae	28	4.40	26	0.12
Felidae	24	3.77	16	0.07
Phasianidae	19	2.99	39	0.18
Iguanidae	17	2.67	29	0.13
Crocodylidae	15	2.36	8	0.04
Macropodidae	14	2.20	26	0.12
Muscicapidae	14	2.20	31	0.14

Table 2b. The top 10 most represented families among those species categorized as threatened by the IUCN (IUCN 2014, USFWS 2014).

Family	Taxa IUCN threatened	Percentage IUCN threatened	Taxa ESA listed	Percentage of ESA foreign
Leguminosae	718	3.24	0	0.00
Hydrobiidae	546	2.47	0	0.00
Cyprinidae	512	2.31	3	0.47
Compositae	425	1.92	0	0.00
Cactaceae	415	1.87	0	0.00
Rubiaceae	388	1.75	0	0.00
Euphorbiaceae	382	1.72	0	0.00
Dipterocarpaceae	370	1.67	0	0.00
Cichlidae	346	1.56	0	0.00
Palmae	321	1.45	0	0.00

not significantly different from the domestic recovery rate (assuming a type-I error cutoff of 0.05), this lower recovery rate suggests that the ESA's restricted application to foreign species may hamper our ability to achieve recovery goals. This is an important consideration, because although many academic studies will explicitly limit consideration of the ESA's efficacy to domestic species, the distinction between the domestic and foreign programs is often muddled. The ESA Congressional Working Group published their conclusion that "with less than 2% of species removed from the ESA list in 40 years, the ESA's primary goal to recover and protect species has been unsuccessful" (Hastings et al. 2013).

To further assess the impact of listing foreign species, we used a multistate Markov model, fit using the R package 'msn' (Jackson 2014), to assess whether being listed as threatened or endangered on the ESA had a statistically significant impact on the probability of transitioning among IUCN Red List categories. We considered all foreign species within eight families (Felidae, Bovidae, Psittacidae,

Alligatoridae, Iguanidae, Cervidae, Cercopithecidae, and Crocodylidae) whose populations had been evaluated by the IUCN at least twice (excluding the categories *data deficient* and *indeterminate*), and we examined transitions among categories as a function of listing status during the period between IUCN evaluations. There were 526 foreign species included in the final analysis, including 137 listed on the ESA. We found that although being listed on the ESA was associated with an overall increase in transitions between *least concern* and *near threatened* (the two lowest IUCN risk categories), uplistings and downlistings were roughly balanced. We found no evidence that being listed on the ESA was associated with significant changes in transition rates among any of the other categories, including the transition from *critically endangered* to *extinct*, and no evidence that being listed on the ESA correlated with an increased rate of transition to a lower threat category. Therefore, we find no evidence to suggest that being listed on the ESA affects population stability, prospects for recovery, or risk of

extinction. This is not a trivial consideration because one of the major criticisms of the ESA is a poor record for improving population status. Therefore, our inability to achieve recovery for foreign-listed species may lower the apparent efficacy of the ESA.

It is worth noting in this regard that many species are listed on the ESA even though they are classified as of least concern (using the Lande-Mace protocols; Mace and Lande 1991) by the IUCN (figure 1). We find that these species fall into one of three categories. A subspecies or population segment (“distinct population segment”) may be listed under the ESA even if the species (broadly defined) is categorized by the IUCN as of least concern. For example, the serval *Leptailurus serval constantina* subspecies is listed as endangered under the ESA, but the species as a whole is considered to be of least concern by the IUCN. Alternatively, a species may have been listed under the ESA when the species was considered to be threatened, but the species may have recovered since its initial listing (e.g., the scarlet-chested parakeet, *Neophema splendida*). For species that recovered and were eventually delisted ($n = 7$), we find an average of 6.1 years between the IUCN downlisting and the ESA delisting. Given the time lags involved in the process for delisting a species under the ESA, it is not surprising that some species remain listed under the ESA long after the IUCN has recategorized them as of least concern. Finally, a small fraction of species have had fluctuating population status assessments that include, temporarily, periods when they have been considered by the IUCN as of least concern (e.g., Pennant’s colobus *Procolobus pennantii*).

Does listing foreign species increase public awareness? Outside the explicit protections afforded by the ESA and direct measures of efficacy, conservation groups, as well as the Branch of Foreign Species itself, have suggested that designation as threatened or endangered provides indirect benefits, such as greater public and scientific awareness (USFWS 2016, American Bird Conservancy 2006). The increase in attention offered to a listed foreign species may in turn increase private and federal funding for research or conservation efforts. To determine the effect of listing on scientific research, we used Web of Science to conduct a systematic review of the number of publications associated with six families: Accipitridae, Alligatoridae, Cervidae, Crocodylidae, Felidae, and Iguanidae. The number of publications on listed species for the 10 years prior to listing and the 10 years following listing was compared with the baseline publication rate for unlisted species of the same family. The results suggest that ESA listing may, indeed, spawn additional research, but these results are limited to charismatic and game species. Species considered less charismatic enjoyed little change in the rate of scholarly publication following listing (figure 3), a bias that has been noted in other contexts (Flemming and Bateman 2016).

Aside from academic research, there is some anecdotal evidence that foreign listings may raise political awareness of species at risk. For example, the red kangaroo (*Macropus rufus*) was listed as threatened in 1974, soon after the passage

of the ESA (US OFR 1974). By 1981, however, Australian states had developed regulation and certification processes for kangaroo harvesting, and the following year, the Australian government petitioned the USFWS to delist the red kangaroo, under the assurances that should the species suffer decline, commercial harvest would cease (US OFR 1983). Despite considerable opposition by both the public and conservation groups, the red kangaroo was delisted in 1995 (US OFR 1995b). The fact that it was the Australian government specifically that petitioned for the kangaroo’s delisting suggests that the ESA process does have the potential to increase awareness and apply political pressure overseas.

The future of the foreign-listings program: The ESA and climate change

In recent years, increasing attention has been paid to species that may be negatively affected by climate change and, in particular, how this might affect the ESA listing process (McClure et al. 2013, Seney et al. 2013). The elkhorn and staghorn coral listings in 2006 were the very first to mention climate change, but only as a possible future threat and not the primary threat justifying listed status. The polar bear (*Ursus maritimus*; a domestic species), however, was the first endangered species to cite climate change as the *primary* threat to survival; since its listing in 2008, almost 40% of all 48 listed foreign species have cited climate change as an explicit threat justifying listing (figure 4). Despite the increasing use of climate change as a motivation for an ESA petition (e.g., emperor penguin, relict leopard frog, and headwater chub), the ESA has not yet been successfully used to address the causes of climate change or limit carbon emissions or power-plant development (Corn and Alexander 2014), and legislation to forestall its use in this context has already been introduced (e.g., the Energy Production and Project Delivery Act of 2013). The interest in using the ESA to limit carbon emissions will likely continue as climate change becomes implicated as a threat to more species, many of which are likely to be foreign, even though the effectiveness of the ESA in this context remains uncertain. Conservation biologists should follow this issue, because it is a particularly fluid area of the law that has far-reaching implications for the future of the ESA and its capacity to protect foreign species.

Conclusions

Listing a foreign species under the ESA signals the commitment of the United States to conserve an important environmental resource and provides a symbolic gesture that may encourage other countries to redouble their efforts to prevent species extinction. Although the ESA has considerable power within the United States to designate habitat for conservation and mandate conservation actions, its reach outside US jurisdiction is inherently limited. Although some may champion the law but curse its interpretation as manifest by current regulations, the fact remains that the legal protections afforded by the ESA

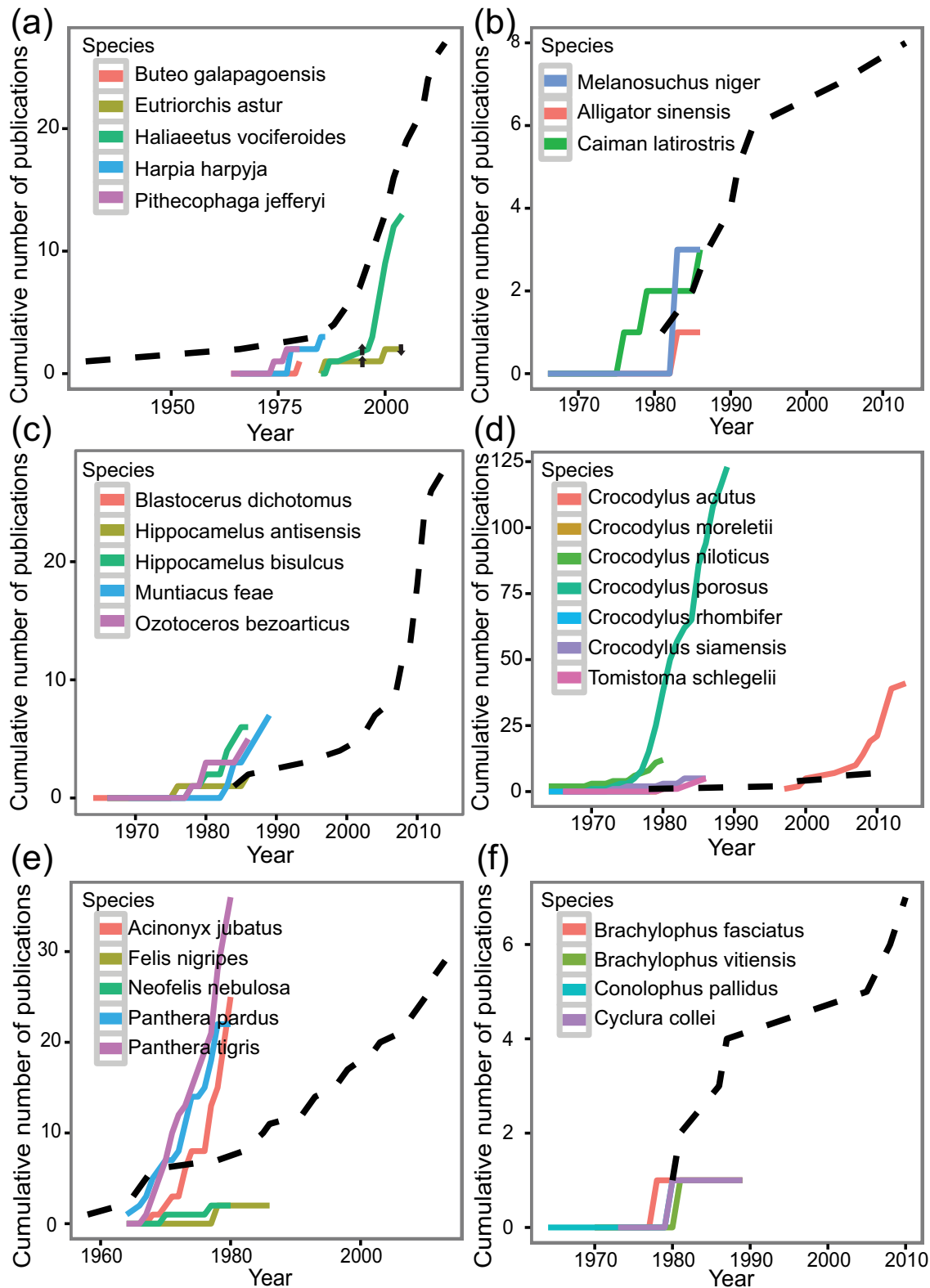


Figure 3. The number of academic publications for foreign-listed species (colored lines) in the period 10 years before to 10 years after their listing as compared with a nonlisted but taxonomically similar species in the same family (black dashed line) for (a) Accipitridae, (b) Alligatoridae, (c) Cervidae, (d) Crocodylidae, (e) Felidae, and (f) Iguanidae. Changes in IUCN status for each species during the time period analyzed are noted with up arrows (upgrading the threat level) or down arrows (downgrading the threat level). Publications include all those returned by Web of Science in which the Latin name or the common name appeared under “topic” or in the manuscript’s title.

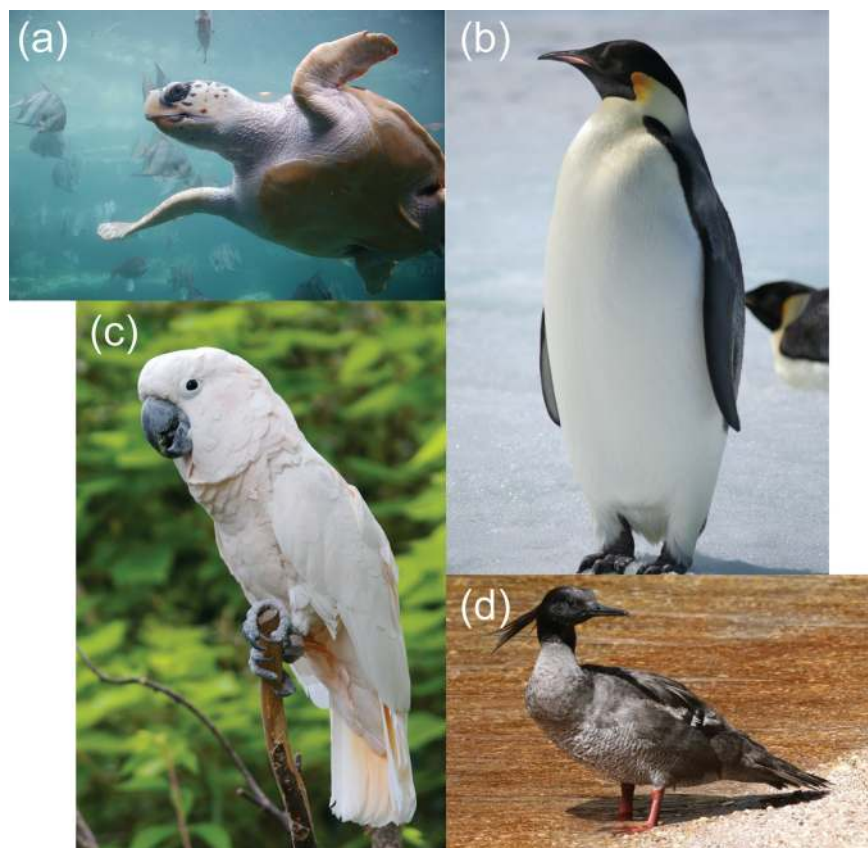


Figure 4. The species being petitioned for listing or currently listed under the Endangered Species Act because of threats posed by climate change. (a) Loggerhead sea turtle, listed (*Caretta caretta*; photograph: Upendra Kanda, CC-BY-2.0); (b) emperor penguin, petitioned, under review (*Aptenodytes forsteri*; photograph: Heather Lynch); (c) salmon-crested cockatoo, listed (*Cacatua moluccensis*; photograph: John Moose, CC-BY-2.0); and (d) Brazilian merganser, listed (*Mergus octosetaceus*; photograph: Sávio Freire Bruno CC-BY-SA-3.0).

are generally unenforceable outside of US jurisdiction. The USFWS describes two primary benefits of listing foreign species: regulatory control within US jurisdiction and conservation benefits spawned by the ESA listing process (USFWS 2016, NMFS 2016). Although this is certainly true, current policies associated with foreign-species ESA implementation greatly limit the regulatory control, and the conservation benefits, such as increased research funds, are not universally enjoyed by foreign-listed species. Direct financial costs of foreign listings appear limited, because foreign ESA expenditures represent a very small proportion of the total conservation budget. However, the time and energy of federal scientists who must consider petitions—and manage listings—for foreign-listed species may present a significant burden. As of November 2013, there was a backlog of 146 domestic candidate species (US OFR 2013), suggesting that the current level of resources for federal consideration of listed species is insufficient. Delayed protections for domestic species backlogged by

this process may create even bigger recovery challenges (Wilcove et al. 1993).

Our analysis indicates that many of the benefits afforded to listed foreign species are, at best, indirect and suggests that the foreign species listed under the ESA may not accurately reflect which foreign species need protection. In addition, our review finds no evidence to suggest that listing foreign species under the ESA improves their population status. Most of the species listed under the ESA are protected under CITES or the Lacey Act, and the additional legal protections offered by the ESA may be unenforceable or of little marginal value. Although population recovery may be disputed as a measure of the ESA's effectiveness (Doremus and Pagel 2001), our inability to effectively manage conservation outside US jurisdiction may exacerbate the ESA's mixed track record in this regard. In addition, although listing species under the ESA may stimulate increased research for charismatic species and may have additional symbolic benefits, the direct and practical benefits of listing foreign species under the ESA are severely limited.

Conservation biologists should be aware that although listing foreign species may be viewed as an important step in preventing extinction overseas, additional conservation actions within the international political arena may be

necessary. Reviewing the act's role in protecting foreign species is especially timely given the recent fortieth anniversary of the ESA, and we hope our overview of the ESA foreign-listings program will have clarified a complex area of conservation law and provoke a conversation within the conservation community regarding the ESA's role in protecting species overseas.

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