

PETITION TO LIST THE
Ridgway's Hawk (*Buteo ridgwayi*)
UNDER THE U.S. ENDANGERED SPECIES ACT



Male Ridgway's hawk calling. (Photograph used with permission)

**Petition Submitted to the U.S. Secretary of Interior
Acting through the U.S. Fish and Wildlife Service**

Petitioner:

WildEarth Guardians
1536 Wynkoop Street, Suite 301
Denver, Colorado 80202
303.573.4898

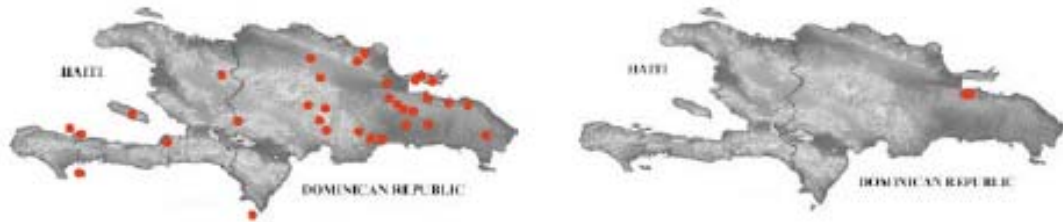
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SUMMARY

WildEarth Guardians requests that the U.S. Fish and Wildlife Service (FWS) list the Ridgway’s hawk (*Buteo ridgwayi*) as a “threatened” or “endangered” species under the Endangered Species Act (ESA). Ridgway’s hawks survive as a small and fragmented population in one location in the wild (Woolaver 2006: 3). The number of breeding pairs continues to decline. Once found throughout Hispaniola and adjacent islands, and at least one island off of Puerto Rico, the species range has been reduced to one location in the Dominican Republic – Los Haitises National Park and lands immediately adjacent (Thorstrom 2004; Thorstrom et al. 2005: 865; Figure 1). The protection offered by the park is considered ineffective and the forest is being rapidly cleared as the Dominican Republic’s human population increases (growth rate is estimated at 1.33 percent, CIA 2011: 2). The most recent estimate of the Ridgway’s hawk population was 80-100 pairs, confined to approximately 208 k² of rainforest (Woolaver 2006: 3), or 160-240 mature individuals (BirdLife International 2011: 1).

Figure 1. Maps of Hispaniola (Dominican Republic and Haiti) showing historic (left) and current (right) distribution of *Buteo ridgwayi* (Woolaver 2006: 3).



The International Union for Conservation of Nature (IUCN) has listed the Ridgway’s hawk as “critically endangered” since 2000, indicating that the species is extremely vulnerable to extinction in the wild (IUCN 2010) (see Table 1).

Table 1. IUCN Assessment of *Buteo ridgwayi*

Red List Category and Criteria	Critically Endangered C2a(i) ver 3.1
Year Assessed	2010
Justification	This species is considered Critically Endangered because it has an extremely small and fragmented population, which continues to decline. Only effective protection of Los Haitises National Park and captive breeding and release are likely to save this species from extinction.
History	2009 – Critically Endangered 2008 – Critically Endangered 2004 – Critically Endangered 2000 – Critically Endangered 1994 – Endangered 1988 – Threatened

Hispaniola, a Caribbean Islands Hotspot, is exceptionally important for global biodiversity conservation (Wege et al. 2009: 1). Specifically,

[t]he island of Hispaniola is of international priority for conservation science due to its unique biological diversity and the high degree of threat to the endemic flora and fauna. The island has a particularly distinct avifauna with six endemic genera, and is one of the highest rated Endemic Bird Areas in the world. The Dominican Republic covers the eastern two-thirds of Hispaniola. Less than 10% of the Dominican Republic remains forested and the remaining areas of native pine, rain and cloud forests are highly fragmented and in immediate danger of further loss due to unregulated logging, slash-and-burn agriculture, and cutting for charcoal production... Currently, 21 of the 32 endemic bird species are considered threatened and very little data exists regarding the ecology and status of the majority of these species. Conservation is therefore constrained by lack of even the most basic ecological data.

(Woolaver 2006: 1, internal citations omitted).

The most effective way to prevent the Ridgway's hawk from becoming extinct is to enforce effective protection of Los Haitises National Park and create a captive breeding program to increase its population and distribution (IUCN 2010: 1). The species has been seen on the island of Culebra (east of Puerto Rico) indicating that hawks may use and/or fly over Puerto Rico to go from the Dominican Republic to Culebra (*see* Figure 2). FWS should investigate the likely possibility that these hawks originally used or lived on Puerto Rico and other nearby islands that offer suitable habitat for the species.

Major threats to the Ridgway's hawk are deforestation, wood burning, and other human activities that eliminate and fragment forest habitat (BirdLife International 2011: 1). In the Dominican Republic most forested areas are currently being converted to farmland and only 10 percent of the country is primary forest (Woolaver 2006: 2). Virtually all primary rainforest has been destroyed, and "the remaining secondary fragments are being cleared at a rapid rate" (Birdlife International 2011: 1). Further, there are significant deforestation problems in Los Haitises National Park due to "unregulated logging, slash and burn agriculture and cutting for charcoal production" (Woolaver 2006: 2). Although the park is supposed to be protected, there is limited enforcement and local people are unaware of park boundaries (Birdlife International 2011: 1). The Ridgway's hawk is also commonly persecuted as poultry-killers (Curti 2005; Thorstrom 2004).

Figure 2. Map of the Caribbean. The red arrow depicts how Ridgway’s hawks might have once used and/or perhaps still use or fly across Puerto Rico to reach Culebra (east) from the Dominican Republic (west).



PETITIONER

WildEarth Guardians is a nonprofit environmental advocacy organization that works to protect wildlife, wild places and wild waters. The organization has more than 12,000 members and supporters and maintains offices in New Mexico, Colorado and Arizona. WildEarth Guardians has an active endangered species program that works to protect imperiled species and their habitat throughout the United States and beyond.

THE ENDANGERED SPECIES ACT AND IMPLEMENTING REGULATIONS

The Endangered Species Act of 1973 (ESA) protects plants and animals that are listed by the federal government as “endangered” or “threatened” (16 U.S.C. § 1531 et seq.). Any interested person may submit a written petition to the Secretary of the Interior requesting him to list a species as “endangered” or “threatened” under the ESA (50 C.F.R. § 424.14(a)). An “endangered species” is “any species that is in danger of extinction throughout all or a significant portion of its range” (16 U.S.C. § 1532(6)). A “threatened species” is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. § 1532(20)). “Species” includes subspecies and distinct population segments of sensitive taxa (16 U.S.C. § 1532(16)).

The ESA sets forth listing factors under which a species can qualify for protection (16 U.S.C. § 1533(a)(1)):

- A. The present or threatened destruction, modification, or curtailment of habitat or range;
- B. Overutilization for commercial, recreational, scientific, or educational purposes;
- C. Disease or predation;
- D. The inadequacy of existing regulatory mechanisms; or
- E. Other natural or manmade factors affecting its continued existence.

A taxon need only meet one of the listing criteria outlined in the ESA to qualify for federal listing.

If the Secretary determines that a species warrants a listing as “endangered” or “threatened” under the ESA, he is obligated to designate critical habitat for that species based on the best scientific data available (16 U.S.C. § 1533(b)(2)).

CLASSIFICATION AND NOMENCLATURE

Common Name. *Buteo ridgwayi* is known by the common name “Ridgway’s hawk” and “Hispaniolan hawk.” It is known as “Busardo de la Española” in Spanish (IUCN 2010: 1). We refer to the species as “Ridgway’s hawk” or “hawk” in this petition.

Taxonomy. The taxonomic classification for *Buteo ridgwayi* (Cory 1883) is shown in Table 2.

Table 2. Taxonomy of *Buteo ridgwayi*.

Phylum	Chordata
Class	Aves
Order	Falconiformes
Family	Accipitridae
Genus	<i>Buteo</i>
Species	<i>Buteo ridgwayi</i>

SPECIES DESCRIPTION

The Ridgway’s hawk is a compact bird that ranges in size from 36-41 centimeters (14.2-16.1 inches). Male hawks are slightly smaller (330-350 grams) than females (360-420 grams). Adults are brown-grey on their upper parts, with grayish bars and a reddish-brown wash on their underparts, rufous (strong yellowish pink to moderate orange; reddish) thighs, and a black-and-white barred tail. Males are grayer overall, with bright rust shoulders and a neutral gray belly. Females are browner with drab, brown shoulders; their breasts are lighter with more barring; their bellies are gray with a reddish-pink tint;

and their tails are more heavily barred. Both sexes have white crescent-shaped wing panels or “windows” that are visible during flight. Immature hawks have buffy white underparts with grey and brown streaks, and less well marked tails (BirdLife International 2011: 1; Wiley and Wiley 1981: 133-134) (*see* Figure 3).



Figure 3. Sketch of *Buteo ridgwayi*. (BirdLife International 2011)

LIFE HISTORY

Habitat Requirements. Ridgway’s hawk uses a variety of habitats, including rainforest, subtropical wet, dry, and moist forests, pine forest, and limestone karst forest (Wiley and Wiley 1981: 147). It has also been recorded in secondary and agricultural habitats (Wiley and Wiley 1981: 147; Thorstrom et al. 2005: 867). However, the species appears to prefer mature, subtropical wet forests, woodlands, and forest edge habitat (Thorstrom et al. 2005: 865). Ridgway’s hawks are found up to approximately 2000 meters (6561.7 feet) in elevation. They usually nest in the crowns of tall, endemic trees such as the Hispaniolan royal palm (BirdLife International 2011: 1).

Diet and Hunting Behavior. Ridgway’s hawks prey primarily on lizards, snakes, and frogs, and occasionally on small mammals (bats and rodents), centipedes, and small birds (BirdLife International 2011: 1). Prey items fed to nestlings are primarily *Celestus* skinks, *Uromacer spp.* tree snakes, and *Anolis* lizards, with some *Eleutherodactylus* tree frogs, small mammals, and small birds (Woolaver 2006: 4). Wiley and Wiley (1981: 142) observed the hawks using “four basic hunting techniques: (1) Still-Hunting, (2) Hang-Searching, (3) Foot-Thrusting, and (4) Direct Stoop from soaring.” The hawks used two types of Still-Hunting techniques; in both kinds, the bird searches the surrounding area from its perch. The Hang-Search technique involves the hawk leaving its perch in a very slow flight, appearing to hunt the area below it, especially the tree branches. It then suddenly dives, cleanly snatching up its prey. During the Foot-Thrust technique, the bird plunges its foot into flowers, such as bromeliads or orchids, in an attempt to flush prey out of them. Finally, during the Direct Stoop from soaring technique, the bird stoops from a soaring flight in an attempt to capture its prey (Wiley and Wiley 1981: 142).

Reproduction and Dispersal. Ridgway’s hawks build their nests between January and March (IUCN 2010: 2). Males build most of the nests; Wiley and Wiley (1981: 137)

observed the males making 76 percent of the trips bringing material to the nest. Females appeared to become more involved with nest building during the later stages (Wiley and Wiley 1981: 137). Females lay eggs (typically 2-3) between February and April. Males are known to participate in incubation (IUCN 2010: 2;). Pairs usually rear only one or two chicks. Male attendance at the nest dropped off greatly by week five, when the chicks began to hatch, and males visited the nest only to deliver food (Wiley and Wiley 1981: 139-140). Overall average productivity was 1.6 ± 0.1 young per successful breeding attempt, and 0.6 ± 0.2 young per breeding attempt (Thorstrom et al. 2007).

The Ridgway's hawk is a K-selected species. It has a small number of offspring in which it invests significant energy (Withgott and Brennan 2007: 139). Due to the hawk's breeding habits, their population would tend to stabilize near carrying capacity over time under natural conditions. This makes it difficult for the species to recover when the population declines at dramatic rates, making it vulnerable to extinction. The hawk has a low biotic potential (ability to produce offspring). "The interaction between an organism's biotic potential and the environmental resistance to its population growth helps determine the fate of its population" (Withgott and Brennan 2007: 139). Due to deforestation, human persecution, and other threats, there is significant environmental resistance to Ridgway's hawk population growth, and their K-selected reproduction strategy may not be sufficient to overcome these challenges. The species is increasingly incapable of raising enough young to stabilize their population, increasing their risk of extinction.

GEOGRAPHIC DISTRIBUTION

Historic. Ridgway's hawk is endemic to Hispaniola and surrounding islands. It was found in both Haiti and the Dominican Republic and surrounding areas, including the adjacent Haitian islands of Île de la Gonâve, the Cayemite Islands (reportedly common in 1934), and Île-à-Vache (reportedly common in 1962, but now apparently extirpated), and the Dominican islands of Isla Beata and Isla Alto Velo (IUCN 2010: 1). The species was also seen on the island of Culebra east Puerto Rico (IUCN 2010: 1). This may indicate that the Ridgway's hawk might have once used and/or perhaps still use or fly across Puerto Rico to go from the Dominican Republic to Culebra (*see* Figure 2). This species was formerly widespread but is now rare (IUCN 2010: 1).

Current. The Ridgway's hawk is presumed extinct in Haiti due to extensive habitat loss (Brocca and Thorstrom 2010: 1; IUCN 2010: 2; Thorstrom 2004) and only has one stronghold remaining—Los Haitises National Park in the Dominican Republic (Thorstrom et al. 2005: 865) (Figure 1). The park is considered a "Wholly Irreplaceable Site in the Caribbean Islands Hotspot" by BirdLife International (Wege et al. 2009: 13). Currently, the Peregrine Fund is "attempting to establish a new population in the private reserve of Loma la Herradura by translocating individuals from the Los Haitises National Park" (IUCN 2010: 1). To date four juveniles have been successfully relocated to this area (IUCN: 2). Relocation efforts are expanding to Punta Cana. Brocca and Thorstrom (2010: 3) write that "[the four hawks released in Loma la Herradura] did so well that the following year we released six more birds – three in Loma la Herradura and three in the

Ecological Reserve of Punta Cana... [M]ost of the released birds are doing well and continue to hunt and survive on their own. This coming year we plan to do more releases to help increase the number of birds in the two areas and eventually, create several breeding populations.”

POPULATION STATUS AND TRENDS

The last survey of the Ridgway’s hawk (in 2007) found only 40 fledglings were produced from 27 successful nests (IUCN 2010: 1). Very few individuals have been recorded outside Los Haitises in the past few years and the number of breeding pairs is currently unknown. It is estimated that there are 80-100 pairs (Woolaver 2006: 3) or 160-240 mature individuals (BirdLife International 2011: 1).

The species population is decreasing rapidly (IUCN 2010: 1).

Ongoing monitoring at Los Limones in the east of Los Haitises National Park shows a 5-10 percent annual decline in the number of individuals at this site, equating to a decline over ten years of 40-65 percent. Declines in the west of the park are expected to be continuing at a similar, although perhaps slower rate, hence overall rates of decline are perhaps best estimated to fall within the band 30-50 percent over ten years. However, forest clearance within the park boundary remains rapid with an annual loss of c.10-15 percent, thus careful monitoring is a priority and it may reveal that a higher rate of decline is occurring.”

(BirdLife International 2011: 1).

IDENTIFIED THREATS TO THE PETITIONED SPECIES: CRITERIA FOR LISTING

The Ridgway’s hawk meets at least four of the criteria for listing identified in ESA Section 4 (16 U.S.C. §1533(a)(1)).

(Factor A) The Present or Threatened Destruction, Modification, or Curtailment of the Species’ Habitat or Range

Dominican Republic. Over 90 percent of the primary forest in the Dominican Republic has been destroyed due to human encroachment, deforestation, and conversion to agriculture (Woolaver 2006: 1). According to the World Bank, ten million people are estimated to live in the Dominican Republic, and 50.5 percent live in poverty (WB 2011: 1). The population is projected to continue to increase at a rate of 1.33 percent (CIA 2011: 2). Human agriculture for *conucos* (mixed plantings of root crops, banana, citrus, and cocoa) and coconuts has rapidly eliminated hawk habitat (Thorstrom et al. 2005: 865).

Remaining Ridgway hawks are confined to degraded and fragmented patches of forest in Los Haitises National Park. Although this park is 208 square kilometers, there are no apparent boundaries, making it difficult for local people to recognize what land is inside the park. Local people are also unaware of the park’s biological significance (Woolaver

2006: 5). The annual forest loss within the park is estimated at 10-15 percent due to lack of protection and enforcement (IUCN 2010: 1-2).

Haiti. Currently less than 1.5 percent of Haiti is primary forest (Vermont Center for Ecostudies 2011). Ridgway's hawk is considered extinct in Haiti (IUCN 2010: 2).

Other Islands. The Caribbean in general is one of the most threatened bastions of biodiversity in the world. "The Caribbean Islands Hotspot is one of the world's greatest centers of biodiversity and endemism, yet its biodiversity and the natural services it provides are highly threatened. Although the islands have protected areas systems, most are inadequately managed and important areas lack protection" (Wege et al. 2009: viii). The Caribbean is one of five "biodiversity hotspots" that "contains endemic plants and vertebrates amounting to at least 2 percent of total species world-wide... At the same time, they feature some of the most depleted habitats: the Caribbean retains only 11.3 percent of its primary vegetation" (Myers 2000: 855). The Caribbean Islands face threats from invasive species, residential and commercial development, agricultural expansion and intensification, severe weather and climate change, over-exploitation, pollution, and other factors (*see* Wege et al. 2009: 51-62). Potential habitat for the Ridgway's hawk in other Caribbean Islands of the Caribbean are at risk from these threats.

(Factor B) Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Woolaver (2006: 2) noted that "hunting and persecution of birds for food and as crop-pests has... had a significant impact" on bird species in Hispaniola. Direct human persecution is one of the most significant causes of decline in Ridgway's hawk (Thorstrom 2004). The Ridgway's hawk has a "misplaced reputation as a fierce chicken hunter" in the Dominican Republic (Curti 2005). "They are being shot, in large part, due to a case of mistaken identity. They are being confused with the much more common Red-tailed Hawk *B. jamaicensis*, which occasionally does prey on free-ranging domestic poultry. However, during our studies which documented nearly 150 prey items, we did not see one case of a Ridgway's Hawk feeding on chickens. They prefer, instead, to feed on lizards, snakes, frogs and small rodents – and are, in actuality, important in helping to limit the rodent population on the island" (Brocca and Thorstrom 2010: 1). Curti (2005) noted the difficulty of convincing farmers to save Ridgway's hawks when they fear the birds will kill their chickens, a main source of food and income. Curti approached this dilemma by educating local people about the Ridgway's hawk's role in controlling unwanted pests, especially rodents, and their resulting benefit to the community (Curti 2005). There is still a significant amount of work to be done in this area (Curti 2005).

In 2005, Woolaver observed four Ridgway's hawk nests being destroyed by human activity during the nesting stage. He observed a fifth nest abandoned during incubation when two local men flushed a female during a rainstorm and then attempted to kill her with a slingshot. Woolaver suspected that human disturbance caused another five nests to fail (Woolaver 2005: 14). Thorstrom et al. (2007: 36) also noted significant impacts to hawks from human activities, including persecution:

“[o]f 77 breeding failures, most were due to human impacts including fires for clearing land and uncontrolled wildfires, cutting nesting trees for use in building materials, collecting nestlings for food consumption, and persecution of hawks near nests. From 2003-2005, 13 adult Ridgway's Hawks were killed by people because the hawks are predatory birds and are believed to kill poultry. One local hunter claimed in the last decade to have killed more than 100 hawks in one community along the southwestern park boundary.”

(Factor C) Disease or Predation

Disease and predation do not currently threaten Ridgway's hawk. However, due to a small population size and limited range, a stochastic event or disease outbreak could cause the extinction of the species. “Climate change, particularly changes in temperature and rainfall patterns, may also lead to the establishment of new diseases in the region or exacerbate existing ones that previously were not a problem and poses a potential threat to native biodiversity” (Wege et al. 2009: 72, internal citations omitted). FWS should investigate possible threats from disease or predation in its review of this species.

(Factor D) The Inadequacy of Existing Regulatory Mechanisms

Dominican Republic. The Ridgway's hawk is listed as “critically endangered” by the Dominican Republic Ministry of the Environment and Natural Resources (SEMARN) (Brocca and Thorstrom 2010: 1). However, SEMARN was quickly established during the 2000-2004 presidential term, and has limited resources for species protection. “As a new ministry, which in the short-term at least represents a cost center, the environmental ministry is in a weak position in debates with other ministries such as tourism and agriculture, which generate revenue and employment... On top of the challenges posed by the ad hoc and highly politicized culture of the Mejía administration, the economic and fiscal crisis after April 2003 meant more limited resources for the environmental portfolio” (FESS 2005: 57). SEMARN must also deal with contradictory policy from other ministries, which hinder habitat protection. “The prevention of... slash and burn practices is the responsibility of the ministry of the environment and the environmental police. But that task is made more difficult—and the Dominican state is working at cross-purposes—when agricultural policy promotes hillside farming... in the highest and most forested areas...” (FESS 2005: 52). It is unclear how much protection the SEMARN designation actually provides to the hawk.

Although Los Haitises National Park is considered a national wildlife refuge, there is little enforcement to ensure that species within the national park are actually protected. Park boundaries are unnoticeable to local people and there is little to no enforcement of regulations against logging, slash and burn agriculture, and cutting for charcoal production within the park (Woolaver 2006: 2). “The laws covering specific sectors, such as protected areas, have been enacted only recently or have not yet been enacted” (FESS 2005: 9). Furthermore, park administration is considered “incompetent and corrupt” and the change in government in the Dominican Republic has allowed for increased cutting of

forested areas (Woolaver 2006: 5). Indeed, corruption “continues to be a key concern” for SEMARN (FESS 2005: 9). Less than 10 percent of the Dominican Republic is forested and the remaining areas of native pine, rain, and cloud forests are extremely fragmented and in immediate danger of further loss (Woolaver 2006: 2). As the human population of the Dominican Republic increases, deforestation for economic and subsistence activities, such as cutting trees for charcoal, unregulated logging, etcetera, will likely increase as well.

Numerous international and non-governmental organizations recognize the Ridgway’s hawk as critically endangered and are initiating conservation projects. The Peregrine Fund launched a publicity campaign in 2005 to raise public awareness of the species. The organization also initiated research on the species’ breeding ecology and conservation genetics. In 2006 four community meetings were held at villages near Los Haitises National Park to discuss the uniqueness and importance of the hawk. They were extremely successful and nearly 70-80 villagers attended each one (Woolaver 2006: 6). “[I]t will be imperative to continue working with local people, who are essential for the conservation of these raptors” (Curti 2011: 2). While these efforts are both commendable and essential, they are not mandated by legal requirements nor do they represent any form of regulatory protection.

Haiti. We are not aware of any laws or regulations that protect the Ridgway’s hawk or its habitat in Haiti.

Other Islands. We are not aware of any laws or regulations that protect Ridgway’s hawk or its habitat in Culebra, Puerto Rico, or other Caribbean Islands that may have suitable habitat for the hawk.

(Factor E) Other Natural or Man-made Factors Affecting its Continued Existence

Small Population Size. The small number of individuals left in the wild may have a negative effect on genetic diversity and could be limiting genetic variation among offspring, but the effects of population decline is not yet known. As of 2006, remaining individuals are being examined to determine if inbreeding is occurring and if so what effect it is having on the population (Woolaver 2006: 5). Since the hawk is a K-selected species with low biotic potential (as described above), it is extremely susceptible to extinction in the face of rapidly declining numbers.

With approximately 160-240 Ridgway’s hawks remaining in the wild, it is highly possible that one stochastic event (such as a fire, earthquake, tropical storm, etc.) could eliminate the species and/or destroy its habitat, causing extinction. “Population size matters; small populations are more likely to go extinct as a result of chance effects (known as the small population paradigm)” (Brook et al. 2008: 455, internal citation omitted). FWS has frequently recognized small population size as a threat to species’ persistence.¹

¹ See, for examples, candidate assessment forms for *Porzana tabuensis* (spotless crane, April 2010), *Eumops floridanus* (Florida bonneted bat, March 2010), *Vagrans egistina* (Mariana wandering butterfly,

Climate Change. Climate change is expected to impact the Caribbean in several ways. Increased temperatures, decreased precipitation, an increased number of severe storms and hurricanes, and shifts and shrinkage of montane habitat are symptoms of climate change that could negatively impact the Ridgway's hawk and its habitat.

Climate in the Caribbean has already begun changing following the pattern observed globally and elsewhere in the Northern Hemisphere. Temperatures and the frequency of extreme weather events, such as hurricanes and droughts, have already increased in the region, and there is particular concern over predicted sea level rise... Climate change is projected to have profound effects on the Caribbean Islands Hotspot in terms of increasing air temperature, changes in rainfall patterns and quantities and rising sea-levels... The Intergovernmental Panel on Climate Change (IPCC) predicts that temperatures in the Caribbean will rise between 1.4°C and 3.2°C by the end of the 21st century. Other estimates give a similar range e.g. the PRECIS Caribbean Climate Change Project predicts an increase of 1°C to 5°C in the Caribbean by the 2080s. The north-western countries (Cuba, Jamaica, Haiti and the Dominican Republic) are likely to experience the greatest warming... In general, rainfall is anticipated to decrease throughout the Caribbean, particularly in the summer wet season, except in the southern Bahamas and western Cuba. At the same time, hurricanes are predicted to become more severe with increased precipitation and higher peak wind speeds.

(Wege et al. 2009: 70, internal citations omitted).

The Caribbean is one of the most hurricane prone regions of the world and has had 260 tropical storms and hurricanes pass through the Eastern Caribbean and 347 through the Bahamas and Turks and Caicos region between 1851 and 2008... [T]he loss, fragmentation and degradation of natural habitats in the Caribbean islands, especially in the last 50 years, has reduced the resilience of the region's remaining biodiversity to survive hurricanes and tropical storms, with species possessing small and often isolated populations (many threatened species) and specialist groups, such as montane nectar-feeding and fruit-/seed-eating birds (which may lose virtually all of their food sources from the storm), particularly at risk.

(Wege et al. 2009: 54, internal citations omitted).

Montane habitats are expected to be reduced in size as they shift upwards in altitude due to temperature increases, or to disappear completely if they are unable to shift any further in elevation. Predicted decreases in precipitation will also impact montane systems, such as the Caribbean's elfin forests that are dependent on high moisture levels. Caribbean elfin forests, or cloud forests, generally occur above 1,500 meters in elevation and are characterized by heavy rainfall and moist

conditions. The Blue and upper Port Royal mountains of Jamaica, the upper elevations of Puerto Rico's El Yunque, Mt Scenery in Saba, and mountain peaks such as Pico Duarte (Cordillera Central Corridor) in the Dominican Republic all support elfin forest. Increased storms, particularly more intense hurricanes that damage or bring down trees, and predicted increases in the frequency of droughts and/or flooding that cause changes in soil-water availability, are likely to significantly impact Caribbean forest ecosystems. Higher temperatures and greater periods of drought could also lead to increased risk of fires, which pose a threat as most Caribbean forest types are not fire-adapted. While hurricanes are natural events in the Caribbean and native forests are adapted to these events to some extent and usually eventually recover, any increased intensity of hurricanes may reduce the resilience of the region's forests. For example, gaps in forests resulting from storms increase susceptibility to further wind damage. Future storms may have a devastating impact from which forests may find it difficult to recover, especially given that most Caribbean forests are already degraded and fragmented.

(Wege et al. 2009: 71, internal citations omitted).

Synergistic Effects. The synergistic effects of aforementioned threats could conspire to cause the extinction of Ridgway's hawk. "Like interactions within species assemblages, synergies e stressors form self-reinforcing mechanisms that hasten the dynamics of extinction. Ongoing habitat destruction and fragmentation are the primary drivers of contemporary extinctions, particularly in the tropical realm, but synergistic interactions with hunting, fire, invasive species and climate change are being revealed with increasing frequency" (Brook et al. 2008: 457, internal citations omitted).

The combination of threats to the hawk and its habitat could cause a greater and faster reduction in the remaining population than might be expected from simply the additive impacts of the threats. "[H]abitat loss can cause some extinctions directly by removing all individuals over a short period of time, but it can also be indirectly responsible for lagged extinctions by facilitating invasions, improving hunter access, eliminating prey, altering biophysical conditions and increasing inbreeding depression. Together, these interacting and self-reinforcing systematic and stochastic processes play a dominant role in driving the dynamics of population trajectories as extinction is approached" (Brook et al. 2008: 453, internal citations omitted).

The hawk is already at risk as a low-fecundity or K-selected species, rendering it more vulnerable to synergistic impacts of multiple threats. "Traits such as ecological specialization and low population density act synergistically to elevate extinction risk above that expected from their additive contributions, because rarity itself imparts higher risk and specialization reduces the capacity of a species to adapt to habitat loss by shifting range or changing diet. Similarly, interactions between environmental factors and intrinsic characteristics make large-bodied, long-generation and low-fecundity species particularly predisposed to anthropogenic threats given their lower replacement rates" (Brook et al. 2008: 455, internal citations omitted).

CONCLUSION AND REQUESTED DESIGNATION

WildEarth Guardians petitions the U.S. Fish and Wildlife Service within the Department of Interior to list Ridgway's hawk (*Buteo ridgwayi*) as an "endangered" or "threatened" species under the Endangered Species Act. This action is warranted, given the numerous threats facing the species and the small number of individuals left in the wild. On November 3, 2009, FWS proposed to list the Indonesian Salmon-crested cockatoo as "threatened" under the ESA (U.S. Fish and Wildlife Service 2009). In its news release, FWS stated that adding the cockatoo, a foreign species, to the list of "threatened" and "endangered" species would serve the purpose of 1) restricting imports of the animal or its parts, and 2) raising awareness of "the importance of conserving the species among foreign governments, conservation organizations and the public" (U.S. Fish and Wildlife Service 2009). Listing foreign species also provides "increased awareness of listed species, research efforts to address conservation needs, or funding for in-situ conservation of the species in its range countries. The ESA also provides for limited financial assistance to develop and manage programs to conserve listed species in foreign countries, encourages conservation programs for such species, and allows for assistance for programs, such as personnel and training."² These conservation actions could benefit the Ridgway's hawk. Like the cockatoo, the Ridgway's hawk lives in a biodiverse area that is a "priority area for global conservation" (U.S. Fish and Wildlife Service 2009) and as such both the hawk and its habitat would especially benefit from the benefits of ESA listing.

In addition, evidence of hawks in Culebra indicates that Puerto Rico and surrounding islands were likely part of the Ridgway hawk's historic range and may warrant designating suitable areas in these U.S. territories as critical habitat to support reintroduction and recovery of the species.

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