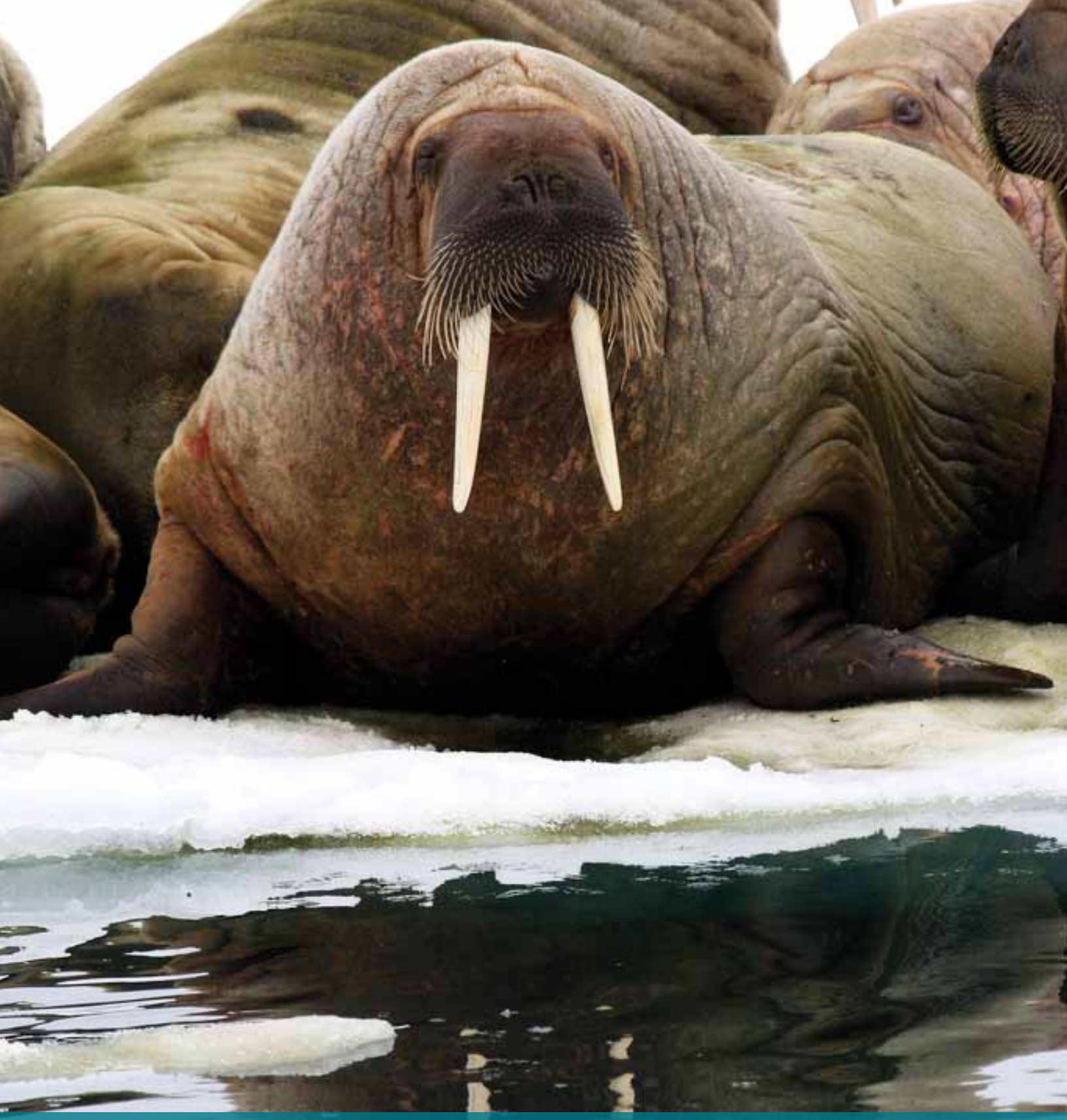

CITES AND CLIMATE CHANGE: A NEED FOR INTEGRATION

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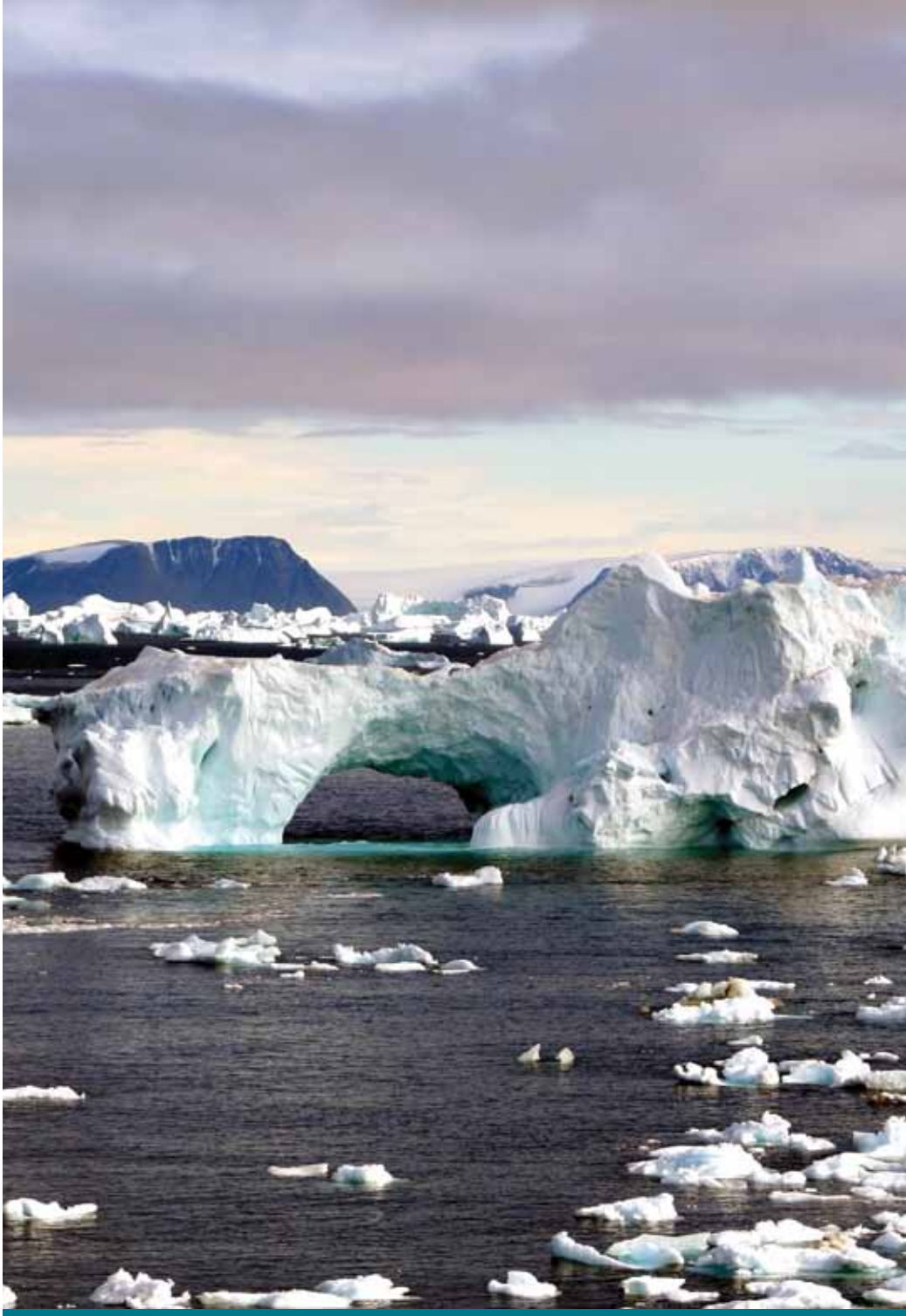


This document was prepared by the Natural Resources Defense Council, Defenders of Wildlife, the International Fund for Animal Welfare, the Animal Welfare Institute, and the International Environmental Law Project in light of Decision 15.15, which directs a Joint Working Group of the Animals and Plants Committee to consider how climate change might affect CITES decision-making. Our goal with this document is to highlight some of the most important ways climate change may affect the most significant scientific decisions that the Parties make. We hope this document aids the Parties and Climate Change Working Group members by facilitating dialogue on a way forward to ensure that climate change impacts are properly considered in the context of international wildlife trade and CITES.

March 2012

"Climate change is set to be one of the major drivers of species extinctions in the 21st century: approximately 20 to 30 percent of plant and animal species are likely to be at increasingly high risk as global mean temperatures rise." –IUCN

INTRODUCTION

Climate change affects species worldwide. The Millennium Ecosystem Assessment suggests that climate change is one of the primary drivers of ecosystem change. These effects represent indisputable scientific reality, and the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) must decide how climate change will directly or indirectly affect scientific decision-making under the Convention.

Implementation of CITES depends significantly on a number of scientific decision-making processes, including listing decisions, the making of non-detriment findings, the Review of Significant Trade, the setting of export quotas, the Periodic Review of the Appendices, and trade in invasive species. Decisions taken under each of these processes must consider the direct and indirect impacts of climate change, including any projected impacts in order to ensure that the Convention achieves its overall goal—to protect species from over-exploitation due to international trade.

The six processes identified above are sufficiently flexible to accommodate consideration of climate change. However, because our understanding of the effects of climate change has evolved significantly in recent years and the scale of climate change impacts on species continues to increase, the Parties should adopt a resolution that more clearly provides guidance as to how to incorporate climate change into CITES decision-making.

OVERVIEW OF CLIMATE CHANGE IMPACTS

The 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) indicates that the global average surface temperature increased 0.74 degrees Celsius from 1906 to 2005 and that 11 of the 12 years prior to 2007 were the warmest on record. The IPCC report also estimates that the global average sea level rose 0.1-0.2 meters during the 20th century and identified spatial and temporal changes in precipitation patterns. The IPCC projects further increases in global mean surface temperature of 2 to 6 degrees Celsius by 2100; additional sea level rise; and greater frequency of floods, droughts, and extreme weather events. All of these climate change impacts may adversely affect species; many effects are already occurring.

"Our planet is now in the midst of its sixth mass extinction of plants and animals —the sixth wave of extinctions in the past half-billion years. We're currently experiencing the worst spate of species die-offs since the loss of the dinosaurs 65 million years ago."
–Center for Biological Diversity

DESERT

Deserts may face hotter and drier conditions, which could adversely affect species already living at their heat-tolerance limits.

POLAR

Populations of krill and other small organisms may decline as ice recedes, which may negatively affect marine food webs. Walruses (*Odobenus rosmarus*), polar bears (*Ursus maritimus*), and other arctic mammals are further threatened by melting of sea ice because they rely on ice for resting, feeding, and breeding.

SAVANNA

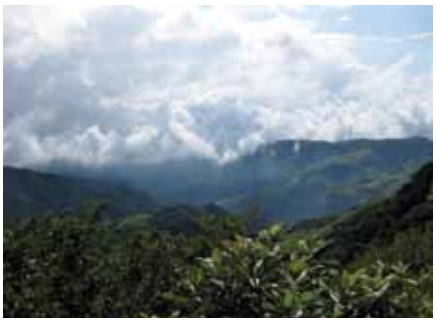
Climate change-related increases in woody plant cover, changes in precipitation, and disturbance to the natural fire regime may impact savanna-dependent species, such as the African elephant (*Loxodonta africana*).

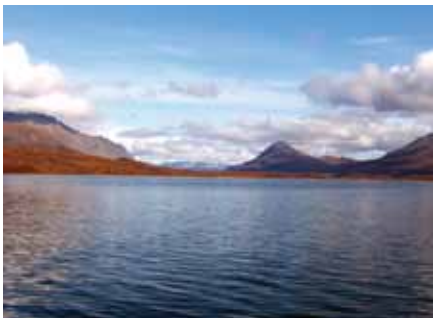
TUNDRA

Climate change is melting permafrost and facilitating the colonization of plants that are transforming tundra into boreal forest. Tundra species, including the Arctic fox (*Vulpes lagopus*), are facing competition from other species that are moving northward in response to climate change.

MOUNTAINS

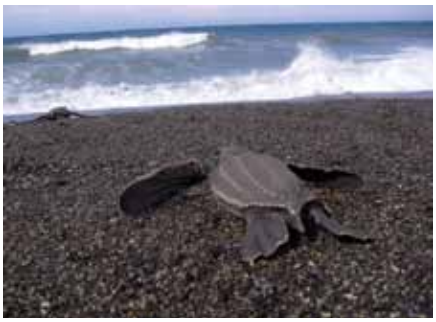
Species in mountain ecosystem have limited capacity to move to higher altitudes in response to temperature increases. Species endemic to mountain tops may be especially constrained. In the Alps, plants have been migrating upwards, and some populations previously found only on mountain tops have disappeared.





FRESH WATER

Climate change may reduce stream flow, lead to warmer water temperatures, and result in loss of wetlands. Cold, well-oxygenated waters may become too warm to support native species, such as sturgeon (*Acipenseriformes spp.*), while benefiting other species that may compete with sturgeon.



OCEANS & COASTS

Tropical fish, corals, and other marine species may experience population declines or range shifts due to changes in ocean circulation, ocean acidification, and warmer temperatures. Coastal habitats that serve as breeding, nursery, and feeding grounds for birds and marine species are also changing or disappearing due to climate change including sea-level rise.

CLIMATE CHANGE AND SPECIES

Climate change is likely to be the principal cause of future species loss due to direct threats, indirect threats, or compound stressors that compromise already vulnerable species. Although some species may tolerate climate change and even thrive as a result of habitat changes and the loss or decline in competing species, many more species are likely to suffer negative consequences. In fact, the IPCC predicts that more than 20 percent of animal and plant species are likely to be exposed to a greater risk of extinction under a 2-3 degree Celsius temperature increase. For example, climate change has already likely caused the extinction of at least one species, the golden toad (*Incilius periglenes*), from the cloud forests of Costa Rica.

Certain biological traits make some species particularly vulnerable to climate change. Broad categories of species-specific characteristics that may influence vulnerability to climate change include habitat requirements, dispersal and colonization abilities, dependence on seasonal or other environmental cues, and dependence on interactions with other species.

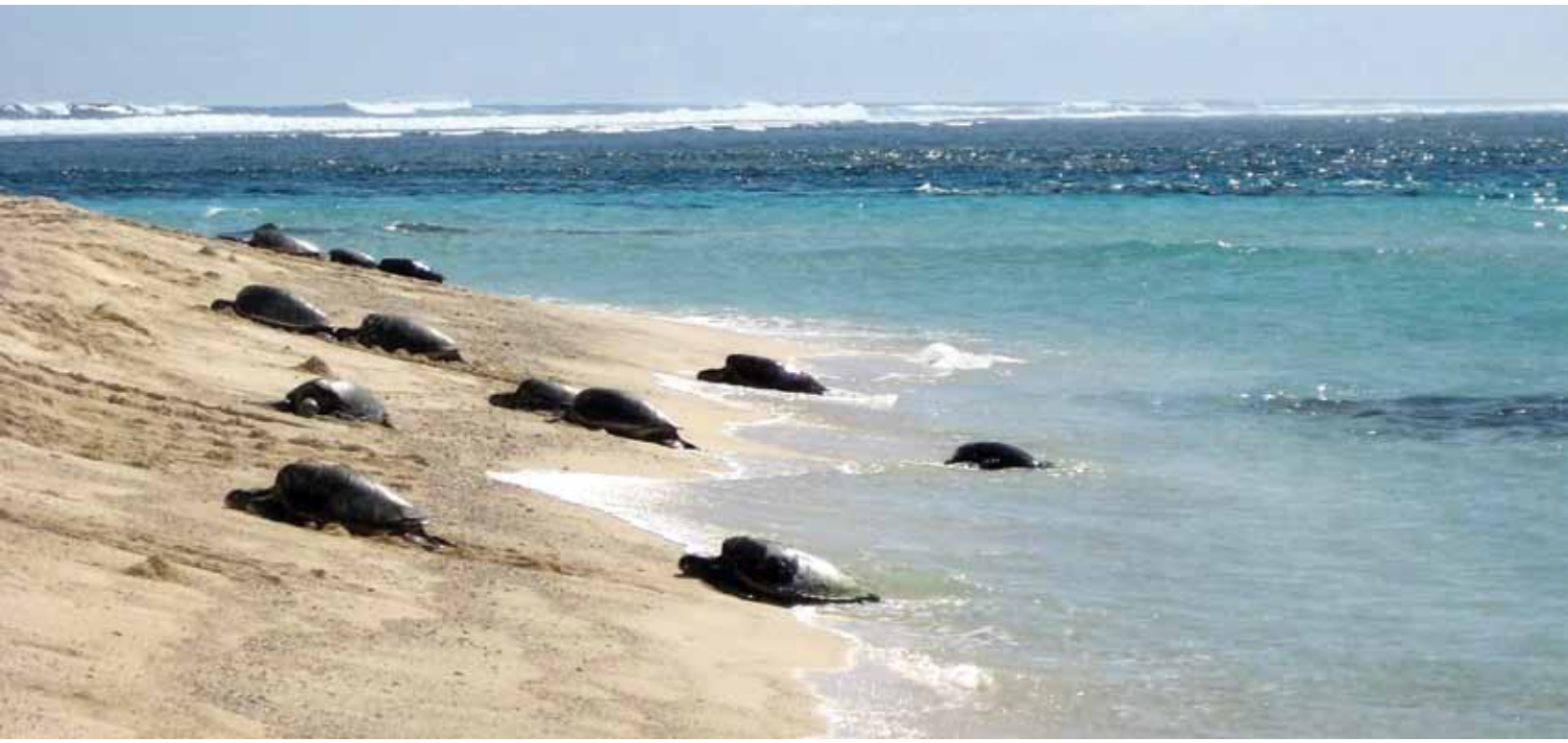
Species with highly specialized habitat are less likely to tolerate climatic or ecosystem change than species with generalized needs. Reptiles and amphibians, for example, survive only in narrow temperature ranges. Because these species are physiologically limited to a narrow temperature range, any deviation outside of that range threatens their survival.

Species with limited dispersal or colonization ability are vulnerable to climate change because they may not be able to migrate to areas of suitable habitat. For example, certain species may be confined to specific geographic areas and may not be able to colonize new areas. The Abbot's day gecko (*Phelsuma abbotti*) only inhabits low-lying islands where its habitat is at risk from sea-level rise. Even species that may be able to colonize new areas may not be able to move to new, suitable habitats fast enough to cope with rapid climate change if they are slow growing, have low reproductive ability, have small population sizes, or have limited dispersal distances or rates. For example, although the Quiver Tree (*Aloe dichotoma*) is expanding in the cooler part of its range, it is not known whether the rate of expansion is enough to compensate for die-offs occurring in the warmer parts of its range.

Dependence on seasonal cues or other environmental triggers that are likely to be disrupted by climate change may increase species' vulnerability because such triggers can affect reproductive success, migratory patterns, and food availability, among other things. For example, temperature plays a key role in determining hatchling sex in marine turtles (*Cheloniidae spp.*), and higher temperatures can skew sex ratios.

In other species, rainfall and temperature changes may cause shifts in breeding patterns, egg laying, and resource availability. This is evident in the already-observed impacts to migratory birds due to changes in the distribution, abundance, and timing of food resources. Reproductive success of migratory birds has been greatly impaired when their arrival at stopover or breeding grounds is no longer in synchrony with the availability of food resources because of warmer temperatures, drought, or other climate change impacts.

In addition, species that are strongly interconnected are at risk if any of the connected species are likely to be disrupted by climate change. For example, climate change-related loss of coral reef habitat disrupts the relationship between sea anemones and clownfish because sea anemones depend on coral for habitat and clownfish depend on sea anemones for habitat and protection. Other species may be vulnerable due to shifts in closely connected predator/prey relationships, host species availability, and competitive interactions.



WARMER TEMPERATURES

Climate Impacts		Major Impacts on Species
Increase in terrestrial surface temperatures	· Increased heat stress · Greater vulnerability to invasive species and diseases · Changes in growth and reproduction · Alteration of interactions between species · Disruption to hibernation and migration · Geographic range shifts	· The ranges of many butterfly populations are shifting northward as temperatures increase. Populations of some northern species, including the mountain ringlet (*Erebia epiphron*), have disappeared. · The quetzal (*Pharomachrus mocinno*) has declined as temperatures have increased in upper-slope montane habitat. The quetzal is further threatened by nest predation as competing species move upslope.
Increase in water temperatures	· Coral bleaching · Changes in productivity · Range shifts · Spread of invasive species	· Coral bleaching results after rapid temperature increases cause corals (*e.g. Agaricia tenuifolia*) to expel their symbiotic algae, causing corals to die off.
Decrease in ice and snow cover	· Changes to hydrological regimes · Changes in seasonal cues in mountain ecosystems · Increased predation · Loss of snow-dependent ecosystems and species · Changes in food availability	· American pikas (*Ochotona princeps*) live in alpine habitats and are especially threatened in areas facing declining snowpack. Lemmings (*Dicrostonyx torquatus*), an important prey species for Arctic fox (*Vulpes lagopus*) and other predators, also prefer deeper snow for winter habitat. Lynx (*Lynx canadensis*) are uniquely adapted to survive in deep snow but, as snow accumulations decline, other species can more easily compete with lynx for habitat and prey. Loss of snow cover, which provides insulation and protection from predators, threatens these and other snow-dependent species.
Sea-level rise	· Landward intrusion of saltwater · Increased coastal erosion · More extensive coastal flooding · Changes in nesting habitat availability	· Sea-level rise threatens the mangrove forests that are home to the Bengal tiger (*Panthera tigris*) and other species that depend on this ecosystem (e.g. estuarine crocodiles (*Crocodylus palustris* and *Crocodylus porosus*). · Sea turtle (*Cheloniidae spp.*) reproduction may decline following degradation or loss of nesting areas due to sea-level rise and more frequent storm disturbance.

CHANGES IN PERCIPITATION

Climate Impacts		Major Impacts on Species
Increased instances of drought	· Increased water stress · Reduced food availability · Increased fire risk	· Drought-related alteration of the wildfire regime in Indonesian forests is increasing fire-related orangutan (Pongo spp.) deaths and fragmenting remaining orangutan habitat.
Increased flooding	· Increased soil erosion · Threats from water-borne disease · Habitat destruction from flooding · Changes natural flow of rivers and streams	· Flooding may promote the spread of avian malaria and avian pox, mosquito-transmitted diseases that threaten native forest birds in Hawaii.

INCREASED FREQUENCY OF EXTREME CLIMATIC EVENTS

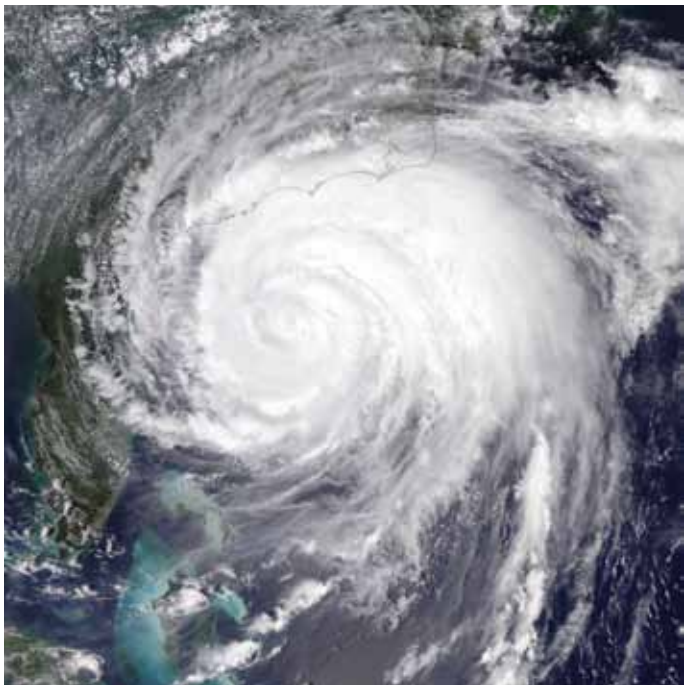
Climate Impacts		Major Impacts on Species
Increased frequency and intensity of storms	· Disruption to growth and reproduction · Decrease in productivity · Increase in mortality	· The combined impact of increased frequency of hot summers, increased storm intensity, and flooding events will likely damage coastal ecosystems, especially coral reefs and seagrass pastures, on which sea turtles (Cheloniidae spp.), dugongs (Dugong dugon), and other species depend.
Increased flooding due to storm surges	· Increased erosion of coastal beaches and cliffs · Increased habitat disturbance and loss · Saltwater intrusion of coastal wetlands	· Salt marshes and coastal wetlands are vulnerable to saltwater intrusion and erosion from flooding due to storm surges. Birds that use coastal wetlands for foraging, nesting, and roosting will also be affected by disturbance or loss of these habitats.

CITES AND CLIMATE CHANGE

Many processes under CITES, including listing criteria, non-detriment findings, the Review of Significant Trade, export quotas, the Periodic Review of the Appendices, and trade in invasive species, currently accommodate consideration of climate change impacts. However, it is not clear that Parties regularly analyze climate change impacts when making scientific decisions under CITES. In fact, few examples exist of Parties explicitly considering climate change threats.

Failing to adapt trade management practices to account for climate change impacts may lead to over-exploitation of species in contravention of the goals of CITES. In other cases, Parties may find that climate change enhances the population of a species and/or its role in its ecosystem. Thus, appropriate trade regulation and implementation of CITES in light of climate change necessitates a close view of not just climate change or other known threats to species but a review of the synergistic and cascading impacts of climate change, as well as a longer-term view of threats and population data.

The goal of this document is to outline the ways in which climate change impacts may be factored into CITES decision-making. The following sections identify ways in which the various scientific decision-making processes accommodate consideration of climate change, as well as the ways in which the processes could be clarified or enhanced to explicitly recognize the importance of climate change threats to species.



LISTING CRITERIA

The criteria for listing species in Appendices I and II, found in Resolution Conf. 9.24 (Rev. CoP15), ensure that decisions to amend the Appendices—listings, downlistings, uplistings, and delistings—are scientific and thus consistent with the Convention's core purpose.

The criteria for amendment of Appendices I and II are based on two fundamental principles. First, decisions to amend the Appendices should be based on the best information available. Second, Parties should, in general, take a precautionary approach to decisions to amend the Appendices. A precautionary approach is especially important in the context of downlistings and delistings, as Annex 4 of the Resolution suggests.

These two principles—consideration of the best information available and use of a precautionary approach—necessitate the factoring of climate change into decisions to amend the Appendices. In fact, as described below, the listing criteria explicitly allow consideration of climatic factors. However, further clarification is still necessary to ensure uniformity of interpretation and application.

Criteria for Inclusion of Species in Appendix I

According to Article II of the Convention, Appendix I includes "all species threatened with extinction which are or may be affected by trade." Resolution Conf. 9.24 (Rev. CoP15) further provides that a species must meet one of the following criteria:

> A species is considered to be threatened with extinction if it meets, or is likely to meet, **at least one** of the following criteria.
>
> A. The wild population is small, and is characterized by **at least one** of the following:
>
> i. an observed, inferred or projected decline in the number of individuals or the area and quality of habitat; or
>
> ii. each subpopulation being very small; or
>
> iii. a majority of individuals being concentrated geographically during one or more life-history phases; or
>
> iv. large short-term fluctuations in population size; or
>
> v. a high vulnerability to either intrinsic or extrinsic factors.
>
> B. The wild population has a restricted area of distribution and is characterized by **at least one** of the following:
>
> i. fragmentation or occurrence at very few locations; or
>
> ii. large fluctuations in the area of distribution or the number of subpopulations; or
>
> iii. a high vulnerability to either intrinsic or extrinsic factors; or
>
> iv. an observed, inferred or projected decrease in any one of the following:
>
> - the area of distribution; or
> - the area of habitat; or
> - the number of subpopulations; or
> - the number of individuals; or
> - the quality of habitat; or
> - the recruitment.
>
> C. A marked decline in the population size in the wild, which has been **either**:
>
> i. observed as ongoing or as having occurred in the past (but with a potential to resume); or
>
> ii. inferred or projected on the basis of any one of the following:
>
> - a decrease in area of habitat; or
> - a decrease in quality of habitat; or
> - levels or patterns of exploitation; or
> - a high vulnerability to either intrinsic or extrinsic factors; or
> - a decreasing recruitment.

Climate change can affect many of the criteria for listing a species in Appendix I. For example, a wild population may be small because climate change has reduced the number of individuals or the area of viable habitat. Or, the sex of the offspring of a species, such as certain reptile species, may be exclusively male or exclusively female, greatly affecting reproductive success and influencing population size, depending on how that species reacts to changes in temperature. In many cases, climate change may be the cause of existing, inferred, or projected threats to species or indirect threats that increase a species' vulnerability. As a result, climate change may be an integral component of an Appendix I listing proposal.

Observed, Inferred, and Projected Threats

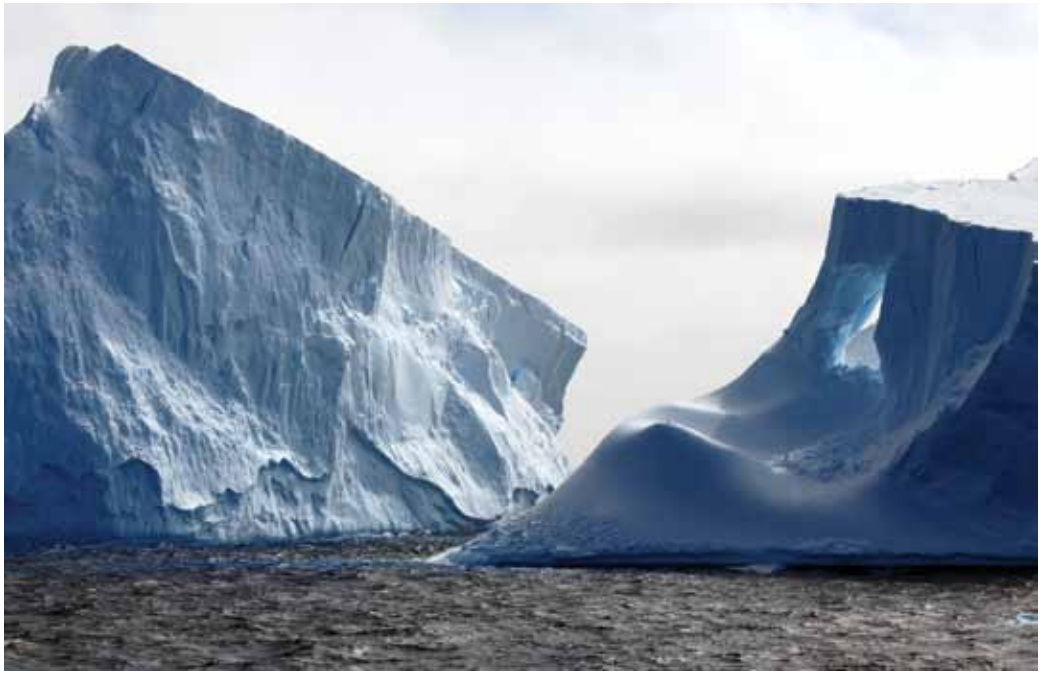
Consideration of observed, inferred, and/or projected threats to species in listing proposals allows Parties to consider existing as well as predicted climate change threats to species. In fact, if a marked decline in a wild population is inferred or projected on the basis of a high vulnerability to climate change, the species qualifies for an Appendix I listing. In the case of coral bleaching, for example, scientists are able to project species decline. When proposing to list a potentially affected coral species in Appendix I, a Party could include science indicating projected declines in population due to coral bleaching, as well as those declines already observed and quantified.

In the case of inferred or projected threats, the timeframe in which we consider these effects is important, especially with respect to climate science. Annex 5 of Resolution Conf. 9.24 (Rev. CoP15) defines "inferred or projected" as

> *estimations using indirect or direct methods. Inferences may be made on the basis either of direct measurements or from indirect evidence. Projection involves extrapolation to infer likely future values.*

This definition helps Parties understand the type of science that may be looked to, but it does not indicate how far into the future projections and inferences may be made.

As Annex 1 of Resolution Conf. 9.24 (Rev. CoP15) contemplates, inferences and projections of future values may be necessary for many different types of criteria, such as a "decline in the…area and quality of habitat" for a small wild population, "decrease in…the recruitment" of a wild population with a restricted area

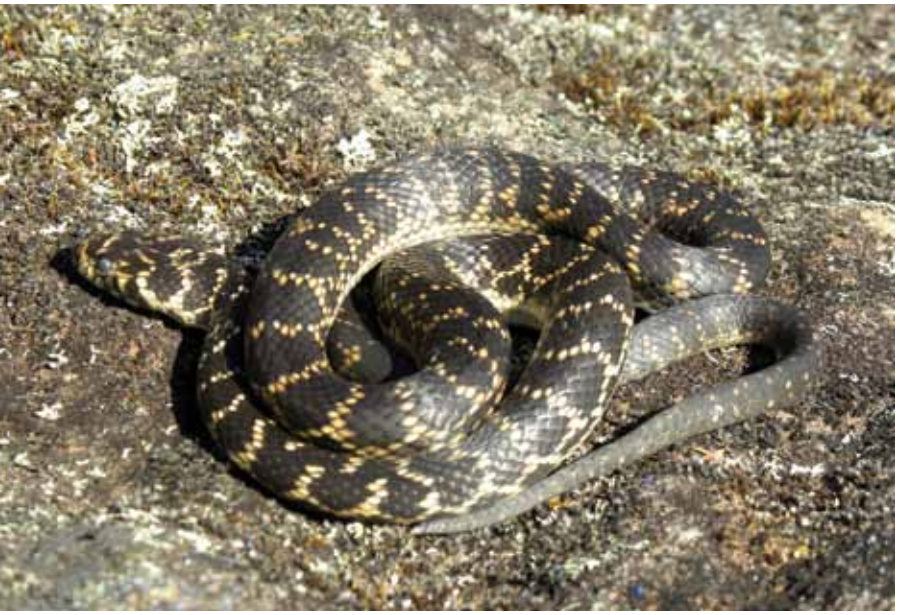


of distribution, or a "marked decline in the population size in the wild" based on "a high vulnerability to either intrinsic or extrinsic factors."

Some have suggested that the definition of "near future"—a term used only in the Appendix II listing criteria—should be applied to the term "future values" as used in the Appendix I listing criteria. However, this interpretation is legally inaccurate and contrary to the precautionary approach identified in the preamble to the Resolution as a defining principle for listing species in the Appendices. Definitions and terms should only be applied where the drafters explicitly used those terms. Under international law, treaty interpreters must assume that drafters choose words deliberately and that the use of different terminology is a specific choice. Thus, it would be contrary to the drafters' intent to apply specific definitions of terms used in one Annex—such as that of "near future," to different terms used in a different Annex — such as "future values."

Importing the definition of "near future" into the Appendix I listing criteria would mean that Parties would only be able to consider a 5-10 year timeframe for inferred and projected threats. In many cases, this timeframe may suit the science available; however, in other cases, the Parties may wish to consider a longer timeframe because climate science indicates that the threats to a species may be particularly grave over the course of two or three generations, which for many species exceeds a 5-10 year timeframe.

"Recent estimates indicate that 25% of the world's mammals and 12% of birds are at a significant risk of global extinction" (Stattersfield et al., 1998; UNEP, 2000)



Consideration of Extrinsic and Intrinsic Factors

Extrinsic and intrinsic factors are defined in Annex 5 and include a number of biological and ecological characteristics that may influence a species' risk of extinction. Climate regime shifts are explicitly recognized as an extrinsic factor that may be considered as part of an Appendix I listing. For example, the broad-headed snake (*Hoplocephalus bungaroides*) has a narrow physiological tolerance to temperature changes. If its habitat warms as a result of climate change, and population numbers decline accordingly, an Appendix I listing may be warranted under the listing criteria.

Additionally, climate change can act as a compound stressor, increasing the threat of other listed extrinsic factors, or climate change can directly affect any of the listed extrinsic factors. Other examples of extrinsic factors include habitat loss, degradation, fragmentation, and threats from disease and alien invasive species. For example, amphibians are increasingly threatened by diseases that thrive as temperatures increase. Thus, listing decisions regarding amphibian species should consider the current vulnerability of the species to disease as well as vulnerability that may be inferred or projected due to future climate change. If a marked decline in a population of amphibians can be expected due to the vulnerability of a population to disease—taking into consideration future impacts from climate change—then an Appendix I listing may be warranted.

Climate change can influence any of the intrinsic factors listed in Annex 5 as well. Examples of intrinsic factors include life history, specialized niche requirements,

behavioral factors, and endemism. Most, if not all, of the intrinsic factors included in Annex 5 are likely to interact with climate change. For example, the vulnerability of species with specialized niche requirements would be exacerbated by climate change if the specialized habitat or food source of that species is detrimentally affected by climatic factors.

Criteria for Inclusion of Species in Appendix II

Appendix II includes all species that may become threatened with extinction unless trade is strictly regulated. Resolution Conf. 9.24 (Rev. CoP15) further clarifies the criteria for listing a species in Appendix II. A species meets the requirements for listing in Appendix II

> *if it is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future . . . [or] is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences.*

The listing criteria for Appendix II recognize that the regulation of trade can mitigate the impacts of other stressors such as climate change. By reducing the level of specimens removed from the wild, the ability of wild populations to recover, adjust, or adapt to climate change is enhanced. If a species affected by trade also experiences lower reproductive success due to climate change, then an Appendix-II listing may be appropriate to ensure that trade does not reduce the population to a level at which its survival is jeopardized by its lowered reproductive rate.

The criteria for listing species in Appendix II also emphasize that all information relevant to a species' status should be considered. Parties are directed to consult available trade data, as well as "information on the status and trends of the wild population" when making determinations about the eligibility of a species to be included in Appendix II. The information consulted during consideration of listing proposals should include short- and long-term population trends, taking into account potential for direct and indirect effects of climate change. Listing decisions informed by the best available science will be most effective at ensuring species conservation.

Listing decisions and scientific uncertainty

Prudent measures should be taken to ensure that trade does not threaten the survival of the species, even in the case of uncertainty about the potential for climate change to impact a species or the precise consequences of climate change. The effects of climate change are likely to vary in time, intensity, and effect, making it difficult to predict some impacts with absolute certainty. To ensure consistency with the Convention's goal of ensuring species conservation, Parties can account for uncertainty by using the best scientific information available and acting in the interest of the conservation of the species concerned.

APPENDIX III

Appendix III listings provide Parties with the opportunity to obtain the support of the international community to conserve a species in trade. Appendix III assists Parties with addressing climate change impacts to species that may not otherwise meet the criteria for listing in Appendix I or II. Appendix III may provide Parties with a tool to monitor the effects of trade on species vulnerable to climate change.

Resolution Conf. 9.25 (Rev. CoP15) requests that the Animals or Plants Committees assist Parties as necessary in reviewing the status of species being considered for Appendix III. Parties—in consultation with the Committees when necessary or appropriate—should ensure that the biological status determination takes into consideration current and projected climate change impacts on the species.

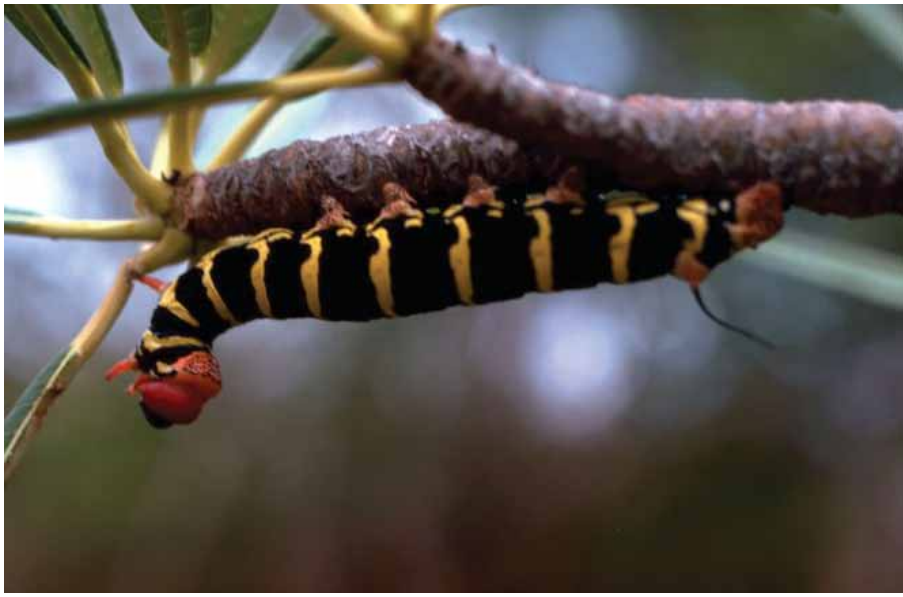
NON-DETRIMENT FINDINGS

Non-detriment findings represent the core scientific finding for the issuance of permits. Because climate change affects a species' population status, climate change considerations can affect the outcome of non-detriment findings.

Although no single resolution comprehensively outlines the requirements for making non-detriment findings, Resolution Conf. 10.3 (Rev. CoP14) recommends that population status, distribution, population trends, harvest, and other factors be considered when making a non-detriment finding. These factors, as outlined below, accommodate the consideration of climate change.

However, as the Parties consider further guidance for the making of non-detriment findings, climate change impacts, both positive and negative, should be addressed as an important independent factor to consider. Further, any future guidance should specifically describe how Parties might factor climate change impacts into their consideration of the relationship between the species and its ecosystem. This is especially important when climate change affects the interconnectedness among species and highly specialized relationships between a species and its environment.

Explicit consideration of climate change when making non-detriment findings further ensures that species are protected against over-exploitation through international trade. If climate change is not considered as a factor in the making of non-detriment findings, then Scientific Authorities may not be sufficiently evaluating the impact trade is having on species.



Population Status

The population status of a species may be affected by climate change. For example, if warming temperatures alter the sex ratio of a population such that maintenance of a healthy population or genetically diverse population is at risk, a non-detriment finding should take this into account.

Distribution

A population's restricted distribution may make the population less resilient to climate change impacts; thus, trade and other population stressors may increase species' vulnerability. For example, a high altitude ungulate may find that, due to climate change, it must expand its range to even higher elevations to survive, assuming such habitat is available and that it is suitable. When a species is threatened by climate change due to impacts on its distribution, a non-detriment finding must consider such impacts. In other cases, climate change may have a positive effect and may expand the distribution and suitable habitat for a species.

Population Trends

Climate change is already affecting wild populations and these impacts are projected to increase as climate change intensifies. Population trends are driven by factors such as habitat availability, reproductive rates, and life cycle patterns. Climate change can influence these factors and thus may indirectly influence population trends. Direct effects of climate change on population are also possible, as with declining coral populations resulting from bleaching events.

Harvest

For species that exhibit sex-determinative or other vulnerabilities that affect individuals, selected harvest may exacerbate the impact of climate change on wild populations and thus should affect the outcome of a non-detriment finding.

Other Biological and Ecological Factors

Climate change itself is an "ecological factor" that should be taken into account even when it does not have measurable impacts on the factors identified above. This is true whether the effect on the wild population is positive or negative.

Finally, because climate change represents, in many instances, an adverse additive impact to species already affected by habitat loss and/or fragmentation, pollution, poaching, and other domestic threats, it is imperative that Parties consider the cumulative impact of all such threats, including collection for international trade, when making non-detriment findings.

REVIEW OF SIGNIFICANT TRADE

The Review of Significant Trade determines whether a Party is effectively implementing non-detriment findings for Appendix-II species. Given the need to consider climate change impacts for non-detriment findings, the Review of Significant Trade must also consider climate change when reviewing the adequacy of non-detriment findings.

Like most of the scientific decision-making processes, the Review of Significant Trade is sufficiently flexible to accommodate consideration of climate change, but the Parties would benefit from explicitly identifying the ways in which the Review of Significant Trade might address climate change concerns. In many ways, the role that climate change science plays in making non-detriment findings is relevant to the Review of Significant Trade, but certain aspects of the process itself are also relevant to addressing climate change.

Only those species subject to "significant" levels of trade are included in the Review of Significant Trade. However, "significant" is undefined and the threshold that constitutes "significant" may depend on the specific climate change impacts facing a particular species. "Significant" in light of climate change may not necessarily be a high volume of trade if a species is particularly vulnerable. Alternatively, if a species is expected to respond positively to climate change, then "significant" may be a relatively high level of trade.

Once trade in a species is determined to be "significant," selection of species for review requires the Plants and Animals Committees to address "biological, trade and other relevant information." These criteria implicitly cover any climate change impacts to species, including those likely to affect the factors for the making of non-detriment findings: population status, distribution, population trends, harvest, and other biological and ecological factors.

As part of the Review of Significant Trade process, the Animals or Plants Committee recommends actions for Parties to take to resolve implementation issues related to the making of non-detriment findings. Resolution Conf. 12.8 (Rev. CoP13) provides examples of recommendations and most could accommodate climate-change threats. For example, the Animals or Plants Committee may request an evaluation of threats to populations, which could include an evaluation of the threat of climate change if it is an actual or projected threat to the species. Additionally, the Animals or Plants Committee may recommend a cautious export quota due to anticipated climate change impacts or suggest the application of adaptive management procedures to accommodate population fluctuations as a result of climate change.

Despite the accommodation of climate change threats in the Review of Significant Trade process, only a few species that have gone through review have been noted to be affected by climate change.

In 2011, Vietnam reported that three species of orchid (*Calanthe alleizetti, Cymbidium erythrostylum*, and *Renanthera annamensis*) and three turtle species (*Heosemys annandalii, Heosemys grandis*, and *Heosemys spinosa*) that were chosen for review were affected by climate change. Despite the noted impact of climate change, all of these species were listed as of "least concern," presumably because trade levels were low. Although not necessarily the case for these species, in some cases even low trade numbers would warrant a higher level of concern when climate change has a known impact.

"Through compiling scores for birds, amphibians and warm-water reef-building coral species, initial results suggest that up to 35%, 52% and 71% of these groups respectively could be susceptible to climate change." –IUCN

EXPORT QUOTAS

Export quotas are used to manage trade and must be approved by a Party or the CoP, based on information that is equivalent to making a one-time non-detriment finding for the entire quota, instead of making non-detriment findings for each individual shipment. Parties and the CoP should set quotas at a level that ensures the quota effectively and adequately maintains a level of trade that is not detrimental to the survival of the species.

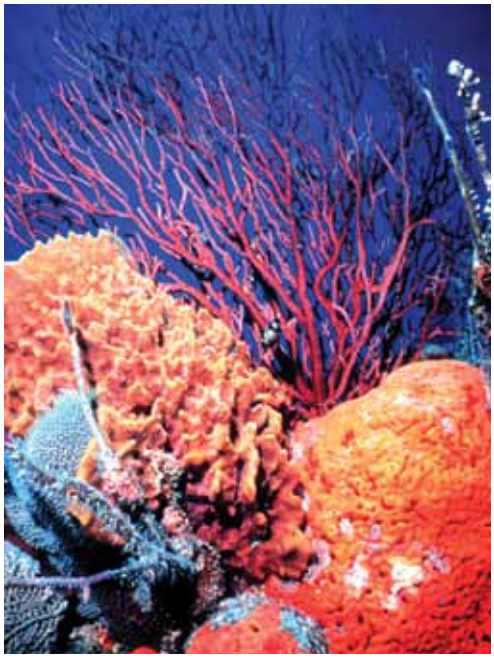
Because the quota serves as a substitute for making individual non-detriment findings, the Parties and the CoP should evaluate the non-detriment finding factors—population status, distribution, population trends, harvest, and other biological and ecological factors—in light of climate change when it may be a factor threatening a species. Parties and the CoP should utilize the best available science, including all relevant impacts to species from climate change, whether they are positive or negative, direct or indirect.

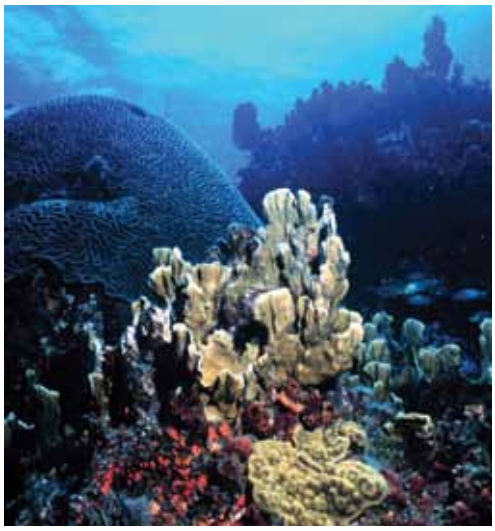
Additionally, because the extent of a particular threat due to climate change may not be known with certainty, quotas should be set using a precautionary approach. Parties and the CoP should address climate change when initially setting quotas and when reevaluating established quotas.

Nationally Established Quotas

Resolution Conf. 14.7 (Rev. CoP15) indicates that the cornerstone of a sound export quota is scientific decision-making, and also provides that export quotas should be adjusted to accommodate changing biological, legal, or administrative needs. Climatic factors are explicitly identified as an example of a biological factor that may require the flexibility to adjust quotas. Thus, Parties should periodically evaluate quotas to incorporate new information about a species, including current and projected threats related to climate change.

If a quota is not adjusted to take into account new information and species' needs, the quota could have an "undesirable effect"—a consequence that the Resolution indicates should be avoided. If climate change impacts are newly revealed, the Resolution provides sufficient flexibility to reevaluate and update quotas if necessary to ensure a quota is not detrimental to the survival of the species.





CoP-Approved Quotas

The Conference of the Parties may establish quotas for Appendix I species by Resolution or for either Appendix I or II species by annotation to a listing in the Appendices. According to Resolution Conf. 9.21 (Rev. CoP13), a Party may propose a quota as long as it is accompanied by supporting science and submitted to the Secretariat 150 days before a meeting of the CoP. The CoP reviews the science submitted to confirm that the proposed quota will not be detrimental to the survival of the species.

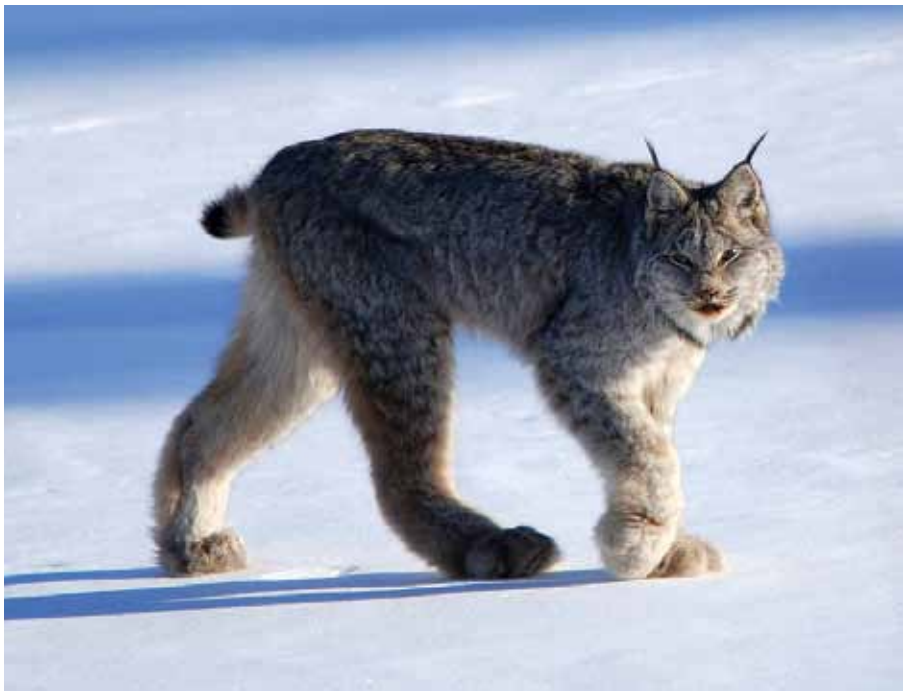
Resolution 9.21 (Rev. CoP13) states that a CoP-approved quota for an Appendix I species meets the non-detriment finding requirement as long as it is not exceeded and no new information indicates that the species cannot sustain the quota. However, once adopted, neither Resolution 9.21 (Rev. CoP13) nor the resolutions that provide species-specific quotas require that CoP-approved quotas are revisited on any sort of regular basis. Because climate change impacts are variable and may be unforeseen at the time the quota is set, the Parties should establish a review mechanism for CoP-approved quotas.

PERIODIC REVIEW OF THE APPENDICES

The Periodic Review of Appendices is a process to determine whether a listing designation remains appropriate for a given species. The Animals and Plants Committees manage the review process, but a Party volunteers to undertake the review. Reviews take into account a species' current status in light of the listing criteria found in Resolution Conf. 9.24 (Rev. CoP15) for the relevant Appendix.

Because the Periodic Review of the Appendices is a reconsideration of a species' current status in relation to the listing criteria, it is critical that climate change impacts be considered, just as they must be considered when proposing to list a species on the Appendices. For example, the United States' review of the bobcat (*Lynx rufus*) and the Canada lynx (*Lynx canadensis*) noted that Canada had indicated that climate change is a potential threat to both species.

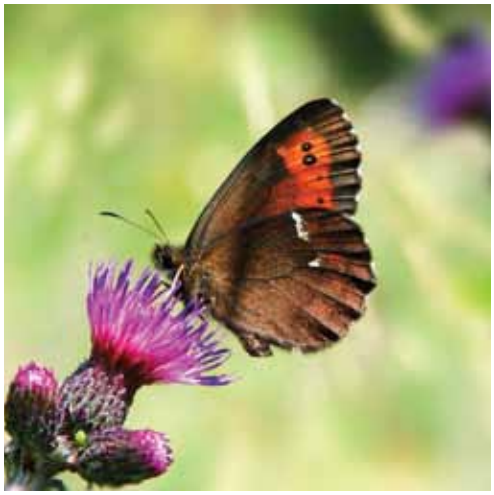
Additionally, Parties may want to consider an Assessment Protocol for choosing which species to review that relates specifically to climate change, similar to the Assessment Protocol found in the Annex to Resolution Conf. 14.8. Because climate change impacts evolve and interact with other stressors on species' populations, climate change should be a major factor when considering whether a species requires review under the Periodic Review process. For example, if climate change positively affects the status of a species, then a downlisting or delisting may be warranted. Conversely, when climate change negatively impacts a species' status the considerations may warrant an uplisting. In both scenarios, considerations of positive and negative impacts of climate change are necessary to ensure an accurate Periodic Review of the Appendices.



INVASIVE SPECIES

Parties cannot fully consider the effects of alien invasive species without also addressing climate change impacts. Resolution 13.10 (Rev. CoP 14) encourages Parties to consider the problems posed by invasive species when developing standards on the trade in live animals or plants. Because climate change is generally expected to exacerbate the threats posed by alien invasive species to biodiversity, understanding and considering the implications of climate change is important when evaluating the threats of trade in such species.

Given the potential for climate change to substantially influence the ability of invasive species to establish and spread in new environments, Parties should take precautionary measures to minimize the potential for spread due to trade.



CONCLUSION

This document outlines a number of ways in which the current CITES regime and, in particular, the major scientific decision-making processes can incorporate evolving scientific awareness of the escalating impacts of climate change on species. Many of the processes discussed here may be sufficiently flexible to address climate change, especially because climate change is often an indirect, compound stressor that impacts other population variables, such as distribution, habitat, and population trends.

However, in many cases, further clarification of these processes in light of climate change is necessary. As this document outlines, this is true for processes such as CoP-approved export quotas that do not include built-in, regular review mechanisms so that Parties are able to efficiently evaluate whether a quota should be amended in light of observed or projected climate change impacts.

Even where a particular resolution may not need to be amended to address climate change specifically, the Parties should consider adopting a general resolution that provides guidance as to how best to incorporate climate change science into CITES decision-making. Despite the known impacts of climate change on species, very few species proposals or other CITES documents indicate that Parties and relevant CITES bodies have adequately considered and addressed climate change. In order for CITES to achieve its goal of preventing over-exploitation of species due to international trade, climate change must become a regular factor in CITES decision-making.

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