

Save Our Frogs!

What's causing these problems in our Frog populations?

While researchers are still far from finding any definitive answers, some of the puzzle pieces are starting to fit together. For one thing, there's a lot of different kinds of data to take into account. Not all species of amphibians are in trouble. For example, there don't seem to be the same devastating effects on salamanders, and some frogs are actually *increasing* in numbers rather than decreasing. This suggests that it's probably not just a single, planet-wide phenomenon. Instead, it's probably a whole bunch of different things contributing to the problems...some of which might even be made worse by others!

These factors probably include such things as destruction of natural habitat, increases in ultra-violet radiation (and the decrease of the Ozone layer), pesticides, industrial pollution, acid rain, changes in temperature, introduction of new predators or competitors into breeding areas, diseases, and even just natural population fluctuations.

Habitat destruction

Activities such as logging of forests and drainage of wetlands has obvious and pretty bad effects on amphibians: they get kicked out of their homes. In some places the rainforests are in danger of being completely wiped out! Just think of all the different types of frogs that we still haven't discovered that we'll never get to find if their habitat disappears!



Depletion of our Ozone Layer

Increases in ultra-violet (UV) radiation as a result of the earth's thinning ozone layer may also have lethal effects on amphibians. Experiments in the laboratory and in the field have shown that UV radiation interferes with the development of eggs in some species. Increased UV levels may have even worse effects in higher elevations, where levels are already high.

Pollution, Pesticides, and Acid Rain

Frogs breathe and drink *through* their skin, so pollution, pesticides, and acid rain have really devastating effects on them. This is particularly true in their developmental stages. In addition, chemicals can interfere with a frog's natural ability to fight off diseases and infection. Considering how it's a bad idea to even handle frogs when you can avoid it, just imagine what chemicals spilled out of factories must do to the poor critters!

Competition and Predators

Sometimes fish that aren't native to an area are introduced to new lakes. This can spell big trouble for local frogs, particularly in the case of so-called "sport-fish" which EAT all the tadpoles and can completely wipe out a frog population. Fish aren't the only threat though: for example, Cuban treefrogs hitched rides in banana boats from Cuba to the U.S. These are now the largest species of treefrog in North America. With an amazing appetite, the Cuban treefrogs didn't wait long before they started devouring all the smaller local frogs!

Frogs have recently become quite popular as they are a very good symbol of the health of our environment. They are in many ways the "canary in the coal mine," signalling the overall need for protection of our global ecosystem.

Decline in amphibian populations

From Wikipedia, the free encyclopedia

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The [Golden toad](#) of [Monteverde](#), [Costa Rica](#) was among the first casualties of amphibian declines. Formerly abundant, it was last seen in 1989.

Dramatic **declines in [amphibian](#) populations**, including [population](#) crashes and mass localized [extinctions](#), have been noted since the 1980s from locations all over the world. These declines are perceived as one of the most critical threats to global [biodiversity](#), and several causes are believed to be involved, including [disease](#), [habitat destruction](#) and modification, exploitation, [pollution](#), [pesticide](#) use, [introduced species](#), [climate change](#), and increased [ultraviolet-B](#) radiation (UV-B). However, many of the causes of amphibian declines are still poorly understood, and the topic is currently a subject of much ongoing research. Calculations based on extinction rates suggest that the current extinction rate of amphibians could be 211 times the background extinction rate and the estimate goes up to 25,039–45,474 times if endangered species are also included in the computation.^[1]

<http://creatures101.weebly.com/amphibians.html>

Major Threats to Amphibians:

There are nearly 6000 species of amphibians worldwide. The amount of species known to science has increased almost 35% since the 1980's and the number of new species being discovered is still rising. However, globally, amphibians are greatly at risk and some scientists believe that as many as one half of the world's species may become extinct by 2050. This would be the largest mass extinction of species since the dinosaurs! Globally, 32% of amphibian species are endangered or at risk and at least 43% have declining populations. Because of amphibian's close relationship with their environment; they are extremely sensitive to even slight changes in their ecosystem. This makes amphibians extremely vulnerable to habitat destruction and pollution. Globally, habitat destruction, pollution and disease are responsible for more than half of all negative impact on amphibians. Locally, the threats to amphibians are slightly different. Habitat destruction due to human development and pollution are still the main negative impacts on local amphibian species. However, the use of amphibians for fishing bait and road mortalities are also other negative impacts.

Fishing is a very relaxing and enjoyable experience that can be fun for all ages. Some anglers choose to use artificial bait and some choose to use live bait. Frogs are easy to catch, in some areas are quite plentiful and are a favourite food of fish. This would seem to make frogs a good choice for fishing bait. This being said, it is important to realise the impact on frog populations by using them as fishing bait. Removing a lot of frogs for live bait can present a few problems both to the frogs and for you (legally). Firstly, the "over catching" of frogs for bait will decrease the population for obvious reasons. The other impacts on amphibians and those who choose to use them as fishing bait may not be as well known. Many anglers who keep live bait frogs do so by keeping them in a bucket. These close quarters not only harm the frogs due to lack of oxygen, it may increase the amount of disease that is spread from frog to frog. So the frogs that may not have been used and that get dumped back into the swamp or lake may in fact transmit diseases to other frogs which can decrease the frog population. It is important for anglers in Ontario to know that in fact it is illegal to use any species of amphibian (other than northern leopard frogs) for bait. Ontario EBR Registry Number: PB06E6006 says that effective January 1st 2008 it is now illegal to:

- 1) Sell any species of amphibians for use as bait;
- 2) Use any species of amphibians for bait except for Northern Leopard frogs and;
- 3) Have more than 12 Northern Leopard Frogs on your possession or any other species of amphibian at any given time.

Another major cause of declining amphibian (especially frog) populations is caused by motorists. Frogs need their environment to be moist in order to survive. Also, they seem to need to move from pond to pond in a "mini migration" especially during mating season. It seems that the best time for frogs to move is at night time just after a heavy rain. Any motorist who has driven by a marsh or wetland during one of these times certainly has seen the thousands of frogs trying to make it from one side of the road to another. Another thing they may notice is how many of those frogs are actually roadkill! The large amounts of frogs that migrate at these times ensure that some frogs do make it to the other side of the road but a lot of them do not. This has a more intense effect on frog populations during mating season because each frog that is run over is one less frog that is able to reproduce, effectively killing the next generation of frogs.

Threats to Salmon Stocks

Salmon, both farmed and wild, face many dire threats. These are mostly related to things such as land development and pollution, which take away the salmon's habitat. Areas that are left undeveloped maintain a sponge effect so that soil can soak up large amounts of water. Because the soil is absorbant they also slow down the rate at which storm water runs off. If storm water runs off the bank of the streams too fast, gravel from the stream bed would be swept away, causing valuable nesting grounds to be destroyed. This is only one of the risks to the salmon population.



The smallest change in a salmon's environment can be a matter of life and death. In some parts of the world, such as Taiwan, factors such as storms, earthquakes, and climate changes affect the water levels so much that large quantities of rare salmon lose their habitat. When the water levels are always being disrupted Salmon may also have difficulty breathing due to varying quantities of dissolved oxygen in the water.

In the United States, man-made facilities such as dams that divert water to other areas are responsible for killing many salmon. Some of them are killed in the machinery itself, some are killed when they get carried down dried up side-streams, and still more are killed when they are poisoned by the different chemicals that enter the water as a result of the man-made machinery. Dams make it much harder for fish to swim up stream to their nesting grounds.

Mining and logging can destabilize the area surrounding the banks of rivers causing dirt and debris to be washed into the rivers that help to control the water levels of surrounding lakes. Research indicates that over the course of the past 200 years, 48 United States have lost at least 53 percent of their wetlands. California may have suffered the worst damage, losing a massive 91 percent of all wetlands over a 200 year period.

Run-off pollution kills organisms and insects in the food chain causing salmon to be unable to obtain a proper source of food, hence many of them die. Pollution also kills off salmon eggs, or roe, when they are in their most vulnerable state. The population is at risk of decreasing as a result.

Since salmon are in high demand in some countries, many fishermen see this as an opportunity for economic benefit and go on giant fishing sprees. The result is a vast decrease among the salmon population. Over the years, demand for salmon has gone up, while the population of salmon has steadily gone down. If this growing trend continues, it may not be long before salmon are on the verge of extinction.

Salmon And Climate Change

The news about Pacific salmon is often confusing. Are stocks in crisis - or not? The short story is that some hatchery stocks are booming, some wild stocks are fine, and far too many unique and irreplaceable stocks - from Alaska to California, are hovering on the edge of extinction.

Clearcut logging destroys forested spawning streams, industrial effluent still pours into rivers and urban development means building parking lots on fish streams. The agribusiness industry, overfishing of endangered stocks, dams and the construction of marinas on top of fragile estuaries add to the damage. Pacific salmon are under siege.

One of the most serious, and least talked about, risks is the danger posed by global warming. But increasing research is beginning to put the gravity of the threat in perspective. Pacific salmon could meet an end in thousands of streams if governments around the world do not act now to reduce fossil fuel use and commit to reductions in greenhouse gas emissions.

From Alaska's Bristol Bay, through the fishing towns of British Columbia to the California coast people depend on salmon. Jobs - and cultures - revolve around the annual return. If the streams are too hot, the salmon will vanish.

A 1992 study by D.A. Levy in the Canadian Technical Report of Fisheries and Aquatic Sciences frames the issues confronting salmon in a warming climate. At writing, the scientists contributing to the report envisioned the following scenarios:

- Global warming will increase water temperatures and decrease water flows during spawning migrations. Result: increased pre-spawning mortality. Salmon will die before reproducing
- Global warming will increase water temperatures during egg incubation. Result: salmon fry will emerge too early, increasing mortality
- Global warming will increase the severity and frequency of winter floods. Result: reduced survival rates of eggs to salmon "fry" or young juveniles.
- Global warming will increase stream and river water temperatures. Result: conditions necessary for salmon survival will be less likely to occur.
- Global warming will alter the timing and volume of stream flow discharges. Result: Reduced capability of streams to support juvenile salmon.
- Global warming, and resulting increased water temperatures, will alter the aquatic community as a whole. Result: adverse impacts on salmon populations.
- Global warming will shift the timing of the spring freshet or snow melt into rivers and streams. Result: increased mortality of out-migrating juvenile salmon.

The study by Levy focussed on potential impacts in the Fraser River basin. But all salmon species spend most of their lives in the ocean. More recent research has focussed on oceanic survival and the possible impacts of climate change on salmon at sea. The facts paint a dismal picture.

Projections based on circulation models for the northeast Pacific predict sea surface temperatures may increase by 2 to 4 degrees celcius, and wind speeds will decrease. The combination would impact ocean upwelling of nutrients, born to the surface by the movement of cold waters from deep in the ocean. These nutrients play a critical role in the food chain for ocean-going salmon. The upwelling cold water nutrients support and maintain the zooplankton, a primary food source of salmon. Warmer sea surface temperatures would also mean a loss of ideal ocean habitat for salmon stocks. Salmon depend on cool waters.

Fishermen on the west coast of Vancouver Island are already witnessing another impact of changing ocean temperatures - this time brought about by El Nino. The warm water current has brought with it a population of mackeral -- a fish normally found in more southern ocean areas. The mackeral's arrival coincided with the out-migration of juvenile endangered chinook salmon. The voracious mackeral consumed chinook at a frightening rate. A more lasting change in ocean temperatures, brought about by climate change, could lead to a permanent stock of mackeral in B.C. waters, with devastating consequences for Pacific salmon.

In their paper "Effects of Climate Change on Coastal Systems in B.C. and Yukon", Beckman et.al. highlight another risk global warming poses for salmon survival. The authors note that "...increases in precipitation will wash increased amounts of organic material through watersheds and into estuarine areas. Oxygen depletion caused by the decomposition of this material may cause large-scale fish die-offs (Reid and Trexler, 1996) and/or may affect survival rates of (salmon)."

Alaska may be experiencing a taste of what's in store. This season's expected run of millions of Bristol Bay reds (sockeye) is simply not materializing. Initially, speculation revolved around theories that the fish were merely holding offshore. Late June and early July have been unusually warm in the region, and river and estuary temperatures were higher than normal, discouraging the salmon from entering the river.

One short commerical opening for gillnets (inshore driftnets) was held on July 12. Optimism plummeted when over 400 vessels caught an average of only 115 fish each. On July 13, Alaska governor Tony Knowles met with fishermen from the region and was fully briefed on what fishermen are calling "disastrous conditions". The Governor ordered his disaster cabinet to convene, and some compensation for fishermen may be in the offing. There is no discussion of oil company compensation for salmon if it is proven that changing climatic conditions caused this year's run failure.

All the disruptions predicted in a globally changed climate for salmon, fish, shellfish and crustacean populations won't just impact humans. In all likelihood, altered food availability will have a profound impact on black bears, seals, sea-lions, otters, killer whales and eagles to name but a few species.

There is little the bears and whales can do to prevent this potential disaster.

Humans, on the other hand, can take climate change seriously and take action now to prevent the worst impacts of greenhouse gas emissions from destroying ocean life.

No one can say for certain if the salmon will adapt to a changing climate, or die out as a species. But 2,500 of the world's top climate scientists say for certain that climate change is upon us - now. We're about to find out how the salmon fare unless we change course, dramatically and immediately.

Greenpeace concludes:

The threats that global climate change pose to salmon, other fish stocks and ocean ecosystems are numerous and very real. Yet they are only a fraction of the larger, bleaker realities of Earth in a dramatically changing climate. These potentially drastic changes in salmon production serve as a wake up call to governments and individuals alike to take action now. Greenpeace fully supports substantial reductions in greenhouse gas emissions. Greenpeace supports the research concluding that the global climate cannot sustain the risk of industry burning the fossil fuel reserves we have now, therefore further exploration and development should halt immediately. Societies must begin to move from a fossil fuel-based economy to one based on clean, renewable energy sources. Solar and wind power along with energy efficiency measures are available now. These alternatives to fossil fuel have the potential to meet the world's energy needs, create jobs and reduce energy costs while protecting the planet. The barriers to these solutions are not technical but political. Greenpeace is calling on

world leaders to drastically reduce fossil- fuel emssions; invest in, and implement, renewable energies and efficiency, and end new oil and gas exploration now.

Butterfly decline signals 'biodiversity crisis'

<http://www.guardian.co.uk/environment/2006/mar/02/conservationandendangeredspecies.uknews>



The Small Blue: Intensive grazing has reduced its habitat, including its favourite purple vetch flowers.

Photograph: Butterfly Conservation

Britain's farmland butterflies have declined by 30% over the last 10 years, according to a government study today, which ministers admit has "worrying" implications for the ecosystem.

Researchers from Butterfly Conservation looked at 40 butterfly species on more than 800 sites. They found a 30% fall in butterfly numbers across the board, including on sites that have been targeted for conservation.

Their report for the Department for Environment, Food and Rural Affairs also found some evidence that the decline had accelerated in the last three years of the 10-year study.

It concluded: "Because butterflies are widely accepted as good indicators of ecosystem health, the overall decline is an alarming result with important implications for other insects and biodiversity."

Sir David Attenborough, chairman of Butterfly Conservation, said: "The declines of butterflies are deeply concerning, especially in light of the recently published declines of common moths. Together, these losses indicate that we are entering a deep biodiversity crisis that needs the urgent attention of us all."

Announcing the findings, the biodiversity minister, Jim Knight, said: "Butterflies are an iconic species in their own right, and they can be good indicators of the health of the entire ecosystem, so this decline is worrying."

The study found that a general approach to conservation, over the last 10 years, had often harmed butterfly habitats. Land managers have tended to promote a uniform diversity of flowers and shrubs in conservation areas, which has not always suited the often fussy requirements of butterfly species.

It said: "General conservation measures aimed at conserving birds and improving habitat have not been sufficient to halt butterfly declines. Moreover, for some species types they may have exacerbated declines."

The species that were declining included the Small Blue, Grizzled Skipper, Green Hairstreak and Duke of Burgundy. These are all "mosaic" species because they require varied habitats.

But the study revealed more encouraging findings where the specific habitat of endangered species had been targeted for protection.

As part of commitments made at the 1992 Rio earth summit, the government agreed to single out eight butterfly species for special protection as part of a biodiversity action plan.

Today's study found significant improvements in four of these species; the Adonis Blue, High Brown Fritillary, Heath Fritillary and Silver-studded Blue. Of the other four, the population of the Pearl-bordered Fritillary and Silver-spotted Skipper had stabilised. But the Marsh Fritillary and the Northern Brown Argus continued to decline despite efforts to improve habitats which they relied on.

Mr Knight said the government was now promoting a more targeted approach to protect individual species under its environmental stewardship scheme.

He said the scheme "has the potential to address many of the concerns highlighted in this report, and could make a big difference to butterflies and to all the other insects, mammals and birds that rely on them".

Experts: Monarch butterfly population in jeopardy

By Sameera GokalCNNWednesday, April 20, 2005 Posted: 12:53 PM EDT (1653 GMT)

ATLANTA, Georgia (CNN) -- Monarchs are dying in Mexico. No, not kings and queens, but creatures that are just as majestic -- in the butterfly world.

Monarch butterflies flock by the millions to the tree-laden mountains of central Mexico each November and depart for northern climes the first of April.

On their return northward, the monarchs lay their eggs on milkweed plants and die, according to the Encyclopedia Britannica. The eggs hatch and mature, and a new generation continues the trip. Each group is three to five generations removed from the previous arrivals.

In recent years, bitter cold, severe rainstorms and droughts have taken their toll on the delicate creatures. Experts say that three of the past five winters in Mexico have seen major die-offs in monarch populations.

Additional threats, say researchers, include loss of habitat and a declining food supply due to the rise in illegal logging operations and the unrestricted spraying of pesticides and other poisons in forested areas of Mexico where the butterflies are known to gather.

Although the butterflies showed signs of rebound in 2003, hundreds of millions of monarchs succumbed over the past two years to winter temperatures in Mexico that were the coldest in a decade, scientists say.

"In 2002 and January 2004, there were severe winter storms from Canada to Mexico, and because of the high altitude, millions of monarch butterflies froze to death," says Lincoln Brower, a biologist at Sweet Briar College in Virginia. "They were killed last winter, and many did not get back to the United States for the spring."

Brower, an expert on monarch butterflies, says that the 2004 migration was the lowest he has ever seen.

Other experts acknowledge that the number of monarch butterflies is down by as much as 75 percent, and the birth of this season's migration again has signaled the death of millions of butterflies.

Researchers have spent years trying to decipher the reasons for the butterflies' annual migration from Canada to Mexico. The practice has been linked to a variety of factors, including internal clocks and instinct.

With their orange and black coloring and wing pattern, monarchs are one of the largest butterflies in North America and the best-known species.

Despite their size, the butterflies remain vulnerable to cool climatic conditions and rely on clustering in large numbers and the safety of forests to keep warm.

"In 2004, there was not a good recovery because of the low spring population, the summer being extremely cold, and the loss of habitat in the upper Midwest," says Chip Taylor, a professor at the University of Kansas.

Scientists say they fear the migration situation could worsen as butterflies and forests in Mexico continue to decline.

They say the loss of habitat means monarchs will produce fewer offspring and migrating numbers will be the lowest in the past 14 years.

"If we lose the whole migration, we lose one of the nation's most magnificent phenomenon." Taylor says. "They are pollinators of native plants and have impacts on plants utilized.

"These butterflies are the symbol of richness of biological diversity and marvelous scientific aspect."

CNN's Camille Feanny contributed to this report.

• Female monarch butterflies on 30-year decline in eastern North America



September 23rd, 2009

Andy Davis, a Ph.D. candidate in the Warnell School of Forestry and Natural Resources, analyzed published overwintering and migratory data for the insect from 1976 to the present, discovering that the female to male ratio for the [butterflies](#) east of the Rockies has gradually been changing. In the late 1970s, Davis said, females made up around 53 percent of the monarch butterfly population that migrated to [Mexico](#) for the winter. Today, that number has dropped to about 43 percent which paints a dire picture for population recruitment. Davis outlines his findings in a new paper co-authored with Eduardo Rendón-Salinas of World Wildlife Fund-Mexico. The paper appears in *Biology Letters*.

“I nearly fell over when I saw the trend,” said Davis. It was an unintentional but extremely important finding.”

The monarch butterfly, one of the most well-known and widely-recognized [insects](#) in the world, is a flagship species for conservation. North American Monarchs can migrate more than 2,000 miles as they fly to Mexico from Canada and the U.S. for the winter. “The implications of this decline are huge,” Davis said. “Female monarchs can lay as many as 400 eggs over their lifetime, which is why the species is so resilient.”

But Davis said that as the monarch population continues to struggle because of breeding habitat loss, widespread pesticide use, and deforestation of the overwintering sites, losing a significant number of females could seriously hinder the population’s ability to rebound after periodic crashes. Davis, who studies monarchs in addition to his doctoral work, said that news of the decline has gone unnoticed until now “because no one’s ever looked at the data like this. For years, scientists have been collecting male and female monarchs at the overwintering sites and during the fall migration. When we compiled the numbers from these collections, along with the year they were made, the trend was obvious.”

At their wintering sites, monarchs cluster on trees and form massive colonies that can number in the millions. Illegal logging of these trees is a serious threat to their wintering stage, but the threats they face in their breeding range in the United States and Canada are just as important. Further, because the decline in females is also present in the fall migration, Davis says, it means that whatever is causing this decrease is happening during the breeding season in the U.S. and Canada.

“That tells us we need to look here to see what the cause is,” he said. Whatever it is, Davis explained, “it must be something that affects females more so than males. This will be the challenge for future studies to sort out. We’ll also need to monitor the numbers of females in the population closely over the next few years, at all stages of their life cycle.

This discovery just goes to show how new insights can be gained from critical re-examination of published studies, and more generally, how much we still need to learn about this amazing insect before it is too late.”

Provided by University of Georgia ([news](#) : [web](#))

Warming Climate May Put Chill On Arctic Polar Bear Population

ScienceDaily (Sep. 14, 2006) — Some travel agencies touting Arctic tours have been revving up their recent promotions to tourists about the increased likelihood they will spot polar bears in this region where several populations of polar bears live. According to scientists from NASA and the Canadian Wildlife Service, these increased Arctic polar bear sightings are probably related to retreating sea ice triggered by climate warming and not due to population increases as some may believe.

The new research suggests that progressively earlier breakup of the Arctic sea ice, stimulated by climate warming, shortens the spring hunting season for female polar bears in Western Hudson Bay and is likely responsible for the continuing fall in the average weight of these bears. As females become lighter, their ability to reproduce and the survival of their young decline. Also, as the bears become thinner, they are more likely to push into human settlements for food, giving the impression that the population is increasing. The study will be published this week in the September issue of the *Journal Arctic*.

Claire Parkinson, a scientist at NASA's Goddard Space Flight Center, Greenbelt, Md., and Ian Stirling, a senior scientist with the Canadian Wildlife Service, Edmonton, Alberta, used NASA satellite observations captured from 1979 to 2004 to show the reduction in sea ice cover in several specific areas where there are known polar bear populations. In most of the areas studied, they found that ice break-up in these areas has been occurring progressively earlier.

"Our research strongly suggests that climate warming is having a significant and negative effect on a primary species reliant on the sea-ice cover for survival," said Parkinson.

The researchers studied the sea ice in regions that are home to five different polar bear populations: western Hudson Bay, eastern Hudson Bay, Foxe Basin, Baffin Bay and Davis Strait-Labrador Sea. "Polar bears live much of their lives on the sea ice, which is fundamental for their survival, at least in terms of their traditional lifestyles," said Parkinson. "It's the sea ice surface that provides them a platform from which to hunt seals and other marine mammals for food."

Sea ice is most scarce during the summer months, causing the bears to retreat to land and fast on their stored fat reserves until sea ice comes back in the fall. "Our concern is that if the length of the sea ice season continues to decrease, then the polar bears will have shorter periods on the ice, when they can feed, and longer periods on the land, during the open-water season in summer and early fall," she said. "Their stored fat from life on the ice will likely not provide enough nourishment for the fasting period on land, posing a clear danger to their health and, in the long term, possibly to their species."

Sea-ice cover in these regions has decreased since at least 1978, the beginning of consistent satellite monitoring. The researchers used 26 years of satellite data using data from NASA's Nimbus 7 satellite and the Defense Meteorological Satellite Program's Special Sensor Microwave Imager.

"By reviewing satellite data, we found that sea-ice cover break-up in western Hudson Bay took place about seven to eight days earlier per decade," said Stirling. "An extra month of fasting resulting from this phenomenon over four decades can significantly impact the polar bears' eating habits and survival."

"One of the most important things that enabled us to do this study was our ability to draw on long-term satellite databases on Arctic ice," said Stirling. "NASA has maintained an extensive and invaluable database of these observations that made it possible for us to combine our different expertise on this study."

In addition to monitoring sea-ice changes, the researchers incorporated data from previous polar bear studies in the same Arctic regions that also indicated the likelihood that progressively earlier break-up of sea ice was likely to cause problems for polar bears.

"In 1980 the average weight of adult females in western Hudson Bay was 650 pounds. Their average weight in 2004 was just 507 pounds -- a 143-pound reduction," said Stirling. A 1992 study in the Canadian Journal of Zoology indicated that no females weighing less than 416 pounds gave birth the following spring.

According to Stirling, if the climate continues to warm as projected by the Intergovernmental Panel on Climate Change and the ice continues to break up progressively earlier, it is likely that in 20-30 years polar bear reproduction in western Hudson Bay will be significantly limited. Similar events may eventually happen in other areas included in the study.

Polar Bear Population at Risk

February 09, 2007 by

Polar Bears have stopped digging dens on sea ice and are at risk of decreasing their population.

Their diminishing habitat and shorter hunting seasons were revealed in a new federal study which stated that more pregnant polar bears in Alaska are denning on land instead of ice, further from their food supply.

["It's bad enough that polar bears are starving to death, but now their pregnancy and birth patterns have begun to change," said Hilary Stamper of Care2.com. "According to the study, between 1985 and 1994, 62 percent of female bears studied made their dens in snow on sea ice."](#)

[Stamper said that if the ice continues to thin, polar bears will need to swim huge distances from hunting waters to denning habitat, which could cause many to drown or starve.](#)

[The polar bear population could decrease even faster.](#)

[To tell the Fish and Wildlife Service that they are threatened and should be listed as such, go to go.care2.com.](#)

[In other environmental news, one landscaper in Dallas, TX has a self-reliant approach for Texas gardens.](#)

["Jim Martinez is in such high demand in Marfa, TX for his brand of drought-tolerant, self-reliant, native-plant gardens that he's building a second home there so he can sleep in his own bed," said writer Mariana Greene. "Marfa, in West Texas near Big Bend, is](#)

ahead of Dallas and its suburbs in the practice of xeriscape gardening."

But, Greene explains, with a continuing drought, stressed water reserves and our extremes of heat and humidity compounded by hot summer summers, Dallas is a less hospitable place to garden.

For instance, a native muhly grass hybrid, Muhlenbergia capillaries 'Regal Mist' takes the place of traditional turf grass in a Marfa front yard.

According to Greene, though he has lived in Dallas for several decades, Martinez has never created an English-style garden for himself or others here.

Perennials, reseeding annuals and accidents of nature create a front yard with year-round interest.

The jagged terrain in front of Martinez's Austin-stone house is described by Green as "downright florid."

"I am happy to let my garden surprise me," said Martinez.

Global warming to significantly decrease polar bear population



Polar bears are one of the many mammals that are being affected by global warming. According to the [United States Geological Survey](#), the polar bear population will [decrease by two-thirds](#) between now and 2050:

Two-thirds of the world's polar bears will be killed off by 2050 – and the entire population gone from Alaska – because of thinning sea ice from global warming in the Arctic, government scientists forecast Friday.

Only in the northern Canadian Arctic islands and the west coast of Greenland are any of the world's 16,000 polar bears expected to survive through the end of the century, said the U.S. Geological Survey, which is the scientific arm of the Interior Department.

USGS projects that polar bears during the next half-century will disappear along the north coasts of Alaska and Russia and lose 42 percent of the Arctic range they need to live in during summer in the Polar Basin when they hunt and breed. A polar bear's life usually lasts about 30 years.

[Here](#) is the report itself.

Last year, the [U.S. Fish and Wildlife Service](#) proposed to [add](#) the polar bear to the list of endangered species. On Friday, they released a statement reiterating their report about "[polar bear extirpation due to the loss of sea ice.](#)"

This is extremely good news to hear from these government agencies, and somewhat surprising. In Bush's first term, he [appointed](#) more than 100 one-time industry insiders as regulators.

Then again, these days global warming is getting fairly difficult to deny -- especially when the US [acknowledges](#) that more arctic oil will become available once the ice melts in a few decades.

Science News

Global Bird Populations Face Dramatic Decline In Coming Decades, Study Predicts

ScienceDaily (Dec. 20, 2004) — Ten percent of all bird species are likely to disappear by the year 2100, and another 15 percent could be on the brink of extinction, according to a new study by Stanford University biologists. This dramatic loss is expected to have a negative impact on forest ecosystems and agriculture worldwide and may even encourage the spread of human diseases, according to the study published in the Online Early Edition of the Proceedings of the National Academy of Sciences (PNAS) in December.

"Our projections indicate that, by 2100, up to 14 percent of all bird species may be extinct and that as many as one out of four may be functionally extinct—that is, critically endangered or extinct in the wild," said researcher Cagan H. Sekercioglu of the Stanford Center for Conservation Biology (CCB) and lead author of the PNAS study. "Important ecosystem processes, particularly decomposition, pollination and seed dispersal, will likely decline as a result."

These findings come on the heels of the November 2004 Global Species Assessment by the World Conservation Union (IUCN), which found that 12 percent of all bird species are already threatened with extinction, along with nearly one-fourth of the world's mammals, one-third of the amphibians and 42 percent of all turtles and tortoises.

"Even though only 1.3 percent of bird species have gone extinct since 1500, the global number of individual birds is estimated to have experienced a 20 to 25 percent reduction during the same period," wrote Sekercioglu and CCB co-authors Gretchen C. Daily and Paul R. Ehrlich. "Given the momentum of climate change, widespread habitat loss and increasing numbers of invasive species, avian declines and extinctions are predicted to continue unabated in the near future."

Future scenarios

The study was based on a painstaking analysis of all 9,787 living and 129 extinct bird species. Eight researchers spent a year collecting data on the conservation, distribution, ecological function and life history of every species—more than 600,000 computer entries in total. "The result is one of the most comprehensive databases of a class of organisms ever compiled," Sekercioglu said.

To forecast probable rates of extinction, he and his colleagues entered the data into a computer program designed to simulate best-case, intermediate-case and worst-case scenarios for the future.

The best case was based on the assumption that conservation measures in the next 100 years would be sufficient to prevent additional bird species from becoming threatened with extinction.

For the worst case, the researchers assumed that the number of threatened species will increase by about 1 percent per decade—that is, 1 percent in 2010, 2 percent in 2020, 3 percent in 2030, etc. "These assumptions are conservative, since it is estimated that, every year, natural habitats and dependent vertebrate populations decrease by an average of 1.1 percent," the authors wrote.

For the intermediate scenario, the scientists used statistics from 1994 through 2003 as a basis for calculating the likelihood that a non-threatened species would become threatened after a decade.

The results of the three future scenarios were dramatic. The computer forecast that between 6 and 14 percent of all bird species will be extinct by 2100, and that 700 to 2,500 species will be critically endangered or extinct in the wild. Even the middle-of-the-road intermediate scenario revealed that one in 10 species will disappear a century from now, and that approximately 1,200 species will be functionally extinct.

The study cited several reasons for the expected decline in bird populations, including habitat loss, disease, climate change, competition from introduced species and exploitation for food or the pet trade.

"Island birds are particularly at risk," the authors said, noting that one-third to one-half of all oceanic island species will be extinct or on the brink of extinction by 2100. Birds with highly specialized diets are predicted to experience more extinctions than average, they wrote, adding that some plant species also face extinction if their primary pollinators and seed-dispersers vanish.

"It's hard to imagine the disappearance of a bird species making much difference to human well-being," said Daily, an associate professor (research) in Stanford's Department of Biological Sciences and director of the CCB Tropical Research Program. "Yet consider the case of the passenger pigeon. Besides mail becoming a lot less fun to receive, its loss is thought to have made Lyme disease the huge problem it is today. When passenger pigeons were abundant-and they used to occur in unimaginably large flocks of hundreds of millions of birds-the acorns on which they specialized would have been too scarce to support large populations of deer mice, the main reservoir of Lyme disease, that thrive on them today."

Scavengers and insectivores

More than a third of all scavengers and fish-eaters are extinction-prone, according to the study, yet little is known about the potential consequences of their widespread disappearance. "Since most scavenging birds are highly specialized to rapidly dispose of the bodies of large animals, these birds are important in the recycling of nutrients, leading other scavengers to dead animals and limiting the spread of diseases to human communities as a result of slowly decomposing carcasses," the authors wrote.

As an example, the researchers pointed to India, where the collapse of the vulture population in the 1990s was followed by an explosion of rabid feral dogs and rats. In 1997 alone, more than 30,000 people died of rabies in India, more than half of the world's total rabies deaths that year.

Insect control is another important ecosystem service performed by birds, yet the study found that more insect-eating bird species are prone to extinction than any other group. "Exclusions of insectivorous birds from apple trees, coffee shrubs, oak trees and other plants have resulted in significant increases in insect pests and consequent plant damage," the authors wrote, adding that the extreme specializations of many insectivorous birds, especially in the tropics, make it unlikely that other organisms will be able to replace the birds' crucial role in controlling pests.

"The societal importance of ecosystem services is often appreciated only upon their loss," the authors wrote. "Disconcertingly, avian declines may in fact portray a best-case scenario, since fish, amphibians, reptiles and mammals are 1.7 to 2.5 times more threatened [than birds]." Invertebrates, which may be even more ecologically significant than animals, also are disappearing, they noted. Therefore, "investments in understanding and preventing declines in populations of birds and other organisms will pay off only while there is still time to act," the authors concluded.

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Science News

Climate Change And Deforestation Will Lead To Declines In Global Bird Diversity, Study Warns

ScienceDaily (June 5, 2007) — Global warming and the destruction of natural habitats will lead to significant declines and extinctions in the world's 8,750 terrestrial bird species over the next century, according to a study conducted by biologists at the University of California, San Diego and Princeton University.

Their study, the first global assessment of how climate change and habitat destruction may interact to impact the distribution of a large group of vertebrates over the next century, appears in the June 5 issue of the journal *PLoS Biology*.

The scientists warn in their study that, even under the most optimistic scenarios of controlling climate change and protecting habitats, at least 400 bird species are projected to become imperiled by the year 2050 due to reductions in their geographic ranges of greater than 50 percent. All estimates in the study are based on the assumption that birds will not dramatically shift their geographic ranges in response to a changing climate.

“We found in our study that under certain assumptions by the year 2100, 950 to 1,800 bird species may be imperiled or even driven to extinction by climate change and habitat destruction,” says Walter Jetz, an assistant professor of biological sciences at UCSD and the lead author of the study. “Most of these species are currently not recognized as imperiled.”

“It's clear that both climate change and habitat destruction pose grave threats to many of the world's birds and, by analogy, to other species as well,” says David Wilcove, a professor of ecology, evolutionary biology and public affairs at Princeton University and a co-author of the study. “Neither problem can be addressed in a vacuum.”

Climate change and deforestation have already been implicated in the extinctions and geographical range reductions of many terrestrial species of vertebrate animals in recent decades. But the researchers point out that based on global warming and deforestation projections this loss of diversity appears to be accelerating. “Even more dramatic environmental change is projected for this century,” they write in their paper.

To estimate the impact of climate and land use changes in their study, the researchers combined information on four projections of future global warming, agricultural expansion and human population growth from the global Millennium Ecosystem Assessment with current geographic ranges of the world's 8,750 species of terrestrial birds.

“The most intense climate change is expected at higher latitudes, where birds are relatively species-poor and have large ranges,” says Jetz of UCSD. “Dramatic levels of deforestation and other forms of land conversion are projected to continue or even increase in much of the tropics. There birds and most other taxonomic groups are especially diverse and tend to have small ranges, making them particularly vulnerable to extinction.”

The researchers say that in the near future more bird species may be imperiled by deforestation than by the change of their habitat due to climate change. But together these two factors will be devastating for bird populations.

“This is akin to killing two birds with one stone,” says Wilcove of Princeton. “Deforestation drives tropical species to extinction and also contributes to global climate change. Climate change, in turn, drives temperate species to extinction. The good news is that by halting deforestation we can protect both tropical and temperate birds.”

The researchers say a vastly expanded network of wildlife reserves in the tropics, coupled with more ambitious goals to reduce greenhouse gas emissions and monitor the biodiversity impacts of climate change, will be needed to minimize global extinctions.

“The tragic irony here is that the protection of tropical forests is also one of the strongest buffers against future climate change,” says Andrew Dobson, the third author of the paper and a professor of ecology and evolutionary biology at Princeton. “It is crucial that international environmental policy be swiftly developed to focus both on climate change and on habitat loss; the two are not only intimately related, but are arguably the greatest threats not only to birds, but also to human welfare and economic well-being.”

“These hundreds of bird species headed toward extinction are like thousands of dying canaries in coal mines,” Dobson adds. “It's time we paid attention to them.”

“Billions of philanthropic and government dollars are spent annually on clearly crucial biomedical research to avert the future impacts of diseases,” says Jetz of UCSD. “Yet, the support for the necessary research and development to deal with the looming biodiversity crisis, and its multi-fold effects on human well-being, remains at abysmal levels. Drastically increased support for field surveys and impartial biodiversity research is needed to avoid future generations rightfully asking uneasy questions about the limited scope of today's science support.”

The researchers say their study may also help future investigations because it introduces a novel way of combining geographic socioeconomic projections with biodiversity information.

“Our analysis is only a starting point, but with the increased quality of models and data our approach may offer a powerful, general way for a continued assessment of the future of biodiversity,” says Jetz.

Science News

Birds Going Extinct Faster Due To Human Activities

ScienceDaily (July 5, 2006) — Human activities have caused some 500 bird species worldwide to go extinct over the past five millennia, and 21st-century extinction rates likely will accelerate to approximately 10 additional species per year unless societies take action to reverse the trend, according to a new report.

Without the influence of humans, the expected extinction rate for birds would be roughly one species per century, according to Stuart Pimm, professor of conservation ecology at Duke University's Nicholas School of the Environment and Earth Sciences, who is one of the report's principal authors.

"What our study does, for the first time, is provide a well-justified and careful estimate of how much faster bird species are going extinct now than they did before humans began altering their environments," said Pimm, whose research group pioneered the approach of estimating extinction rates on a per-year basis.

"Extinction rates for birds are hugely important, because people really care about birds," he said. "People enjoy them, and bird watching is a big industry. So we know the rates of bird extinctions better than the rates for other groups of species."

"Habitat destruction, selective hunting, invasive alien species and global warming are all affecting natural populations of plants and animals adversely," added Peter Raven, president of the Missouri Botanical Garden, who is co-principal author of the report and a longtime collaborator with Pimm.

The report will appear in the online edition of the Proceedings of the National Academy of Sciences during the week of July 3-7, 2006. Other authors are Alan Peterson, a physician in Walla Walla, Wash., and Paul Ehrlich and Cagan Sekercioglu, conservation biologists at Stanford University.

The researchers calculated that since 1500 -- the beginning of the major period when Europeans began exploring and colonizing large areas of the globe -- birds have been going extinct at a rate of about one species per year, or 100 times faster than the natural rate.

And the rate has been faster in recent times. "Increasing human impacts accelerated the rate of extinction in the 20th century over that in the 19th," the report said. "The predominant cause of species loss is habitat destruction."

These findings do not mean Europeans have caused all of the extinctions of birds over the course of time, the researchers said. "Europe's exploration of the rest of the world merely continued to extinguish species at rates similar to those caused by the earlier Polynesian expansion across the Pacific," they said in the report.

The new assessment considerably exceeds previous scientific estimates that 154 bird types disappeared during that past 500 years, according to the researchers.

One factor contributing to such large differences in estimates is that "more than half of the known species of birds were not discovered until after 1850, an important point that previous estimates of extinction rates have failed to take into account," Raven said. "One can't register a bird as extinct if it was not known to exist in the first place."

According to Pimm, as recently as 1815 scientists were aware of only about 5 percent of the world's birds. "The reality is that scientists did not know about most remaining bird species until about 1845 or 1850," he said.

The new report is not all bleak, Pimm said. "The good news in this report is that conservation efforts are reducing extinction rates to about one bird species every three or four years," he said, but he added that even this improved rate "is still unacceptable."

Of the 9,775 known species of birds, "an estimated additional 25 would have gone extinct during the past 30 years if it were not for human intervention," Raven said.

Despite conservation efforts, "some 1,200 more species are likely to disappear during the 21st century," he warned. "An equal number are so rare that they will need special protection or likely will go extinct, too."

The forecast may be even bleaker for other types of animals, the researchers said.

"We do not give the kind of special attention to other groups of organisms that we do to birds, and extinction rates for them are likely to be much higher over the 21st century and beyond," Raven said.

The researchers derived their estimates using a large database of threatened and endangered species compiled by Bird Life International in Cambridge, England. They also used a compilation by report co-author Alan Peterson of the first scientific descriptions of bird species.

"Knowing when species were first described to science turned out to be a hugely important part of this story," Pimm said.

Wild ape population undergoing "catastrophic" decline

Study predicts animals most like humans may soon reach "brink of extinction"

PRINCETON, N.J. -- The population of apes in Western Equatorial Africa has declined severely over the last 20 years and, without aggressive intervention, may soon reach the "brink of extinction," a study has found.

In a process that went largely unnoticed, years of illegal hunting and an epidemic of Ebola virus have slashed the population of wild chimpanzees and gorillas by more than 50 percent in the last part of the world to have widespread ape habitats, according to the study, which was published in an online edition of Nature April 6. The findings contradict estimates, from as recently as 1995, that the number of wild apes has been relatively stable.

"The species that are most similar to humans are just disappearing before our eyes," said Peter Walsh, a Princeton University scientist who led an international group of 23 researchers from the Wildlife Conservation Society and other institutions.

The study authors called for immediate improvements in anti-hunting law enforcement and in Ebola research and intervention. "The stark truth is that if we do not act decisively our children may live in a world without wild apes," the researchers concluded.

Previous estimates were deeply flawed, said Walsh, because they assumed that the best indicator of ape populations is the amount of intact forestland, which is relatively abundant in Western Equatorial Africa. They did not account for the possibility that hunting and disease could deplete the population even in densely forested areas, he said.

The new study is based on several surveys conducted between 1998 and 2002 in which teams of trained observers traveled through 4,800 kilometers of dense jungle and counted ape nests. In their paper, the researchers compared their results with those of the last comprehensive ape survey, which was done between 1981 and 1983, as well as with results from smaller surveys completed in the intervening years.

"Those who work in the field have had an idea of what's happening, both the hunting and the Ebola, for a while now, but it's been under the public radar," said Walsh. "Ours is a rigorous, quantitative estimate that I hope people will pay attention to. If you ask anybody, even in the international conservation community, they'll tell you that there are lots of apes. The fact is there are not. They've really been hammered, and it's actually accelerating."

(more)

The researchers predicted that, given the current trend, the ape population will decline by another 80 percent within 30 years, but probably much sooner if the loss continues to accelerate. That rate of decline, which spans just one or two generations of the animals, qualifies apes for "critically endangered" status under the World Conservation Union, according to the study. Gorillas and chimpanzees currently are listed as "endangered."

"They won't be extinct," said Walsh, "but we'll have gone from widespread, large populations to scattered pockets in 20 years." Small, isolated populations are often not sustainable, he said.

Walsh emphasized that the researchers did not attempt to estimate the actual number of apes that exist in the study region, which was mainly in the country of Gabon. Observing and counting even a single group of apes is difficult because they are very reclusive, he said. Instead, he used widely accepted statistical techniques to compare the spatial distribution of nests found in the new surveys to the spatial distribution of nests reported in the earlier studies.

As an example of the decline, Walsh cited a small study from 1991 in which researchers cutting a straight line through 20 kilometers of forest found 67 ape nest groups. In 1997 and 1998, researchers in the same area

covered 2,700 kilometers -- more than 100 times the distance -- and found 91 nest groups.

The researchers found that the density of nests varied according to how far the site was from one of Gabon's four major cities and how far it was from a documented outbreak of human Ebola virus, which transfers from apes to humans.

Illegal hunting of apes, a problem for many years, has worsened with an increase in mechanized logging, Walsh said. Many people in the region eat ape meat, although it is taboo in some ethnic groups. Logging companies have created isolated towns of several thousand workers deep in the jungle where employees, with regular salaries, buy large quantities of "bushmeat." In addition, logging roads have opened forests to organized groups of hunters who have "transformed hunting from a subsistence activity to a commercial enterprise," the researchers wrote.

"In the few areas where it's been seriously addressed, strong law enforcement has cut down on poaching," Walsh said. "It takes political will and it takes money, both of which have been lacking in the past."

The Ebola problem also demands immediate financial support for rigorous studies of the forces driving the epidemic, Walsh said. He recommended that Congress make a \$10 million emergency supplement to the U.S. Fish and Wildlife Service Great Ape Conservation Fund earmarked specifically for Ebola field research and intervention.

Walsh said the ape problem progressed as far as it has in part because of a lack funding for large-scale studies that are not tied to small, individual projects. He attributed the success of the study to the dedication of Lee White and other researchers with the Wildlife Conservation Society, for which Walsh worked before coming to Princeton in 1999. Researchers with the society, the World Wildlife Fund, and the Gabonese Water and Forests Ministry gathered important data as part of a successful project to create 13 national parks in Gabon.

"People in the field knew that commercial hunting was taking a huge toll but it took 10 extra years to piece together the data to make it a compelling story. Let's not make the same mistake with Ebola."

World ape population dwindles at fast rate

September 1st, 2005

A United Nations publication calls for greater protection of the dwindling number of apes around the world.

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The World Atlas of Great Apes and their Conservation is a collection of data about the apes detailing fears total ape populations could be extinct within one to three generations.

The BBC reports only 350,000 apes from six species are left in the world.

The Cross River gorilla in Cameroon and Nigeria is the rarest with between 250 and 280 animals left.

The ape population is being decimated by a number of factors, including human expansion, especially logging and mining, and disease.

In the Indonesian province of Aceh, decades of civil war and the deadly tsunami in December further threatened the Sumatran orangutan.

Only 700 mountain gorillas remain in the Democratic Republic of Congo, the site of next week's first meeting of a U.N.-founded group, the Great Ape Survival Project, whose goal is to restore the ape populations in Africa and Asia.

The population of apes in Western Equatorial Africa has declined severely over the last 20 years and, without aggressive intervention, may soon reach the "brink of extinction," a study has found.

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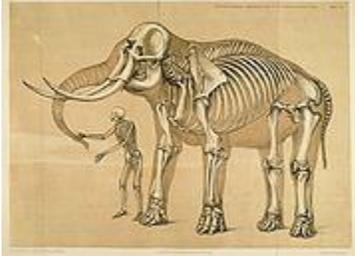
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Elephant

From Wikipedia, the free encyclopedia

Jump to: [navigation](#), [search](#)

For other uses, see [Elephant \(disambiguation\)](#).



Comparative view of the human and elephant frames, c1860.

Elephants are large land [mammals](#) in two [genera](#) of the [family Elephantidae](#): *Elephas* and *Loxodonta*. Three [species](#) of elephant are [living today](#): the [African Bush Elephant](#), the [African Forest Elephant](#) and the [Asian Elephant](#) (also known as the Indian Elephant). All other species and genera of Elephantidae are [extinct](#), some since the last [ice age](#): dwarf forms of [mammoths](#) may have survived as late as 2,000 BC.^[1] Elephants and other Elephantidae were once classified with other thick-skinned animals in a now invalid [order](#), [Pachydermata](#).

Elephants are the [largest](#) land animals now living.^[2] The elephant's [gestation](#) period is 22 months, the longest of any land animal. At birth it is common for an elephant calf to weigh 120 kilograms (260 lb). They typically live for 50 to 70 years, but the oldest recorded elephant lived for 82 years.^[3] The largest elephant ever recorded was shot in [Angola](#) in 1956. This male weighed about 12,000 kilograms (26,000 lb),^[4] with a shoulder height of 4.2 metres (14 ft), a metre (yard) taller than the average male African elephant.^[5] The smallest elephants, about the size of a calf or a large pig, were a prehistoric species that lived on the island of [Crete](#) during the [Pleistocene](#) epoch.^[6]

The elephant has appeared in cultures across the world. They are a symbol of wisdom in Asian cultures and are famed for their memory and intelligence, where they are thought to be on par with [cetaceans](#)^[7] and [hominids](#).^[8] [Aristotle](#) once said the elephant was "the beast which passeth all others in wit and mind"^[9]. The word "elephant" has its origins in the Greek [ἐλέφας](#), meaning "ivory" or "elephant".^[10]

Healthy adult elephants have no natural predators^[11], although [lions](#) may take calves or weak individuals.^{[12][13]} They are, however, increasingly threatened by human intrusion and poaching. Once numbering in the millions, the African elephant population has dwindled to between 470,000 and 690,000 individuals according to a March 2007 estimate.^[14] While the elephant is a protected species worldwide, with restrictions in place on capture, domestic use, and trade in products such as [ivory](#), [CITES](#) reopening of "one time" ivory stock sales, has resulted in increased poaching. Certain African nations report a decrease of their elephant populations by as much as two-thirds, and populations in certain protected areas are in danger of being eliminated^[15] Since recent poaching has increased by as much as 45%, the current population is unknown (2008).^[16]

elephant



Grazing herd of African elephants, Kenya. The African elephant has been aggressively hunted for its ivory tusks and is now an endangered species.



Elephant crossing in Hwange National Park, Zimbabwe, southern Africa. The largest national park in the country, Hwange is thought to hold the world's largest concentration of African elephants (estimates vary between 17,000 and 30,000).



An African bull elephant, one of 1,000 elephants living in the Amboseli Wildlife Park south of Nairobi, Kenya. This animal is clearly distinguished from the Asian elephant by its relatively large ears and sloping, rather than domed, forehead. The trunk of the African elephant is ridged rather than smooth, and there are two fingerlike projections at the tip (the Asian species has only one).



An Indian elephant, in Amber, Rajasthan. This elephant has been decorated with chalk or paint. An annual springtime Elephant Festival, held in the nearby city of Jaipur, begins with a procession of highly decorated and lavishly attired elephants.



Elephant polo being played in Nepal. The World Elephant Polo Association has its headquarters at Chitwan, in the south of the country.

An elephant calf at a watering hole in Kenya. Elephants do not reach maturity until they are 10–15 years old, during which time they remain with the herd. Males leave the herd when they become sexually mature, whereas females normally remain.

Large grazing mammal with thick, grey wrinkled skin, large ears, a long flexible trunk, and huge curving tusks. There are fingerlike projections at the end of the trunk used for grasping food and carrying it to the mouth. The trunk is also used for carrying water to the mouth. The elephant is herbivorous and, because of its huge size, much of its time must be spent feeding on leaves, shoots, bamboo, reeds, grasses, and fruits, and, where possible, cultivated crops such as maize and bananas. Elephants are the largest living land animal and usually live in herds containing between 20 and 40 females (cows), led by a mature, experienced cow. Most male (bull) elephants live alone or in small groups; young bulls remain with the herd until they reach sexual maturity. Elephants have the longest gestation period of any animal (18–23 months between conception and birth) and usually produce one calf, which takes 10–15 years to reach maturity. Their tusks, which are initially tipped

with enamel but later consist entirely of ivory, continue growing throughout life. They are preceded by milk tusks, which are shed at an early age. Elephants can live up to 60 years in the wild, but those in captivity have been known to reach over 65.

Classification

Elephants belong to the phylum Chordata, class Mammalia (mammals), order Proboscidea, family Elephantidae. There are two species, the African elephant (*Loxodonta africana*), and the Indian or Asian elephant (*Elephas maximus*). The African elephant is much the larger of the two species, growing to heights of 4 m/13 ft and weighing up to 8 tonnes compared with the 2.7 m/9 ft and 4 tonnes of the Indian elephant.

Endangered species

Elephants are slaughtered for ivory, and this, coupled with the fact that they reproduce slowly and do not breed readily in captivity, is leading to their extinction. In Africa, overhunting caused numbers to decline rapidly during the 1980s and the elephant population of East Africa is threatened with extinction. They were placed on the Convention on International Trade in Endangered Species ([CITES](#)) list of most endangered species 1989–97, and this combined with a world ban on trade in ivory in 1990, resulted in an apparent drop in poaching. In 1997, however, at the 10th CITES convention, the elephant was downgraded to CITES Appendix II (vulnerable) and the ban on ivory exportation was lifted. The Asian elephant was also placed on the CITES endangered list.

The African elephant has larger ears and longer tusks than its Asian relative (many Asian elephants, particularly the females, are tuskless). The African elephant has a sloping forehead and a hollow back, whereas the Asian elephant has two domes on its forehead just above its ears, and an arched back. The trunk of the African elephant is ridged with two finger-like projections; the Asian species has a smooth trunk with one finger. The African species has four nails on its front foot and three on its hind (back) foot, whereas the Asian elephant has five on its front foot and four on its hind. African elephants live only in Africa, south of the Sahara desert. The Indian or Asian elephant can be found in parts of India and Southeast Asia. Young Asian elephants are hairy, and in this respect somewhat resemble the extinct [mammoth](#) genus; the adults have smooth, nearly naked skin. The African species is of a fiercer disposition and can move rapidly over rough ground.

Elephants are able to detect seismic vibrations over distances as great as 50 km/31 mi, using sensitive tissue in their feet and trunk tips. This enables herds to move away from danger, or towards rain during periods of drought.

In 2005 it was discovered that elephants can mimic sounds. Researchers found that African elephants who had lived for many years in a zoo with Asian elephants could mimic the natural sounds of Asian elephants. Also, an African elephant who had been raised in Kenya near a road was able to mimic the sound of a truck. Elephants are the only land animals other than primates with the ability to copy sounds.

Declining numbers

There were 1.3 million African elephants in 1981; fewer than 700,000 in 1988; 600,000 in 1990; and fewer than 580,000 in 1997. It was estimated in 1997 that in Sri Lanka alone elephants might be extinct within ten years. The country's government maintained that there were 4,000 animals left, whereas the Wildlife and Nature Protection Society of Sri Lanka claimed there were only 2,500. By the end of 2000 it was estimated that there were fewer than 50,000 Asian elephants in the wild. There are about 10,000 working elephants in Asia, most of which are caught from the wild and 'tamed' by starvation and brutality. In March 2000 elephant poaching had increased in 11 African countries and the Born Free Foundation estimated that 9,000 elephants were killed annually.

Threats and Reasons for Decline:

The greatest threat to panda survival is the loss and degradation of its habitat. The giant panda's range is steadily shrinking as logging operations - many of them illegal - fell trees, and peasants clear land for farming or cut down vegetation for fuel (*Litchfield 1992*). Already panda populations are small and isolated, confined to high ridges and hemmed in by cultivation.

Panda pelts can bring two to three times the average annual income of a rural Chinese peasant in some Asian markets, and poaching was a serious problem in the past. However, as a result of enforcement and education, poaching intensity has dropped off, and it is no longer considered a major problem in substantial portions of the range. Giant pandas are still killed as victims of poachers' snares set for musk deer. (*Reid & Gong 1999*) Pandas' body parts have not been sought for use in traditional Chinese medicine (*Schaller et al. 1985*).

An indirect threat from habitat fragmentation relates to the panda's reliance on [bamboo](#) for food. [Bamboo](#) stands are subject to periodic large-scale die-offs, but in the past, when [bamboo](#) died off, pandas could migrate to areas with healthy [bamboo](#). With fragmented habitat, this may not be possible. Since pandas are solitary and shy, they generally will not go into human-populated areas. Cut off from these areas, the pandas have no recourse to alternative food supplies when die-offs occur.

Ongoing threats to the panda's survival

Despite the conservation success in the panda's habitat in recent years problems still persist.

The major factors contributing to [habitat loss](#) and [fragmentation](#) — the most pressing threats to the giant panda — are:

- conversion of forests to agricultural areas,
- medicinal herb collection,
- bamboo harvesting,
- poaching, and
- large-scale development activities such as road construction, hydropower development, and mining.

The illegal wildlife trade and the natural phenomenon of bamboo die-back are also threats.

Because of China's dense and [growing human population](#), many panda populations are isolated in narrow belts of bamboo no more than 1.2km wide — and panda habitat is continuing to disappear as settlers push higher up the mountain slopes.

