

A few more case studies:

19) Blue whale.

We haven't looked at any purely aquatic species yet. Whales are also a "big attention getter" for conservation (I mean seriously - did anyone hear of species like the dark-rumped petrel before taking this class?).

- This species emphasizes the need for international cooperation for its protection.

- It also shows that some environmental problems are global.

Natural history:

As everyone knows, this is the largest animal to exist that we know about:

- Size at sexual maturity is 22.5 meters in males and 25 meters in females (antarctic specimens slightly larger)

- record is 33.58 m female (110 feet) for length, and 190,000 kg (419,000 lbs.) female for weight.

Baleen whales - feed on almost solely on crustaceans of the family Euphausiidae (generally less than 5 cm (2 inches) long). Daily consumption has been estimated as high as 40 million individuals (3,600 kg).

- Feeds only during summer. Rest of the year doesn't feed at all but lives off stored fat.

Low birth rate, females give birth every 2 - 3 years, almost always to a single young. Gestation period is about 9 ½ months.

- at birth the young is about 7 m, and 2,000 kg.

- sexual maturity is at 5 - 10 years.

Life span estimates go up to 110 years, though generally thought to be somewhere around 60 (?).

Some of this life-history information is rather conjectural.

- Initially difficult to hunt, automation made this much easier. It is estimated that up to 350,000 individuals were killed during the 20th century. (1930/31 records show 29,410).

- Numerous efforts launched to protect the whale since the 1930's, but all failed due to lack of compliance. By the 1960's the whale was nearing extinction.

- One problem that emerged is that populations may be too low to be viable. For example, in 1986 it was estimated that 1,300 to 2,000 whales were left in the southern hemisphere (from a population of 150,000 - 210,000). In 1989 the estimates had dropped to 500 whales. Antarctic populations do not show any recovery.

- There does seem to be an increase in other areas (Iceland, California). But total numbers are hard to gauge. There are also conflicting reports about whales around Iceland.

- The populations don't mix much since they migrate at different times (i.e., southern hemisphere populations move north when northern hemisphere populations move north).

- One estimate (2000, World Wildlife, puts the total population at under 5,000, though this excludes the "Pygmy blue whale" subspecies (how's that for an oxymoron!)

- New threats are coming from two possible sources:

- Humans are now harvesting krill in increasing numbers for food.

- There is some speculation that global warming may adversely affect krill populations.

- The main cause of the problem (whale hunting) has been eliminated. There are a few violations (e.g., Japan's infamous "research" hunting). It is too early to know if the species will make a come-back.

- Protection did not start until the mid 1960's. All whale hunting (not just blue whales) was banned after 1984/85.

- The marine mammal protection act (1972) was pivotal in this. It prohibited any taking of whale products by anyone subject to U.S. jurisdiction.

- Other whale populations are obviously also endangered, though you'll have to look up the details yourself.

- An unrelated anecdote about killer whales:

- They are known to prey on other whales. For example, marine biologists have observed a pod of killer whales decimating a small group of sperm whales (essentially taking by taking big chunks out of the whales until the bled to death). There are sometimes purely natural dangers to animals. (Killer whales definitely deserve the name!).

## 20) Cheetahs (a personal favorite).

- Illustrates a lot of misconceptions.

- Fastest land animal, as most folks know. Can reach speeds up to 70 mph (for very short distances!). Incidentally, number 2 on the speed list is thought to be the pronghorn.

Range used to go through most of Africa, through the Middle East, spreading into Iran, Pakistan and India.

There are “field” guides from the 1800’s put out by the British that describe cheetahs in India.

Prehistoric cheetahs existed in North America. These were rather larger than present day forms.

Until recently, was thought to be extinct outside of Africa. Consistent reports of sightings indicate that some may still exist in Iran/Pakistan/Afghanistan. (Anyone want to go find out? This does illustrate some problems about getting information).

There are also reports that the cheetah may be able to cope with extremely low population densities. This might explain it’s persistence without being regularly seen.

### Natural history:

Several good studies have been done on the cheetah, mostly in East Africa, though some from other areas (e.g., Shaller, Caro, Kruuk, Burney).

Basic social structure seems to be solitary, though related males may sometimes stay in small groups (2 - 3).

Litter size is variable, though up to 6 is not uncommon. Mortality can be very high in some areas (some estimates are up to 90% in the Serengeti).

Young stay with mother for just about 18 months.

Hunt mostly small gazelles. But larger prey may be taken occasionally, particularly by cheetahs living in groups (e.g., zebra or wildebeest). In areas without gazelles, are opportunists. A study in Namibia showed cheetahs living mostly off rabbits.

Are adapted for running down prey with a sudden burst of speed. Often the prey is tripped with a leg, and then suffocated by clamping down on the throat.

Prey is often stolen by other predators. Cheetahs are not powerful fighters, so hyenas, lions, and even leopards will steal their prey. Cheetahs have adapted to eat their meals quickly.

No natural “predators”, though lions will often kill cheetahs, contributing substantially to adult mortality.

Tame down readily. If the breeding problem (see below) could be solved, they might even make decent pets, though that’s a whole different issue.

- were accorded privileged status in many cultures

- were used for “hunting”. Similar to falconing - cheetahs were taken on a chariot until this got close to a herd of gazelle. A hood was then removed from the cheetah, and it was released. The cheetah would run down the gazelle.

- this was done mostly for sport, not for meat.

- records show that during the 16<sup>th</sup> century one Indian mogul kept over 9,000 cheetahs during his life time (but only one birth was recorded).

Conservation status:

Estimates are hard to come by, but indicate that in 1900 more than 100,000 cheetahs existed throughout Africa and Asia.

Today the numbers have dropped to somewhere between 9,000 and 12,000, though exact numbers are difficult to come by. Asian population (in Iran and Afghanistan is estimated at just over 200).

- Concentrated in East and South Africa. In some parts they still exist at “normal” population levels.

Main threats are from:

- encroaching human populations and hunting (which persists in some areas despite protection as an endangered species - they are accused, for instance, of taking live-stock in Namibia).

- other predators, which will kill cubs and even adults. See estimated mortality figure above.

As such, it turns out that cheetahs sometimes do best in areas just outside reserves where larger predators are absent.

- It is probably too early to make recommendations, but one possibility for helping cheetahs might be to set up areas where other large predators are excluded (possibly difficult since at least lions are also listed as threatened).

Captive breeding has simply not worked. Despite numerous efforts, only sporadic success has been reported. Possible reasons include:

- high percentage of defective sperm (but they seem to manage in the wild!)

- an incomplete knowledge (even after all the studies) of breeding biology.

For example, one theory suggests that cheetahs do not breed unless there is sufficient prey around. In zoos, they do not “see” their prey, so breeding is suppressed. Obviously speculative.

- poor research doesn't help - one of the most quoted studies of the cheetah (a book by Eaton) is based on about three months' field research.

There are cheetahs in zoos, but due to the lack of breeding success zoos are reluctant to “import” more. Particularly as wild populations are also declining.

Long term outlook is not promising.

Genetic issues:

Several studies from the early 1980's indicate that the cheetah lacks genetic diversity:

- Some speculation that most cheetahs (at least in Africa) are

derived from a population bottleneck that occurred about 10,000 years ago.

- The contribution of this information to conservation is not clear. It is obvious, for instance that cheetahs were doing quite well even with their low genetic variability until humans started hunting and encroaching on habitat.

- Nevertheless, it might help explain the poor breeding success in zoos (though again, they seem to manage fine in the wild).

- It does indicate that cheetahs may be more vulnerable to specific threats such as diseases since variability is so low.

Bottom line - the low genetic variability is interesting and should be kept in mind, but it's impact on most conservation issues is probably not that important.

Another warning about web-based research:

- One web site mentioned:

“In Namibia, where the largest populations of cheetahs are found, more than 95% live on private ranchlands”.

- This seems reasonable. But then another web site seems to have interpreted this as:

“Currently 95% of all remaining cheetahs live on farmlands in Namibia”.

(Totally false - Namibia does appear to have the largest remaining population of cheetahs, but East Africa is close behind. To be honest, numbers are hard to come by, but this is obviously wrong.)

- It is always best to go to the original sources (journals, papers, etc.).

That's it for case studies (for a while - we may do more later to illustrate specific points).

Next we'll spend some time making sure we understand the basic concepts needed to make informed decisions about conservation biology.