

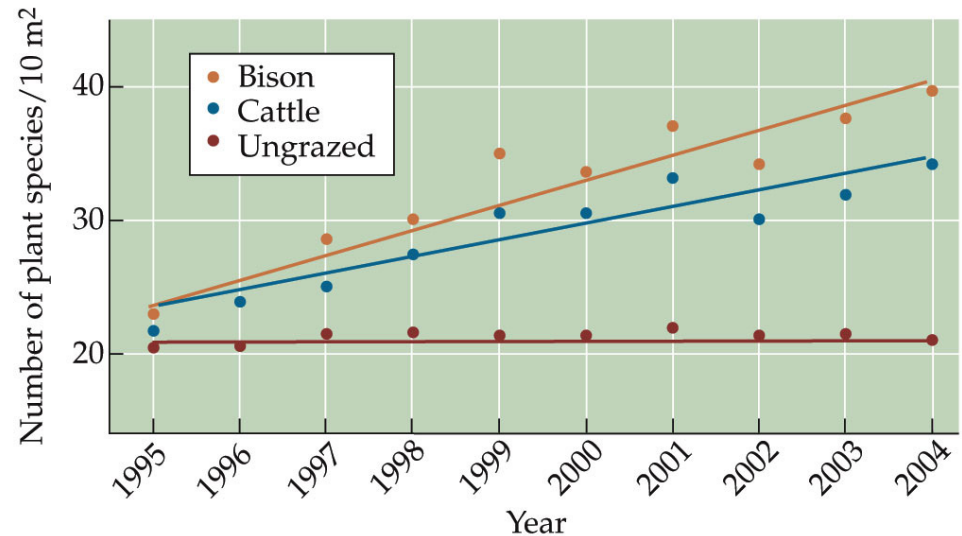
Managing Protected Areas



There is a notion that “nature knows best” and protected areas should be left alone.

Since most areas have already been impacted by human activity, this notion is misguided

Tall Grass Prairies



Tall grass prairies were plowed under for farming.

Simply ceasing farming activities did not restore them as they had originally evolved under grazing pressure of native Bison.

Restoration and a return to original species diversity has been most successful under grazing pressure

Such active management is often not successful

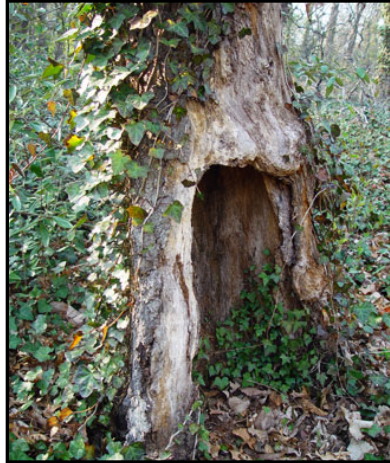


Removal of predators such as wolves and coyotes or limitations on human harvest leads to explosions in white-tailed deer populations.



The excess deer over-consume the understory of forests leading to habitat loss for numerous other species and, ultimately degradation of the forest itself

Other cases of mismanagement include



Removing hollow or dead trees for safety or aesthetic reasons.

These structures afford homes to myriad creatures from bears through bats to birds



Suppression of small forest fires in areas that normally undergo fire cycles.

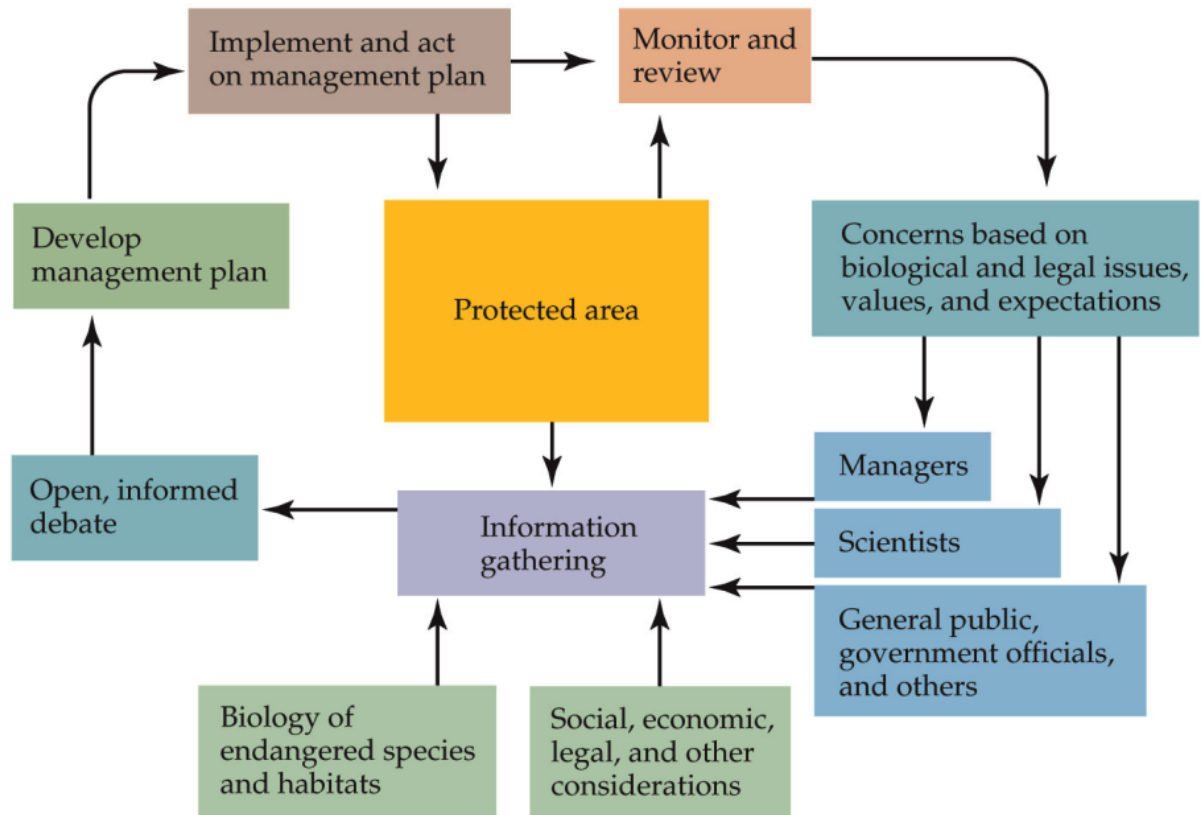
That allows the build-up of excessive tinder.

This leads to mega-fires such as the one that nearly destroyed Yellowstone

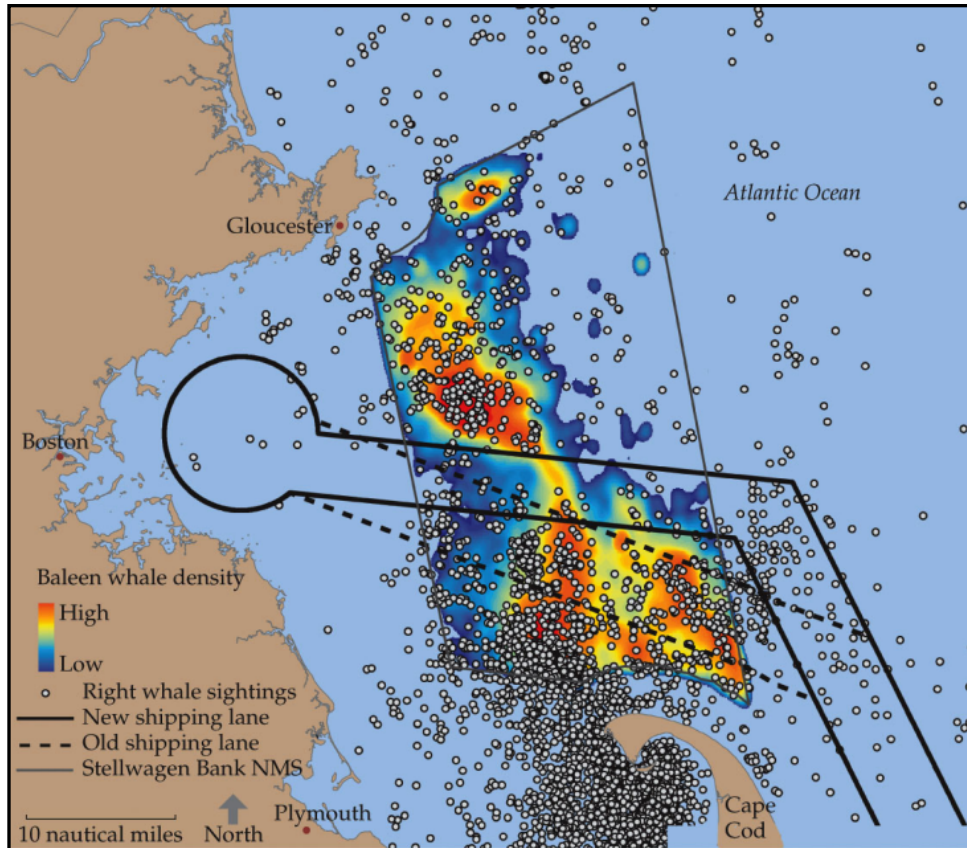
Monitoring as a management tool

Parks must be monitored to determine if their goals are being met.

Adaptive management allows for adjustments based on new information gained from monitoring.



Identifying and managing threats



Careful monitoring of whale sightings made it clear that standard shipping lanes crossed through high-use areas.

Quick action in moving the lanes to a less-used areas reduced the number of whales struck by ships entering Boston harbour.

Managing invasive species



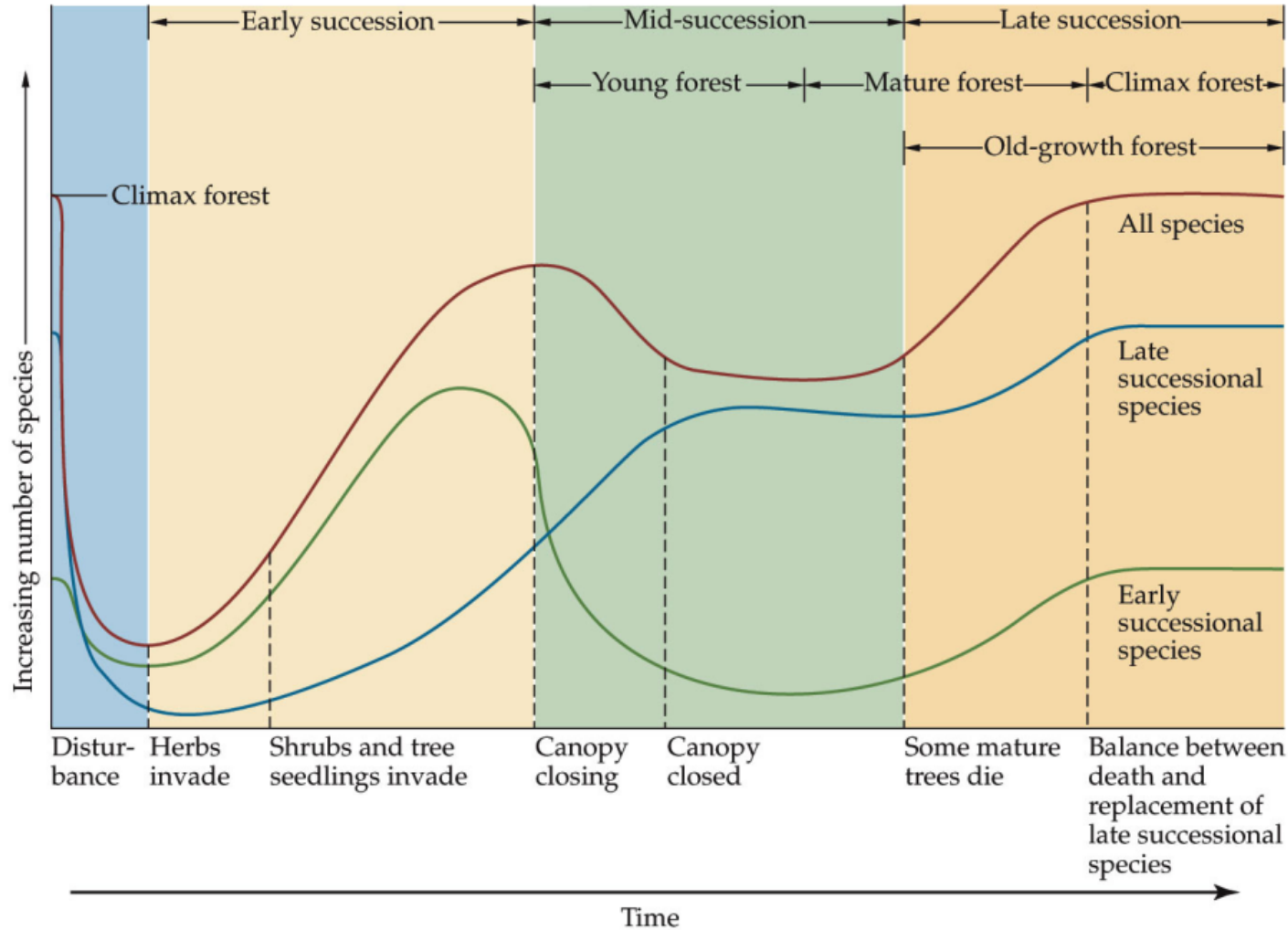
Invasives such as purple loosestrife crowd out native plants leading to monocultures.

In part they outcompete native species for space and nutrients.

They also attract bees that normally pollinate numerous species in the original ecosystem.

Invasives are extreme r-strategists and constant monitoring and eradication or control is required to slow their spread.

Managing specific habitat requires knowledge of its normal successional status and the natural dynamics of reaching that status.



Managing habitat for an early successional species



The heath fritillary butterfly requires early successional patches in mature forest stands

Habitat management



In some cases, prescribed burning is required to maintain open vegetation habitat in the early successional stage required for many wildflowers.

In others, human disturbance has to be minimized or eliminated to protect the understory of old-growth redwood forests



Habitat management



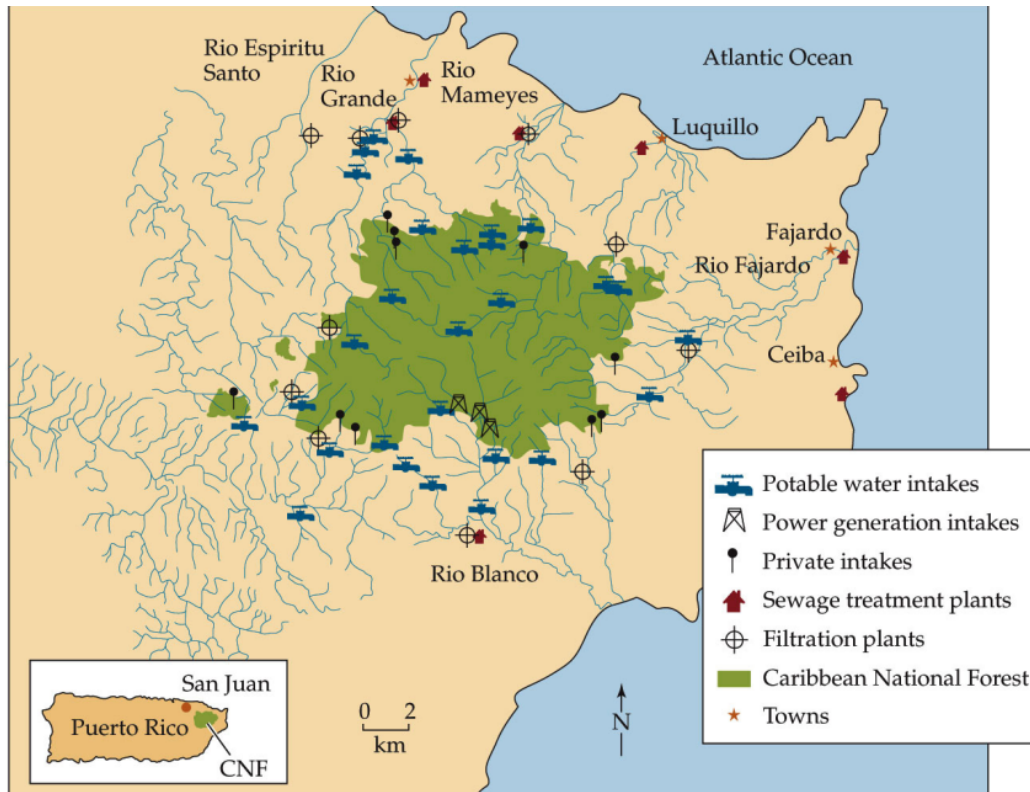
Cattle are allowed to graze on much of the federal land managed by the BLM (Bureau of Land Management).

Ranchers pay a very small fee for using our land.

When the cows on the left were eliminated, the land returned to its original state.

(X marks the tree common to the 2 images.)

Water management



The Caribbean National Forest is an astonishingly beautiful rain forest near the center of eastern Puerto Rico.

It is home to many endemic and endangered species including the coqui frogs.

Unfortunately, more than 50% of the water “produced or collected from rain” in the forest is diverted for human “consumption”.

Managing keystone resources



When their natural wetland habitat was drained for agricultural purposes, the red-crowned crane lost its winter food source.

They now must be fed crane or face extinction.

Managing keystone resources



Turtle populations can be protected and increased by providing sunning rafts.

Co-managing endangered species and humans



Near Mumbai, Indian officials are confronted with protecting the endangered leopards in Sanjay Gandhi National Park from competition for food from the local populous.

At the same time, they must keep the local population from becoming leopard food

Zoning is a technique to try and co-manage multiple uses



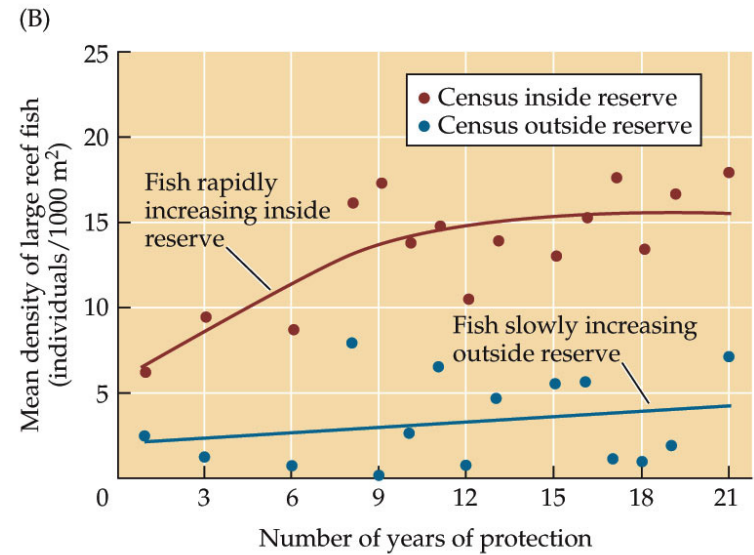
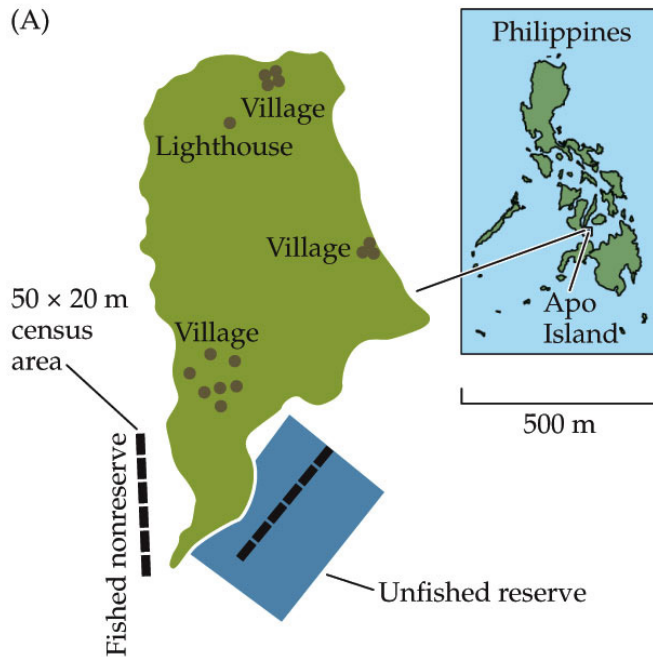
An old adage is that if all potential users are mad, then you probably have the zoning correct!!!!

Zoning is a technique to try and co-manage multiple uses



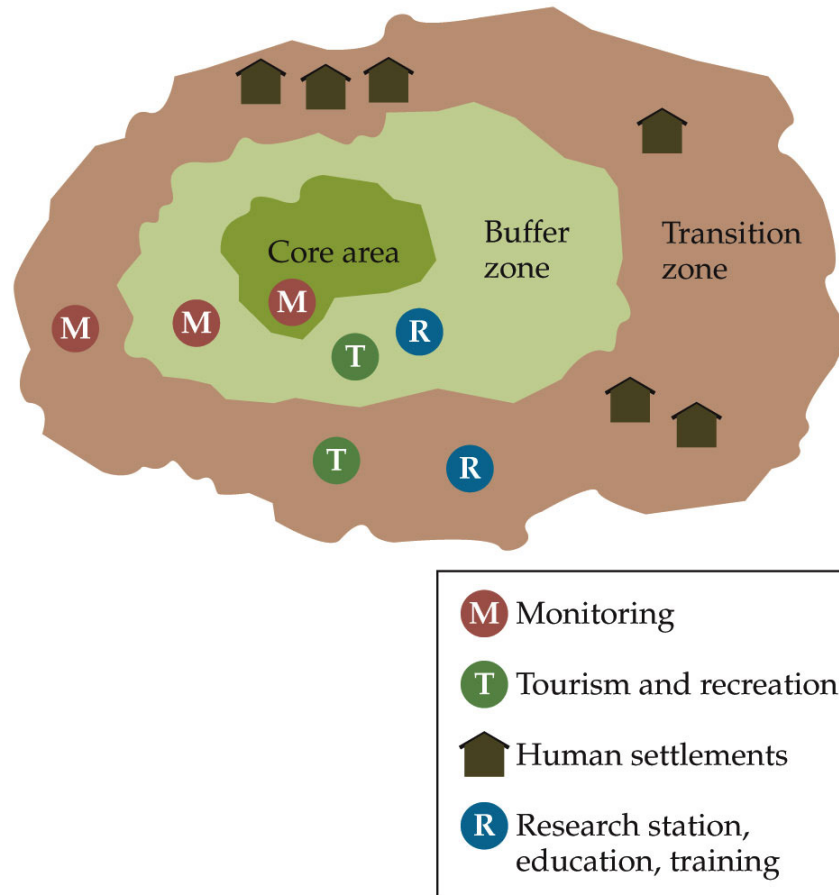
Zoning cooperation is often achieved when areas excluding humans are matched by areas encouraging human activity.

Zoning can have unanticipated effects



The unfished zone actually serves as a “source” for the fished “sink” allowing a sustainable harvest.

Man and the Biosphere Program (MAB)



This too is a form of metapopulation structuring that allows for multiple use

Regulating activities inside protected areas



ANWR is the last truly wild area in the USA - caribou, bears and numerous other species abound.

It sits atop a scant 30 day supply of oil at our current usage rate.

Assertions of safe lateral drilling is untested and unsubstantiated.

Regulating activities inside protected areas

Many activities within protected areas must be regulated or abolished.



Commercial harvest of terrestrial and aquatic species is simply inconsistent with protection.

Dolphins can not be protected and harvested in Japan.



Clear-cut logging is inconsistent with preservation of forest ecosystems.

The practice leads to irreversible changes to the landscape.

Regulating activities inside protected areas



Overharvesting of wild plants such as Agave to make designer mescal is leading to a collapse of wild populations of both the plant and its pollinator, the long-nosed bat.

Using farmed plants on ranches would save protected desert ecosystems.



loggerhead turtle

Off-road vehicle use in national parks and wildlife sanctuaries can be lethal to wildlife and is just wrong at so many levels.

Regulating activities inside protected areas



Irresponsible garbage disposal on lakes and streams and along hiking and climbing trails leads to many problems.

It can attract bears and other predators leading to threat-of-life conflicts.

It leads to pollution at many levels.

If you pack it in, then pack it out



Challenges to park management

TABLE 17.1 Comparison of Personnel and Resources Available for Protecting National Parks and Biological Reserves in the Brazilian Amazon and the United States

Feature	Brazilian Amazon	United States
Protected area (in km ²)	139,222	326,721
Number of park rangers	23	4002
Total number of park personnel ^a	65	19,000
Park ranger:km ² ratio	1:6053	1:82
Park guard ^b	31	100
Administrative building ^b	45	100
Guard post ^b	52	100
Motor vehicle ^b	45	100

There must be adequate personnel, equipment and funding to carry out management of protected areas.

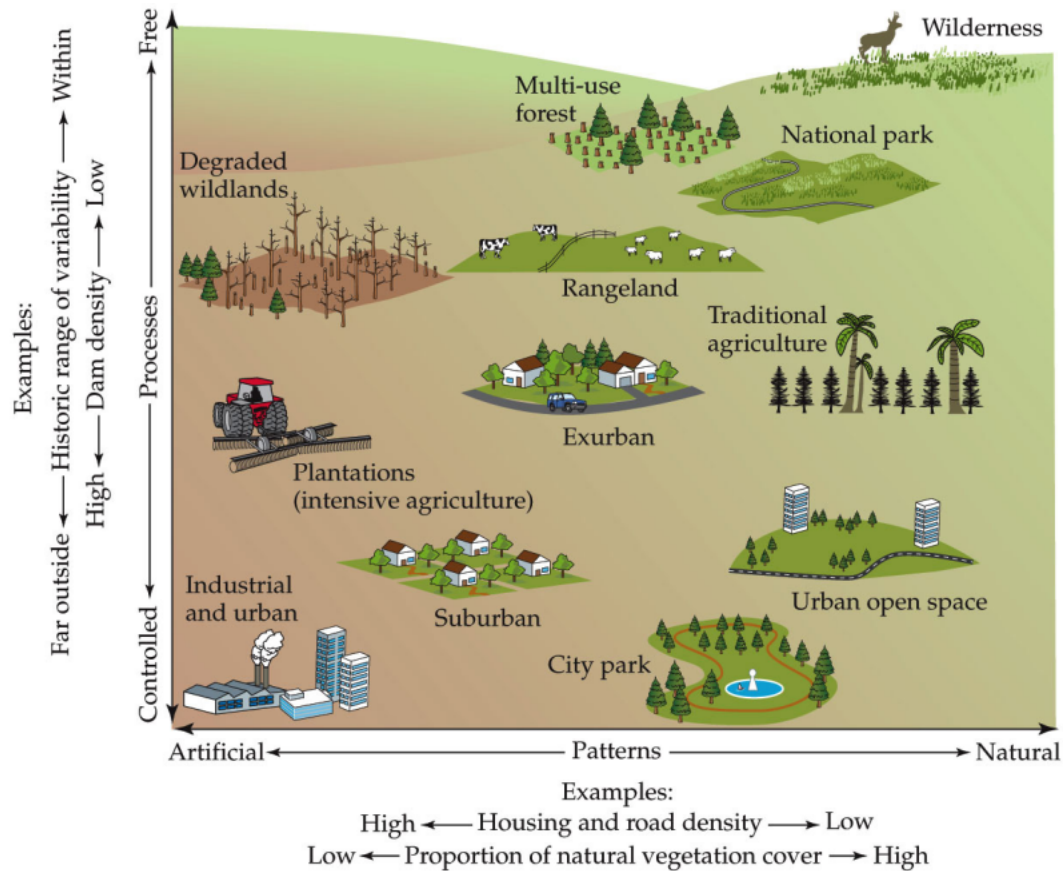
Most protected areas world-wide are understaffed and underfunded.

Conservation outside protected areas



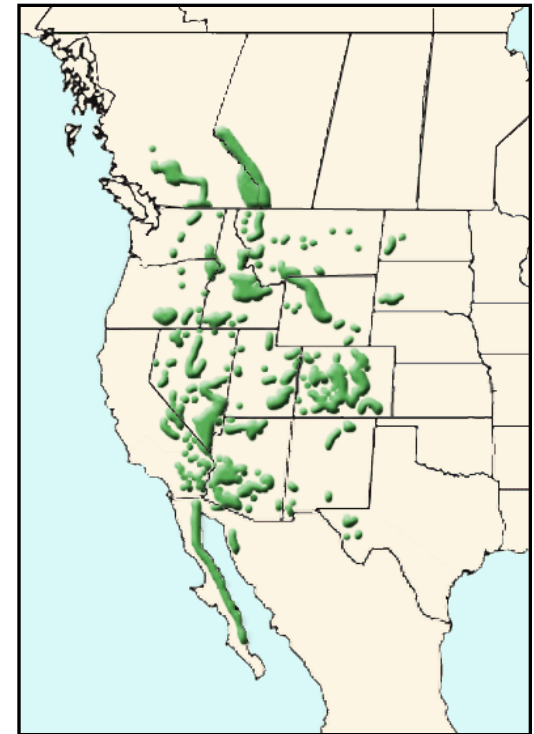
There is a limit to the amount of protected area we can provide.
It is crucial to use sound conservation principles outside such areas.

Conservation outside protected areas



More than 80% of the planet's terrestrial habitat will remain unprotected.
 The extent of human impact in these unprotected areas varies.

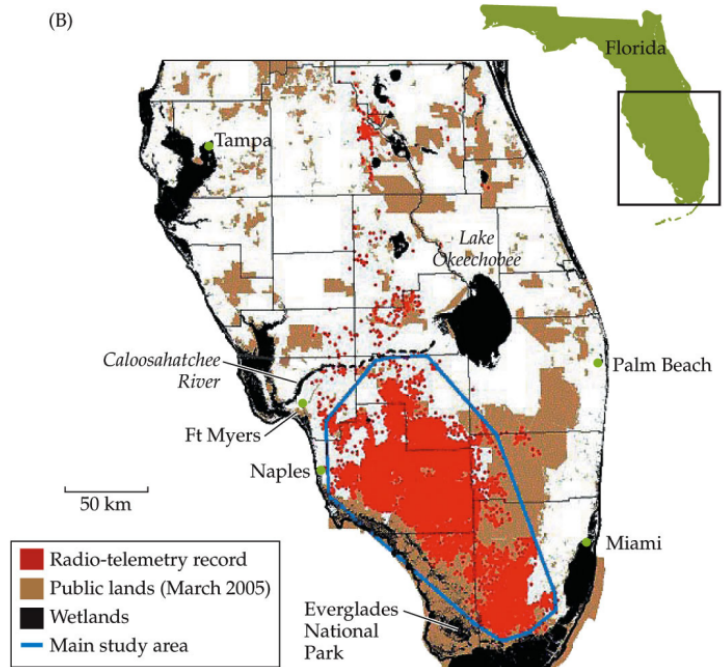
The value of unprotected habitat



Many species like the mountain sheep live in small semi-isolated populations separated by habitat unsuitable for them.

Fortunately, the ruggedness of their preferred habitat affords some protection.

The value of unprotected habitat

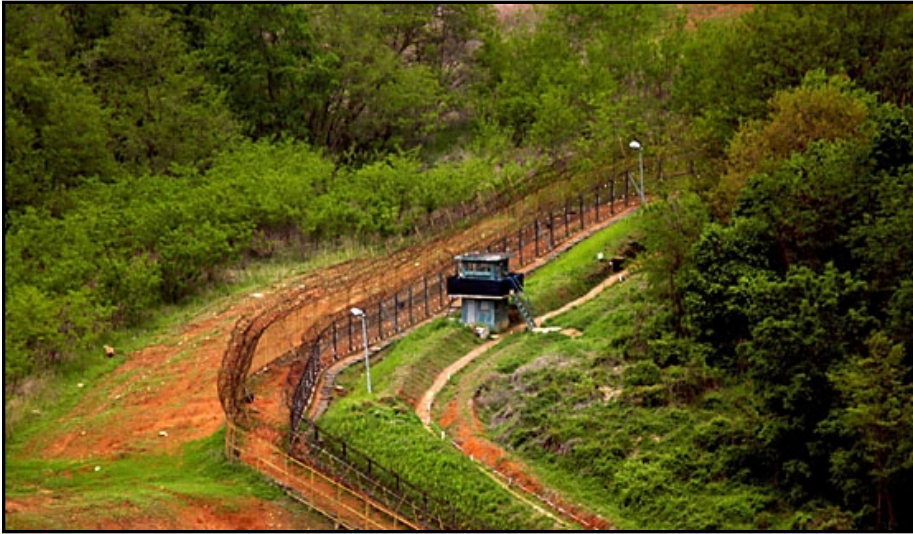


Species like the Florida panther are wide ranging and have much more overlap with shared habitat.

Worse, many species like this are increasingly habituating to “human” areas.

Conflicts usually do not end well for these large predators and only serious protection will ensure their survival.

The value of unprotected habitat



In an odd twist, the 155 mile long and 390 square mile area that is the demilitarized zone between North and south Korea has become sanctuary to more biodiversity than is found in the rest of the peninsula.

Birds in particular take advantage of an area where humans are excluded.

The rare Manchurian crane is one of the beneficiaries of the world's longest continuous military confrontation.



The value of unprotected habitat



In a related fashion, the US military uses less than 10% of the land it excludes the public from.

Wildlife has taken advantage of this although toxic waste is a consideration.

Here, US Marines actually use practice maneuvers to keep wetland habitat in the early successional stage the endangered Hawaiian stilt prefers. centre

Conservation in urban areas



In much of Europe, storks nest in rural villages and many of them have festivals to raise money to help with preservation of the species.

In Manhattan, the once endangered Peregrine Falcon nests on roofs and ledges of many tall buildings including the Empire state building and the Metlife Building.

The falcons have adjusted well to their urban setting and contribute to city life by controlling pigeons, starlings and rats.

Conservation in agricultural areas



In exchange for a small subsidy, farmers reduce herbicide application and provide strips between cultivated fields for wildflowers and the many bird and insect species that use them.

Conservation in agricultural areas



Shade coffee (left) encourages high biodiversity because of the trees incorporated into the fields.

Sun coffee is a monoculture crop that returns more profit but is less hospitable to many species.

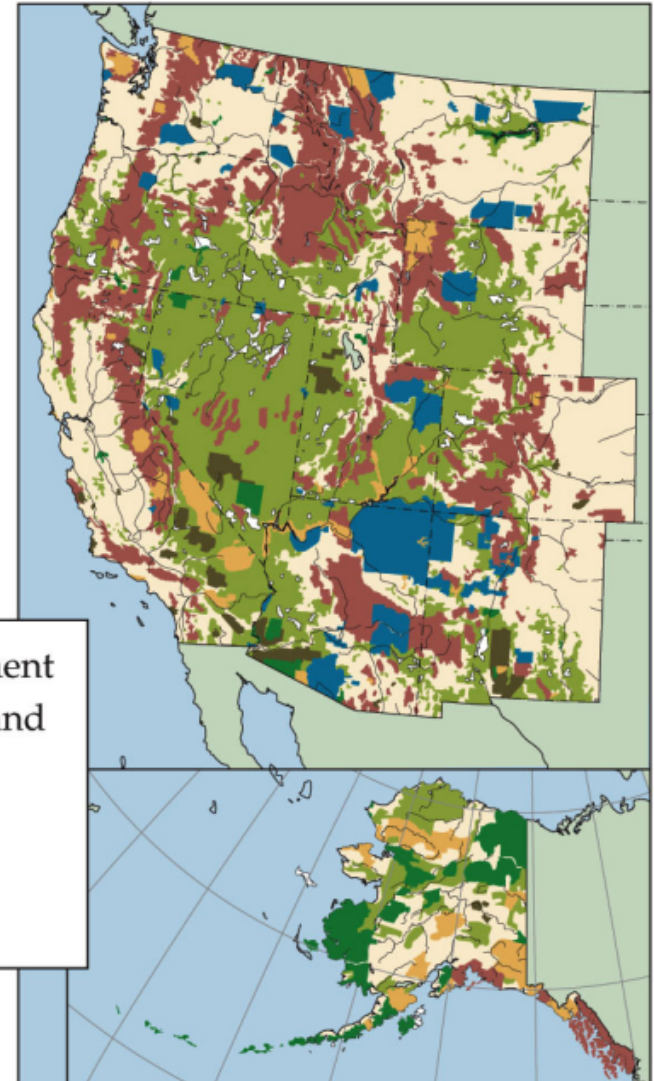
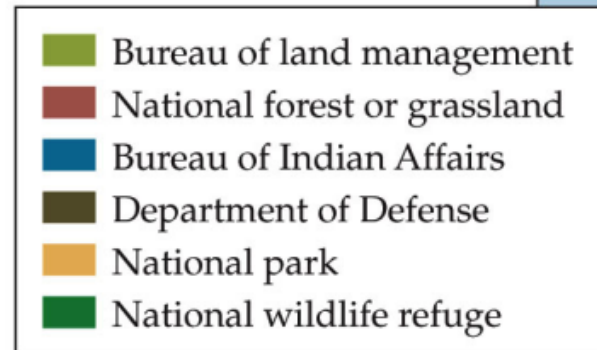
Make sure you drink shade coffee – which I think is tastier as well!!

Multiple use habitat

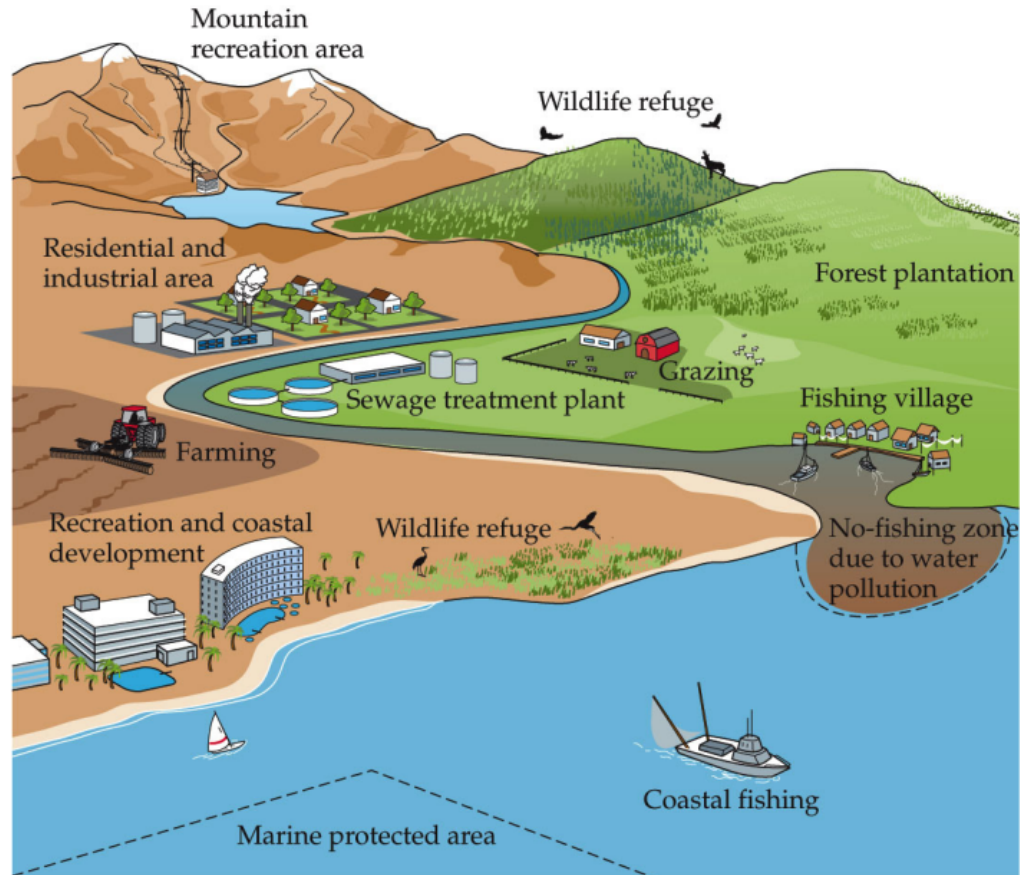
Extensive tracts of land in the west and Alaska are controlled by various government agencies.

Tragically, BLM controls the most and their concept of protection includes mineral and timber extraction and rental of land for cattle grazing at a fraction of market value.

The good news is, we can sue the government to force more judicious use and elect politicians who are more in step with protection.



Ecosystem management



Cooperation among public landowners, government, business and conservation organizations can lead to integrated ecosystem management that can benefit all the stakeholders.

Ecosystem management

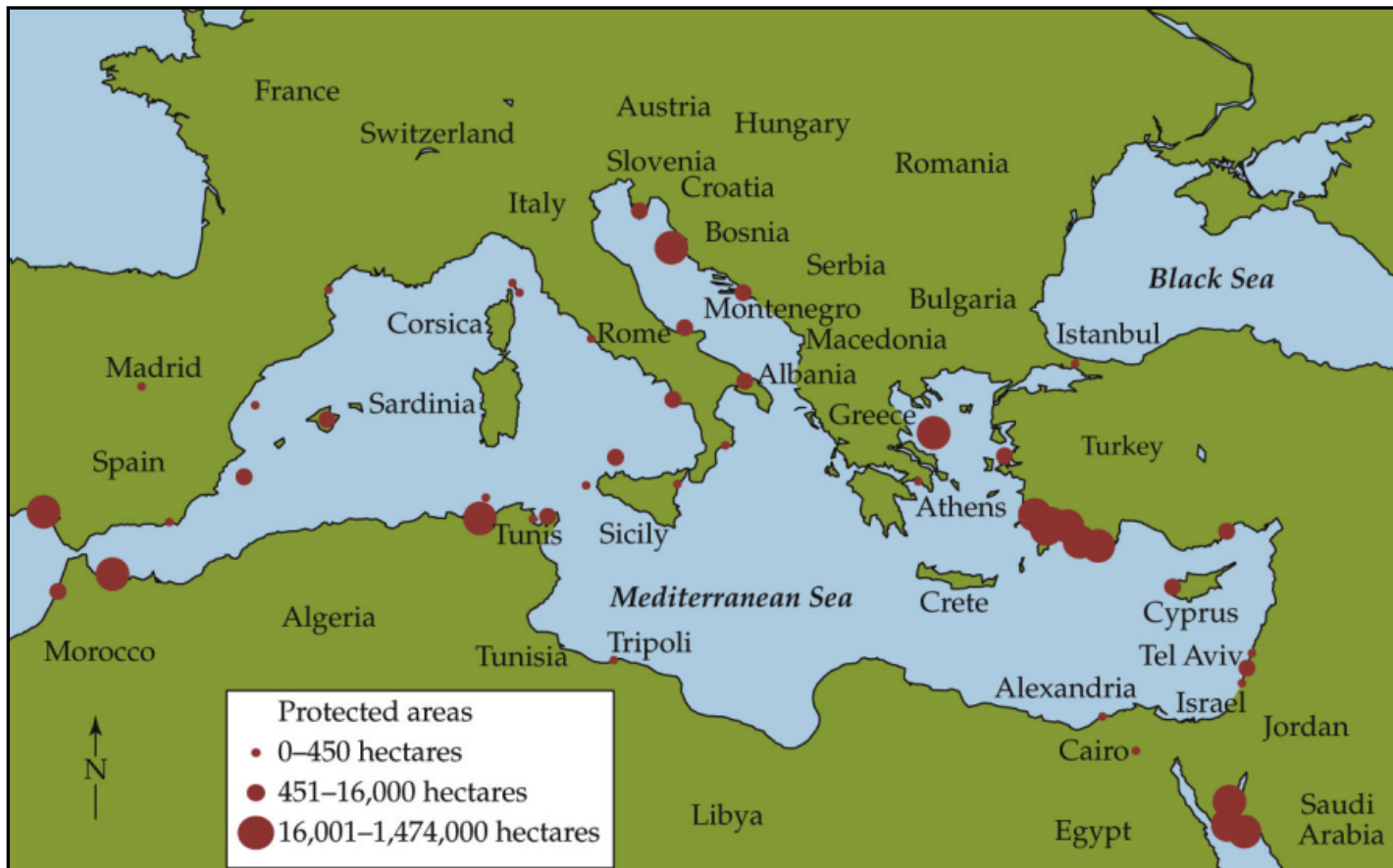


A good example can be found in the Malpai Borderlands Group that has successfully manicured the landscape to protect the Mexican jaguar and numerous other species.

Their cooperative efforts required:

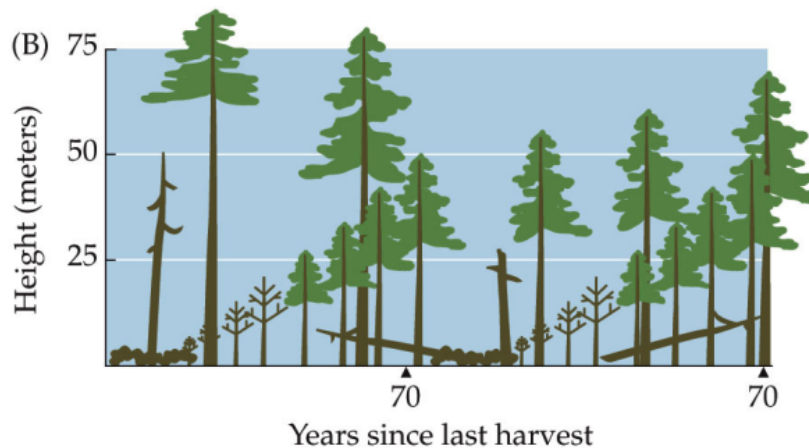
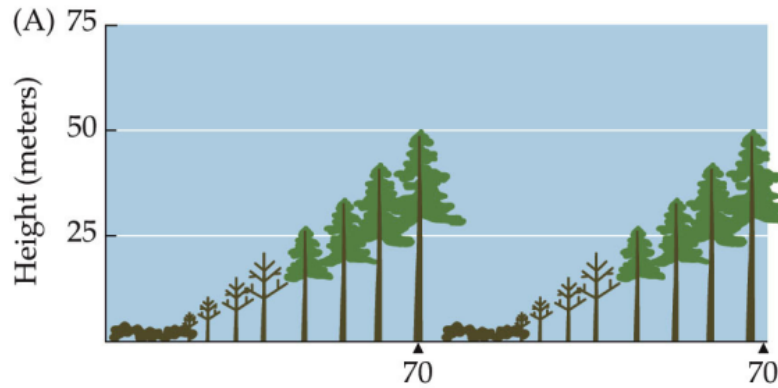
- Using the best science available to develop a plan
- Ensuring viable populations of all key species
- Understanding the interactions among trophic levels
- Monitoring all ecosystem components and adaptively modifying the plan

Bioregional management



With exception of Egypt, Libya and France, Mediterranean partner nations have developed a coordinated plan to limit pollution and coordinate protected coastal habitat.

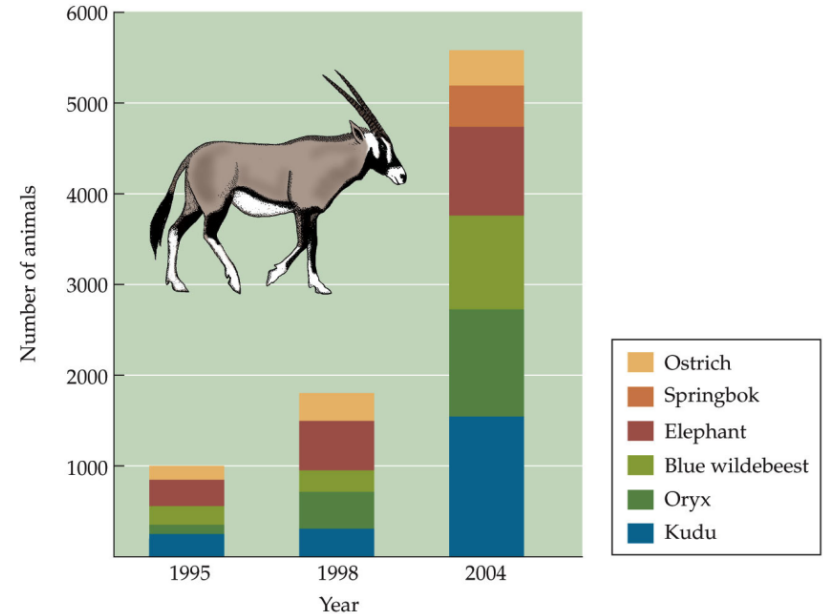
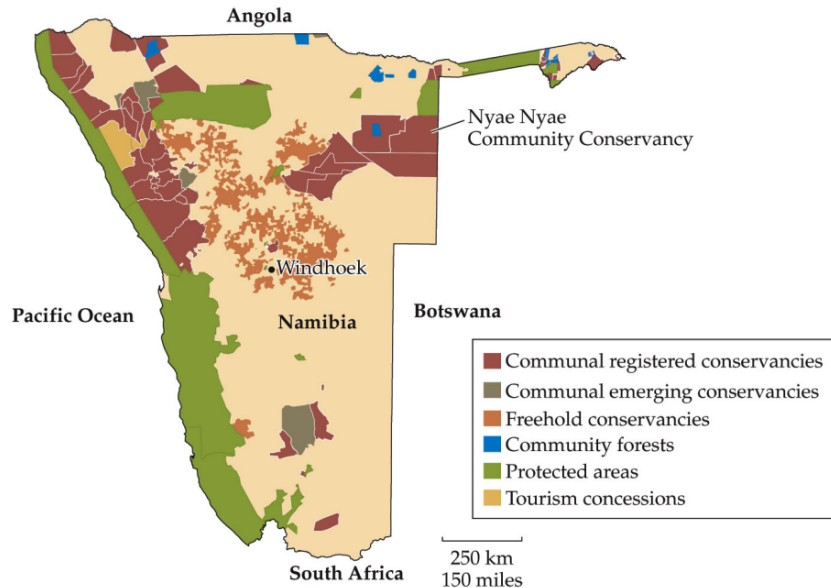
Case Studies – managed coniferous forests



Ecological logging (lower) maintains some structural integrity to the forest and protects species such as spotted owls and marbled murrelets.

While less profitable on its face than clear-cutting (upper), reductions in net profits due to law suits are resulting in a shift to ecological logging.

Case Studies – community-based management in Namibia



Conservation organizations enlist local people and governments in a cooperative to manage wildlife for tourism and shared use.

Everyone becomes part owner and part worker and resources are afforded more protection to meet these multiple shared goals.

The result is an increase in animal abundance, local wealth and living conditions.