

An Endangered Species in a Major Urban Area

- Since British colonization and prior to the signing of the Endangered Species Act more than 500 North American species had gone extinct
- It appears that currently the world wide extinction rate on the order of the two most pronounced prehistoric extinction events; the Permian-Triassic (245 million years ago) and the Cretaceous-Tertiary (65 million years ago)

Extirpation and Extinction

- Up to and during 1800's species became endangered through blatant overharvest.
- Bison heavily hunted to remove from the plains
- Large predators
- Salmonids in the Pacific Northwest (ca. 1890)
- And so on (you know examples too)

States' interest in fish and wildlife...

- *Martin v. Wadell* (1842) – US Supreme Court determined that the State of New Jersey had jurisdiction over oysters in a mudflat claimed by a private property owner
- *Geer v. Connecticut* (1896) – State could exert governmental control over wildlife (defendant's right to ship game birds out of state)
- The above cases give authority w.r.t. wildlife

Federal interests in fish and wildlife

- US fish commission formed 1871
- Yellowstone National Park est. 1872 (bison protection)
- Lacey Act 1900 (illegal to transport birds across state lines if had been taken in violation of any other law in the nation – extinction protection)
- Congress used treaties (e.g. migratory bird treaty with Britain in 1916) to avoid states' rightest constitutional challenges to federal management.
- Bald Eagle Protection Act 1940 – first statutory law to prohibit taking an imperiled species

Causes of Endangerment

- Challenges of overharvest (1800's) were largely overcome...
 - Legislative actions
 - Conservation groups
- ...and causes of endangerment changed very rapidly (1900's)
- With population increases and development our natural capital was (is) being used up through farming, mining, logging, ...
 - This is a much more complex policy issue than was overharvest

Environmental Apocalypse Causes of Biodiversity Loss



Source: BioScience 48:607-615 (data from U.S. Federal Register)
(slide borrowed from Sarah Reichard's 2004 lecture to ESRM 301)

Causes of Endangerment

(species listed as threatened or endangered by US FWS)

- Interaction with non-native species (115)
- Urbanization (247)
- Agriculture (205)
- Outdoor recreation and tourism development (148)
- Domestic livestock and ranching activities (136)
- Reservoirs and other running water diversions (160)

Causes of Endangerment

- Modified fire regimes and Silviculture (83)
- Pollution of water, air, soil (143)
- Mineral, gas, oil and geothermal extraction (134)
- Industrial, institutional and military activities (81)
- Harvest, intentional and incidental (101)
- Logging (79)

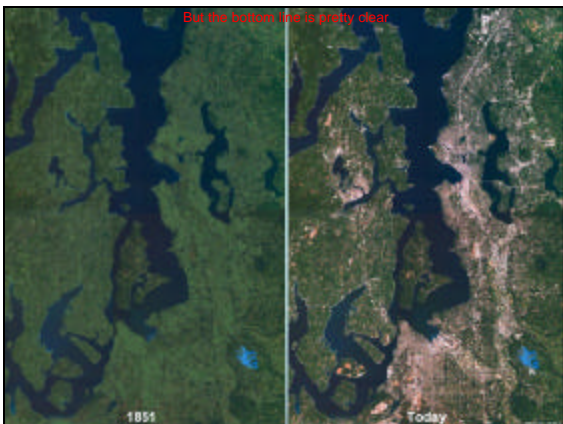
Causes of Endangerment

- Road presence, construction, and maintenance (83)
- Genetic problems (33)
- Aquifer depletion, wetland draining or filling (73)
- Native species interactions, plant succession (74)
- Disease (7)
- Vandalism (destruction without harvest) (11)

Cause: _____

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respond & submit



Endangered Species Act

- Signed into law by President Richard M. Nixon in December 1973.
- Regulatory power given to
 - the Secretary of the Interior (via Fish and Wildlife Service) and
 - the Secretary of Commerce (via the National Marine Fisheries Service).

Endangered Species Act

- Evolved most directly from Endangered Species Preservation act of 1966 (directed agencies to protect within practicable extents) and
- 1969 Endangered Species Conservation Act (helped lead up to CITES)
- Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) early 1973

The Congress (in the ESA) declares that...

“(1) various species of fish, wildlife and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation; (2) other species of fish, wildlife and plants have been so depleted in numbers that they are in danger of or are threatened with extinction; (3) these species of fish, wildlife and plants are of esthetic, ecological, educational, historical, recreational and scientific value to the Nation and its people.”

What the ESA does

- Outlines listing procedures (sec 4)
- Authorizes land acquisition for habitat protection (by the way, this is different from budgeting money) (sec 5)
- Outlines enforcement mechanisms and penalties (sec 10)
- Instructs the Smithsonian Institution to figure out what exactly to do about endangered plants (sec 12)

What the ESA does (cont'd)

- Prevents the ESA from weakening any other existing protection legislation (secs 13,14,17)
- Establishes where exceptions are OK (e.g. protecting a species can't cause the country to lose a war) (sec 10)
- Requires the Secretary of the Interior to report on the costs on a species by species basis (sec 18)

What the ESA does (cont'd)

- Calls for International cooperation and provides guidelines for implementing CITES (sec 8)
- Prohibits the taking of threatened and endangered species by any party, public or private (sec 9)

(Habitat Conservation Plans)

- 1983 amendments to Section 10 – “creative partnerships between the public and private sectors and among governmental agencies in the interest of species and habitat conservation”
- Allows states, local governments, and private landowners to apply for an Incidental Take Permit for otherwise lawful activities that may harm listed species or their habitats.
- To obtain a permit, an applicant must submit a Habitat Conservation Plan (HCP). Big picture to “minimize and mitigate” the impact of the permitted take on the listed species.
- Concept is that some individuals of a species or portions of their habitat may be expendable over the short term, as long as enough protection is provided to ensure the long term recovery of the species.

Source: <http://www.audubon.org/campaign/esa/hcp-guide.html>

What the ESA does...

- Requires federal agencies to pursue the preservation of species and to consult with the FWS before taking any action that could threaten the existence of a species or specimens thereof (sec 7)

Endangered Species Act..

Two big issues

- Species that are listed
- Limitations that the ESA imposes on economic development

Video: Salmon on the Brink. KCTS
(Public Television) reports on the causes,
impact of the Pacific coast salmon crisis.

Why is the ESA listing of Puget
Sound Salmon such a big deal for
state and local government?

Consider "sec 9"
Recall your reading

respond & submit

From your reading... What is being
done in response to the ESA
listing?

respond & submit

STREET EDGE
ALTERNATIVES
(SEA STREETS)



Field trip warmup

Remember we will depart promptly
from behind Bloedel & Winklerworder
at 1:30 PM tomorrow

PACIFIC NORTHWEST FOREST HYDROLOGY

- Trees
 - Intercept rainfall, evaporate much
 - Create “duff”, which absorbs and stores water
 - Take water from soil and store and transpire it
- Soils
 - Store considerable water
 - Recharge groundwater and convey water subsurface to water bodies
- Surface runoff rare, slow sheet flow when occurs

“Heavy, long-continued rains occur in the winter months.
Then every leaf, bathed and brightened, rejoices.
The rivers swell, but there are no devastating floods;
for the thick felt of roots and mosses
holds the abounding waters in check,
stored in a thousand thousand fountains.
Most of the streams are clear and cool always,
for their waters are filtered through deep beds of mosses,
and flow beneath shadows all the way to the sea.”

John Muir on Puget Sound, 1889

URBAN HYDROLOGY

- Trees removed, hydrologic services lost
- Soils removed and compacted in construction, much storage lost
- Most land cover impervious and impervious-like surfaces
- Hydrologic output surface runoff instead of evapotranspiration, recharge; runoff occurs rapidly in pipes and ditches

FORESTED AND URBAN HYDROLOGY COMPARED

- Surface runoff increases from near 0% of hydrologic output when forested, to ~20% when low-density suburban, to ~85% when mostly impervious
- 2-year frequency peak stream flow rate approximately doubles from little impervious to 20% impervious and approximately doubles again at 60%
