Basics of Conservation

Dana Miller, Education Coordinator
Katie Hefner, Intern

“When we try to pick anything out by itself, we find it hitched to everything else in the Universe.”
John Muir, 1911
Biodiversity Conservation
Threats to biodiversity

H - Habitat Destruction/Degradation
I - Invasive Species
P - Population Growth
P - Pollution
C - Climate Change
O - Overexploitation (hunting and fishing)
U.S. Forest Service

- The U.S. Forest Service was established in 1905 to manage natural resources “for the greatest good, for the greatest number, for the longest time”.
- USFS manages 193 million acres through fire, grazing, timber harvesting, habitat restoration, headwater protection, wilderness areas, and wild and scenic rivers.
- USFS’ “ecosystem management” approach works to sustain timber, wildlife, water and recreation resources.
Endangered Species Act - 1973

- Passed in 1973, the goal of the act is to identify and protect threatened and endangered species, and the ecosystems they depend on.
- Listed species can be plants or animals.
- Protected species are not allowed to be shot, harassed, wounded, harmed, pursued or collected.
- Protected species also have a recovery plan.
- US-1,666 species protected
- International- 2,361 species protected
Approximately 60 federally threatened or endangered species (including plants) occur in NC. Find the list here.

NC Wildlife Resources Commission uses the Wildlife Action Plan to plan conservation for wildlife and their habitats in the state.

There are 64 endangered species, 51 threatened species and 129 species of special concern in NC. The list of these species can be found on NCWRC’s website.
Effects of ESA

- The effectiveness of ESA has been debated; it is hard to measure since recovery can take decades and is complex.
- According to the FWS, 98% of species listed are still surviving.
- As of 2013, 27 species had been fully recovered. 29 species were eligible to be upgraded to threatened with another 30 species that may soon be ready to delist.
- The Center for Biological Diversity published a report on the success of the ESA in 2012.
Air Conservation
Types of Air Pollution

- Ground-level ozone
- Lead
- Particles
- Carbon monoxide
- Nitrogen dioxide
- Sulfur dioxide
- Volatile organic compounds (VOCs)

Check the quality of air in your area at AirNow.

Source: [https://www.fws.gov/refuges/AirQuality/sources.html](https://www.fws.gov/refuges/AirQuality/sources.html)
Clean Air Act- 1970

- This was the first federal legislation regarding air pollution control. It led to research on techniques for controlling and monitoring air pollution and quality.
- The act regulates emissions from stationary and mobile sources.
- According to the EPA, the act has prevented 237,380 premature deaths, 75,000 cases of chronic bronchitis and 17 million lost work days in 2020 alone.
- Emissions of air pollutants have decreased 50% since 1990.
Montreal Protocol - 1987

- The Montreal Protocol was a global agreement to help protect the ozone layer by phasing out products that damage it.
- This is the first treaty to achieve universal ratification by all countries in the world.
- According to the UN, 98% of ozone-depleting substances have been phased out and 2 million skin cancer deaths have been prevented each year.
Energy Conservation
Energy in America and the Greenhouse Effect

U.S. energy consumption by source and sector, 2019
(Quadrillion Btu)

Source:
U.S. Energy Information Administration

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The Greenhouse Effect

Some solar radiation is reflected by the Earth and the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth’s surface and the lower atmosphere.

Most radiation is absorbed by the Earth’s surface and warms it.

Infrared radiation is emitted by the Earth’s surface.

Source: U.S. Energy Information Administration
Clean Energy

- “Clean energy” includes utilizing more renewable energy sources and energy efficiency.
- According to the State and Local Energy Efficiency Action Network, nearly ⅓ of energy used in America each year is wasted.
  - Leaking heat or AC
  - Inefficient appliances and equipment
  - Insufficient practices
- Individual actions and large scale practices make a difference.
Kyoto Protocol - 1997

- The Kyoto Protocol is the United Nations’ treaty to reduce 6 different greenhouse gas emissions from developed countries. Developing countries (including China and India were not required to participate).
- 192 nations originally adopted the Protocol with a target of reducing emissions by 5% of their 1990 level from 2008-2012.
- The Doha Amendment was adopted in 2012 to extend the Protocol. It has not been ratified as of 2020, but 30 developed countries have deposited their instrument of acceptance.
Clean Power Plan - 2015-2017

- Originally unveiled by President Obama in 2015, this plan set the first standards and limitations of carbon pollution coming from major U.S. power plants.
- The bill aimed to cut carbon emissions from power plants by 32% of 2005 levels by 2030 and double solar and wind power capacity.
- The CPP was reviewed in 2017 and officially repealed in 2019 citing that it overreached the EPA’s authority.
Conservation and the Individual

In the chat box, share some ways that you conserve natural resources. Please share any resources that could be useful to your peers regarding conservation.
Consumer Choices

- Every day there are choices a consumer can make that affect conservation; being conscious can have a major effect on conservation success.
- The following consumer choices can have effects:
  - Transportation
  - Diet
  - Shopping habits
  - Energy Use
  - Land Use
  - Cleaning products
  - Clothing
  - Electronics
Conscious Choices

- When purchasing products, look to see what is in the product and who produced/manufactured it. Doing so can reveal negative impacts on the environment and people.

- Example:
  - Palm oil is a vegetable oil that comes from the fruit of palm trees. It is a cheap, versatile oil that is used in household products from pizza and doughnuts to toothpaste.
  - Clearing biologically diverse forests to plant palm oil is one of the world’s leading deforestation drivers.
  - What can you do? Use products without palm oil or with RSPO (Roundtable of Sustainable Palm Oil) certification.
Reduce, Reuse, Recycle

- Reduce, reuse and recycle are strategies that are applicable in every consumer's daily life.
  - **Reduce** - Using/buying less of a product
  - **Reuse** - Using a product more than once instead of disposing of it
  - **Recycle** - Taking certain objects to a recycling center to be repurposed.
- Reduce and reuse are the most preferred methods for conservation.
- When recycling, **look up the object to ensure it can be recycled to avoid contaminating other recyclables.**
- [Asheville Waste Wizard](#)
Composting

- Composting is the controlled decomposition of yard and food waste that produces a soil-like substance.
- For hot composting, you will need a minimum 3 x 3 x 3 container, aeration and mixing.
  - The heat produced will kill weed seeds and disease.
- Composting is a great way to recycle organic material and produce fertilizer for you to use in your yard.
- To learn more, check out your local Cooperative Extension office.
Backyard Conservation

Consider incorporating one of the following in your backyard:

- **Rain gardens**: rain gardens typically consist of native plants and are planted in a drainage/low elevation area of your yard. These gardens reduce runoff and pollution.
- **Pollinator gardens**: plant native plants to attract native pollinators. Your local Cooperative Extension office is a great resource for learning about native pollinators and plants that attract them.
- **Certified wildlife habitats**: Create a wildlife habitat in your backyard by providing water, food, cover and areas to raise young. NRCS and the National Wildlife Federation have excellent resources for accomplishing this.
- **Plant trees**: Trees are excellent for reducing runoff, preventing flooding, providing habitat and sequestering carbon.
Sources

https://www.epa.gov/

https://www.nrcs.usda.gov/

Best Management Practices

http://www.aascd.org/agriculture/best-management-practices/

https://extension.umn.edu/agroforestry/trees-shrubs-windbreaks#:~:text=Windbreaks%20are%20plantings%20of%20single,Wildlife%20habitat.

Conservation in America

https://www.earthday.org/


https://www.aldoleopold.org/about/aldo-leopold/sand-county-almanac/
Sources

Water Conservation

http://acsc.lib.udel.edu/exhibits/show/legislation/water

https://cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_object_id=2571

https://deq.nc.gov/about/divisions/water-resources

Biodiversity Conservation

https://www.fws.gov/endangered/

https://www.fs.usda.gov/

https://www.fisheries.noaa.gov/

https://www.ncwildlife.org/
Sources

Air Conservation

https://unfccc.int/process-and-meetings#2cf7f3b8-5c04-4d8a-95e2-f91ee4e4e85d


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https://deq.nc.gov/about/divisions/air-quality

Energy Conservation


https://www.energy.gov/

https://www.eia.gov/

https://www.energy.gov/
Sources

Conservation and the Individual