



Vermont Fish & Wildlife Department



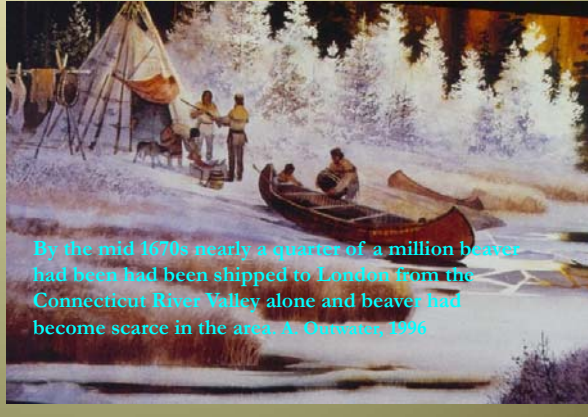
Outline

- Brief natural history of Vermont
- North American Wildlife Model
- Public Trust Doctrine and accountability
- Wildlife related activities in Vermont
- Department structure and funding
- Challenges for the future



Vermont – Natural history

- Search for beaver drove exploration of New England
- 200 million beaver in U.S. pre-Columbus
- Due to unregulated taking beaver were extinct from Vermont by early 1700's



It is difficult to overstate the role that resource extraction, particularly the search for beaver and other furbearers played on the exploration and settlement of North America. Prior to the development of North America by Europeans. They may have been as many as 10 -20 times the number of beaver as there are today. Some estimates suggest that in good beaver habitat there may have been as many as 300 dams/mi². If each dam held back an average of 1 acre of water, that would mean the almost half of the area was either flooded or abandoned flowage.

Vermont – Natural history

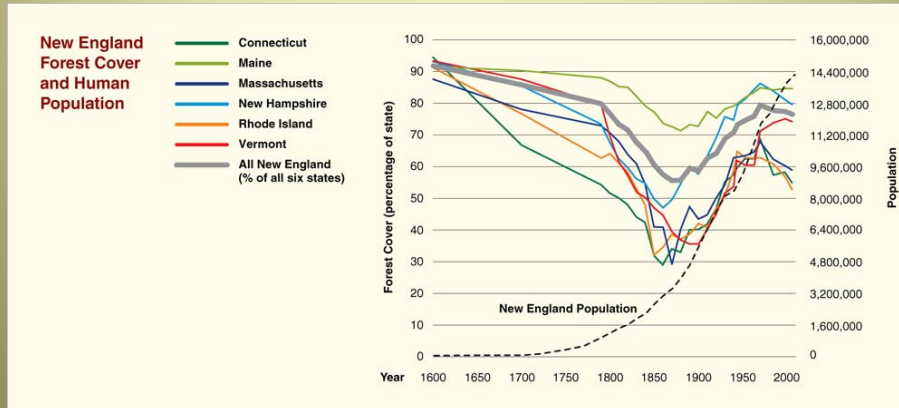
Population (excluding Native Americans):

- 1760: <3,000
- 1790: 85,000
- 1800: 155,000



Vermont was settled much later and very differently than southern New England. Massachusetts's settlements, for example, were generally set up with a central green surrounded by houses and farms. Farmers turned their livestock out on the village green and walked to the crop lands. Most of Vermont on the other hand was not settled until 100 years later. Family groups arrived and cleared small "subsistence farms" that were relatively self sustaining. Settlers arrived in droves through the late 1700's ("the surge") and Vermont's non-native population went from 3,000 to 155,000 in 40 years.

Vermont – Natural history



What followed was the most comprehensive land clearing effort New England has ever experienced. As you can see from the slide, Vermont was cleared later than the southern New England states and ultimately 65%-75% of the forests were cleared as a result of a strong potash industry, vibrant sheep farming, and high elevation subsistence farms by the late 1800's.

Vermont – Natural history

- Deforestation, erosion, pollution, and creation of dams lead to loss of habitat on land and water. (sawdust from one lumber mill generated a 4'X4'X ¼ mile deposit in the adjacent stream). (1893-94 Biennial Commission Report)
- Loss of habitat lead to loss of species
- In 1866, in response to the devastation, the Vermont legislature appointed a Board of Fish Commissioners. *Focus:* the restoration of brook and lake trout which they understood to require “pure water”.



Quote from the 1893-94 Biennial Commission Report: The preservation of our streams would be materially assisted if land owners would be careful to protect all trees growing along their banks. Even the alders and other shrubbery along the banks of a brook are a protection, but the substitution of good shade trees for such shrubbery is recommended; and in clearing wood lots a line of trees along the brook, and better still, a grove one hundred feet wide, is recommended. It will insure greater volume and purity of water for the fish.

Vermont – Natural history

Species lost:

- Deer
- Turkey
- Otter
- Wolf
- Lynx
- Moose
- Bear
- Marten
- Osprey



- Peregrine falcons
- Bald eagles
- Atlantic salmon
- Mountain Lion
- Muskies
- Passenger pigeon
- Beaver
- Canada goose
- HOW MANY others?



The huge habitat transition from forest to fields favored some species (fox, raccoon, skunk) at the expense of many others (list above). Many of the invertebrate and herp species were not tracked during that period so there is no baseline evidence for many of our less understood species.

Vermont – Natural history

- 1876 Fish & Game Commission
- 1906 Current F & W Dept Structure
- 1908 First hunting & fishing license

*The Commissioner of Fish and Wildlife shall manage and regulate the fish and wildlife of Vermont in accordance with the requirements of this part and the rules of the Fish and Wildlife Board. The protection, propagation control, management, and conservation of fish, wildlife, and fur-bearing animals in this State are in the interest of the public welfare. **The State, through the Commissioner of Fish and Wildlife, shall safeguard the fish, wildlife, and fur-bearing animals of the State for the people of the State, and the State shall fulfill this duty with a constant and continual vigilance.***

-10 V.S.A. § 4081. Policy



1876: Legislature gave the Fish Commission authority over game.

1906: Fish and Game Department was created with one Commissioner.

1908: First resident hunting and fishing license was created at a fee of 50 cents.

Vermont – Natural history

- Pittman-Robertson Funds established – 1937
- Created an excise tax on guns, ammo, archery
- Dingell-Johnson Funds followed in 1950
- Created excise tax on fishing equipment, boats, and motorboat gasoline



Active management, conservation, and enforcement have been funded by hunters, anglers, and trappers (characterized as user-pay, user-benefit model). License and permit fees, a motor boat fuels tax, and excise taxes on hunting, shooting sports, and angling products provide dedicated funding for habitat conservation, harvest management, research, restoration, and monitoring initiatives by state agencies. Currently, the combination of sportsmen-derived funds comprise 60-90% of the typical state fish and wildlife agency budget (U.S.F.W.S. unpublished data).

Vermont – Natural history



1878- 17 White-tailed deer were brought in from NY and stocked in Bennington and Rutland Counties

1956– A flock of 44 Canada geese was kept at Dead Creek Refuge (pinioned). Their young, allowed to migrate seasonally, resulted in Canada geese nesting in the Champlain Valley.

1959-1967: 125 fisher were reintroduced from Maine by FPR to help control porcupine numbers

1969: 31 wild turkeys were live-trapped in NY and released in Pawlet and Castleton

1989-91: 116 marten were trapped in Maine and NY and release in the southern Green Mountains

Vermont – Natural history

Other Fish and Wildlife restoration efforts:

- Moose
- Lake sturgeon
- Beaver
- Lake trout
- Peregrine falcon
- Lynx
- Bald eagles
- Atlantic salmon
- Osprey
- Muskies
- Walleye
- Land Conservation/Mgt

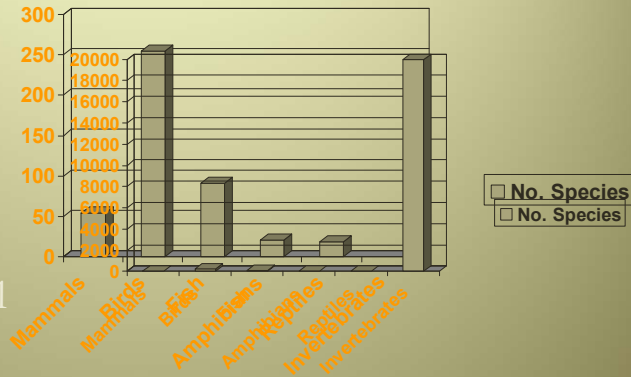


The federal funds combined with license fees have supported many additional restoration efforts over the last 100 years. Although historically the focus was on what some now term 'game' species, they were at one time species at risk or endangered. Today many of the restoration efforts continue to focus on those species that are at risk.



Today Vermont is home to:

- Birds – 252
- Mammals – 58
- Fishes – 92
- Reptiles – 19
- Amphibians – 21
- Plants
- Habitats



Vermont supports a wide variety of birds, mammals, fish, herps, and plants but when compared to the upwards of 20,000 invertebrates the numbers pale in comparison. Herps, plants, and invertebrate monitoring and restoration cannot be funded with federal dollars. The State Wildlife Grants program (SWG) has helped to fill the hole although plant conservation is not currently covered by either federal program and has to be funded with state funds.

North American Model of Wildlife Conservation

- Developed in response to European model
 - Wildlife owned by royals and wealthy elite
 - Hunting only for the privileged few
 - Many species hunted or trapped to extinction



The North American Model of Wildlife Conservation is a set of principles that, collectively applied has led to the form, function, and successes of wildlife conservation and management in the United States and Canada. The model is not cast in stone but a means to understand, evaluate, and celebrate how conservation has been achieved in the U.S. and Canada and to assess the challenges that lay ahead.

North American Model of Wildlife Conservation

In North America, *all* fish and wildlife are owned by no one and held in trust for present and future generations by the **Government**. (Common Law basis: Public Trust Doctrine, Supreme Court 1842)



We are the stewards of Vermont's fish and wildlife populations for future generations.

Keystone component of the Model. In many cases there is no legal code specific to the Public Trust Doctrine.

North American Model—Public Trust Common Law Basis

Legal Foundation for federal, provincial, and state wildlife agencies

- Supreme court decision in 1842 in NJ
- Decision based on an interpretation of the Magna Carta which, in turn, was based on Roman law “the Institutes of Justinian”(A.D. 529).

“By law of nature these things are common to all mankind— the air, running water, the sea, and consequently the shore of the sea. No one, therefore, is forbidden to approach, the seashore, provided that he respects habitations, monuments, and the building which are not, like the sea, subject only to the law of nations.” (Roman Law)

U.S. Supreme Court ruling denied a landowner’s claim to exclude all others from taking oysters from certain mudflats in NJ. Trustee status was ascribed to the states. Roman law considered wildlife as common property. They (1) could not be privately owned and (2) were for common use by everyone.

Public Trust Doctrine—Central Tenet

“The fish and wildlife of Vermont are held in trust by the State for the benefit of the citizens of Vermont and shall not be reduced to private ownership. The State of Vermont, in its sovereign capacity as a trustee for the citizens of the State, shall have ownership, jurisdiction, and control of all of the fish and wildlife of Vermont.”

-10 V.S.A. 4081



In many states, there is no legal code specific to the Public Trust Doctrine. It is “judge-made law”, interpreted and evolved through court decisions. However, in Vermont, unlike many other states, this public trust doctrine has been codified in statute. The state is essentially asserting its own property rights—those that belong to the public.

Grounded in our Hunting Heritage

Section 67 of the Vermont Constitution

The inhabitants of this State shall have liberty in seasonable times, to hunt and fowl on the lands they hold, and on other lands not enclosed, and in like manner to fish in all boatable and other waters under proper regulations, to be made and provided by the General Assembly.

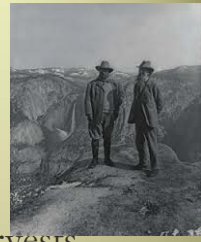


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This is further supported by the state constitution which ensures inhabitants right to “hunt and fowl” on private lands “not enclosed” [posted].

North American Model

- Wildlife as public trust resources
- Elimination of markets for game
- Allocation of wildlife by law—sustainable harvests, habitat protection, access.
- Wildlife should only be killed for a legitimate purpose: fair chase/wanton waste/pioneer spirit
- Wildlife are considered an international resource—migratory wildlife, US/Canada tech committees
- Science (biological and social) is the proper tool for setting wildlife policy. (Wildlife Mgt Triad: wildlife, habitat, people)
- Democracy of hunting



Markets for game: privatizes a common resource and leads to declines (exception for furbearers because there is an active market in Canada and US for pelts. These markets are highly regulated and serve a conservation purpose because harvests are within normal population fluctuations consistent with sustainable use, help manage human/furbearer conflicts, and foster support for habitat conservation. Elimination of markets for game began in NY in 1844 and was promoted by Grinnell in *Forest and Stream* resulting in the Lacey Act (1900): made market hunting illegal nationwide. Threats; reptile/amphibian/pet markets, etc.

F&W Board Accountability

- Trustees (legislature, Board, Commissioner) responsible for decisions that serve the long-term interests of beneficiaries (resource and public)
- Transparency in decision-making process essential
- Stakeholders should be engaged throughout process
- Trustees accountable to whole, not particular interests



The Fish and Wildlife Board are the Trustees of all wildlife species and are responsible for promoting the long-term sustainability of fish, wildlife and plant populations for the public into the future.

North American Wildlife Model

- The model is not perfect
- It is not always applied in every situation, even in Vermont
- The Model's future rests on the adaptability and application of its principles to contemporary wildlife conservation needs.
- The Model must be dynamic to remain relevant

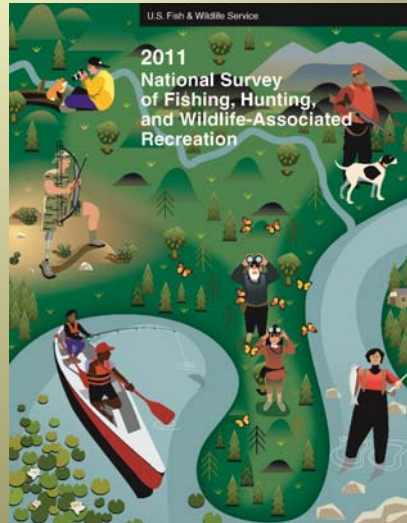


Model evolved during a period where fish and wildlife populations had declined as a result of unregulated taking. Today the biggest threats to wildlife populations is the loss/conversion of habitats and landscape scale modifications.

Wildlife and Fish-Related Activities

Vermonters who participate in:

- Hunting (14%)
- Fishing (20%)
- Wildlife watching (53%, 3rd)
- All wildlife-related recreation (62% 2nd)

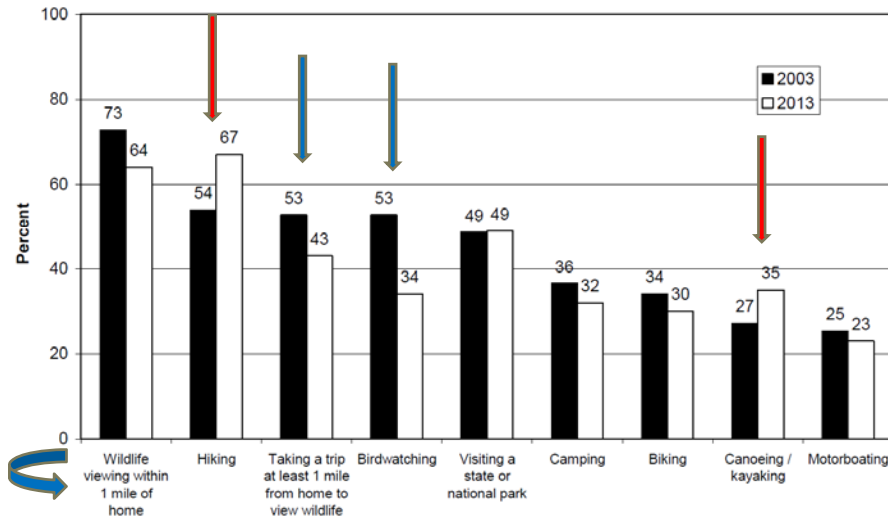


Vermont is second only to Alaska in the number of people per capita who participate in wildlife related recreational activities.

Wildlife and Fish-Related Activities

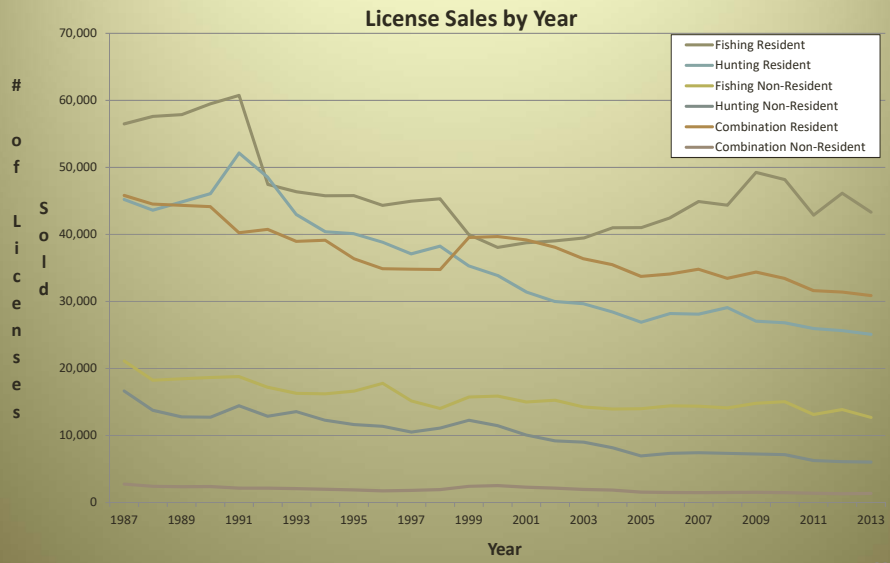
Non-consumptive

In the past 12 months, have you participated in...?
(Residents)



Somewhat worrisome is the decline in participation between 2003 and 2013 in wildlife viewing while hiking and canoeing/kayaking are increasing.

Wildlife and Fish-Related Activities



Wildlife and Fish-Related Activities

Average Vermont Hunter

- He or she is white and 50 years old
- 91% male but percentage of women is on the increase
- Has a high school diploma
- Most (76%) fish
- Slightly less than the median Vt income
- Rural
- Lifelong Vermonter
- Not a techie nor a newspaper subscriber, but watches WCAX



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Wildlife and Fish-Related Activities

Average Vermont Angler

- He or she (82% male) also has a median age of 50
- Median VT income, but angler-only tend to be more affluent
- About 50% hunt too
- Two-years of advanced education
- Small town
- Less likely to be a lifelong Vermonter than hunters

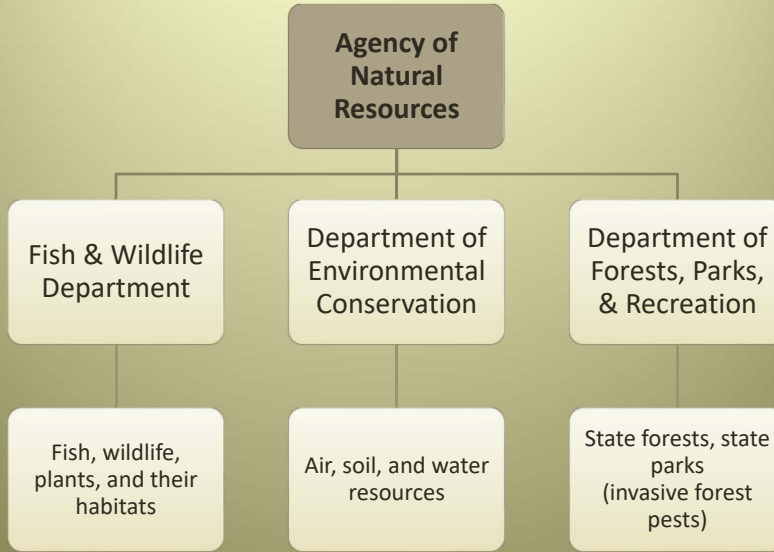


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Agency Structure

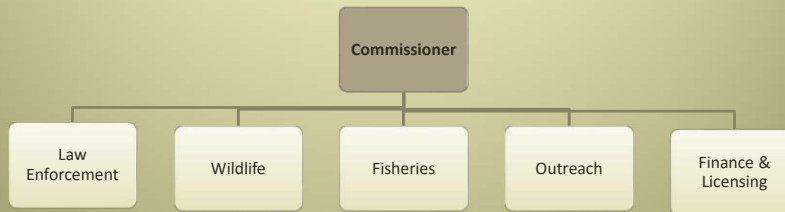


Agency Structure

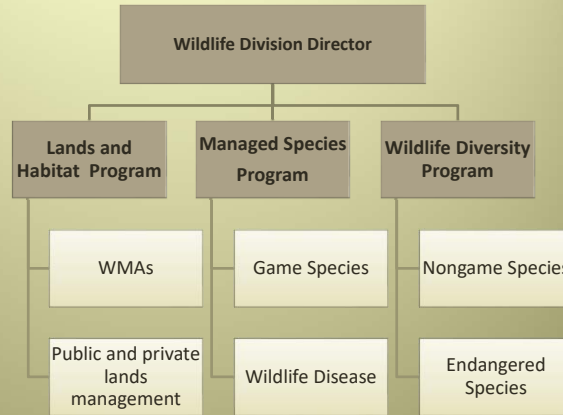


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DFW Organization Chart

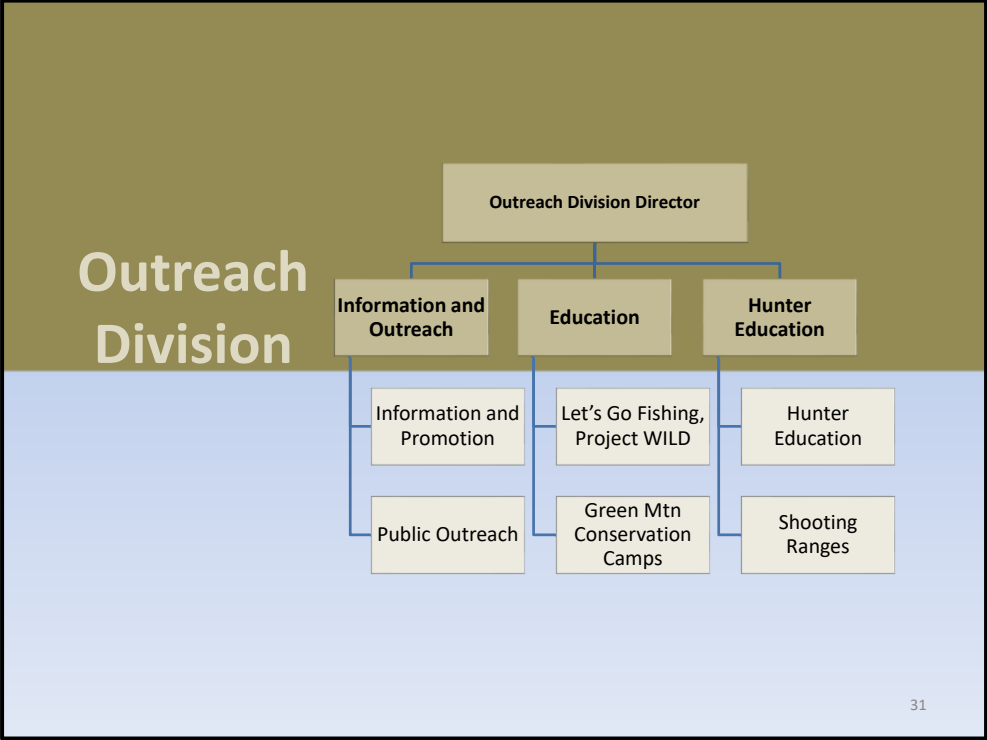


Wildlife Division

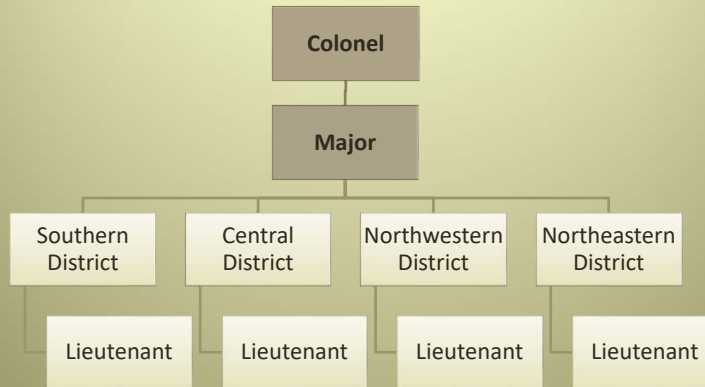


Fisheries Division



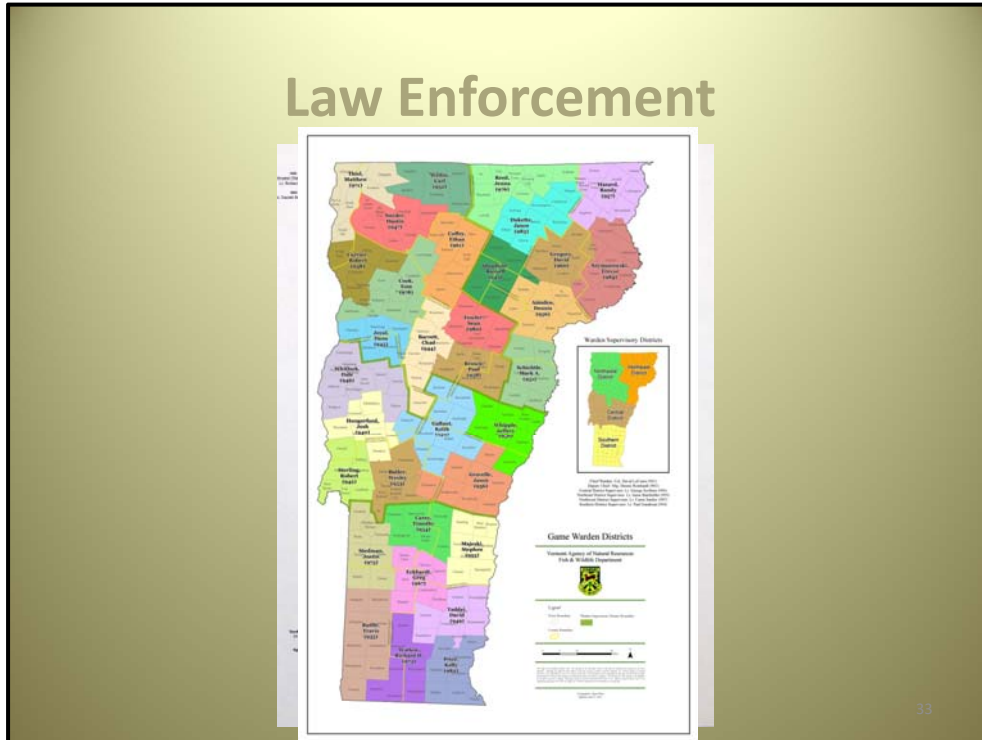


Law Enforcement



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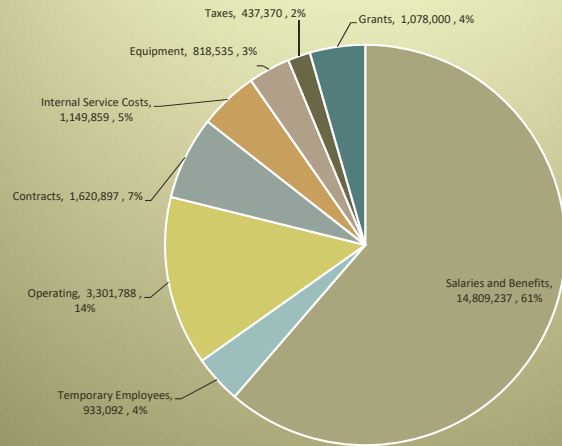
Law Enforcement



The Law Enforcement division was understaffed for many years. In 2011 and '12 the Department was able to fill vacant positions and return the warden force to close to full capacity. As a result, warden districts have been reduced allowing for better emergency response time and customer service.

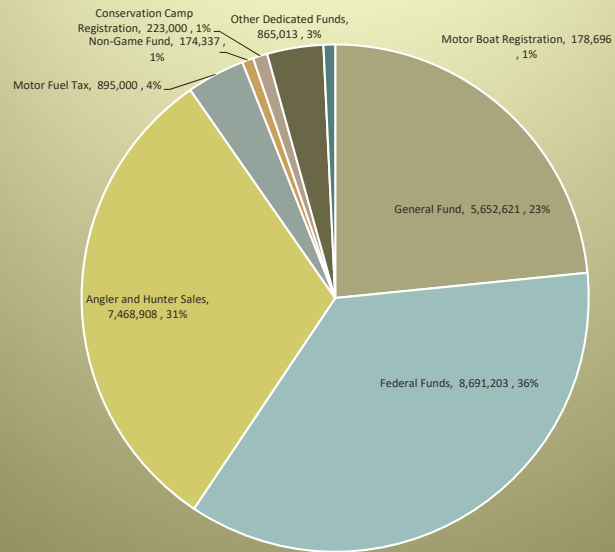
Department Funding

FY 2019 Department Expenditures



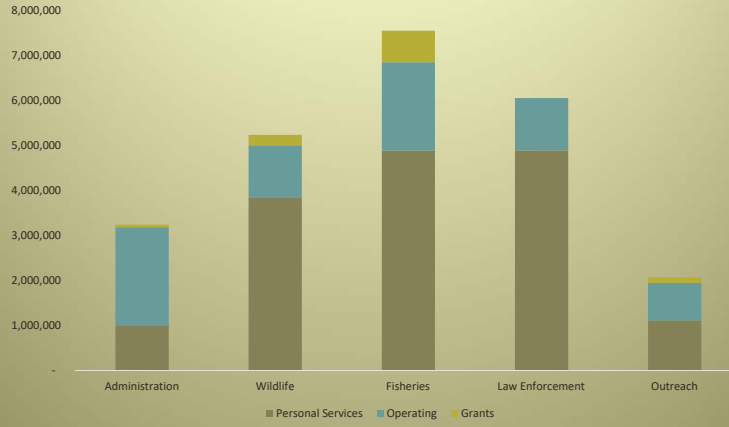
Department Funding

FY 2019 Department Revenue



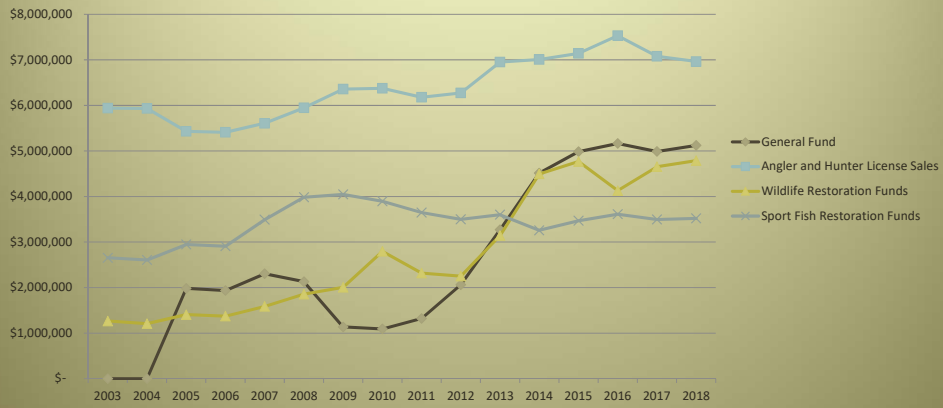
Department Funding

FY 2019 Budget by Division



Department Funding

Trend of Major Revenue Sources 2003-2018



Future Challenges/Threats to the North American Model

Vermont is at a crossroads...



Vermont is at a cross-roads. We have traditionally been a rural state with rural values but that is changing quickly. We are currently experiencing development at a pace faster than New Jersey and an area the size of Montpelier is converted to development every year.

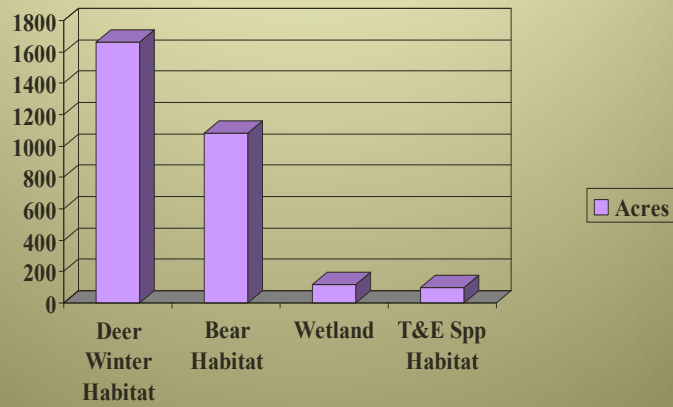
Habitat Loss



Act 250, a land use and development law allows the Department to intervene in projects over a certain size to protect “necessary” wildlife habitat. However, many projects do not meet the threshold and developments that are not covered by Act 250 are covered by town by laws. The deer wintering area in Waitfield was undeveloped in the early 1980’s and by the mid 1990’s it had been totally fragmented by roads and houses. Species like deer and bobcats have fidelity to these areas and either perish due to human disturbance or eek out the winter in smaller patches of habitat.

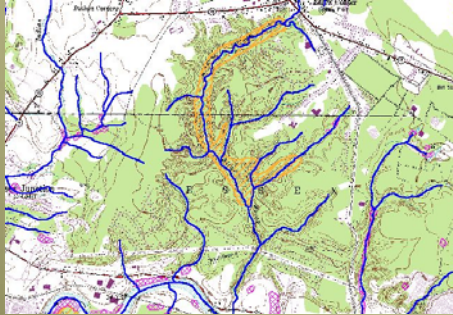
Habitat Loss

- Vermont is losing a square mile of critical habitat to regulated development every year.
- Nationally, we are losing 365 acres per hour.



Shifts in Land Use/Urbanization

Early 1980's

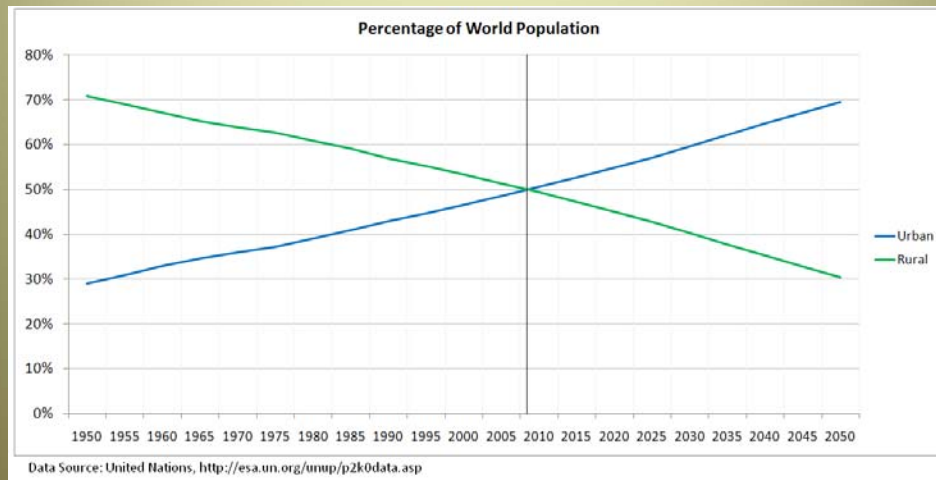


Mid 1990s



Loss of connection to the land

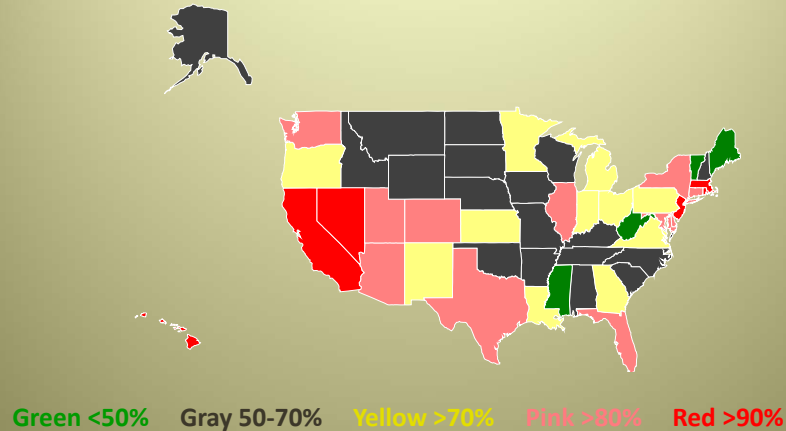
“The greater the proportion of state residents who live in urban areas, the lower the proportion who hunt.” Decker et al. 2001



Attitudes towards wildlife tend to shift as people become disconnected from the land. As of 2011, more people now live in an urban environment as do a rural one for the first time in human history.

Loss of connection to the land

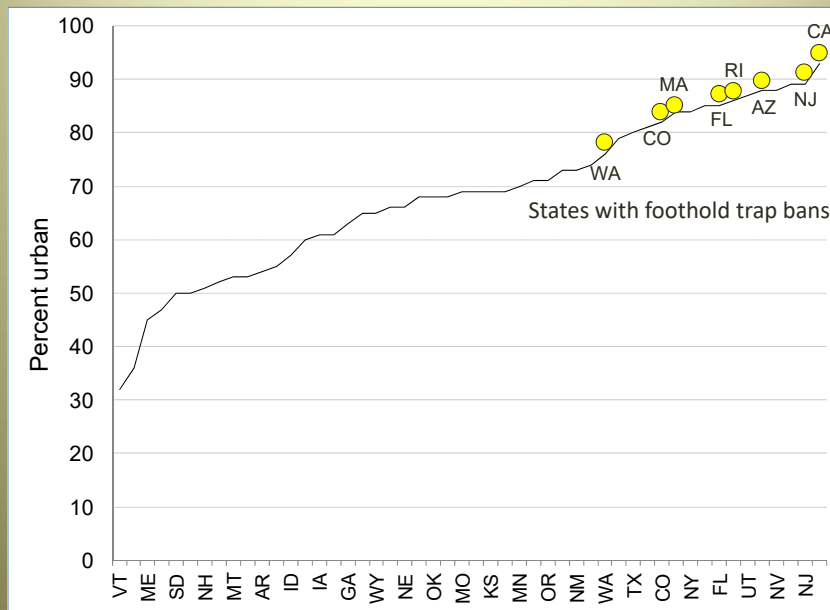
Percent of population living in urban areas



(from DeStefano et al. 2005)

From a demographic perspective, however, the highest proportions of rural dwellers are in the East, including the northeast, while the highest proportions of urban dwellers are spread throughout the country: northeast, south, SW, west.

Changing Cultural Values

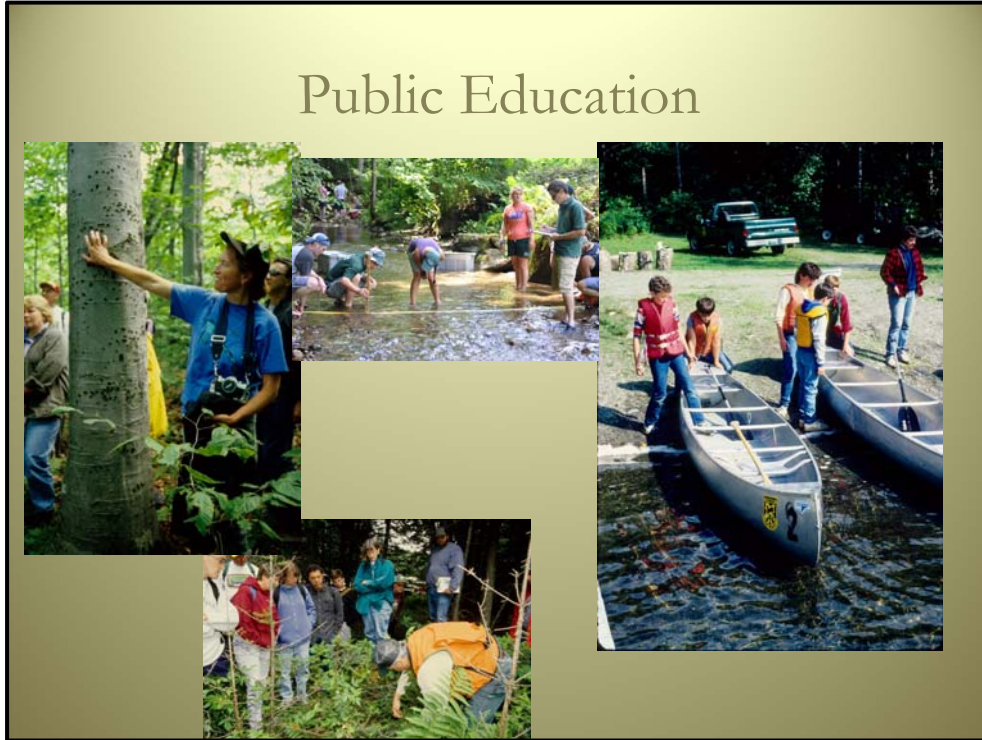


Eight of the most urban states have passed legislation to outlaw or restrict the use of leg- or foot-hold traps, starting with WA, which is 76% urban.

Recruitment and Retention



Public Education



Teachers Course, camps, landowner training, technical assistance, etc. How do we keep kids in particular, interested in the out of doors when they have the 'virtual world' to distract them?

Invasive Species



Barberry



Buckthorn



Climate Change

Increase in diseases and
parasites



Warmer weather during
hunting seasons



Privatization of Wildlife

Pet trade



Elimination of markets for fish and wildlife?

Captive Hunting Facilities



Democracy of hunting?
Wildlife as public trust resources?

Lack of Access

Posted land



Democracy of hunting?

Wildlife as public trust resources?

Long-term Funding

Species at Risk



Federal funds (PR, DJ, SWG) and license sales have traditionally supported the conservation of both hunted and fished species as well as species at risk . Pittman Robinson (PR) funds only fund birds and mammals and SWG funds have filled the gap for reptiles, amphibians, and invertebrates. There is currently no federal funding source dedicated to plant conservation.

Information super-highway

- Instantaneous spread of ideas
- Information and *mis-information* spread just as quickly
- Need to keep the public informed with correct, current information

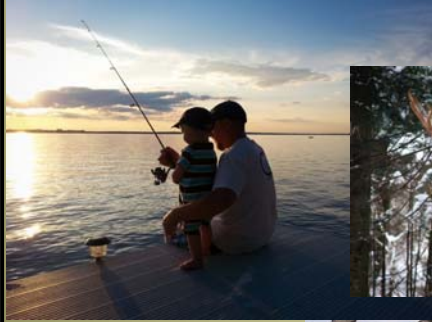


The Future--Could we use the NA Model to help address these and other challenges?

- What is in the best interest for the wildlife resource?
- What may be best for **all** constituent groups?
- What is in the long-term best interest of the Department/Agency?



Thank you for working to ensure the future
of wildlife in Vermont



The End

