

Rabies in Michigan

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Public Health Importance of Rabies

- Rabies is the infectious disease with the **highest known case fatality rate**
- Rabies remains an important public health problem in developing countries, with **50,000 cases** estimated annually around the world (99% due to dog-strain rabies)
- Developed countries see indigenous or imported cases sporadically
- The annual costs of preventing rabies in the U.S. are estimated to be over **\$300 million** and rising

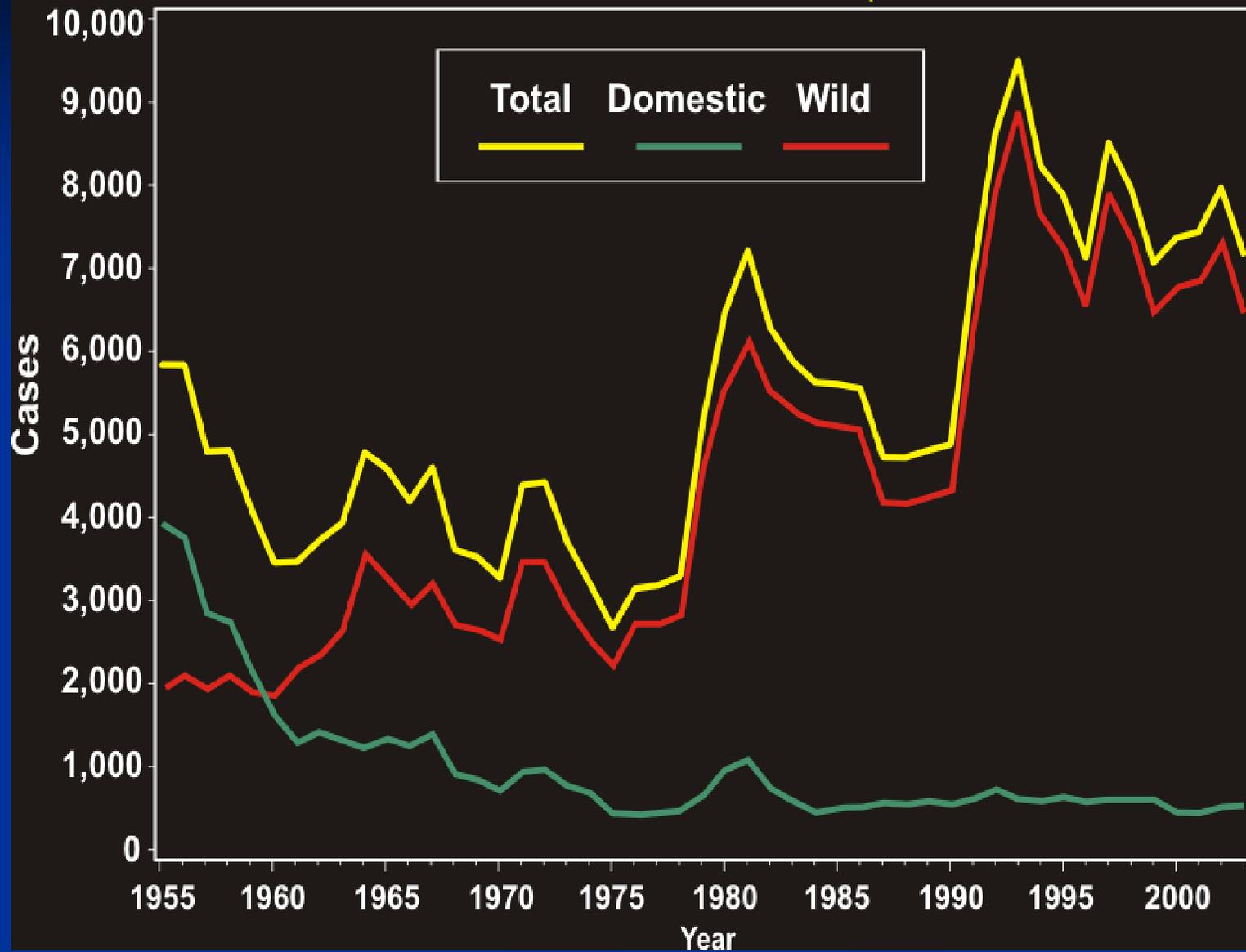
Human Rabies in the U.S.

- Cases have decreased dramatically since the early 20th century
- Of the 47 cases of human rabies reported in the U.S. between 1990-2004, 37 (78.7%) were due to rabies virus variants indigenous to the U. S., and 92% of these were due to bat variants.
- 2003 - The first reported human case of rabies in the U.S. due to the **raccoon strain** (method of exposure remains unknown)
- 2004 – The 1st documented survivor of clinical rabies who did not receive either pre- or postexposure prophylaxis for rabies.

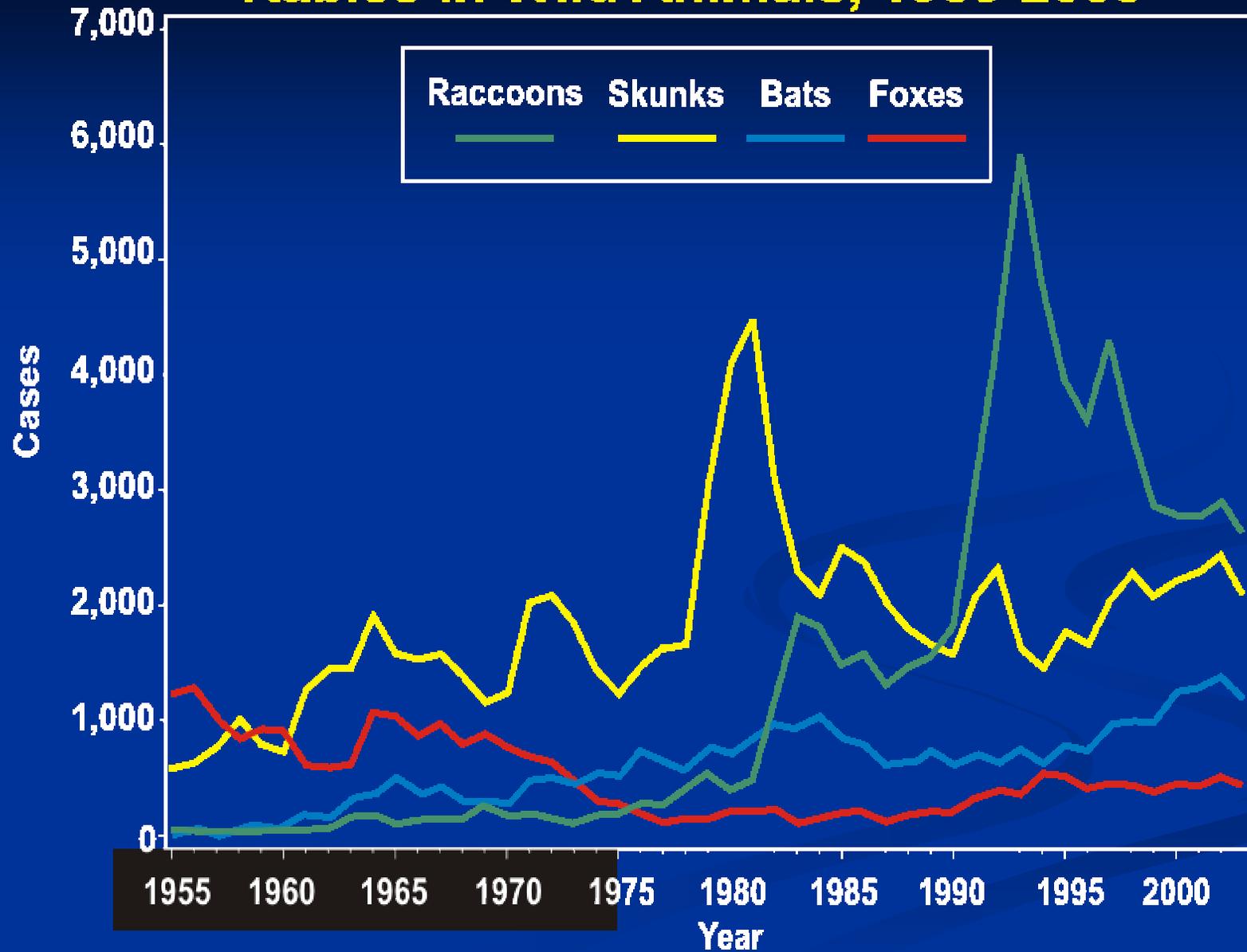
Issues for Public Health

- Rabies is a fatal disease
- No effective treatment once symptoms begin (exception would be recent survivor)
- Clinicians often need guidance in making decisions about PEP
- PEP issues:
 - Treatment is costly, including biologics and professional fees
 - PEP requires a series of vaccines be administered
 - Limited number of biologics manufacturers (supply issues)

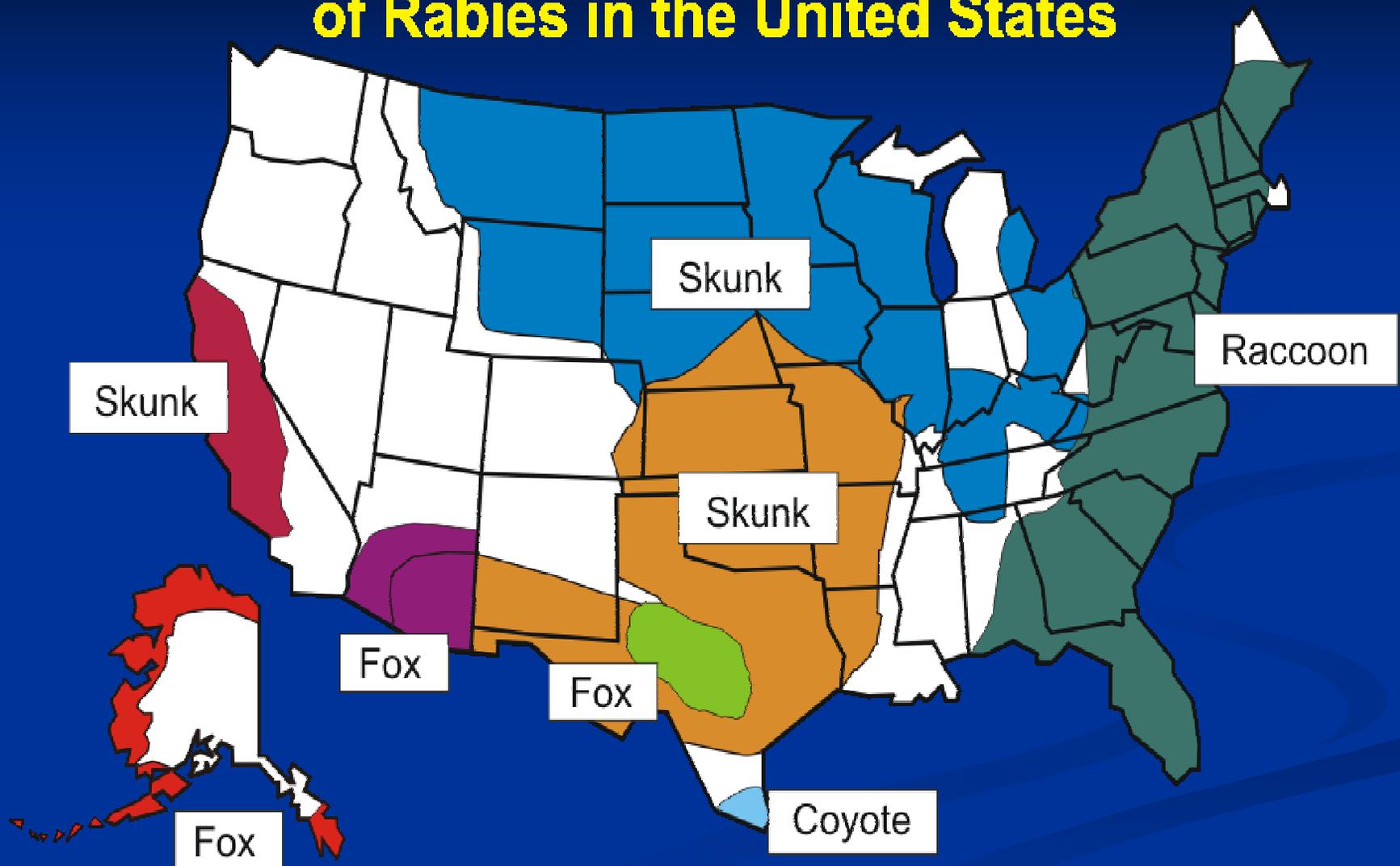
Cases of Animal Rabies, 1955-2003



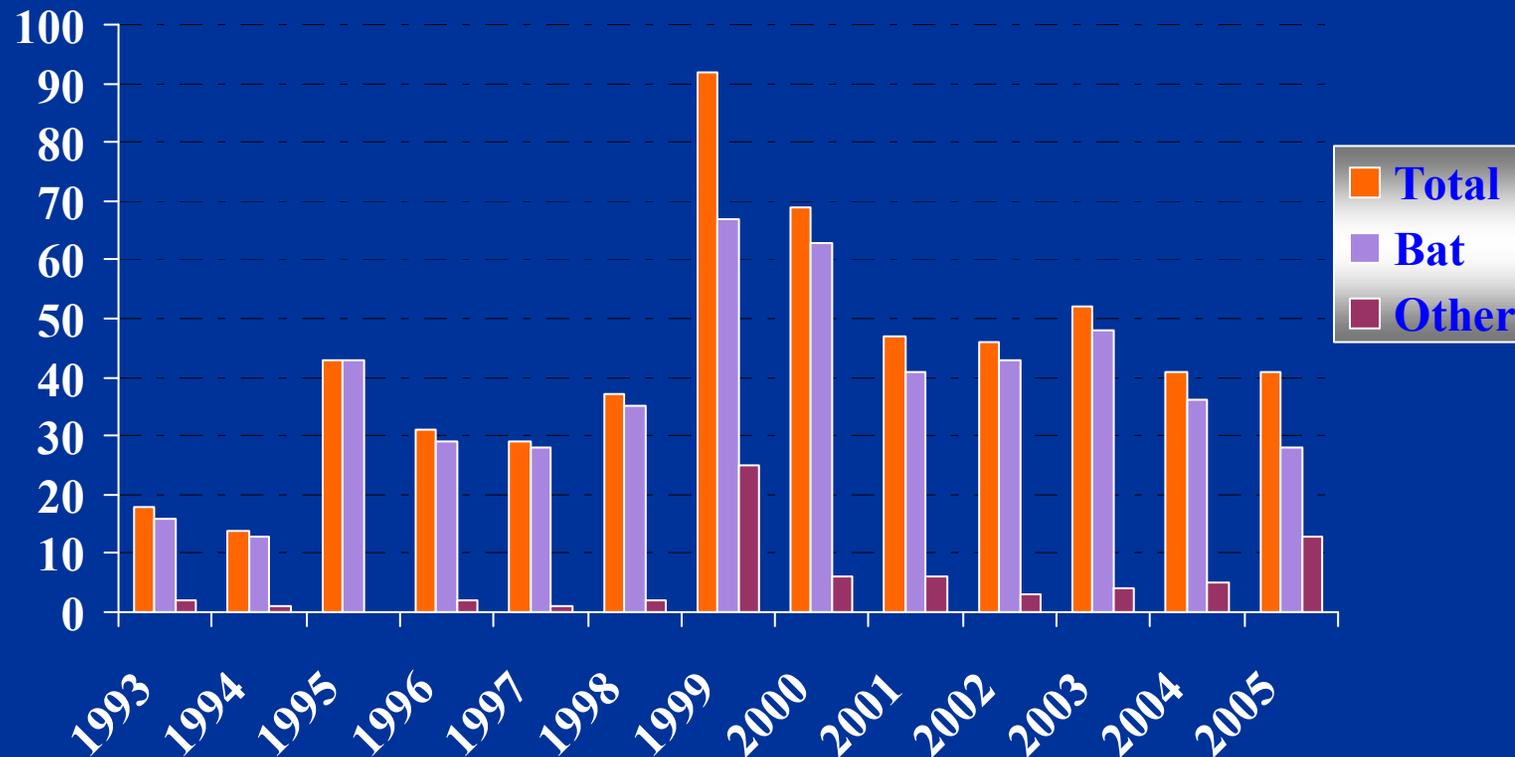
Rabies in Wild Animals, 1955-2003



Distribution of Major Terrestrial Reservoirs of Rabies in the United States

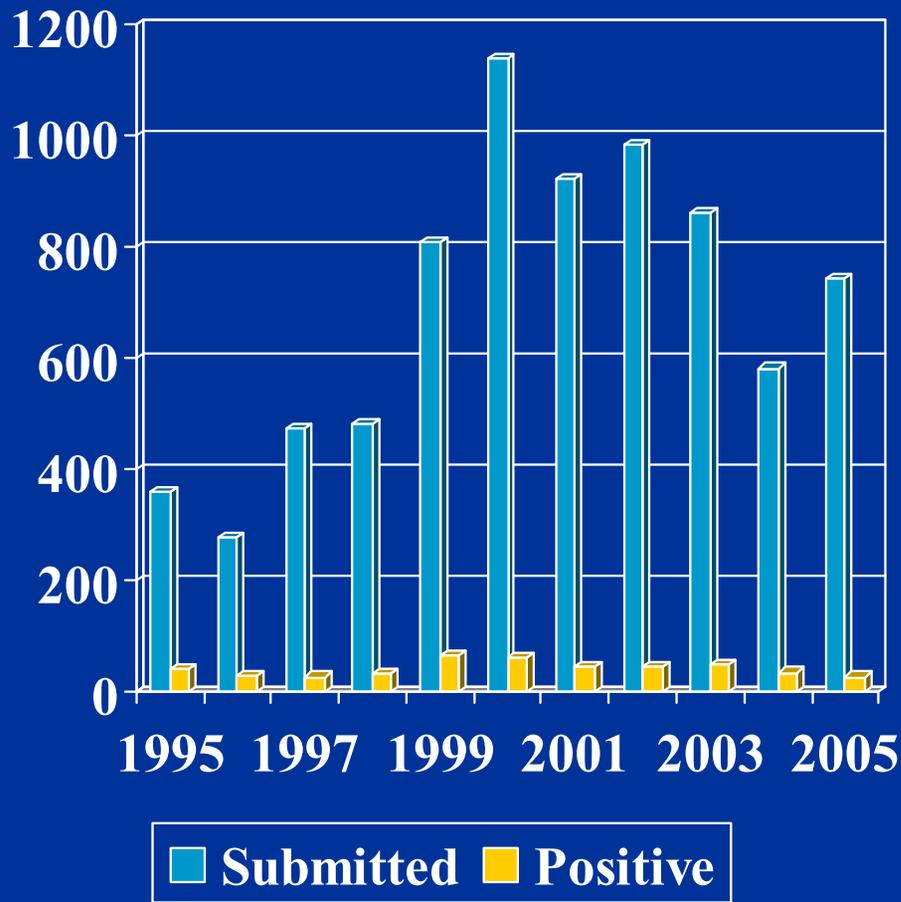


Animal Rabies in Michigan 1993 - 2005



BAT SUBMISSIONS/ # POSITIVE

1995-2005

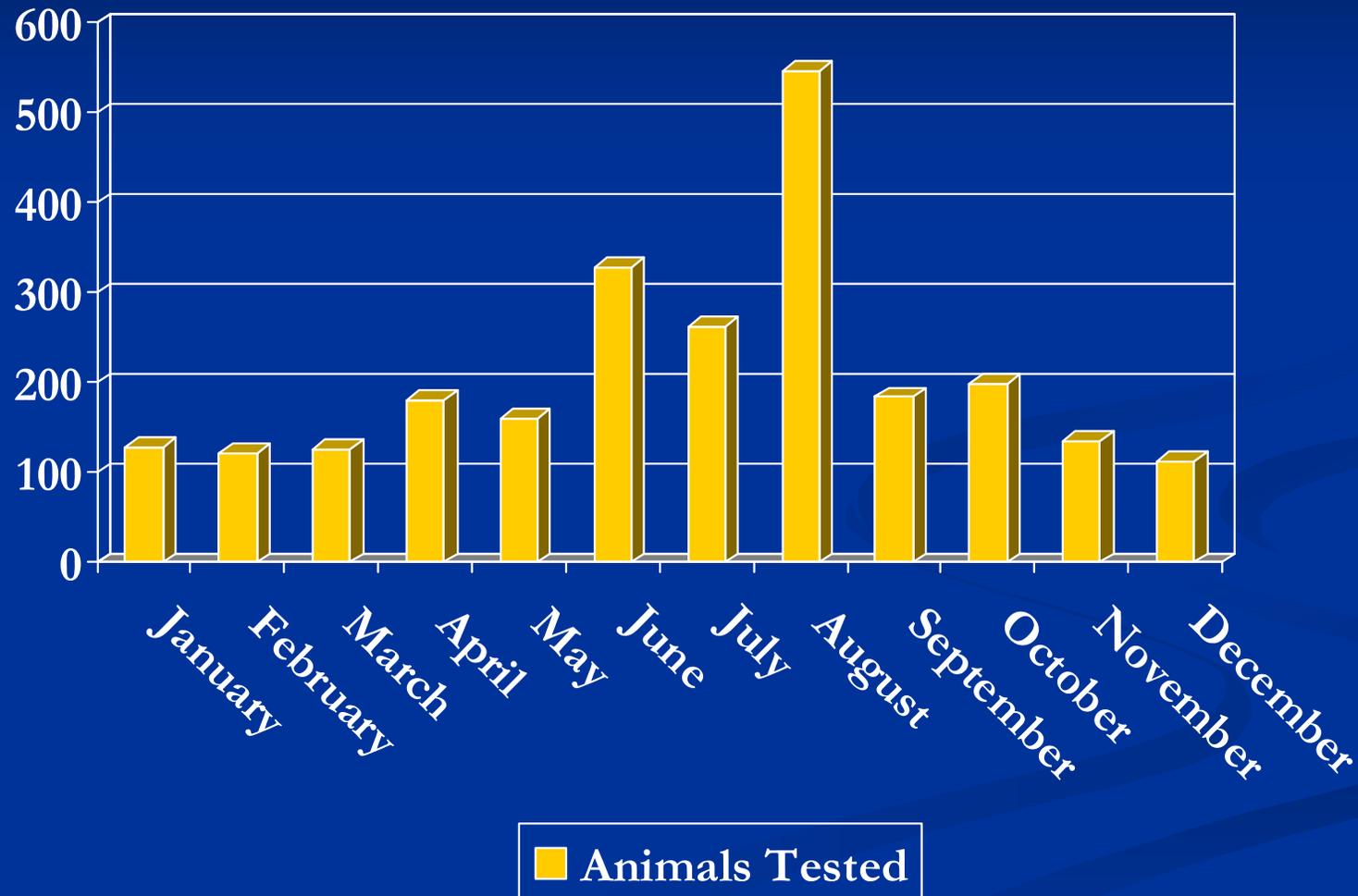


- Species most often testing positive in Michigan

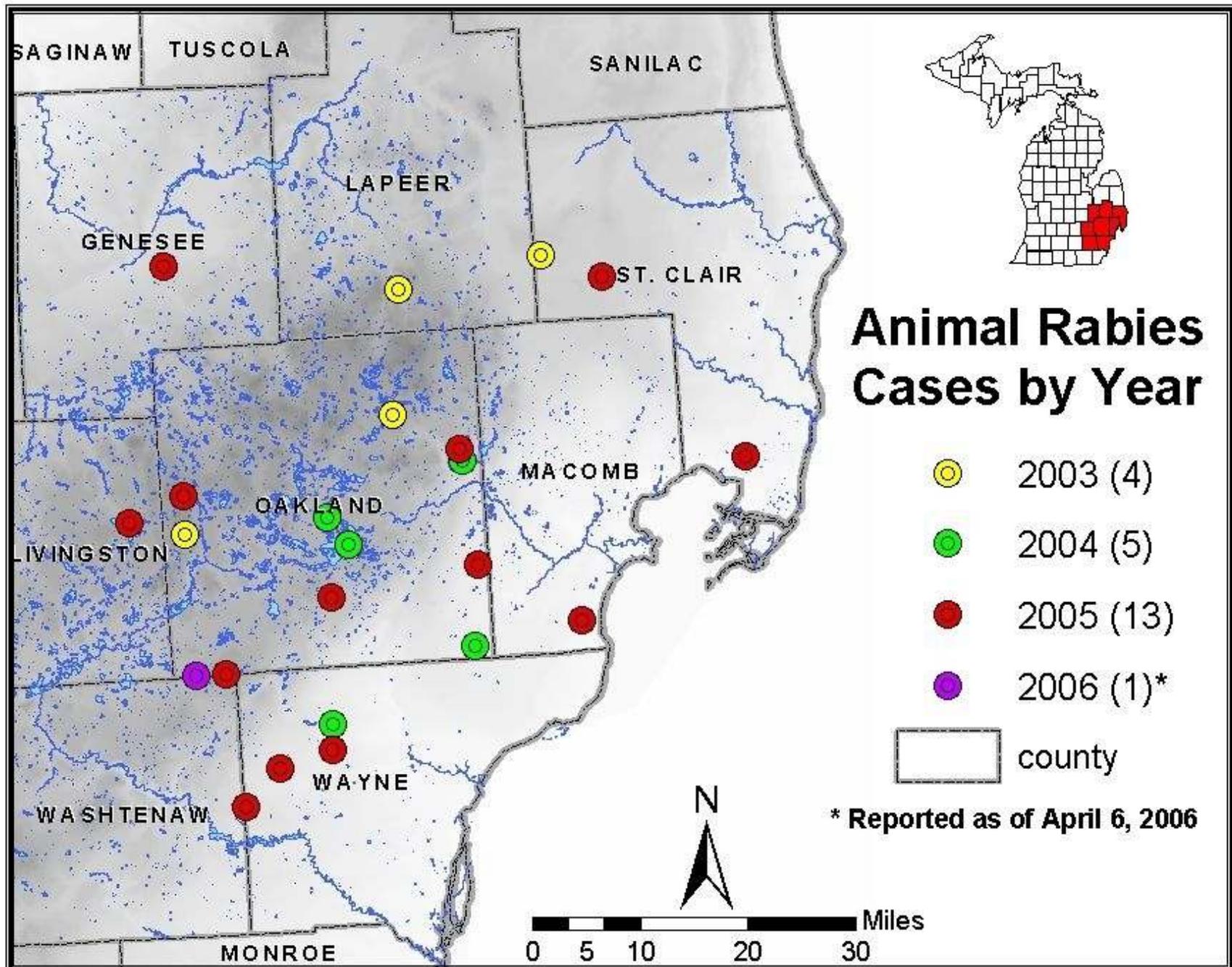
- Large increase in submissions due to revised CDC guidelines in 1997

- % positive is the same (~4-6%)

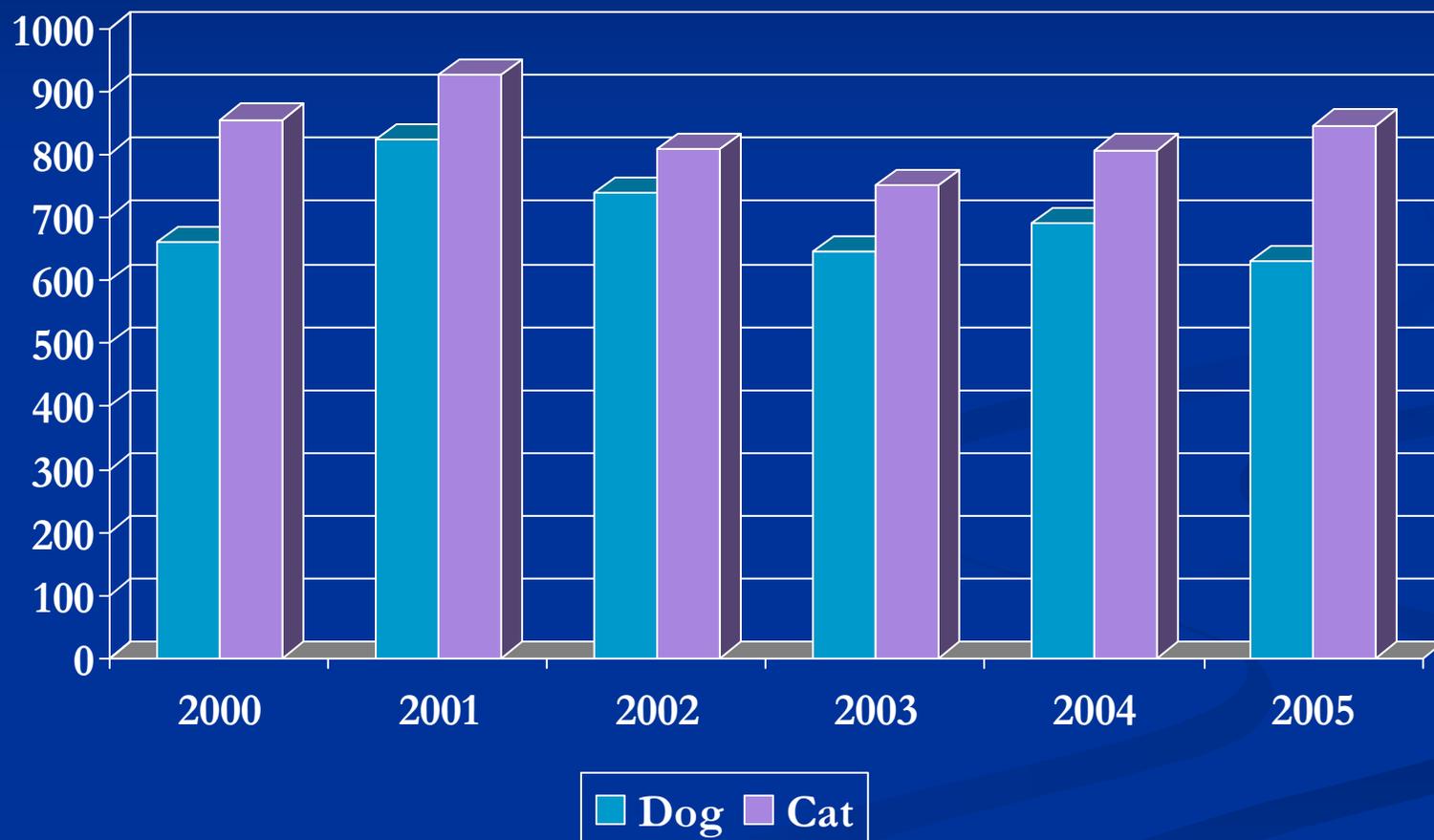
Rabies Testing Seasonal Trends, 2005



All Terrestrial Animal Rabies Cases in Michigan: 2003 - 2006



Dog vs Cat Specimen Submissions



Why Worry About Raccoon Strain Rabies?

Raccoon-Strain Rabies: Emerging Disease

- First described in Florida in the 1940's
- The next 3 decades saw the slow spread of raccoon rabies into GA, AL, and SC
- Hunters translocating raccoons probably introduced raccoon rabies into the mid-Atlantic states in the 1970's from the SE U.S.
- 1977-78 saw reports of rabid raccoons near the Virginia-West Virginia border
- This has since resulted in the most intensive rabies outbreak in the United States to date

Raccoon-Strain Rabies: Emerging Disease

- Since 1990, animal most frequently reported rabid in the U.S.
- Northern spread reached Canada in 1999
- The two epizootics (SE and mid-Atlantic) converged in North Carolina in 1994
- Westward spread has continued, reaching Ohio in 1996
- Current control efforts focus on creating immune barriers to spread



Impact (con't)

- Raccoons are now the species most often testing positive for rabies in U.S. (followed by skunks and bats)
- Raccoons are more likely than other wild animals to be near people and pets. Therefore the risk for human exposure becomes greater
- Raccoon-strain rabies is more likely to spillover into a wide variety of animals

Michigan Rabies Working Group

- This group was formed in 1997
- Specific task was the development of a Contingency Plan for statewide response to an introduction of RSR into Michigan
- Plan was completed in 2004
- Michigan plan has been utilized 3 times since its completion in other states undergoing contingency actions (MA, NY, and OH)
- Current efforts focus on enhancing surveillance, communication, and education

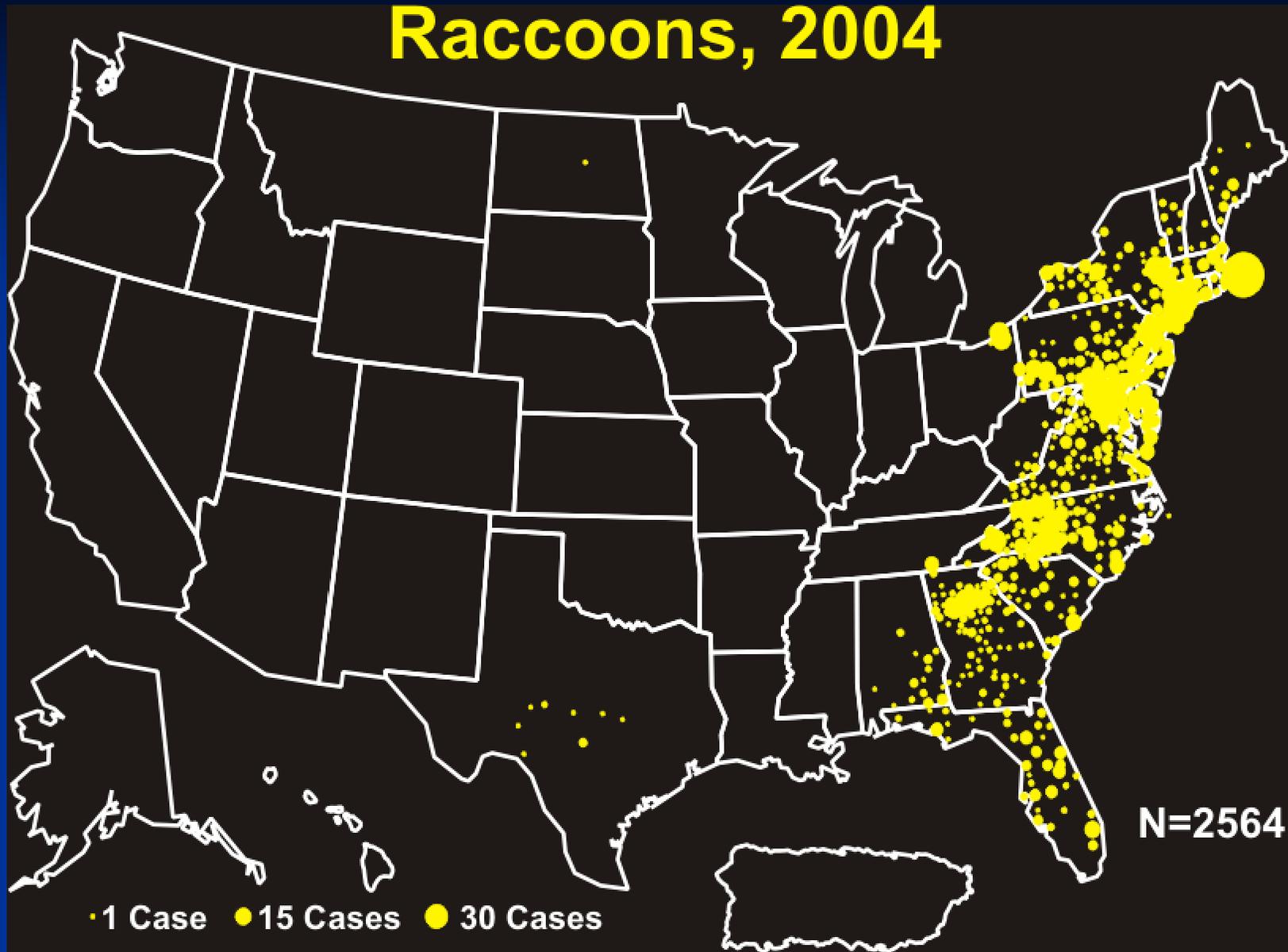
Michigan Rabies Working Group Agencies

- Michigan Dept. of Community Health
- Michigan Dept. Agriculture
- Michigan Dept. Natural Resources
- Michigan State University
- University of Michigan
- USDA
- Several statewide professional groups

Raccoons, 2003



Raccoons, 2004



JAVMA 227(12):1912-1925(2005).

Translocation

- Translocation involves the movement of an animal from its home territory to another location
- Thought to be the impetus for the current RSR epizootic on the East Coast
- Movement can be purposeful (nuisance, rehabilitation, hunting, etc)
- Movement can be accidental (hitchhiking on garbage trucks)

Costs of Raccoon Strain Rabies Surveillance and Control

- State and Local Public Health Departments
 - Public Health Surveillance
 - Enhanced Surveillance
 - Laboratory Support
- Federal
 - ORV Program
 - Laboratory Support
- Medical Costs
 - PEP
 - Animal Vaccinations

Michigan's Raccoon-Strain Rabies Contingency Plan

www.michigan.gov/emergingdiseases

Michigan Rabies Working Group, Contingency Plan Sub-Committee Members:

Peter H. Butchko, USDA, APHIS, Wildlife Services

Thomas Cooley, MDNR, Wildlife Division

Richard Earle, MDNR, Wildlife Division

Dr. Steven L. Halstead, MDA, State Veterinarian

Dr. Duane W. Newton, University of Michigan, Dept.
of Pathology

Goal:

**To prevent raccoon-strain rabies
from becoming established in
Michigan**

Objectives of Contingency Plan

- Develop a contingency plan for the management of a RSR outbreak in Michigan
- Implement and maintain an enhanced rabies surveillance system for the early detection of an RSR outbreak
- Prepare local communities for RSR control activities
- Respond to a focal outbreak of RSR in such a manner as to **contain and eliminate** the virus before it spreads to the surrounding raccoon population.

Overview

Composed of 4 phases:

- Planning/Surveillance
- Containment
- Elimination
- Evaluation

Phase I: Planning/Surveillance

- Finalize Contingency Plan 
- Conduct training programs for responders 
- Educational effort (ongoing)
- Conduct Level 1 rabies surveillance
 - Category 1: Human exposures of PH importance 
 - Category 2: Domestic animal exposure (regardless of vaccination status) to raccoon, fox, or skunk 
 - Category 3: Sick acting raccoons (or fox or skunk)
 - Perform strain-typing on any non-bat rabies positive animal 

Phase II: Containment

- Begins with detection of first case of RSR in Michigan
- Goal is containment of RSR outbreak to smallest possible geographic area
- Establish surveillance zones
- Conduct prescribed activities
- Continues until ORV program is begun
- Testing specimens and strain-typing of positives by MDCH BOL by DFA and PCR.

Phase II (con't)

- Activate Communications component
 - Conduct public education campaign about RSR and the ORV control program
 - Implement restrictions on wildlife movement
- Review testing results/determine extent of outbreak to prepare for Phase III

Phase III: Elimination

- Initiate aerial ORV program
 - Area designated by Phase II surveillance
 - Activities determined by data collected during Phase II
 - Plan implemented will stem from consultation among federal and state cooperators

Phase IV: Evaluation

- Conduct comprehensive evaluation of data collected following the identification of the initial RSR case.
- Develop a plan for the second year of the contingency action
- Make budgetary estimates and requests

Summary Points

- Geography plays role in animal rabies
- Multiple species involved--terrestrials
- Evolving situation (eg raccoons in MI)
- Contingency plan is completed
- Surveillance at this point
- Informed public, animal workers and health care providers will be key