

# Complexities of Safe and Successful ORV Operations

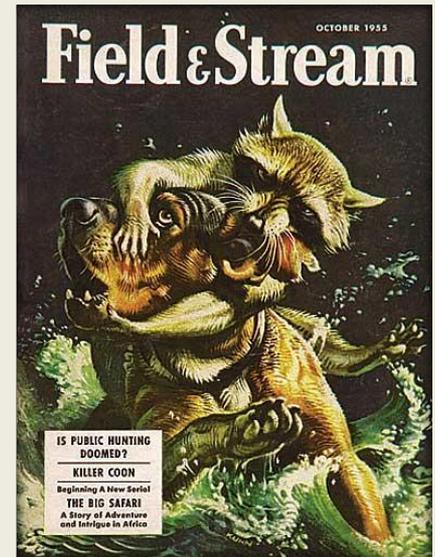
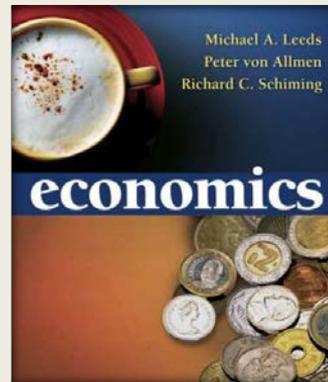
## Developing Sustainable Oral Rabies Vaccination Programs

Bradley Hicks, BS; Jordona Kirby, MS; Robert Hale; Richard Chipman, MS, MBA; Kathleen Nelson, BS; Tim Algeo, MS; Dennis Slate, PhD  
USDA, APHIS, Wildlife Services, National Rabies Management Program

# Why Manage Rabies?

In 2012 there were 6,000+ rabies cases in the US, 90%+ of which occurred in wildlife species.

- **Protect Human Health**
- **Protect Animal Health**
- **Economics**



# NRMP Goals

- **Prevent the spread of specific terrestrial rabies variants in the United States.**
- **Eliminate specific rabies variants at the local, regional, and national level.**



# ORV Operations Overview

- Distribute 7 - 8 million baits over 145,000+ km<sup>2</sup> in 15 states annually.
- Use three bait configurations targeting coyotes, gray foxes, raccoons and skunks.
- Baiting operations occur during 110 days, mostly between August and October.
- Primarily use fixed-winged aircraft for aerial distribution, but also utilize helicopters, ground vehicles and bait stations.
- Fly about 4,000 transect lines (1,200 hours) over 216,000+ kilometers annually.
- Operate out of 10 different airports using 5 fixed-wing aircraft. Generally each airport requires 10 pilots, 20 air crew and 9 ground crew.

# ORV Operations



Sources: Esri, DeLorme, NAVTEQ, USGS, Imagery, IPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Swis, Topocon, 2012

# ORV Operations



United States Department of Agriculture  
Animal and Plant Health Inspection Service  
Wildlife Services

National Rabies Management Program

# ORV Operations



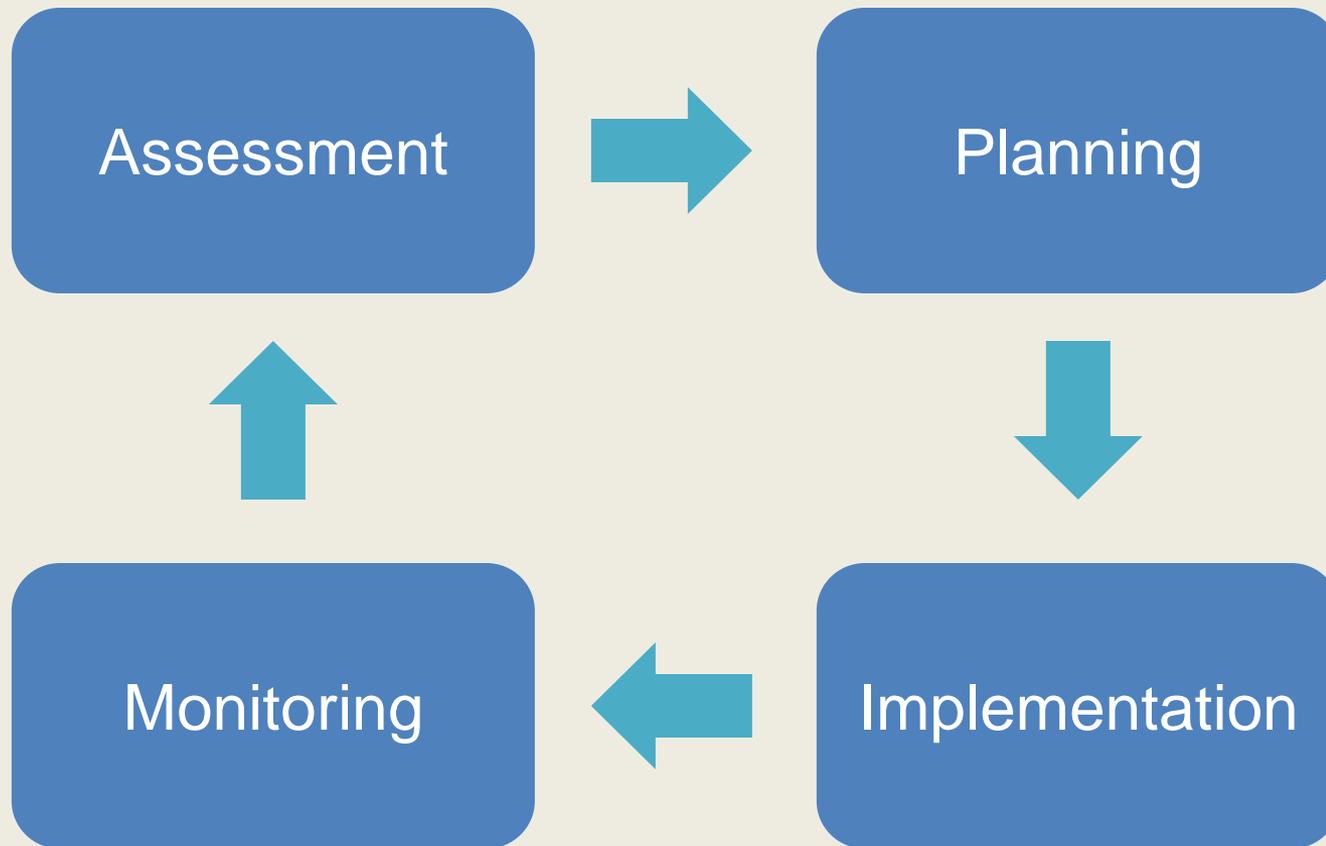
# ORV Operations



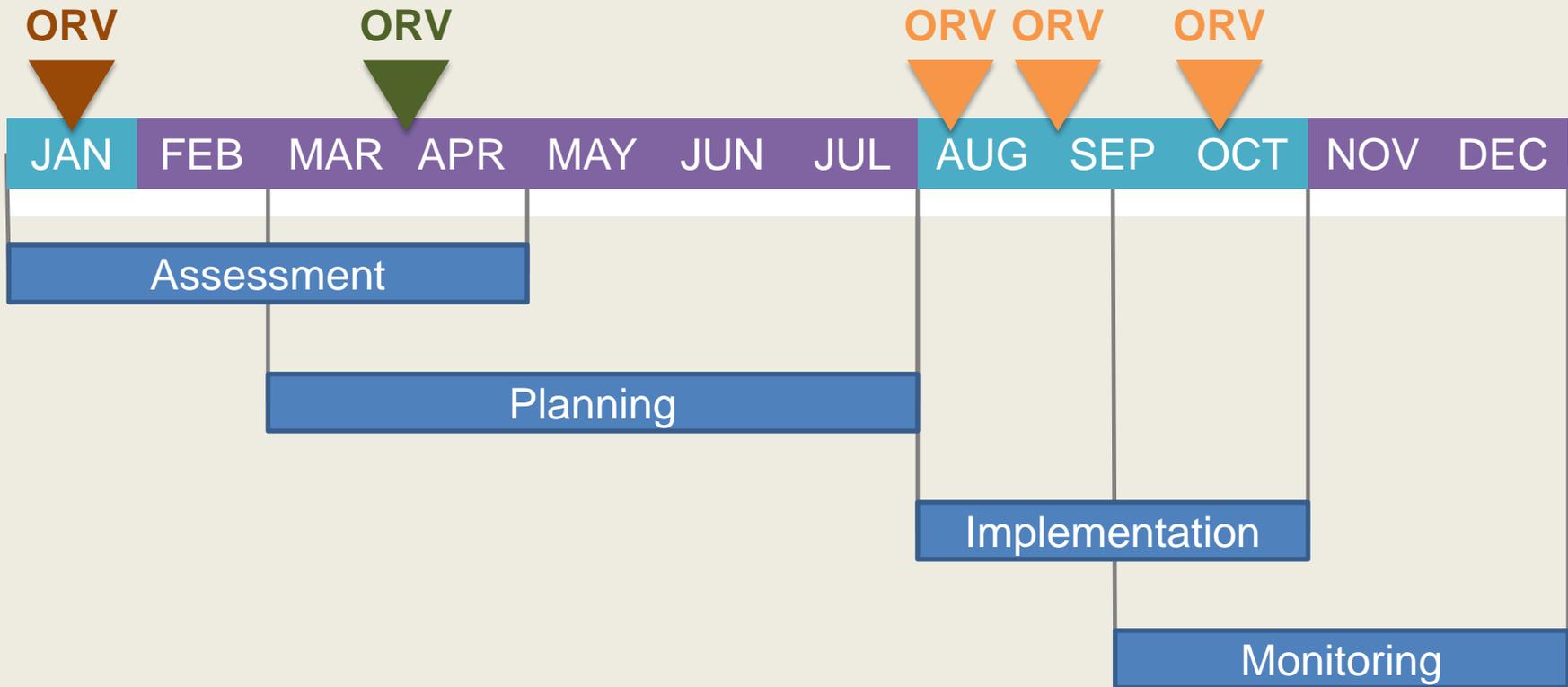
United States Department of Agriculture  
Animal and Plant Health Inspection Service  
Wildlife Services

National Rabies Management Program

# ORV Operational Workflow

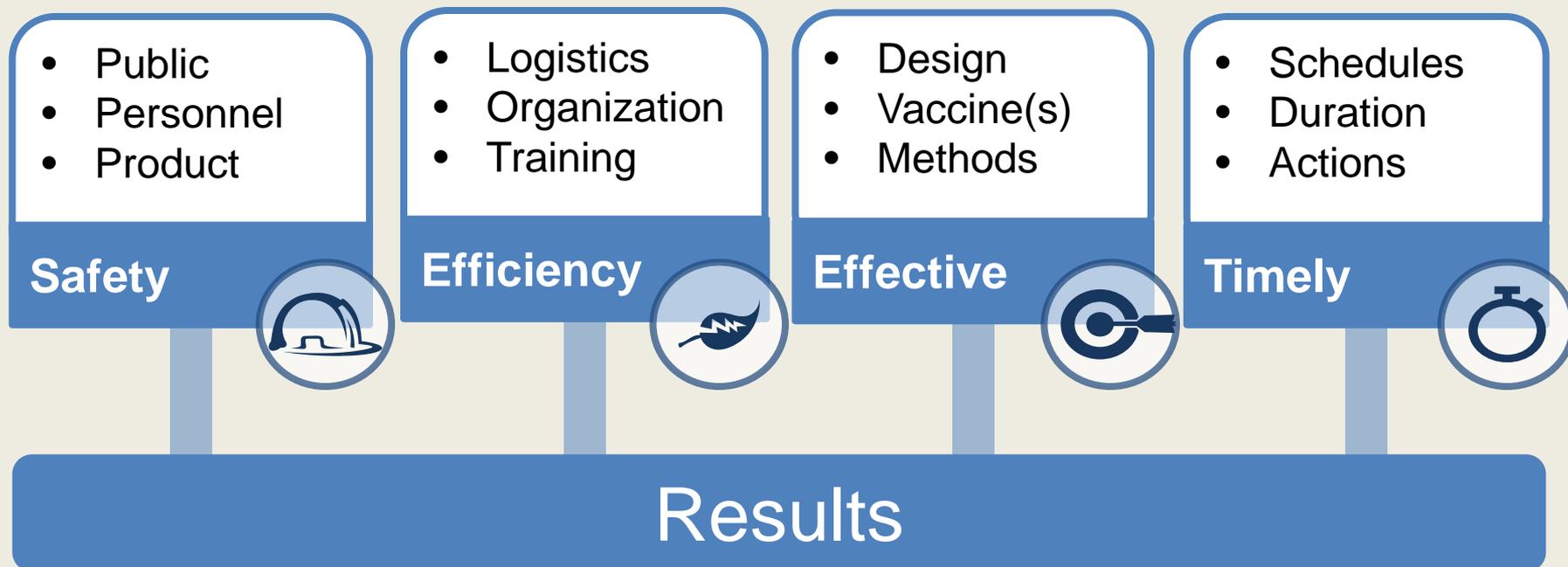


# ORV Operational Timeline



# ORV Operational Principles

**Best Possible Outcome** - Demonstrating the safe, efficient, effective and timely use of allocated resources to address a defined issue.



# Assessment

- **Case evaluation**

**Density, Species, Corridors, Topography, Seasonality, Variant**  
Define spatial extents and develop a containment strategy.

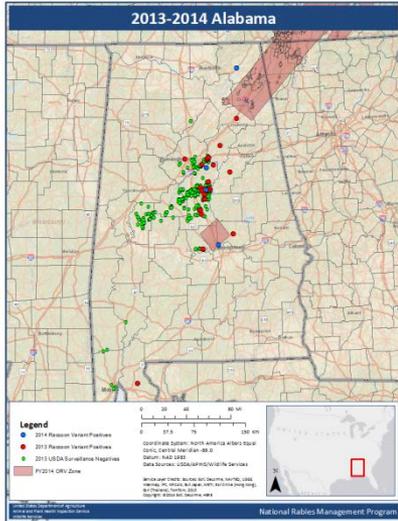
- **Cost/benefit analysis**

**PEP, Pet, Livestock, Product, Distribution Methods**  
Initial and subsequent analyses to ensure economic benefits.

- **Risk assessment**

**Inaction, Product/Method Safety, Locations At Risk**  
Define significant issues and appropriate actions and timeframes.

# Assessment



## Historical Cases

### Criteria for ORV Zone Movement from Previously Baited Areas

2015 Abingdon, 33 mile reduction in southern portion of ORV Zone (TN/M)

These criteria provide general guidelines for evaluating ORV zone movement, removal, or expansion relative to existing baited areas as a program is made entering into enzootic rabies areas. These criteria assume that the area being considered for removal has been baited for a specific variant of rabies and is capable of sustaining an enzootic in a specific wildlife population.

#### Rabies Case History and Surveillance

- The absence of reported rabies cases from the area for a minimum of three years. Any rabies cases whether reported through the public health system or enhanced surveillance efforts, within or immediately adjacent to an area being considered for removal, should be evaluated for potential impacts before removing the area.

Four cases of rabies in raccoons occurred within 4 miles of the southernmost edge of the proposed area to be removed over the last 7 years (Figure 1). These 4 cases are in an area that has never been baited, but will eventually be included as the ORV zone moves eastward (Figure 1). There have been 38 negative surveillance samples treated within 5 km<sup>2</sup> of these 4 cases since 2011. No positive samples have been found in adjacent areas during the same time period. Because of the location of these 4 cases and their proximity to the proposed area to be removed, it is recommended that some of the area along the southernmost edge of the zone remain intact (Figure 2). The original proposed removal area was approximately 1,189.9 km<sup>2</sup>, but the revised area encompasses 944.4 km<sup>2</sup>.

- Rabies surveillance (enhanced and public health) during the past three years. The number of rabies surveillance samples from an area being considered for removal should reflect species density of that area.

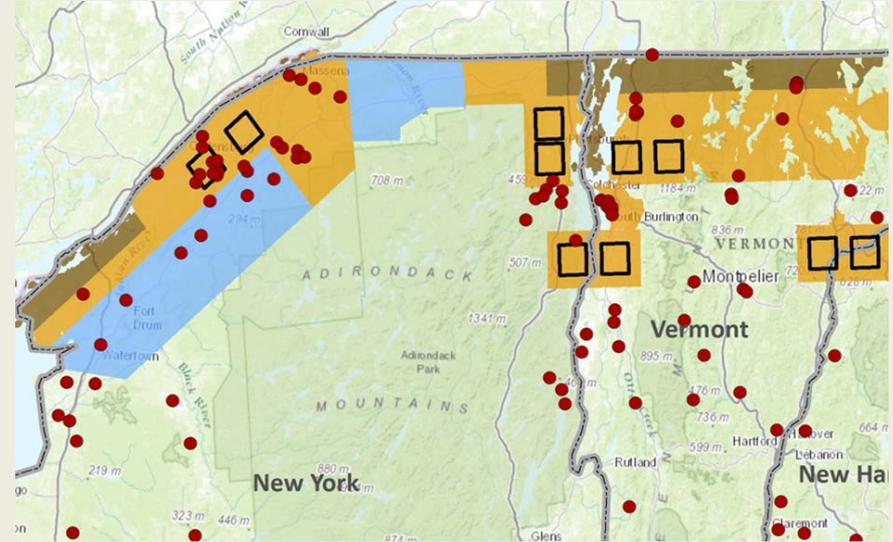
There have been 143 surveillance samples collected since 2011 from and immediately adjacent (10 km<sup>2</sup> buffer) to the portion of the ORV zone being considered for removal (Figures 1 and 2). Presumably, enhanced surveillance should continue without difficulty.

- The long-term history of rabies cases in the general area. The history of rabies in an area being considered for removal should be reviewed to identify possible corridors or problematic areas. Patterns of rabies cases for the previous five years, or more if available, should be evaluated to determine temporal trends, hot, corridors, re-emergence, and distribution events.

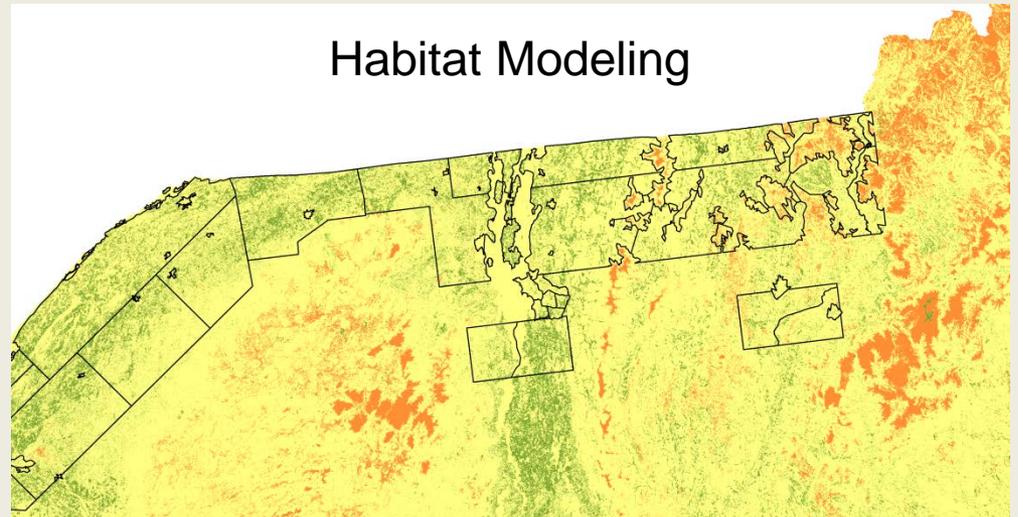
Rabies cases continue to be discovered in un-baited areas ahead (i.e., east) of the ORV zone. No positive rabies cases have ever been reported in the proposed area for removal. The closest case to the proposed area for removal occurred in Greene County during June 2011 (in a striped skunk) as depicted in Figures 1 and 2. There has been no appreciable spread of raccoon rabies in

## Risk Assessments

## Recent Cases



## Habitat Modeling



# Planning

- **ORV zone design**

**Distribution Parameters, Off-time, Cost Estimates**

Accurate and efficient distribution.

- **Approvals and notifications**

**NEPA/State, DOD, DHS, Press Releases, MOU's, Contracts**

Secure approvals, comply with policy and properly notify.

- **Logistics**

**Schedules, Deliveries, Local Facilities, Hotels, Staffing**

Detailed logistics increase efficiency and effectiveness.



# Implementation

- **Training**

**Orientation, Expectations, Safety, Equipment Operations**

Training improves safety, efficiency and effectiveness.

- **Distribution**

**Loading, Refueling, Flight Turns, Experience, Proficiency**

Safe, accurate, and effective distribution make the program.

- **Communication and reporting**

**Scheduling, Notice Board, Changes, Progress**

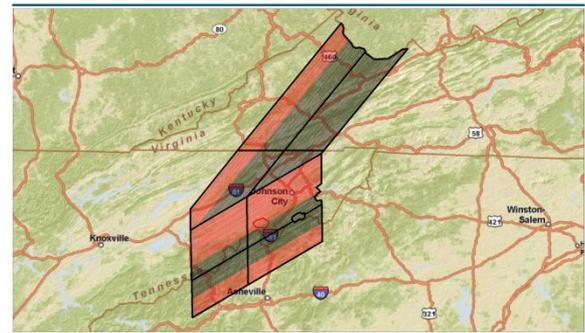
Communication drives the daily flow of work.

# Implementation



**Daily Totals**  
Project: 2013Greenville

| Date          | Flights   | Distance (mi)    | Bait Dist. (mi)  | Ferry Dist. (mi) | Hours Flown  |
|---------------|-----------|------------------|------------------|------------------|--------------|
| 10/18/2013    | -         | -                | -                | -                | -            |
| 10/19/2013    | -         | -                | -                | -                | -            |
| 10/20/2013    | -         | -                | -                | -                | -            |
| 10/21/2013    | -         | -                | -                | -                | -            |
| 10/22/2013    | 11        | 3,288.16         | 2,486.14         | 802.02           | 19.00        |
| 10/23/2013    | 3         | 261.12           | 213.44           | 47.69            | 4.00         |
| 10/24/2013    | 9         | 2,731.18         | 2,301.16         | 430.02           | 17.00        |
| 10/25/2013    | 6         | 1,925.38         | 1,581.36         | 344.02           | 11.80        |
| 10/26/2013    | 10        | 4,398.16         | 3,949.66         | 448.50           | 28.00        |
| 10/27/2013    | 4         | 1,473.49         | 1,271.67         | 201.83           | 9.40         |
| <b>Totals</b> | <b>43</b> | <b>14,077.49</b> | <b>11,803.43</b> | <b>2,274.08</b>  | <b>89.20</b> |



**2010 Greenville ORV Project**  
Tennessee, Virginia and North Carolina  
October 06, 2010



# Monitoring

- **Post-bait surveillance**

Timeframes, Storage, Shipping, Testing, Supplies

Surveillance and cases are the hallmarks for successful ORV.

- **Review and analysis**

Project Reviews, Achieved Densities, Off-time, Methods

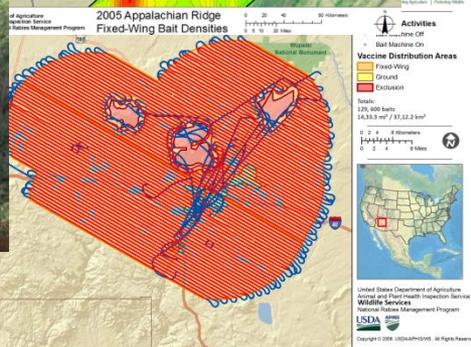
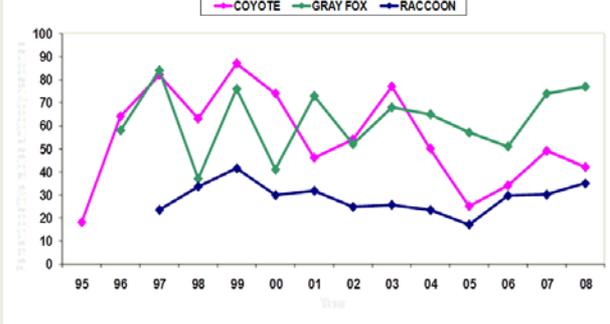
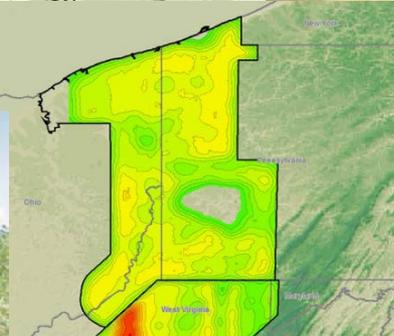
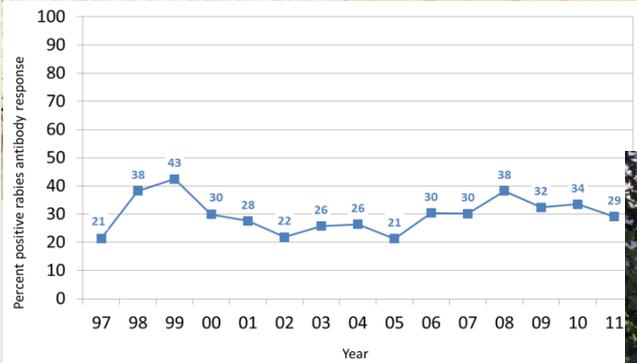
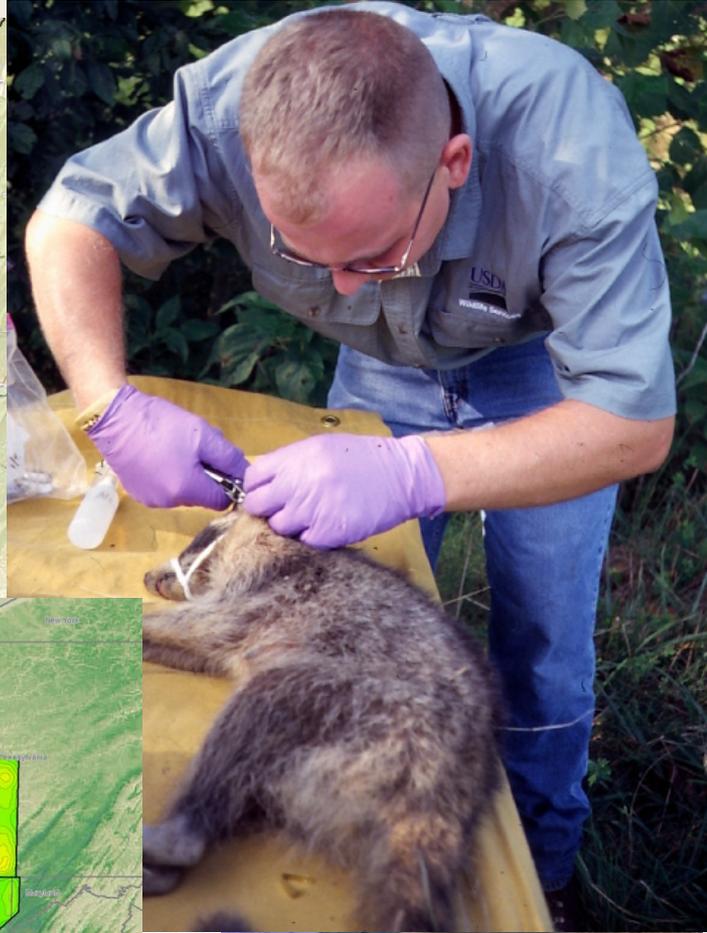
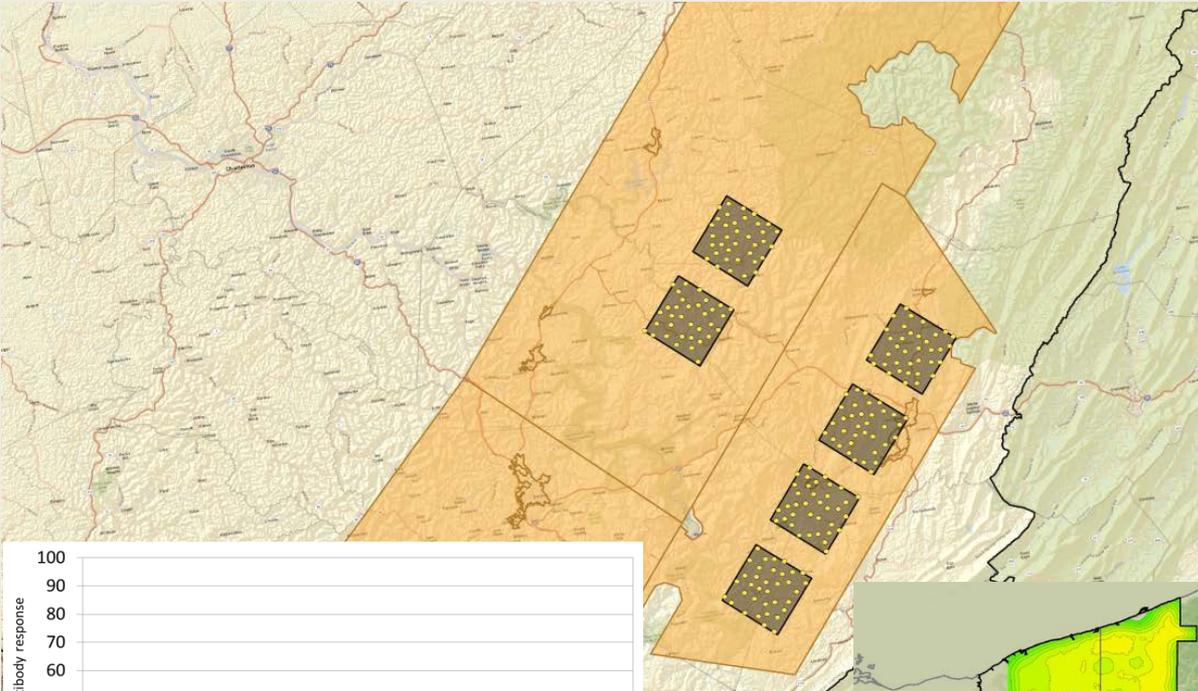
Continuous means of review and assessment of proficiency.

- **Reporting**

Protocols, Statistics, Publications, Results, GIS

Almost every aspect of an ORV program is reported.

# Monitoring



# Cooperative Rabies Management Accomplishments

- **No domestic dog/coyote rabies in U.S. since 2007 declaration.**
- **One case of gray fox rabies in Texas since May 2009.**
- **No cases of bat-like virus in gray foxes near Flagstaff, AZ**
- **No appreciable spread of raccoon rabies to the West**



