

The Monongahela Camera Trapping Project

A Survey for the Eastern Cougar



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Presented by: Helen McGinnis – Eastern Cougar Foundation

Outline

Background Information

Methods

Results

Discussion



Background information

- In late 2002, the Eastern Cougar Foundation (ECF) was awarded two grants:
 - Summerlee Foundation and
 - Norcross Wildlife Foundation
- Purpose: to purchase and deploy a set of remote motion-detector cameras to survey for the presence of cougars in Monongahela National Forest in West Virginia.

Background

- This was the first officially endorsed field search for cougars since USF&WS biologist Robert Downing (now retired and on the ECF Board) conducted the only previous search in the early 1980s.



Background

- The ECF officers formed a Field Advisory Committee, composed of :
 - several ECF Board members who had experience with remote camera surveys
 - representatives of all three agencies
 - U.S. Fish & Wildlife Service,
 - U.S. Forest Service, and
 - WV Department of Natural Resources -- who have jurisdiction over any aspect of this work.

Background

- On Feb. 6-7, 2003, in Beckley, WV, this ECF Field Advisory Committee developed detailed Study Design and Field Manual to guide Todd Lester as he conducted the field work.



Personnel

- Chris Bolgiano – ECF and JMU
- Jeff Hajenga – WVDNR
- Marcella Kelly – Virginia Tech
- Todd Lester – ECF
- Dave Maehr – University of Kentucky
- Jay Martin – USFS
- Helen McGinnis – ECF



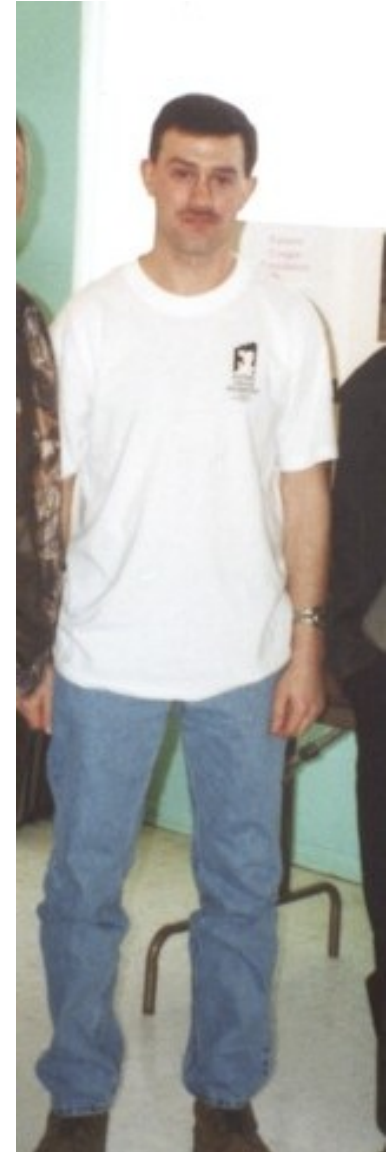
Background

- A myriad of details were decided, including...
 - application for all appropriate permits,
 - use of a GPS unit to record station locations,
 - layout of a grid pattern for effective coverage of terrain,
 - schedule for monitoring, types of film and development,
 - testing of cameras and film, and
 - all the necessary data sheets for recording information.



Background information

- Field work began at the end of March and continued until mid-September in both 2003 and 2004.
- Todd Lester was the leader for all field work and was accompanied by Jay Martin, Chris Bolgiano, Ralph Bolgiano, and Helen McGinnis on occasion.
- Marcella Kelly compiled results seen in this presentation



Methods

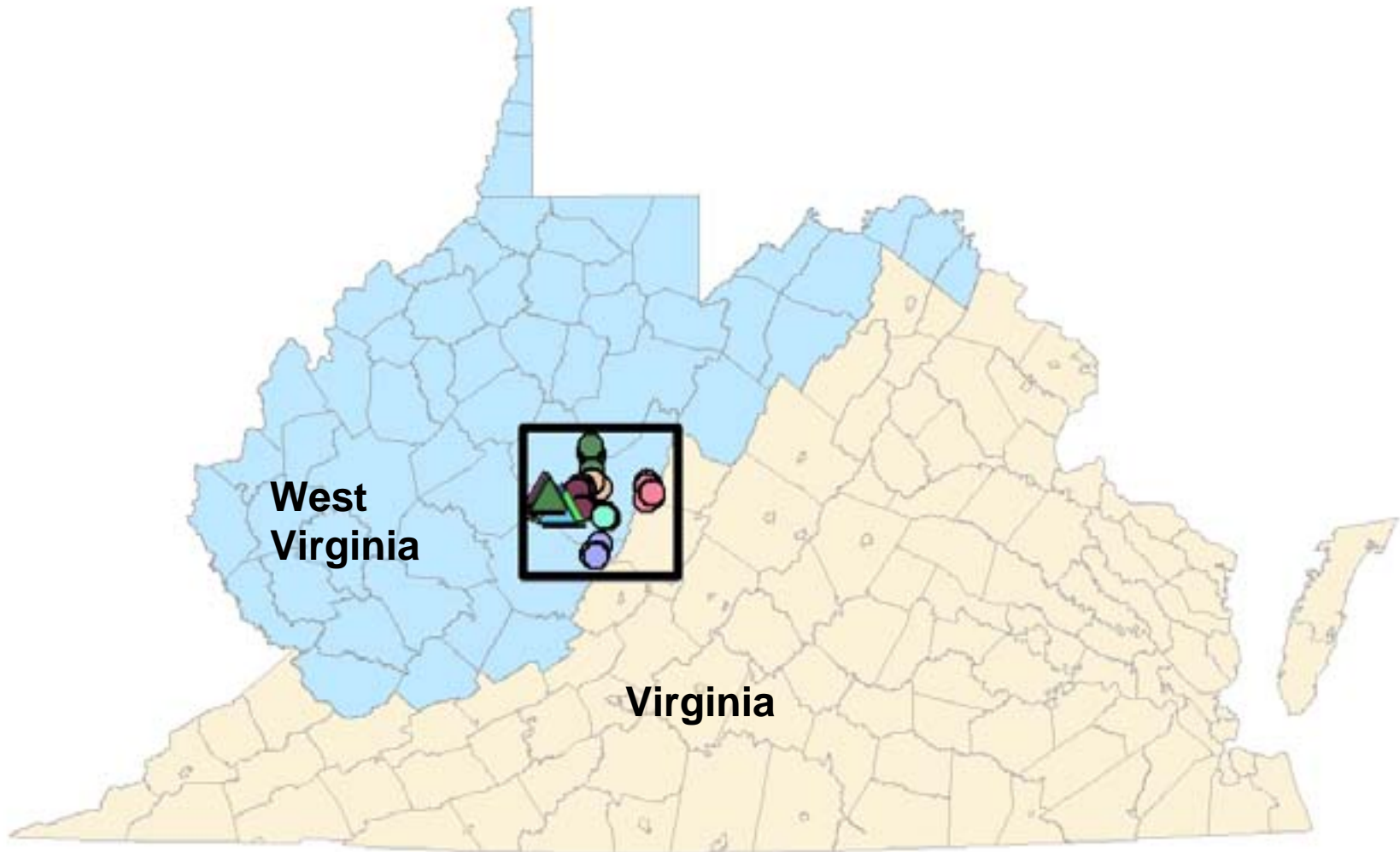


- A grid consisting of 5km^2 blocks was overlaid on topographic maps
- A camera station was placed within each 5km^2 block
- Cameras were left in place for 1 month (27 days on average) and then moved to another location for the next month, for 6 months (April – September).

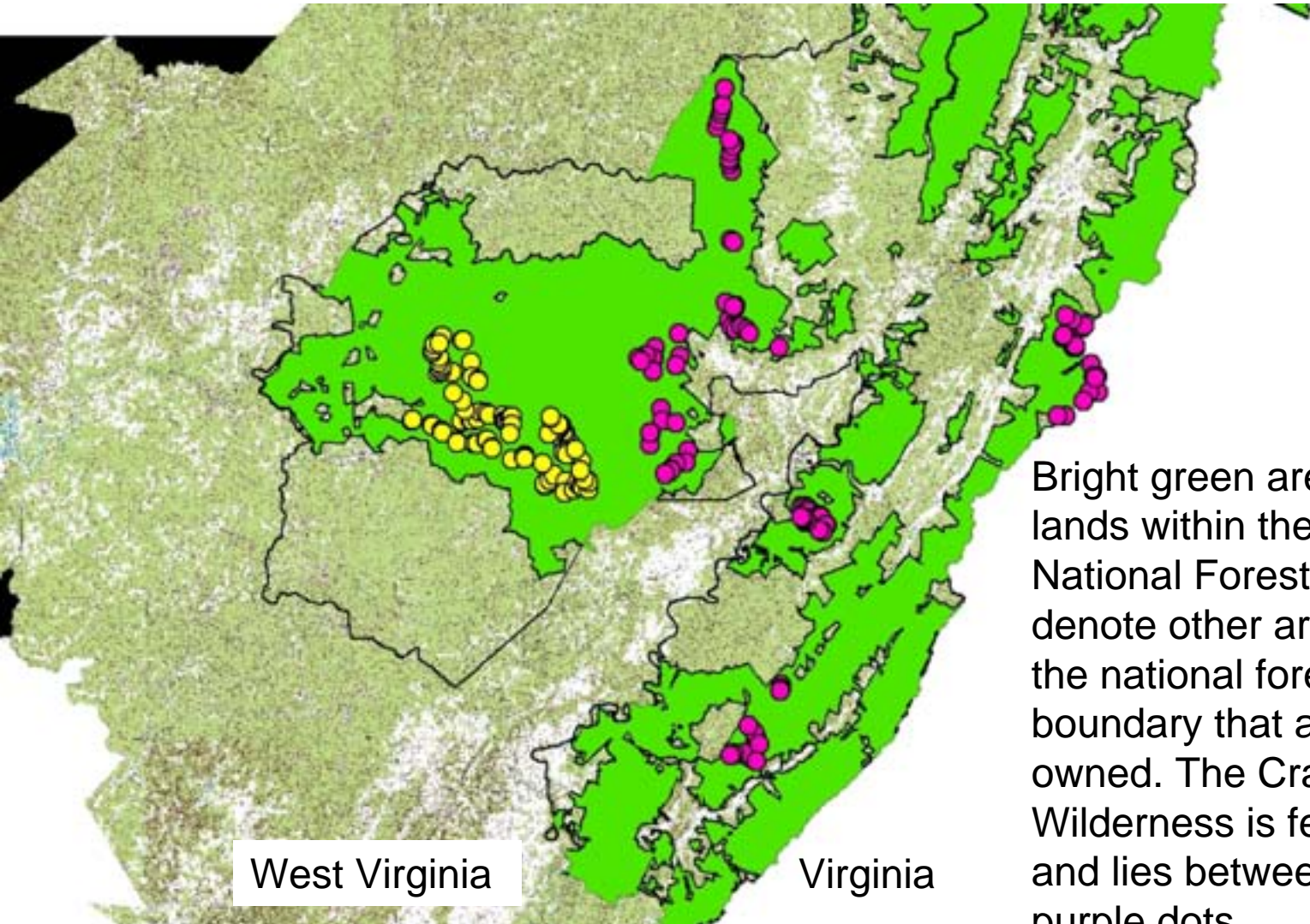
Methods - Study site location



Methods - Study site with camera locations

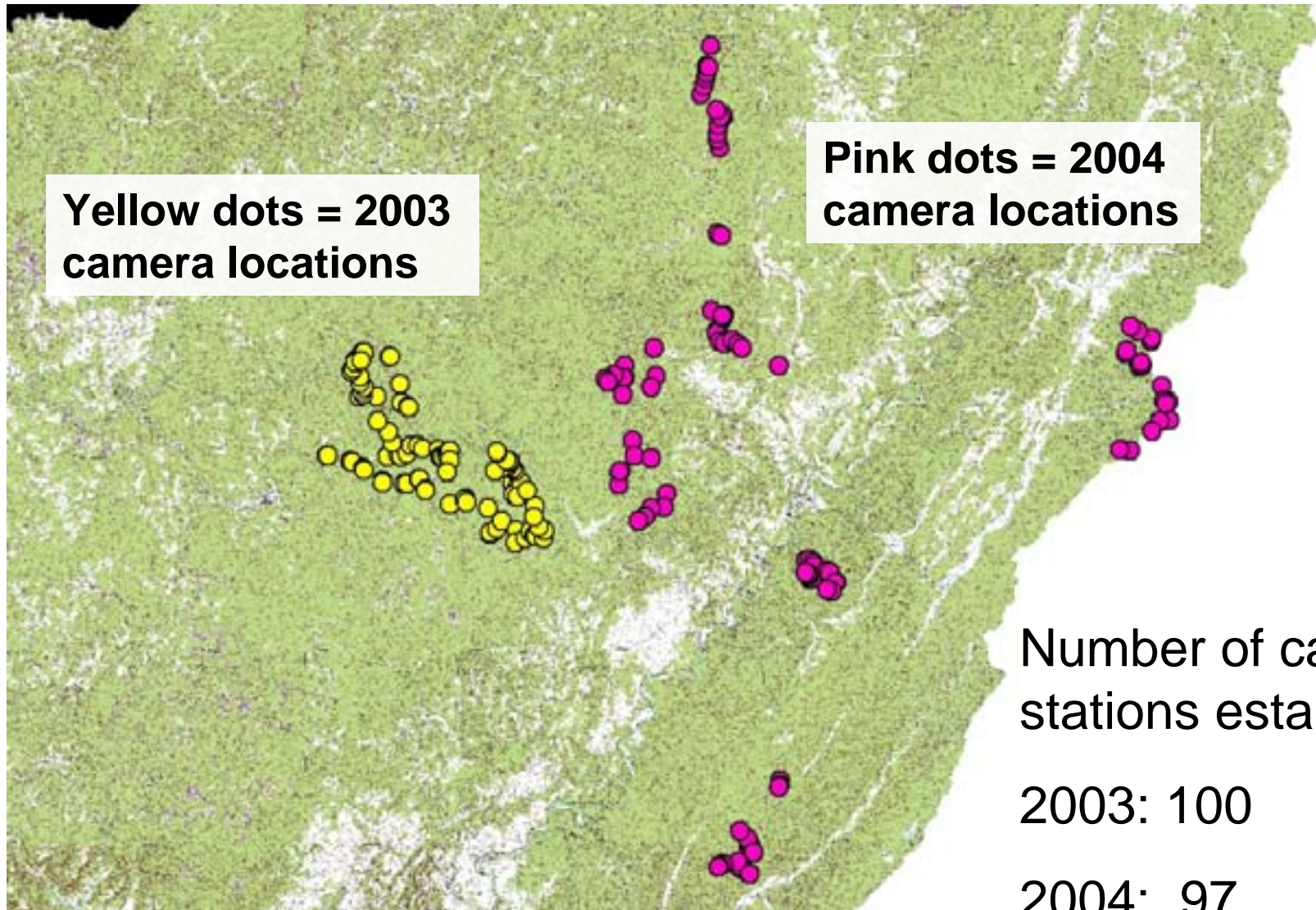


Camera Stations – within Monongahela National Forest



Bright green areas are federal lands within the Monongahela National Forest. Dark lines denote other areas within the national forest proclamation boundary that are privately owned. The Cranberry Wilderness is federally owned and lies between the yellow and purple dots.

Camera stations



**Yellow dots = 2003
camera locations**

**Pink dots = 2004
camera locations**

Number of camera
stations established

2003: 100

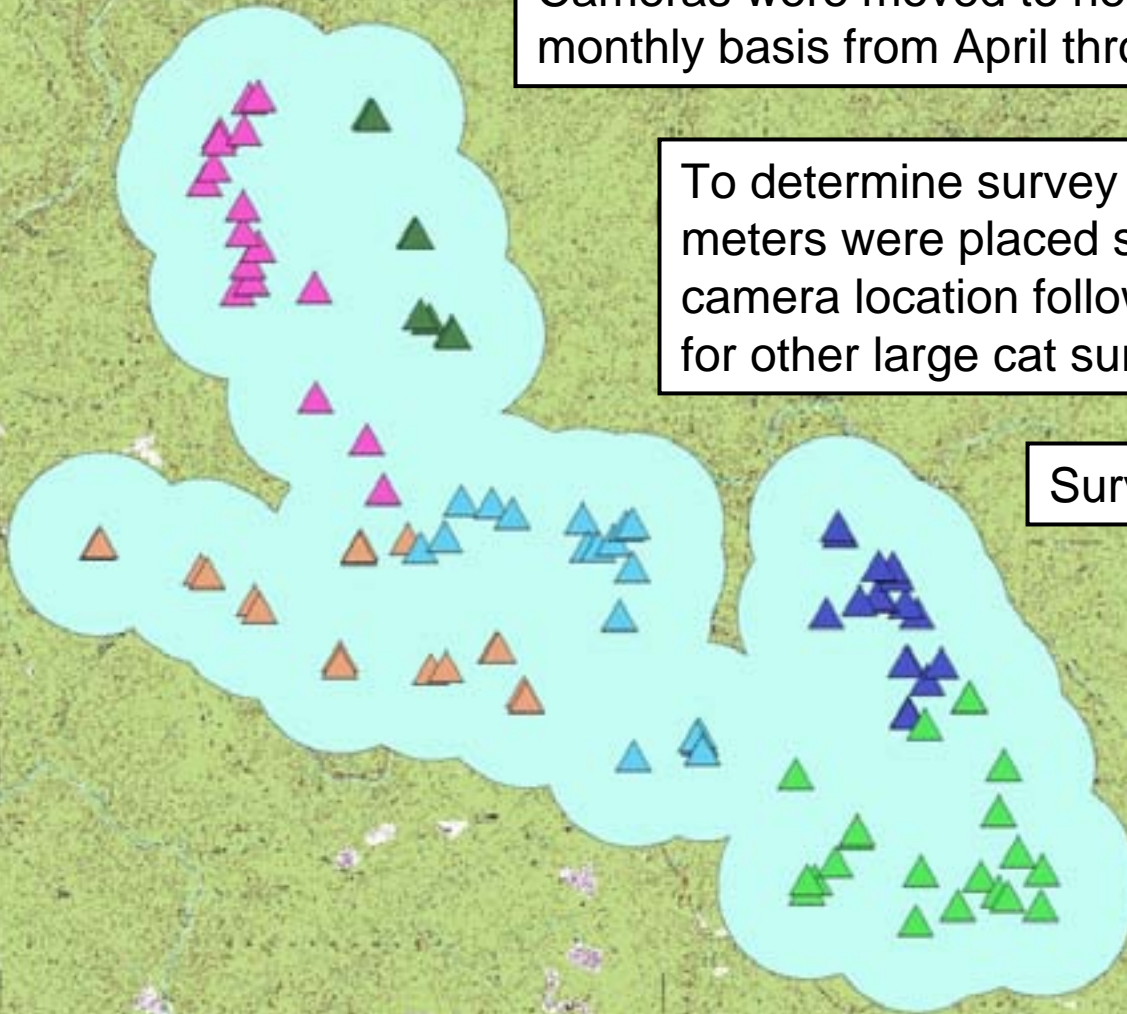
2004: 97

2003 Camera Stations

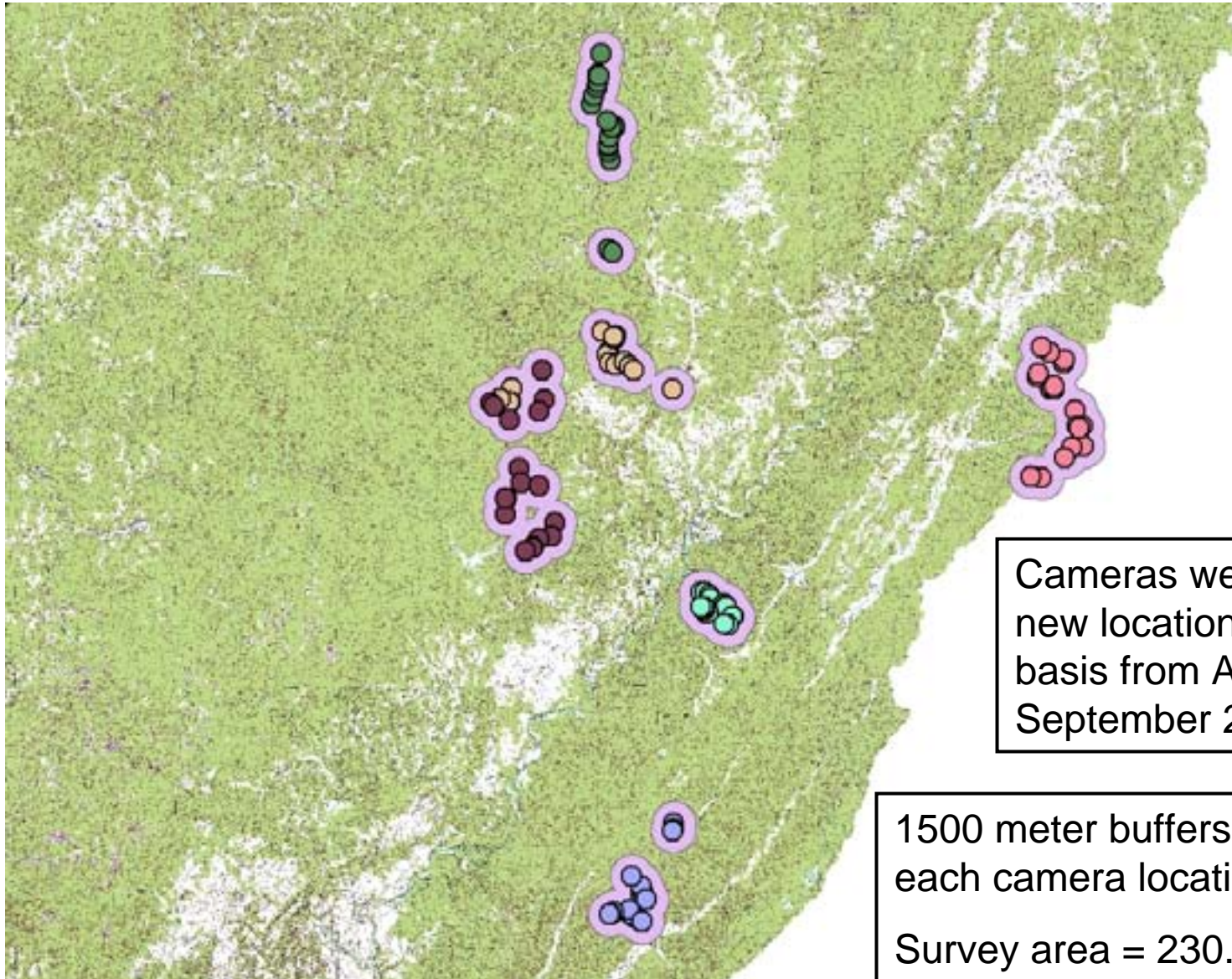
Cameras were moved to new locations on a monthly basis from April through September 2003

To determine survey area, buffers of 1500 meters were placed surrounding each camera location following similar protocol for other large cat surveys

Survey area = 100.02 km²



2004 Camera Locations



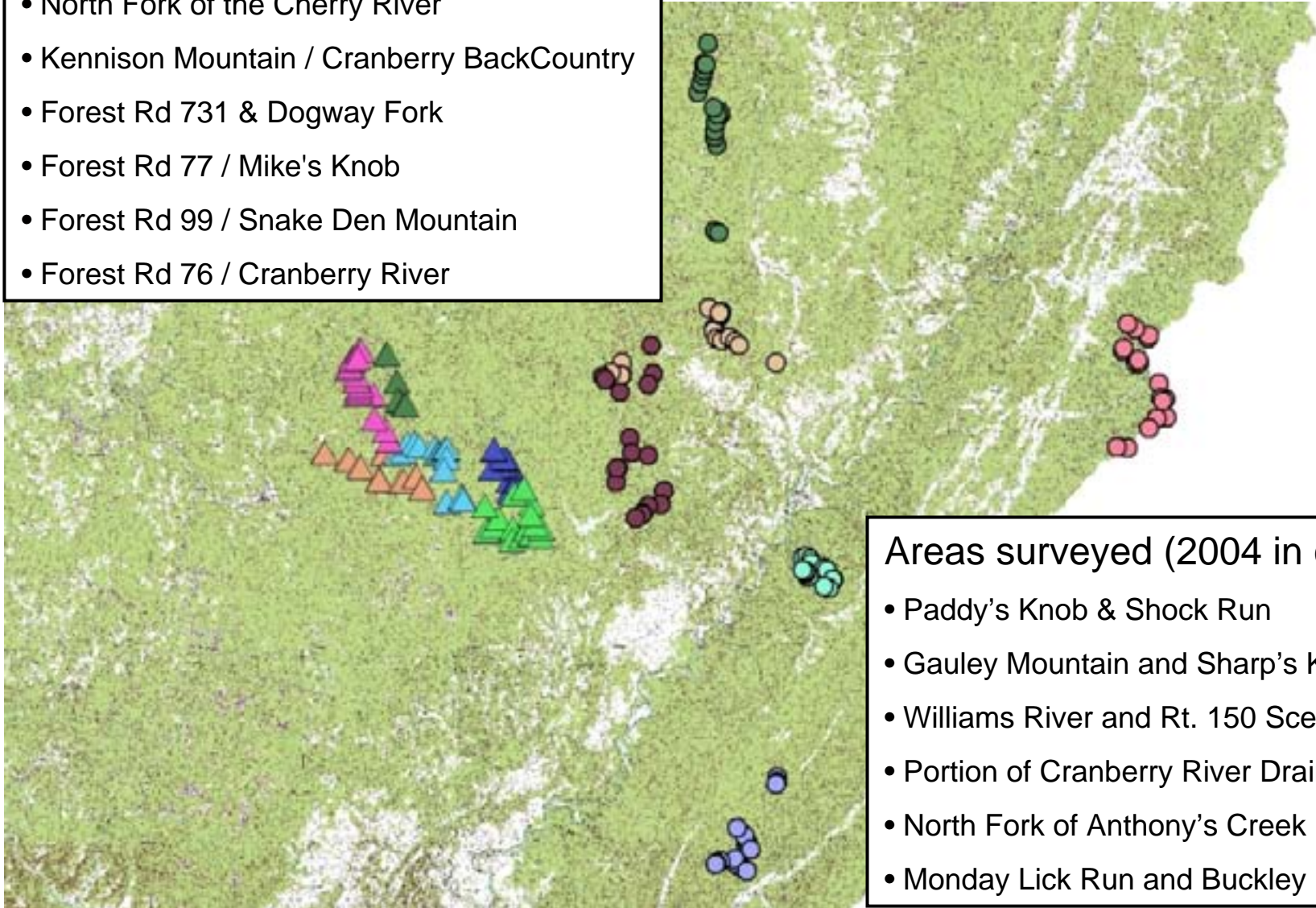
Cameras were moved to new locations on a monthly basis from April through September 2004

1500 meter buffers surrounding each camera location resulted in:
Survey area = 230.73 km²

For those familiar with these areas...

Areas surveyed (2003 in triangles):

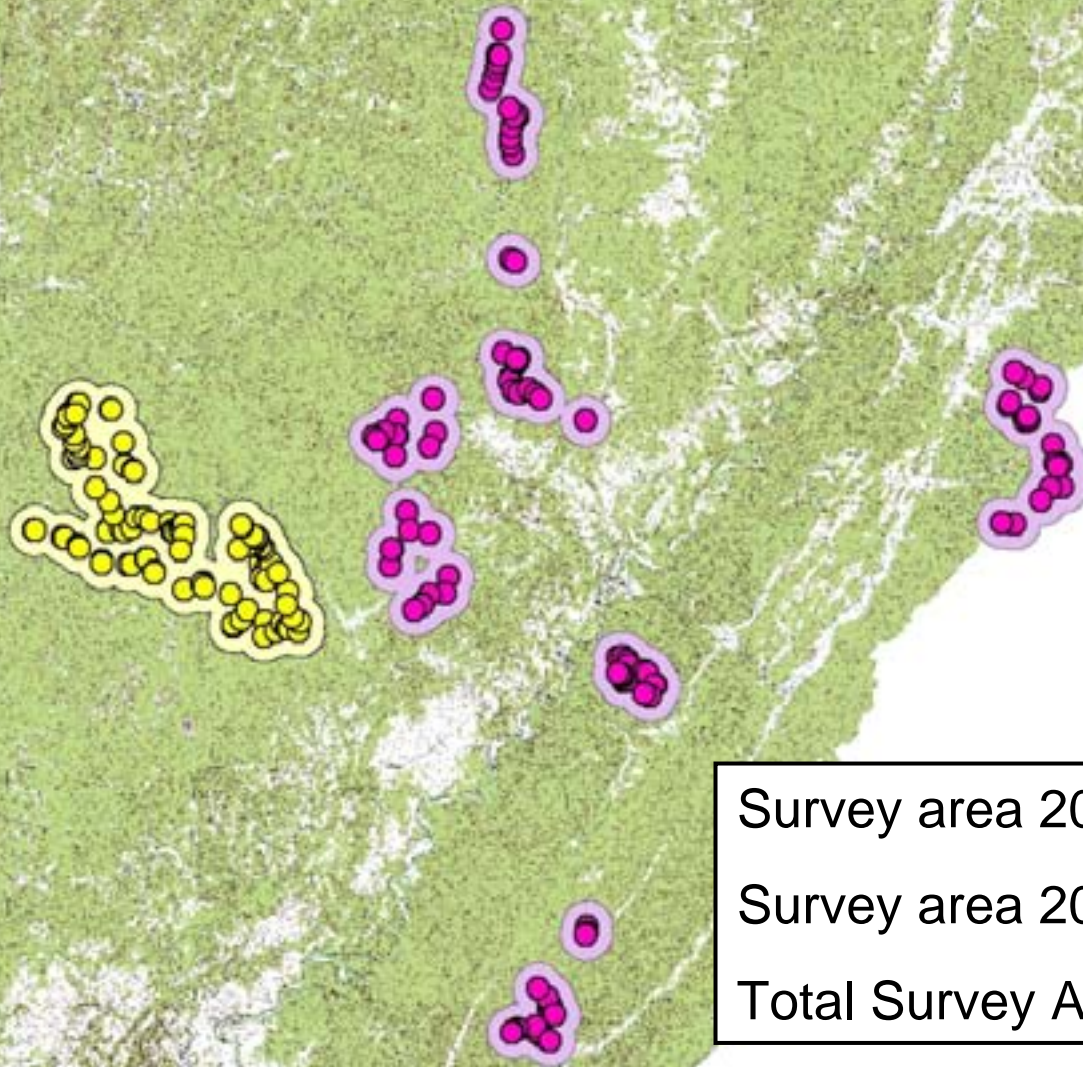
- North Fork of the Cherry River
- Kennison Mountain / Cranberry BackCountry
- Forest Rd 731 & Dogway Fork
- Forest Rd 77 / Mike's Knob
- Forest Rd 99 / Snake Den Mountain
- Forest Rd 76 / Cranberry River



Areas surveyed (2004 in circles):

- Paddy's Knob & Shock Run
- Gauley Mountain and Sharp's Knob
- Williams River and Rt. 150 Scenic Highway
- Portion of Cranberry River Drainage
- North Fork of Anthony's Creek
- Monday Lick Run and Buckley Mountain

Total Survey Area



Survey area 2003 = 100.02 km²

Survey area 2004 = 230.73 km²

Total Survey Area = 330.75 km²

Summary Statistics Calculated

- Number of animals in photographs
- Number of trap nights
- Trap success – number of animals per 100 trap nights
- Trap success on a monthly basis for years 2003 and 2004



Results



Total number of animals in photos = 1606

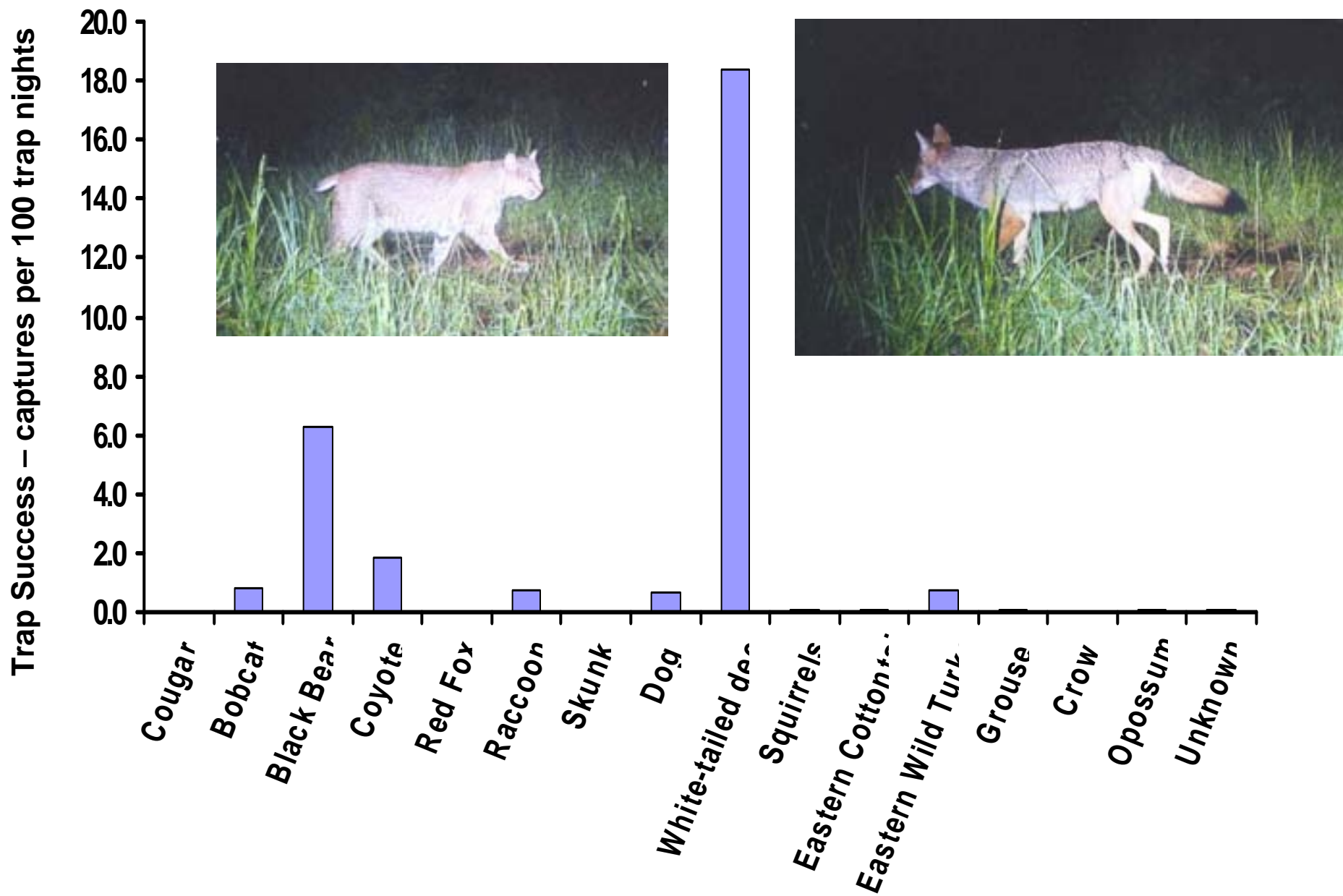
Total Trap nights = 5410

Total Trap success = 29.7%

Number of photos, trap nights, and trap success

	2003	2004
Cougar	0	0
Bobcat	20	22
Black Bear	204	135
Coyote	36	62
Red Fox	0	1
Raccoon	10	30
Skunk	0	1
Dog	4	33
White-tailed deer	638	358
Squirrels	0	2
Eastern Cottontail	1	1
Eastern Wild Turkey	2	38
Grouse	2	0
Crow	0	1
Opossum	2	1
Unknown animal	0	2
Sum	919	687
Trap nights	3062	2348
Trap success	30.013	29.259
Total trap nights and Total trap success	5410	29.686

Trap Success by Species Across both years



Carnivores “captured” monthly in 2003

Trap nights in parentheses

CARNIVORES (2003)	April (631)	May (504)	June (560)	July (627)	Aug. (476)	Sept. (264)	Sum (3062)
Cougar - <i>Puma concolor</i>	0	0	0	0	0	0	0
Bobcat - <i>Lynx rufus</i>	3	1	6	3	7	0	20
Black Bear - <i>Ursus americanus</i>	1	11	39	78	59	16	204
Coyote - <i>Canis latrans</i>	1	2	8	8	11	6	36
Red Fox - <i>Vulpes vulpes</i>	0	0	0	0	0	0	0
Gray Fox - <i>Urocyon cinereoargenteus</i>	0	0	0	0	0	0	0
Raccoon - <i>Procyon lotor</i>	2	2	4	2	0	0	10
Dog- <i>Canis familiaris</i>	0	1	0	1	0	2	4
Sum	7	17	57	92	77	24	274

OTHER ANIMALS (2003)	April (631)	May (504)	June (560)	July (627)	Aug. (476)	Sept. (264)	Sum (3062)
HERBIVORES							
White-tailed deer - <i>Odocoileus virginianus</i>	55	111	57	142	226	47	638
Squirrels - <i>Sciurus carolinensis</i>	0	0	0	0	0	0	0
Eastern Cottontail - <i>Sylvilagus floridanus</i>	0	0	0	0	1	0	1
BIRDS							
Eastern Wild Turkey - <i>Meleagris gallopovo</i>	0	0	0	0	1	1	2
Grouse - <i>Bonasa umbellus</i>	0	1	1	0	0	0	2
OTHERS							
Opossum - <i>Didelphis virginiana</i>	0	0	2	0	0	0	2
Unknown	0	0	0	0	0	0	0
Sum	55	112	60	142	228	48	645

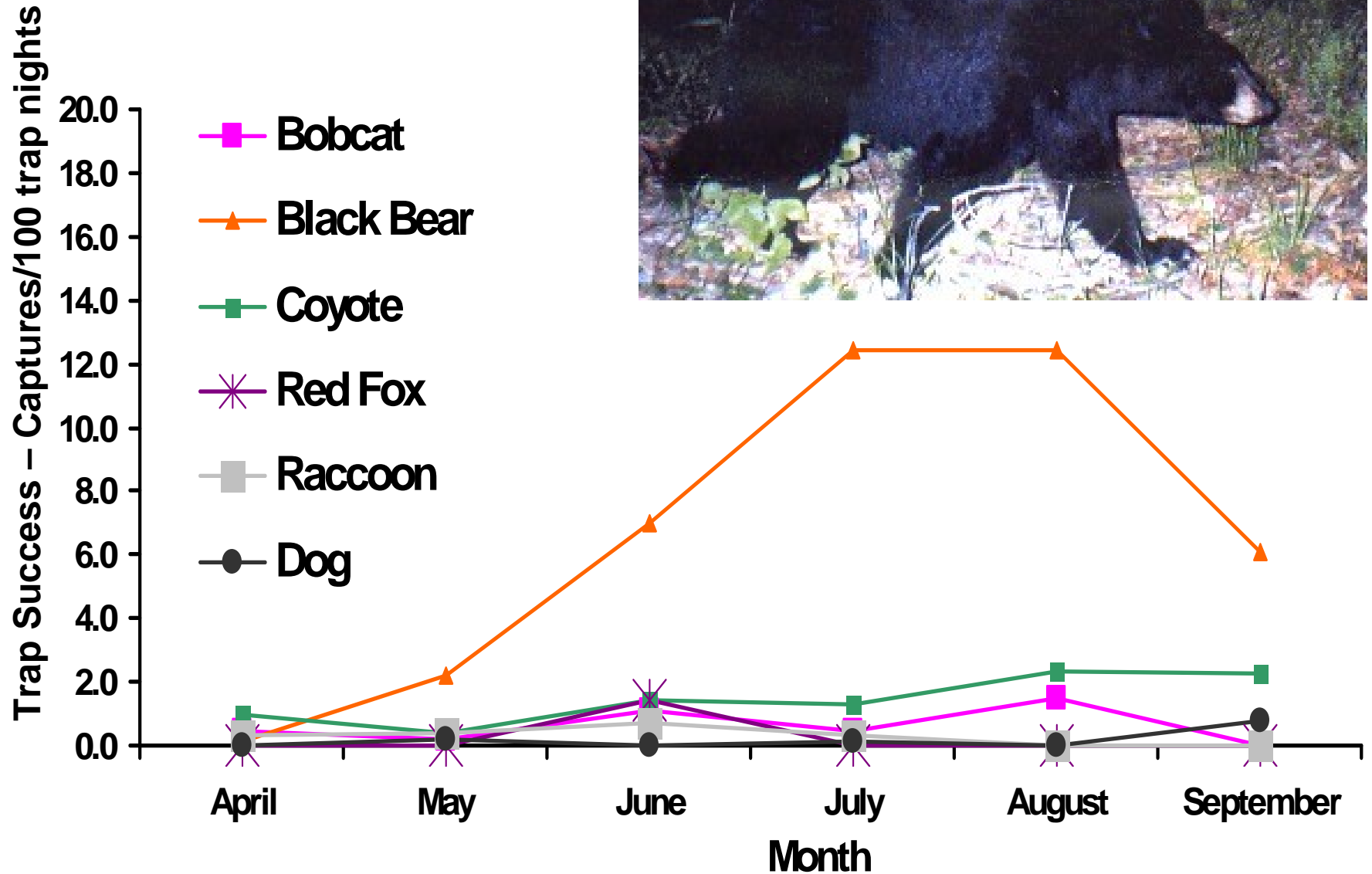
Carnivores “captured” monthly in 2004

Trap nights in parentheses

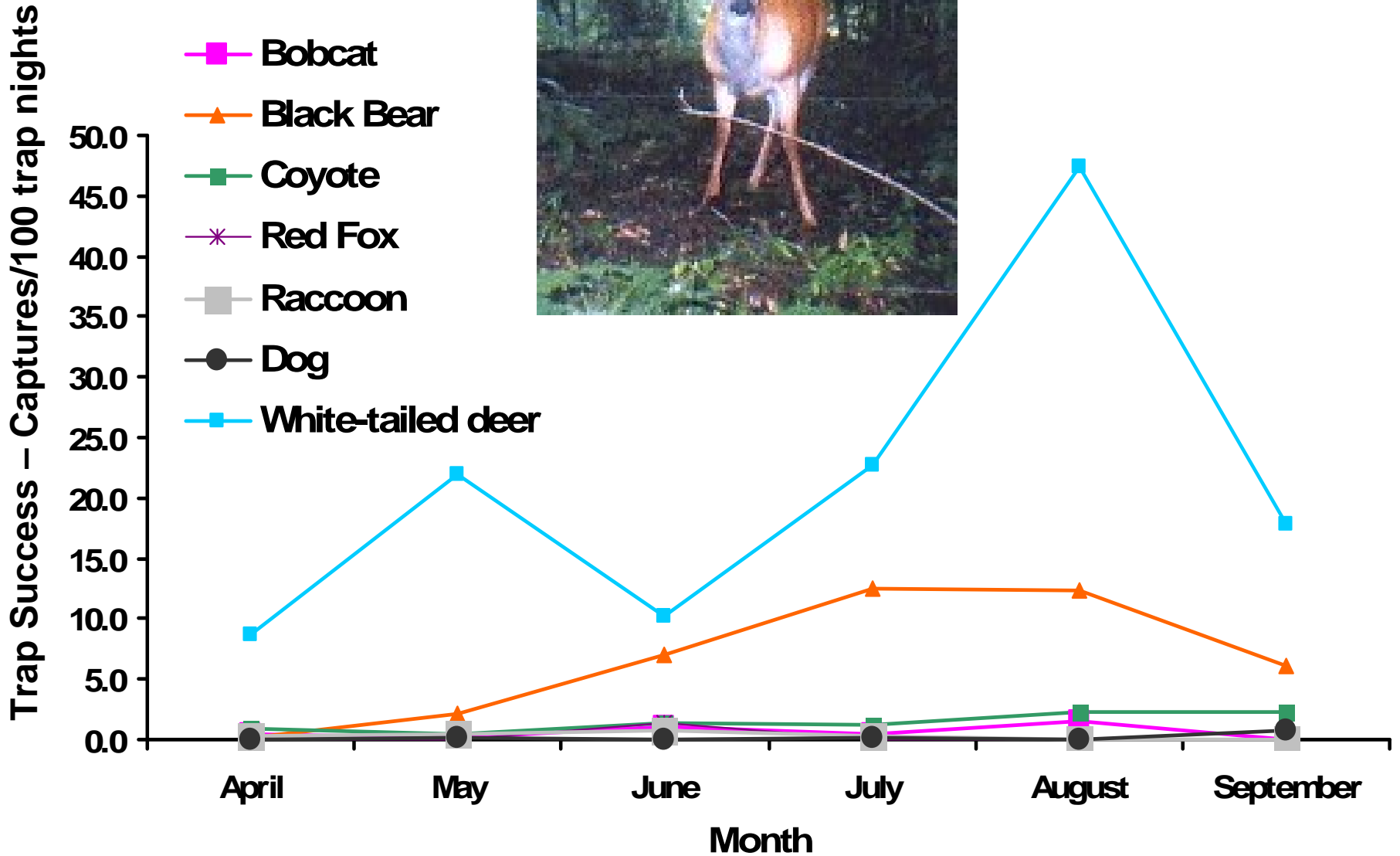
Carnivores (2004)	April (684)	May (459)	June (243)	July (486)	Aug. (459)	Sept. (476)	Sum (2348)
Cougar - <i>Puma concolor</i>	0	0	0	0	0	0	0
Bobcat - <i>Lynx rufus</i>	0	6	4	5	1	6	22
Black Bear - <i>Ursus americanus</i>	0	12	1	14	26	82	135
Coyote - <i>Canis latrans</i>	4	9	3	2	23	21	62
Red Fox - <i>Vulpes vulpes</i>	0	0	0	1	0	0	1
Gray Fox - <i>Urocyon cinereoargenteus</i>	0	0	0	0	0	0	0
Raccoon - <i>Procyon lotor</i>	0	0	0	0	2	28	30
Skunk - <i>Mephites mephites</i>	0	0	0	0	0	1	1
Dog - <i>Canis familiaris</i>	0	5	6	4	13	5	33
Sum	4	32	14	26	65	143	284

OTHER ANIMALS (2004)	April (684)	May (459)	June (243)	July (486)	Aug. (459)	Sept. (476)	Sum (2348)
HERIVORES							
White-tailed deer- <i>Odocoileus virginianus</i>	83	69	34	71	39	62	358
Squirrels - <i>Sciurus carolinensis</i>	0	0	0	0	1	1	2
Eastern Cottontail - <i>Sylvilagus floridanus</i>	0	0	0	0	1	0	1
BIRDS							
Eastern Wild Turkey - <i>Meleagris gallopovo</i>	0	1	0	3	32	2	38
Grouse - <i>Bonasa umbellus</i>	0	0	0	0	0	0	0
Crow - <i>Corvus brachyrhynchos</i>	0	0	0	0	0	1	1
OTHER							
Opossum - <i>Didelphis virginiana</i>	0	0	0	0	1	0	1
Unknown animal	0	0	0	1	0	1	2
Sum	83	70	34	75	74	67	403

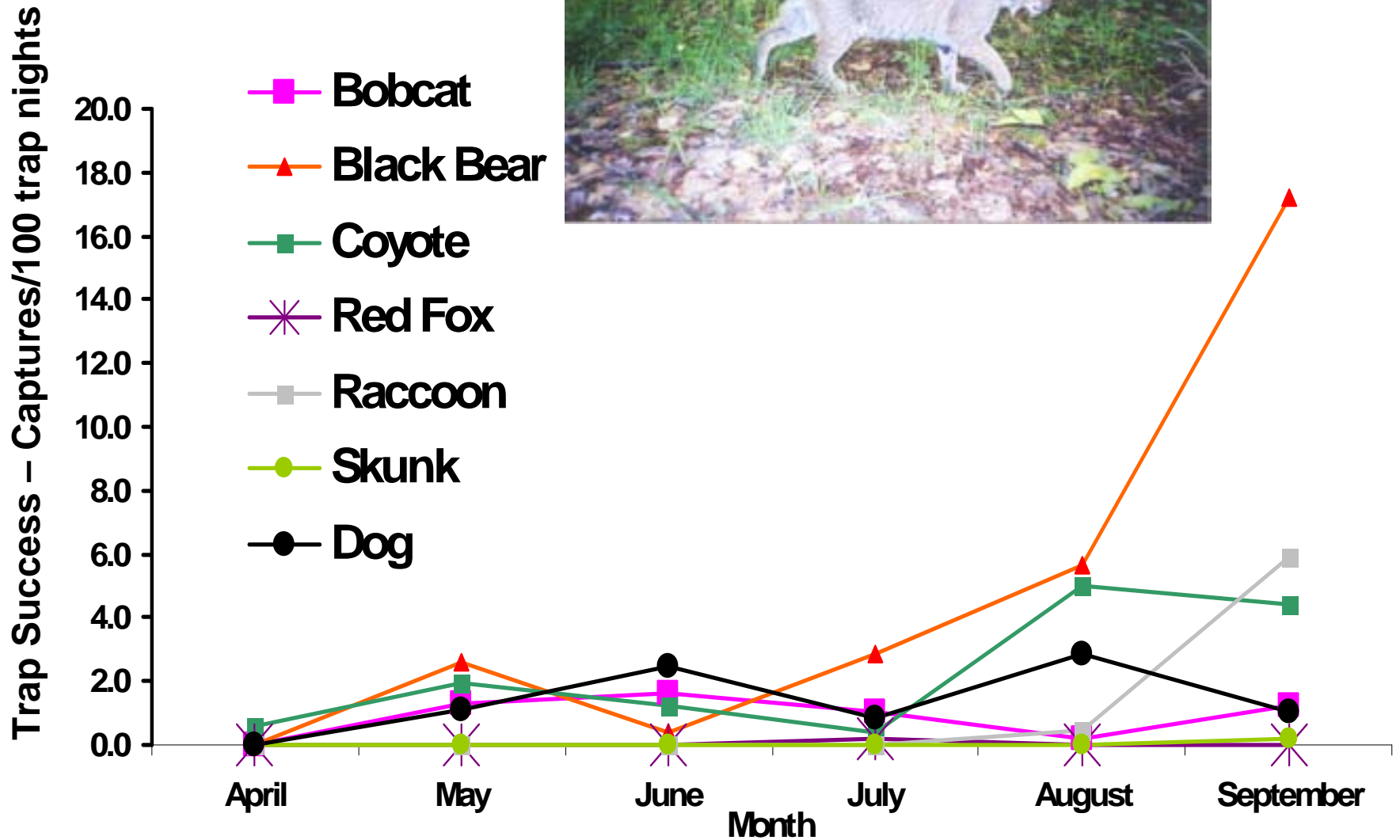
Carnivore Trap Success per month (2003)



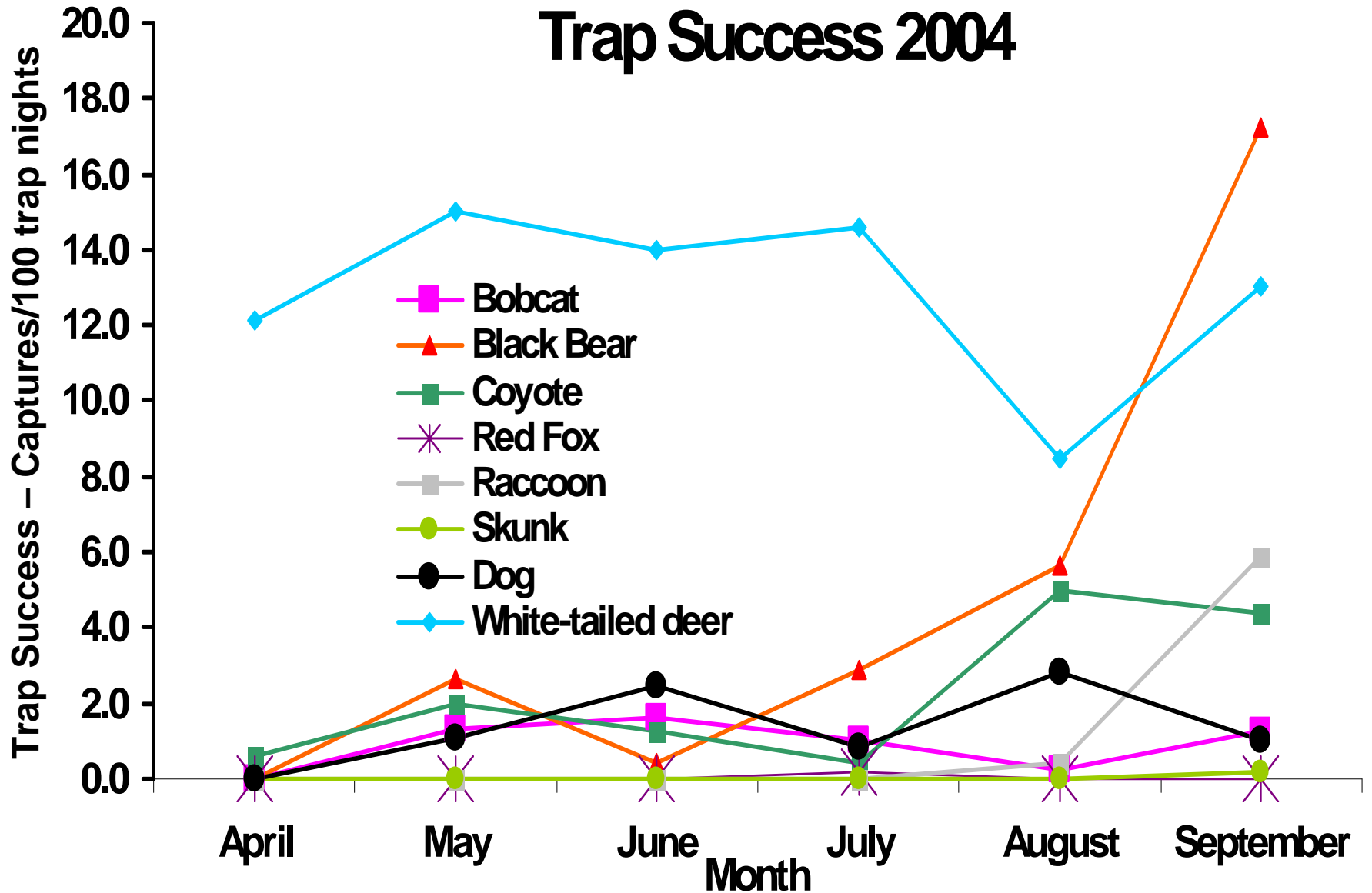
Carnivore & White-tailed Deer Trap Success (2003)



Carnivore Trap Success 2004

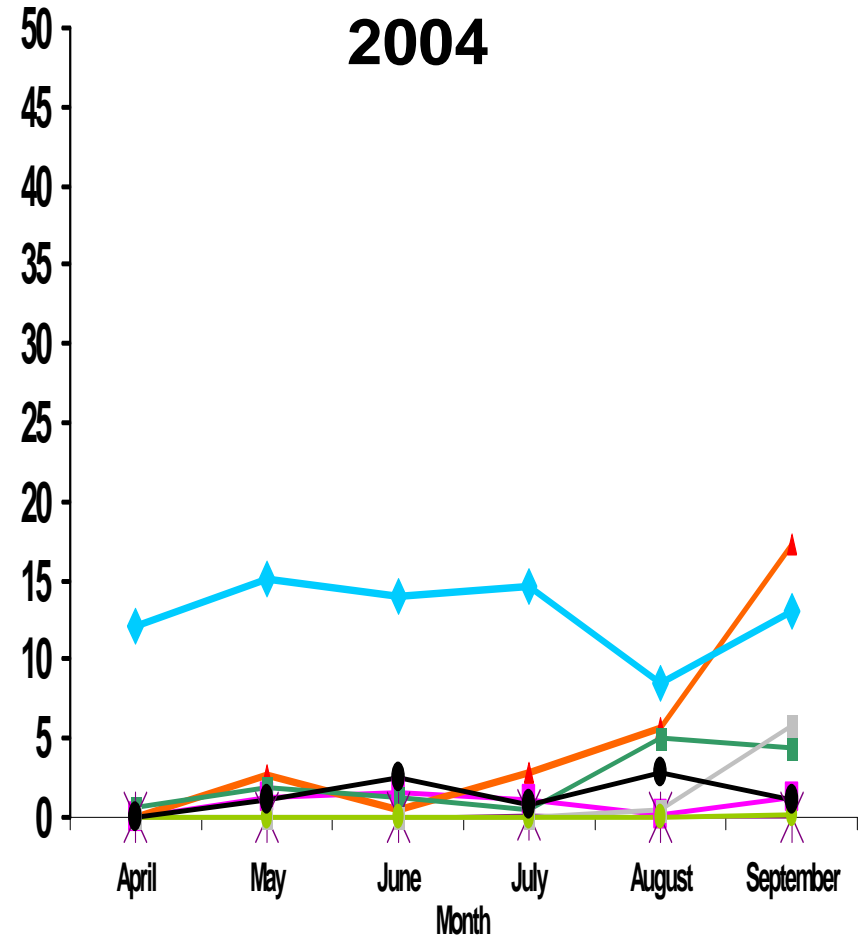
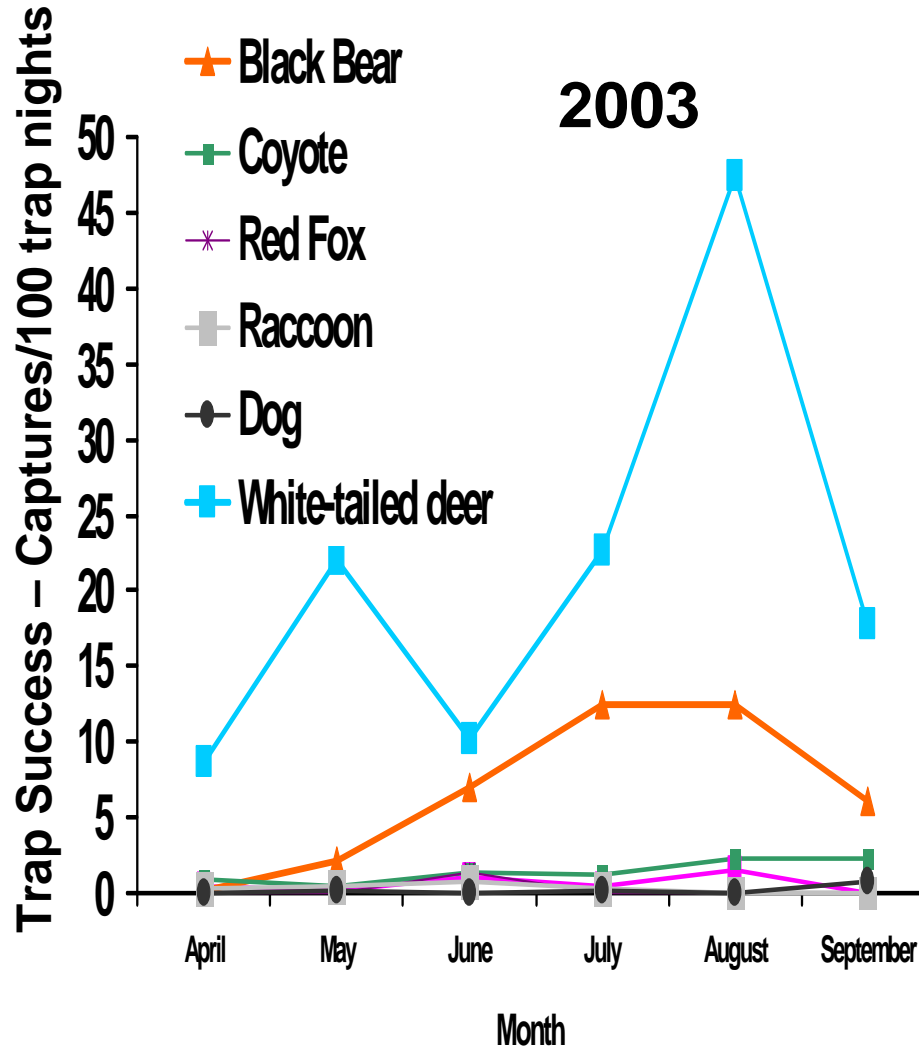


Carnivore & White-tailed Deer Trap Success 2004

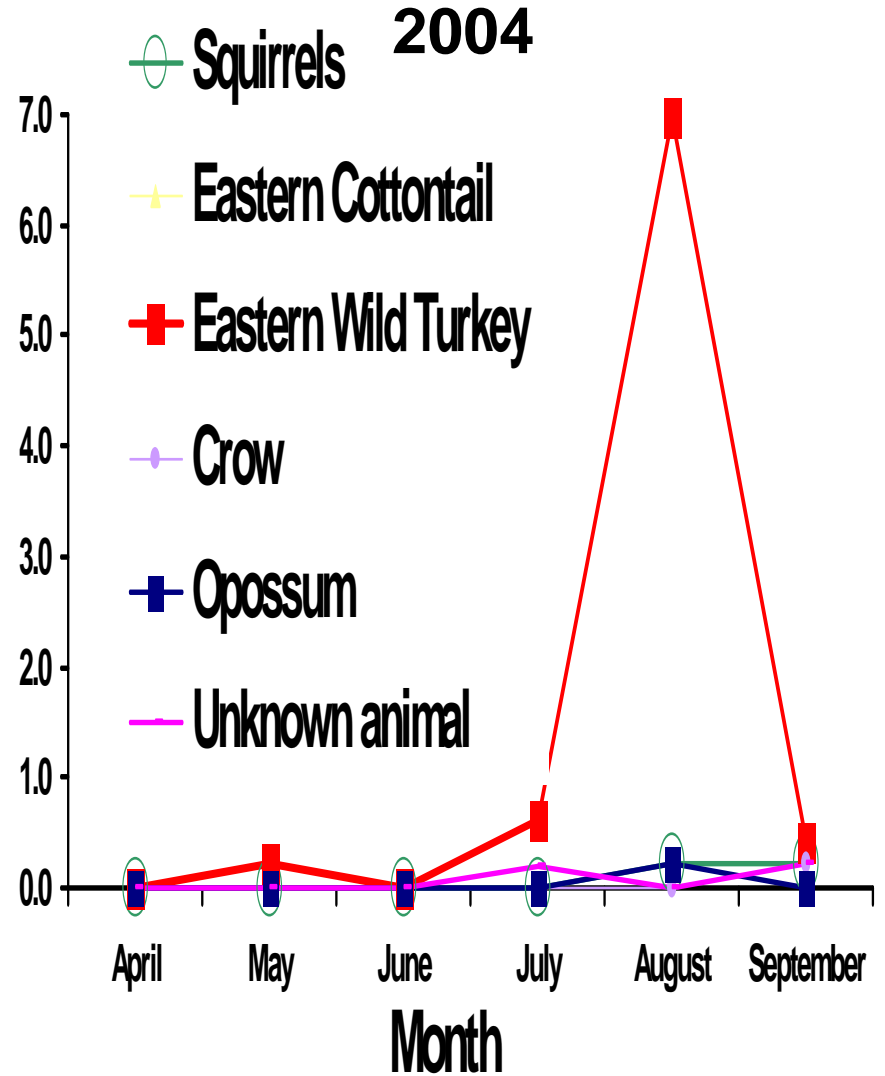
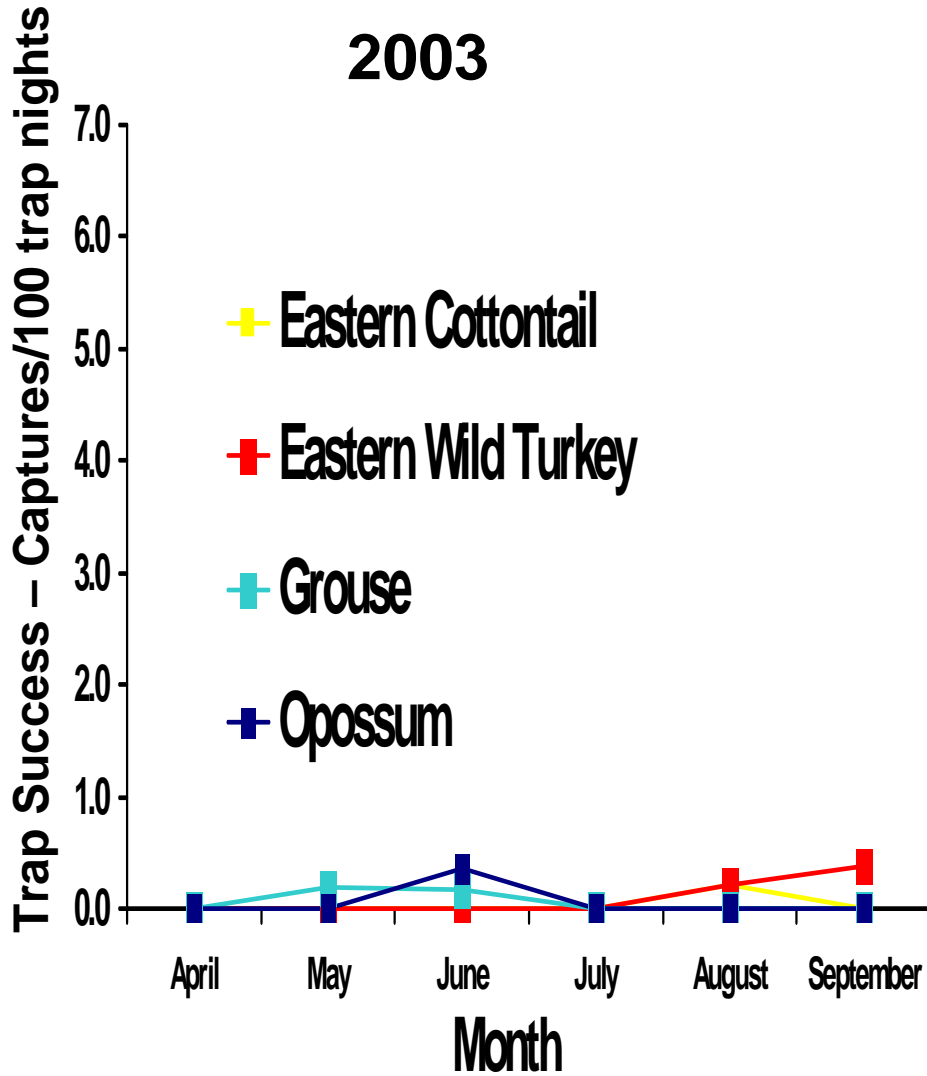


Monthly trap success for carnivores and white-tailed deer

- Bobcat
- Black Bear
- Coyote
- Red Fox
- Raccoon
- Dog
- White-tailed deer



Trap Success for other animals



Note: scale is less than 10% trap success. However – we were not targeting these smaller animals as cameras were placed at approximately knee height

Unknown animal



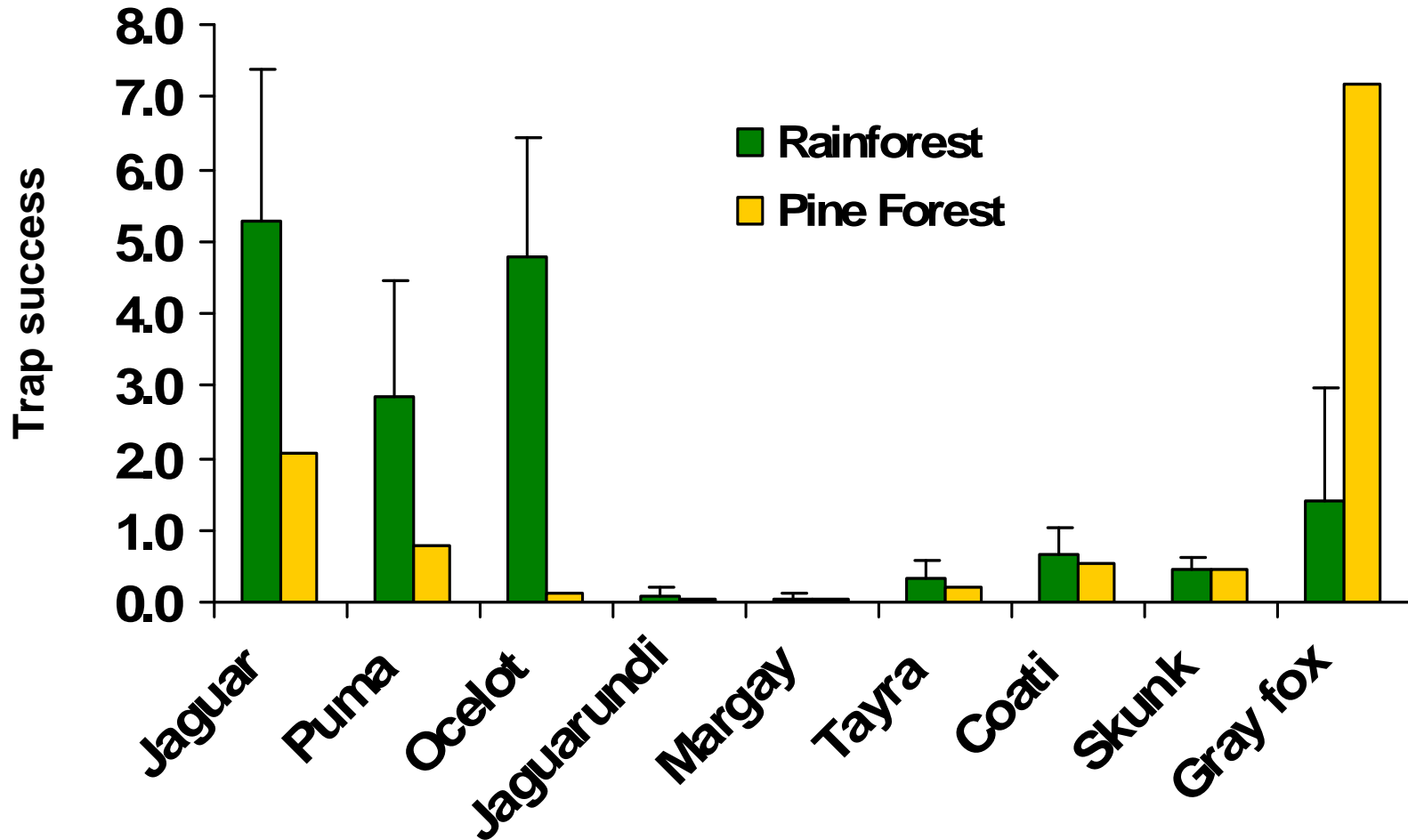
Other interesting photos



Wolf-Coyote Cross? Red Wolf?



If there was a cougar population - trap success could be between 1-3%



Animals from Belize 2003-2004

How do you know if an animal is truly absent??

- This is a difficult question to answer when studying elusive species.
- Carbone et al. (2001) used camera trapping rates and computer simulations to estimate the minimum effort required to determine if tigers (or any other species) were present in an area.



Findings

- Carbone et al. (2001) found that camera trapping programs running for 1000 trap nights had a 95% chance of obtaining at least 1 photograph at simulated low tiger densities of 0.4-0.7 individuals per 100 km².
- If trapping effort were 10,000 trap nights tigers presence could be determined when cat density was very low 0.05/100km²

Our effort was substantial

- We had 5,410 trap nights and, therefore, should have been able to detect cougars at densities of between 0.05 and 0.7 per 100km².
- Cougar densities in other areas with known intact cougar populations in North America range from
 - 0.3-0.5 per 100km² in Utah (Hemker et al. 1984)
 - 0.77-1.04 per 100km² in Idaho (Laundré and Clark 2003)
 - Highest estimate was 4.9 individuals per 100 km² (from Anderson's (1983) summary of North American cougar densities)

- While we can not confirm cougar presence across our study site, it may be that we did not have high enough trap effort if cougar density was extremely low or if only newly dispersing animals are entering the area.



Standardize data collection

- We do hope that others planning to conduct camera trapping studies follow a standardized protocols such as the one we developed (which follows well developed protocols for other large cats such as tigers and jaguars) in order too assess effort and to compare results across sites



Standardize data collection

- Data obtained on other species, such as trap success, is also valuable and informative and can potentially be used as an indicator of abundance.



Questions? Comments?



The End