



**Developing a long-term monitoring
program for Passerine birds in Denali
National Park and Preserve:
A Brief Overview**

**Prepared for Boreal Partners in Flight
annual meetings, 2004
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Denali NPP**

Acknowledgments

- National Park Service,
Central Alaska Network
- Alaska Bird Observatory
 - Tim Walker
 - Nancy DeWitt
- Ryan Drum (NPS)
- Karen Oakley (USGS)
- Ed Debevec (UAF)
- Trent McDonald (W.E.S.T.)
- Doug Wilder (NPS)
- Many field techs!

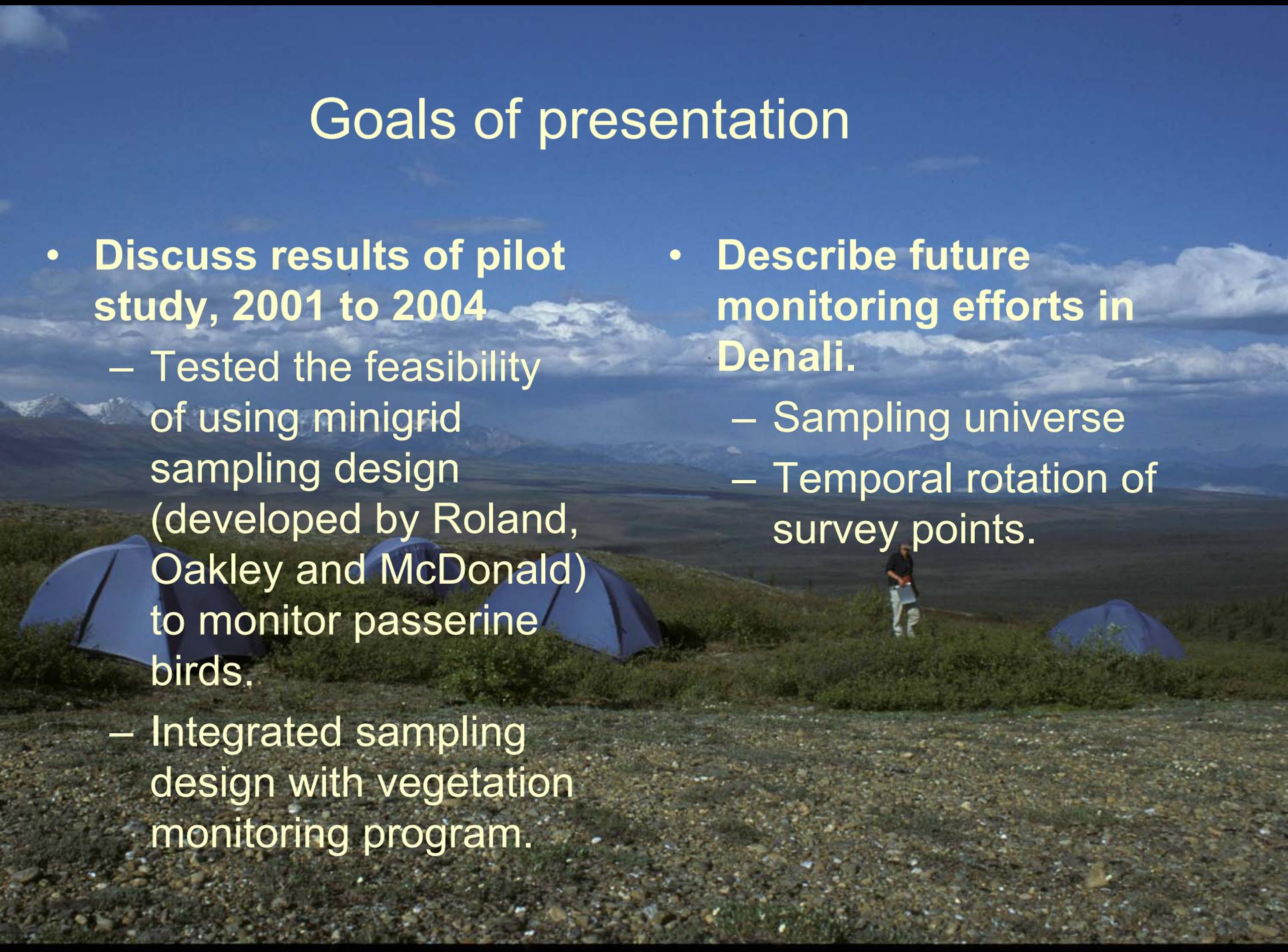


Goals of presentation

- **Discuss results of pilot study, 2001 to 2004**
 - Tested the feasibility of using minigrid sampling design (developed by Roland, Oakley and McDonald) to monitor passerine birds.
 - Integrated sampling design with vegetation monitoring program.

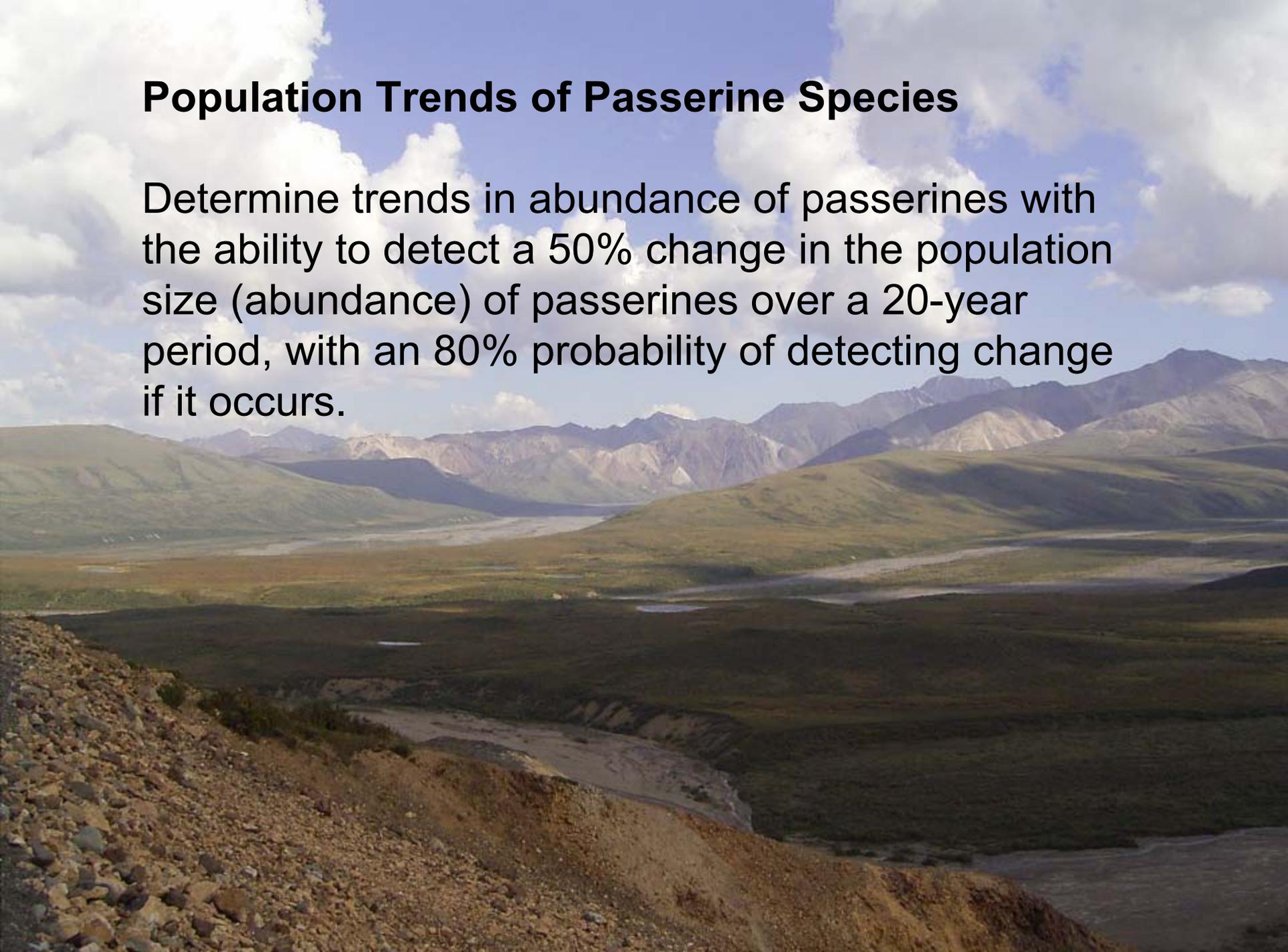


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- **Discuss results of pilot study, 2001 to 2004**
 - Tested the feasibility of using minigrid sampling design (developed by Roland, Oakley and McDonald) to monitor passerine birds.
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 - **Describe future monitoring efforts in Denali.**
 - Sampling universe
 - Temporal rotation of survey points.
- 

Population Trends of Passerine Species

Determine trends in abundance of passerines with the ability to detect a 50% change in the population size (abundance) of passerines over a 20-year period, with an 80% probability of detecting change if it occurs.



Community Composition and Distribution

Detect long-term changes in the distribution and composition of breeding passerine bird communities in relation to changes in their habitats.



Integration and Habitat Relationships

Integrate passerine monitoring with vegetation monitoring.

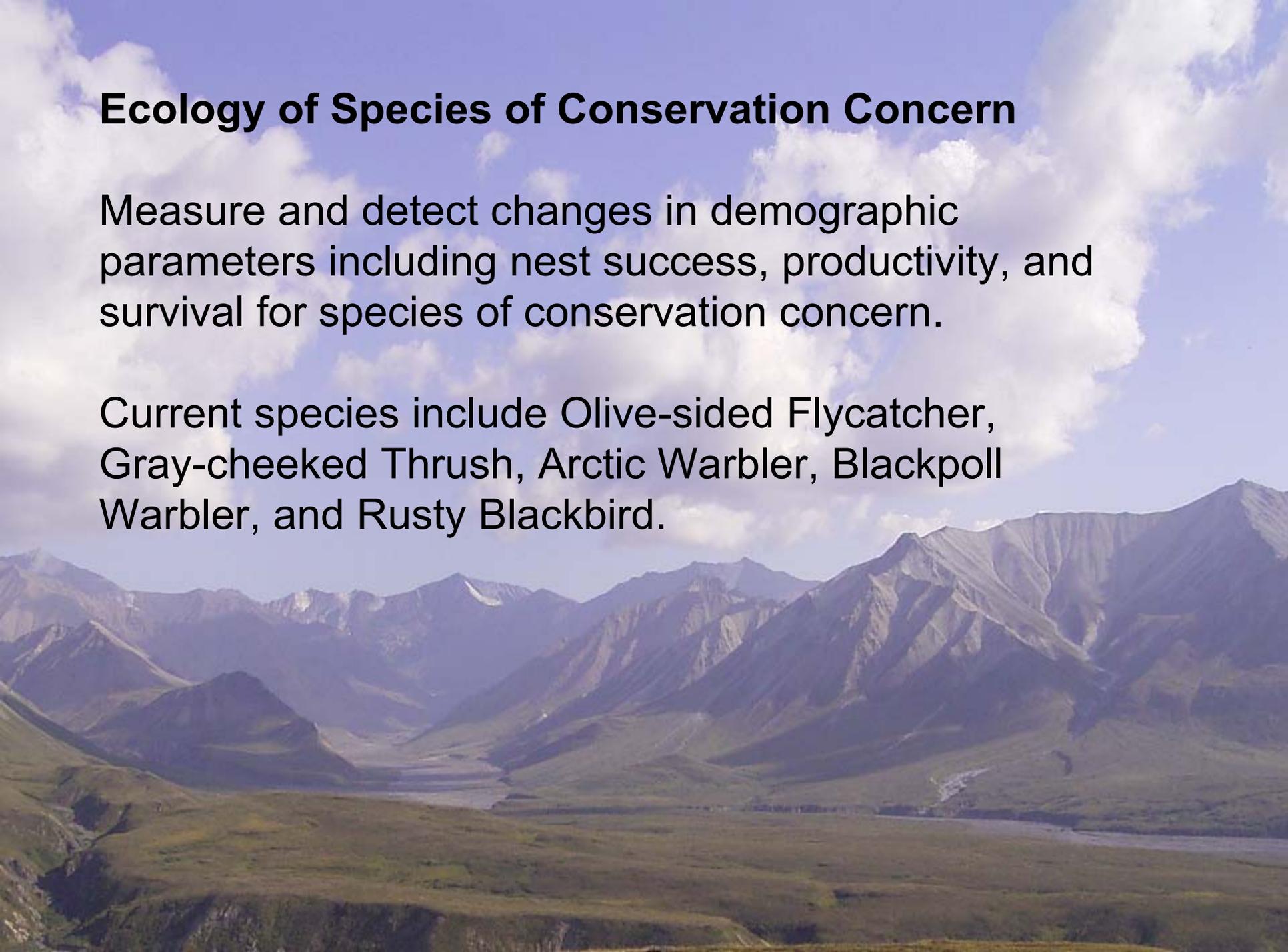
Develop and update habitat models for common passerine species and for species of conservation concern.

Assess response of bird communities (composition, abundance, distribution) to changes in vegetation structure and composition.

Ecology of Species of Conservation Concern

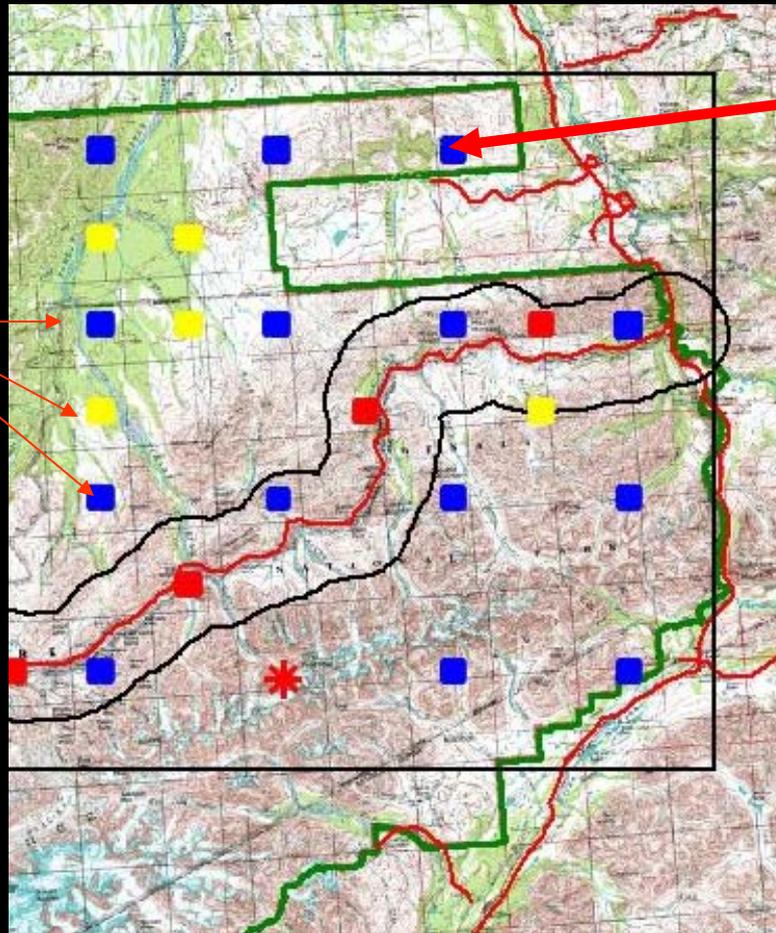
Measure and detect changes in demographic parameters including nest success, productivity, and survival for species of conservation concern.

Current species include Olive-sided Flycatcher, Gray-cheeked Thrush, Arctic Warbler, Blackpoll Warbler, and Rusty Blackbird.



Study Area and Spatial Sampling Design

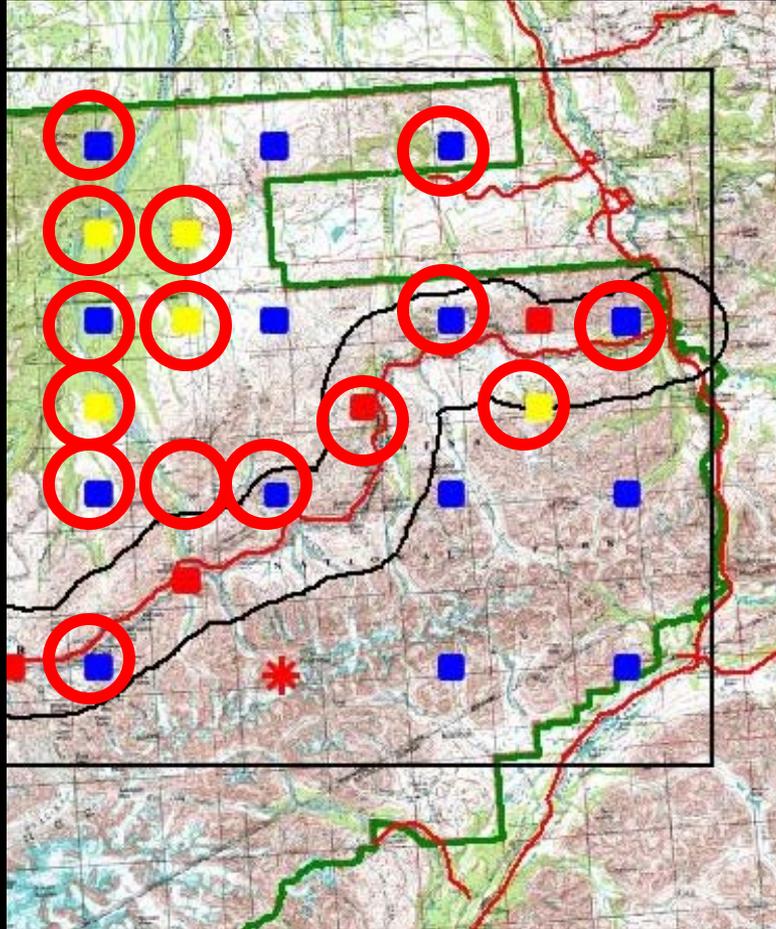
Minigrids
are spaced
10 km or 20
km apart



Each
minigrid
contains 25
sampling
points
spaced at
500 meter
intervals.

Study Area and Sampling Design

Sampled 15 minigrids from 2001 to 2004.



Also conducted repeated sampling at three minigrids and repeated sampling within a season at two minigrids.

Methodology



- Two week training period before field season
- Annual survey period: 2 June – 28 June.
- Daily survey period: 0300 – 0930.
- Used 2 two-person field crews
 - one observer who conducted the survey
 - one recorder who recorded the survey data

Methodology

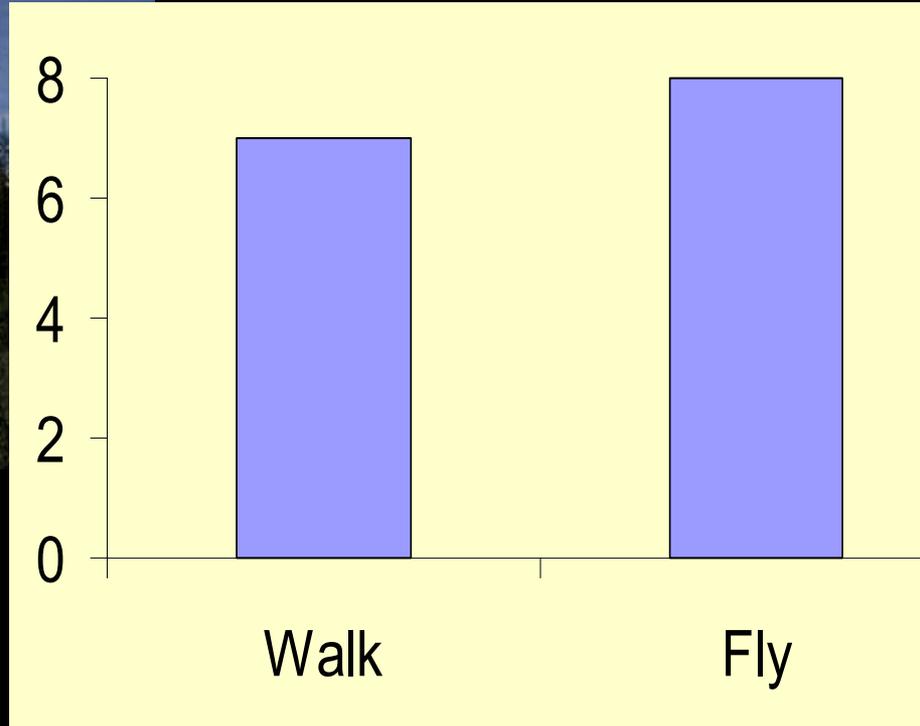


- Used 8 minute (2001-2002) and 10 minute (2003-2004) variable circular plot point counts broken into four time intervals:
 - 0-3 min.
 - 3-5 min.
 - 5-8 min.
 - 8-10 min.
- Estimated distance to detections using 10 meter intervals to 100 meters, then at 25 meter intervals to 150 meters, and all others > 150 meters.

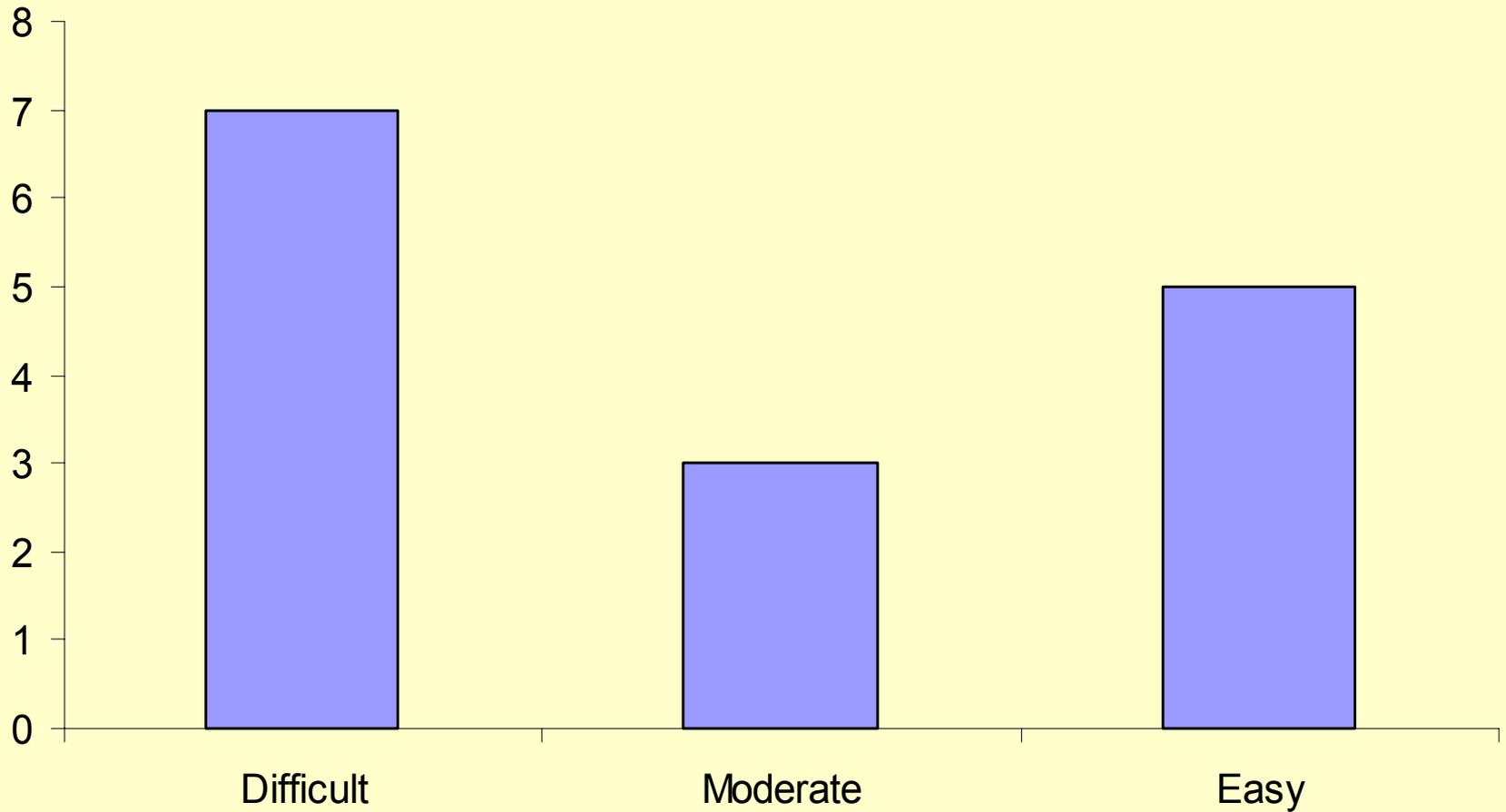
Summary of results

- Access
- Grid difficulty level
- Survey success: how many points did we get to?
 - What affects survey success?
- Detections by time interval
- Detections by distance interval
- Detection type
- Species richness
- Species composition
- Most common species
- “Interesting” results

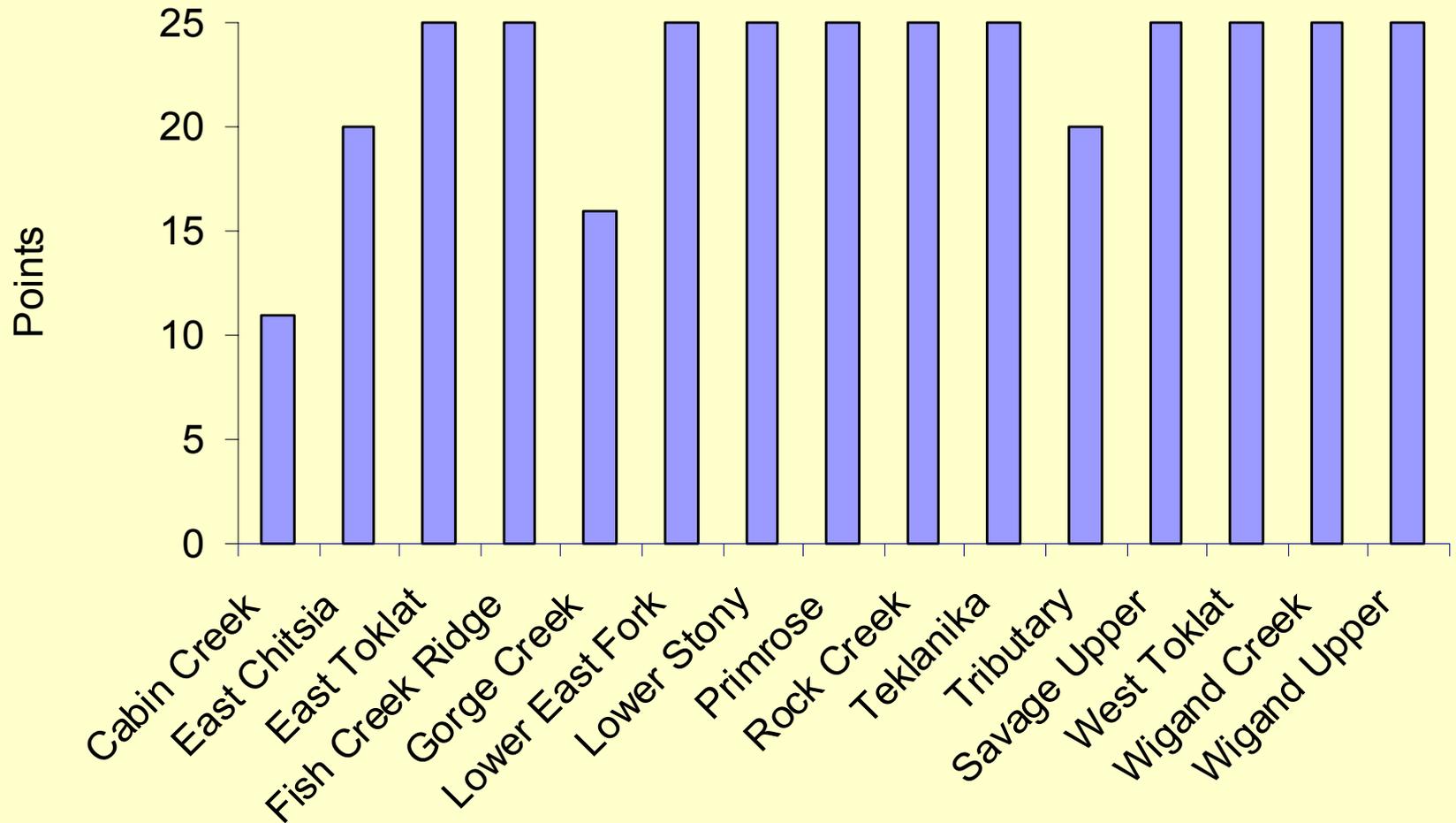
Grid Access: Walk or Fly



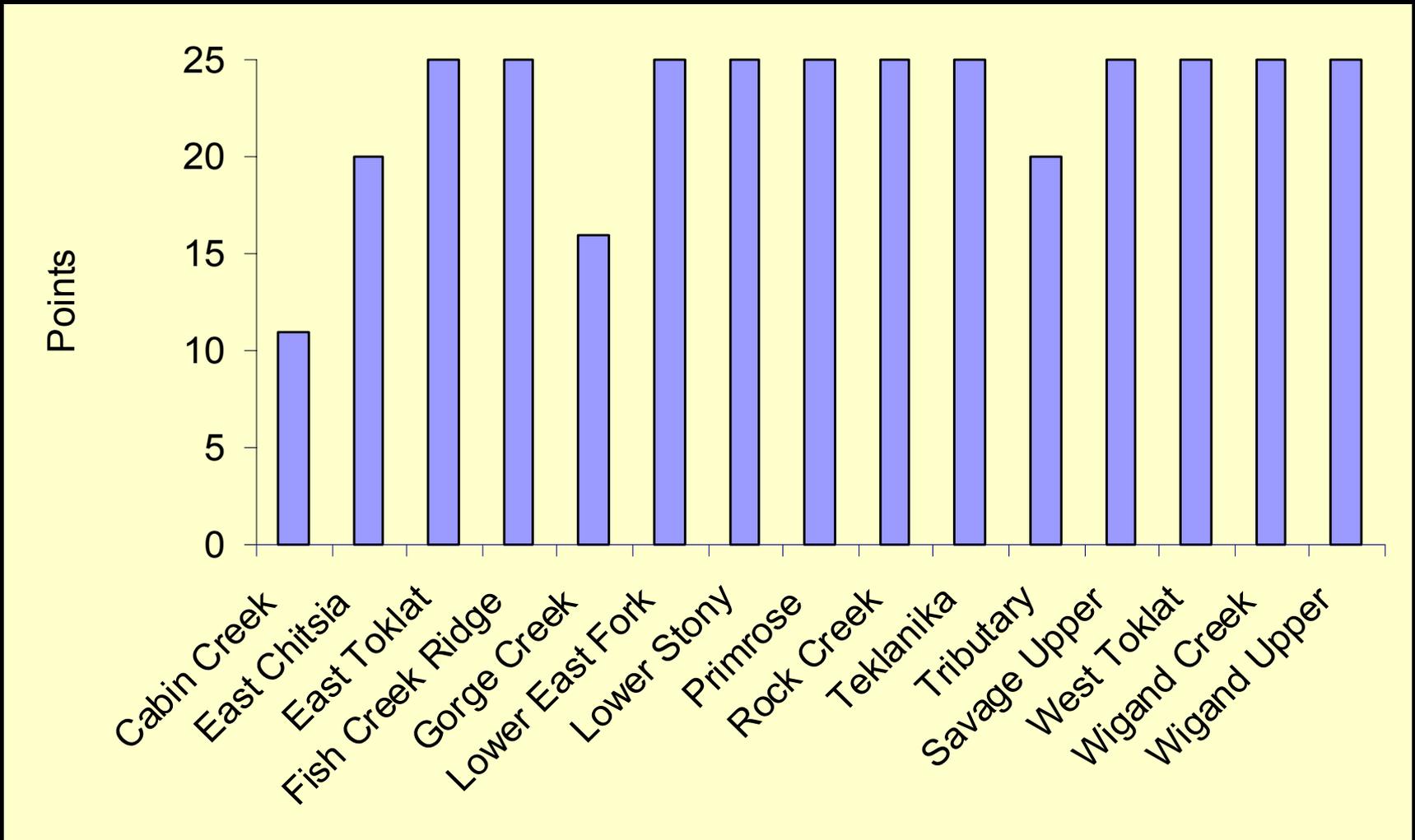
Grid Survey Difficulty



Survey Success

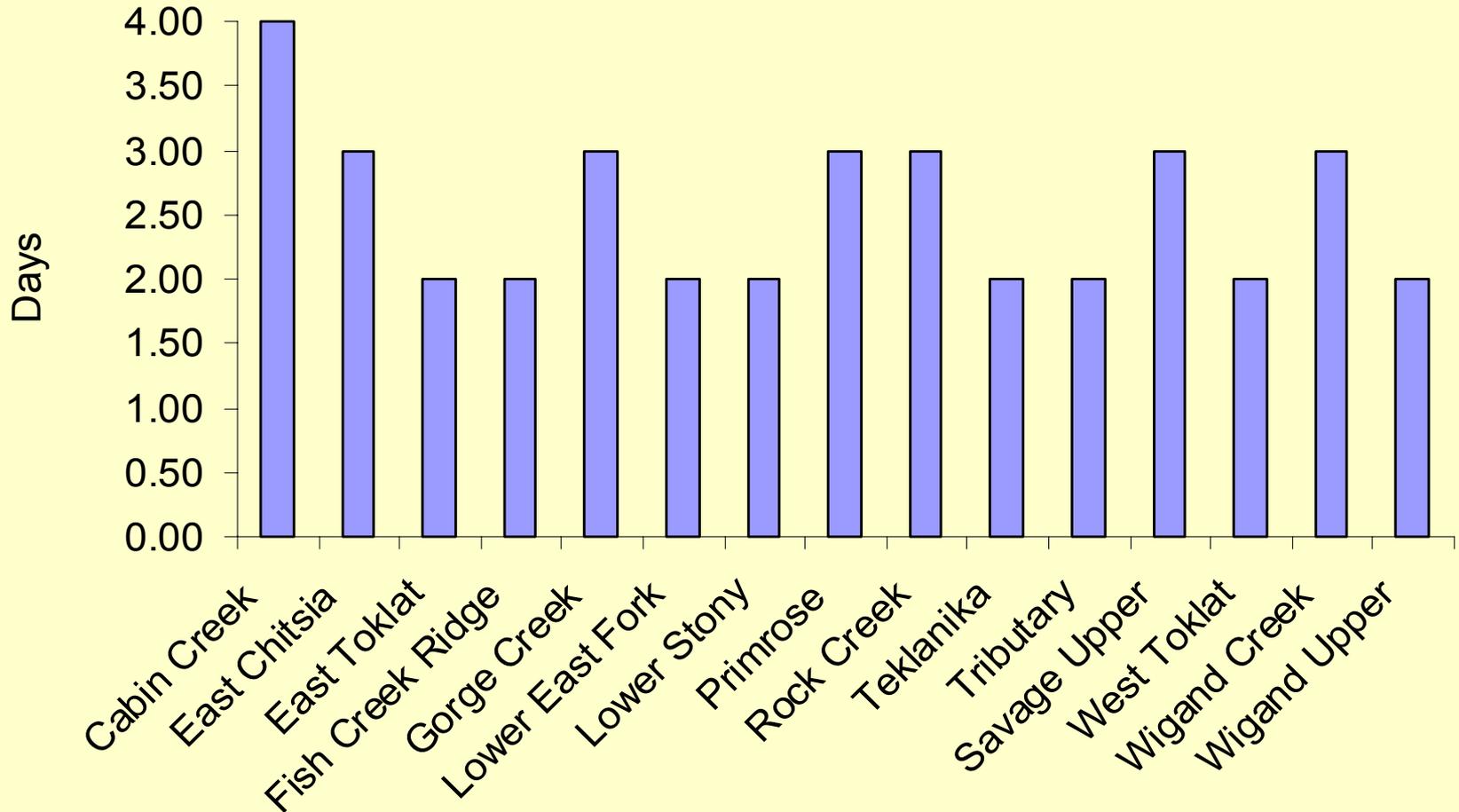


342 points / 375 potential = 91% success rate

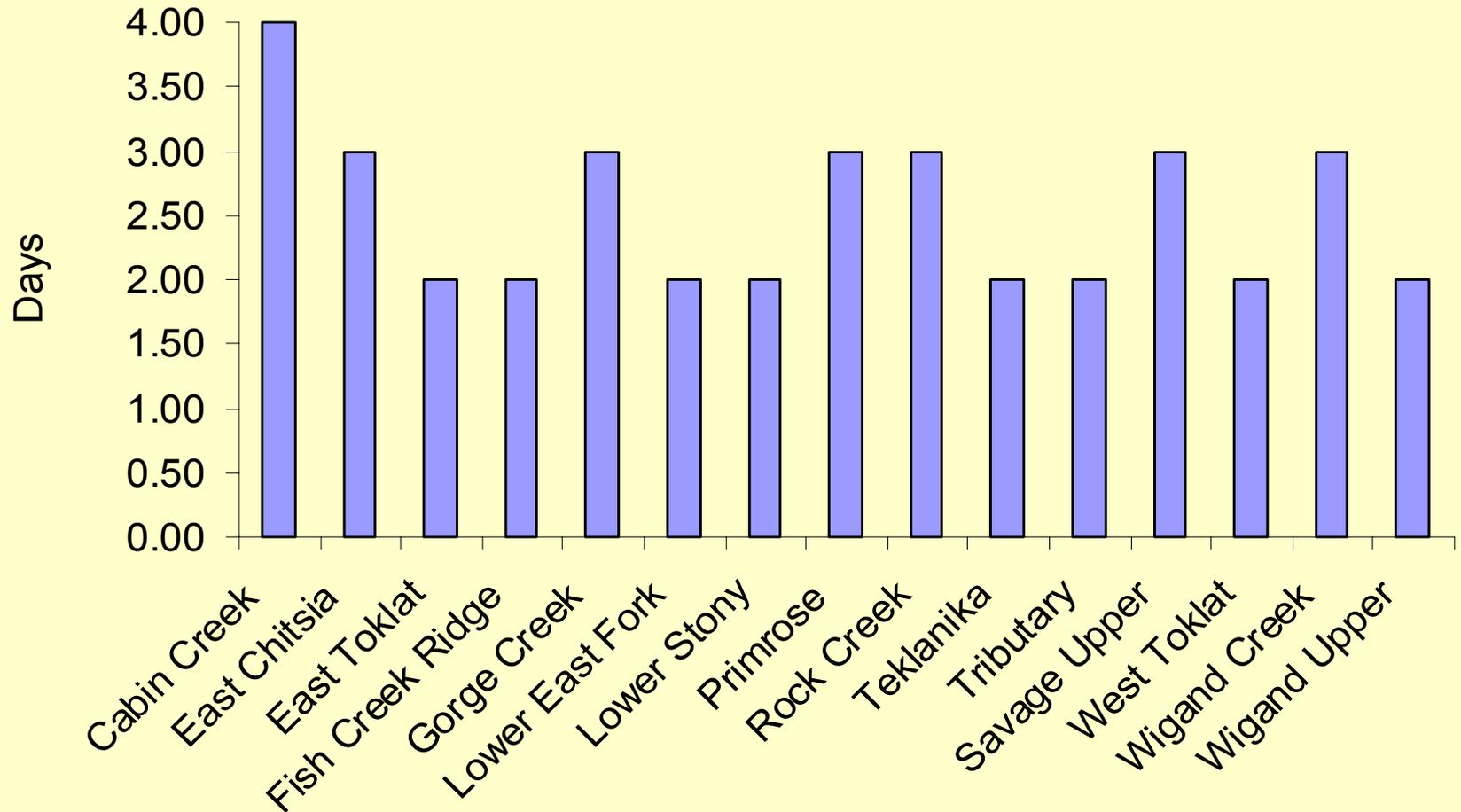


Survey Effort

Days to complete grid with
2 two-person field crews on each grid.



Average time per grid = 2.53 days (SD = 0.64)
with 2 two-person field crews.





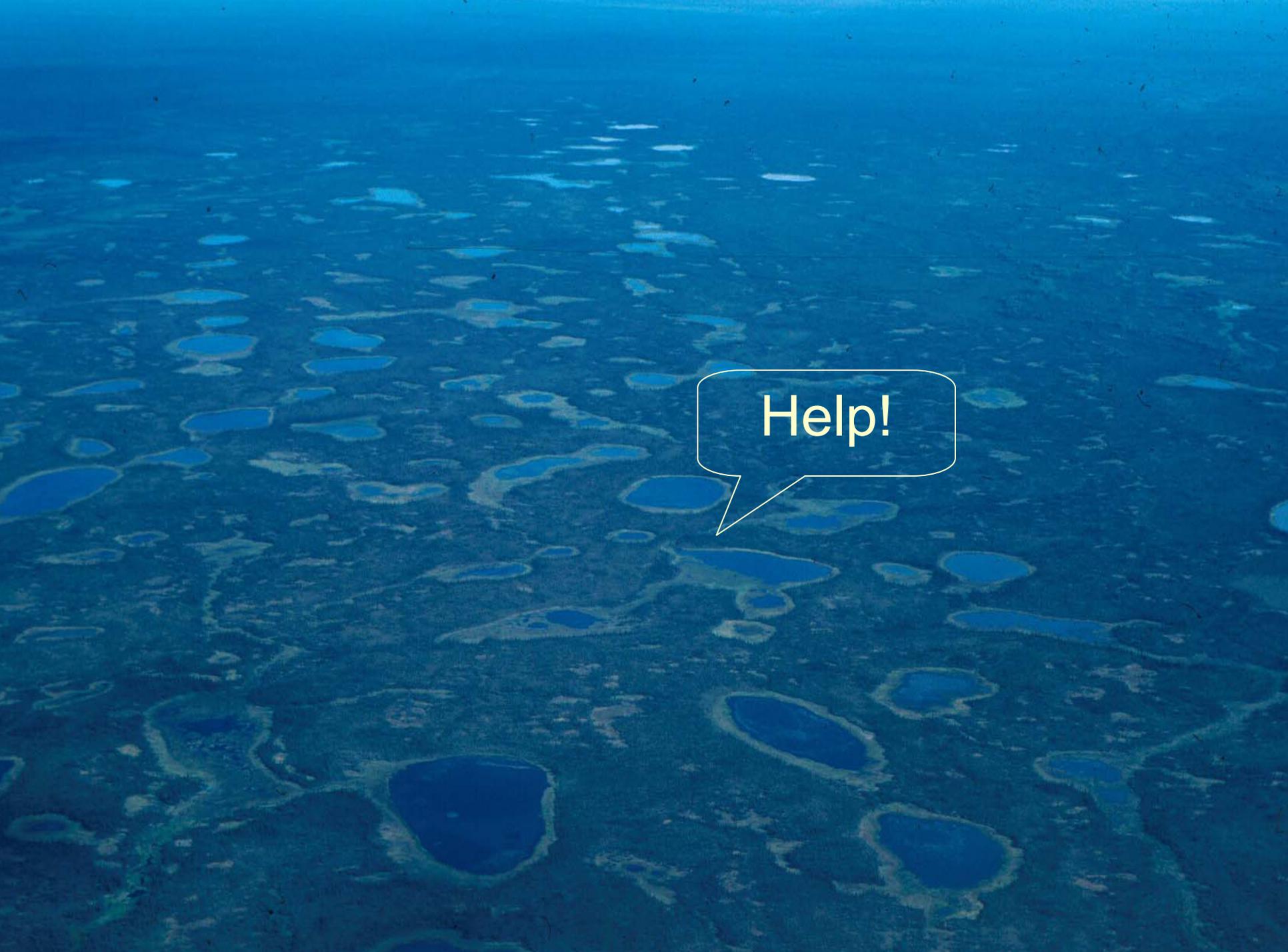




Wahoo!!







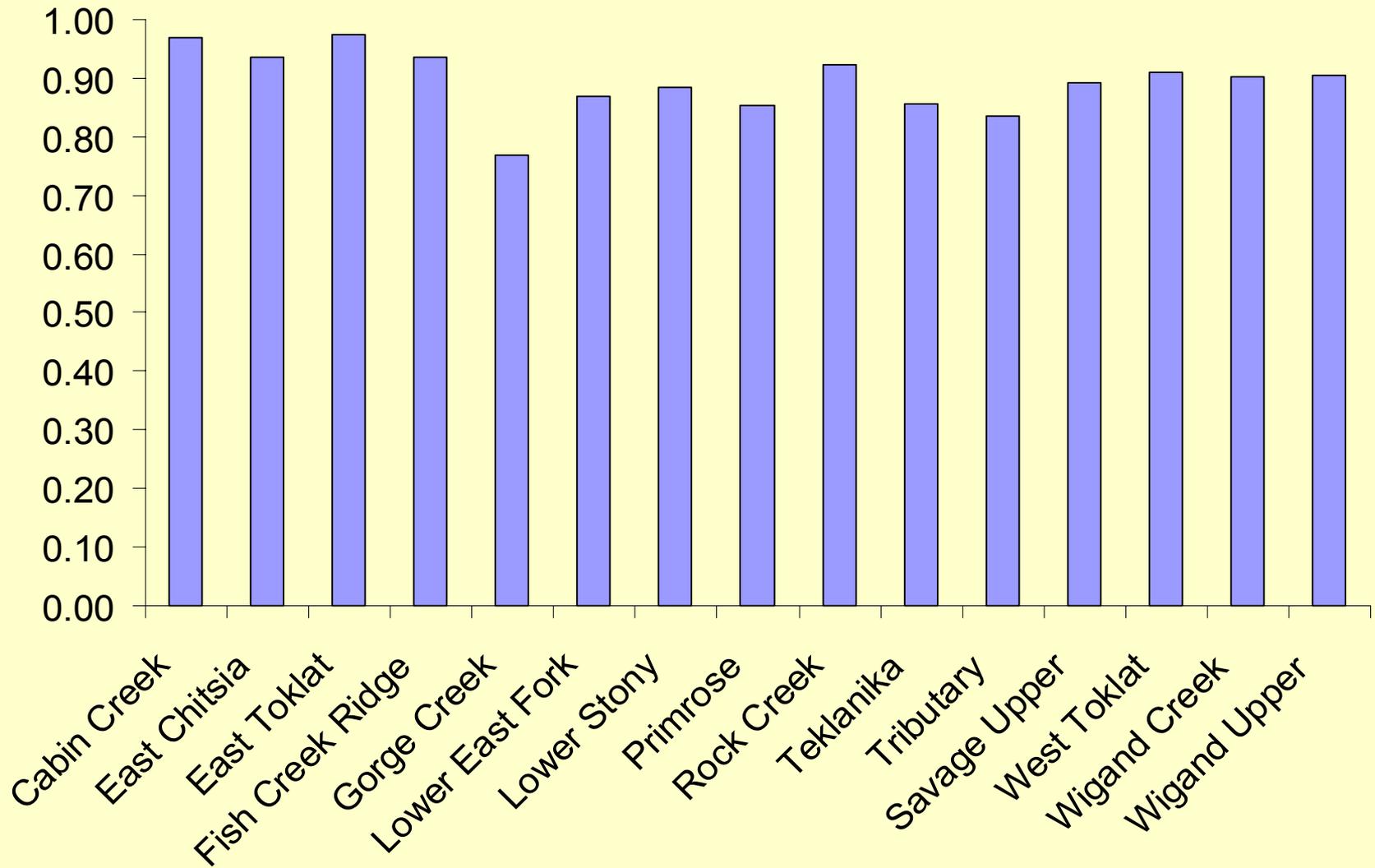
Help!



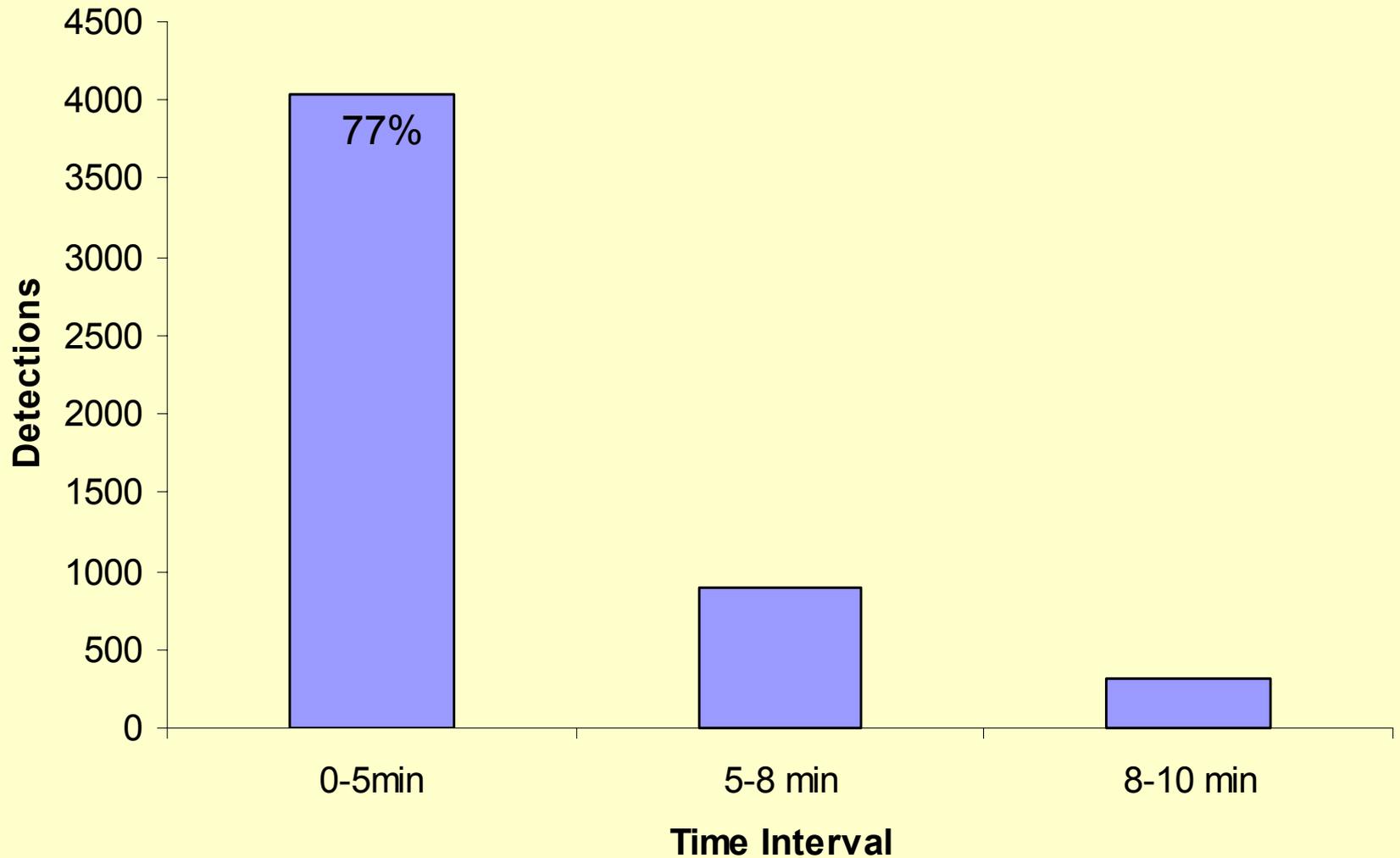
A photograph of a family of brown bears in a lush green field. A large adult bear is on the left, with three smaller cubs following it. A thought bubble is superimposed on the right side of the image, containing the text: "Hey! Isn't that a Golden-crowned Sparrow?".

Hey! Isn't that a
Golden-crowned
Sparrow?

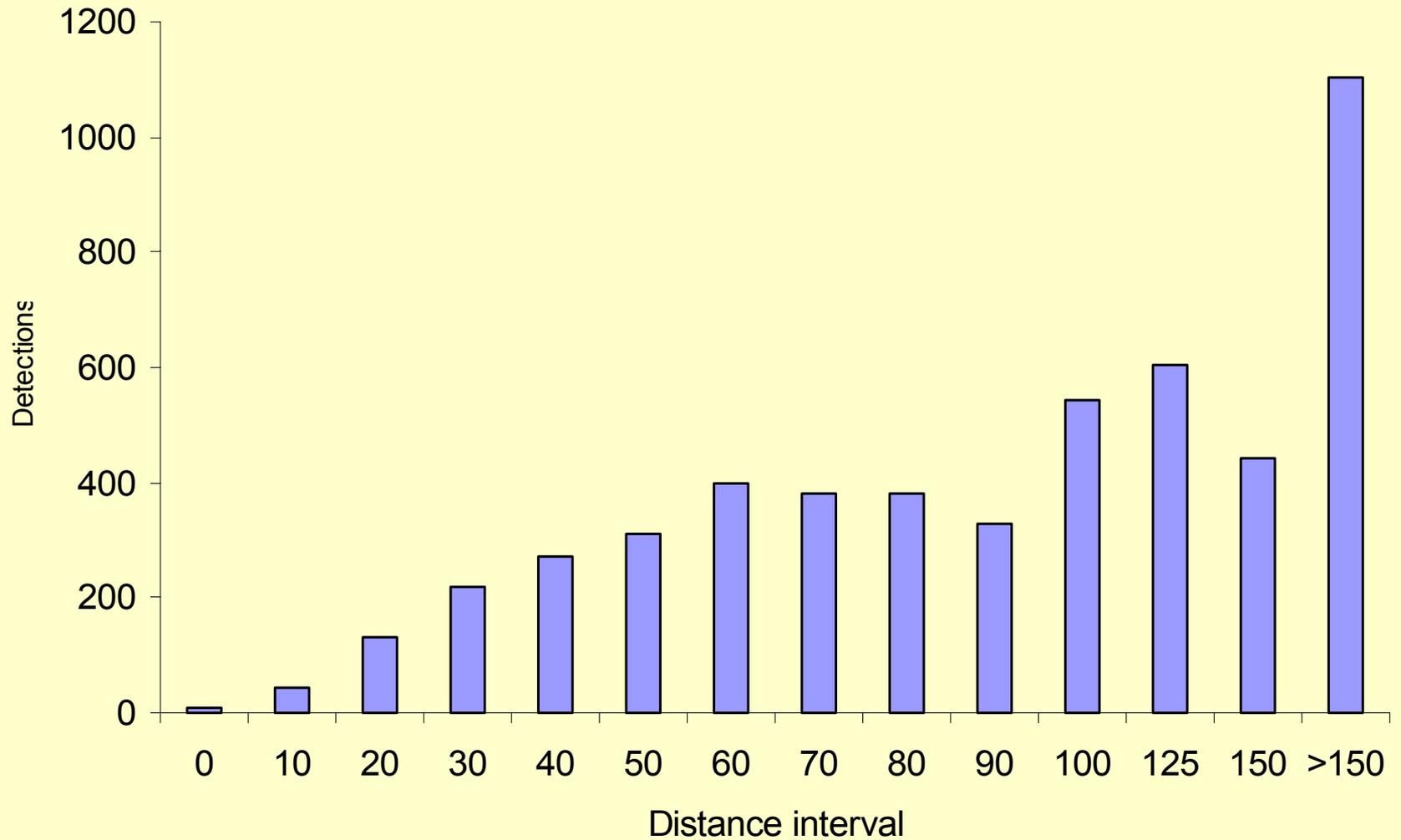
Detection type: singing or calling



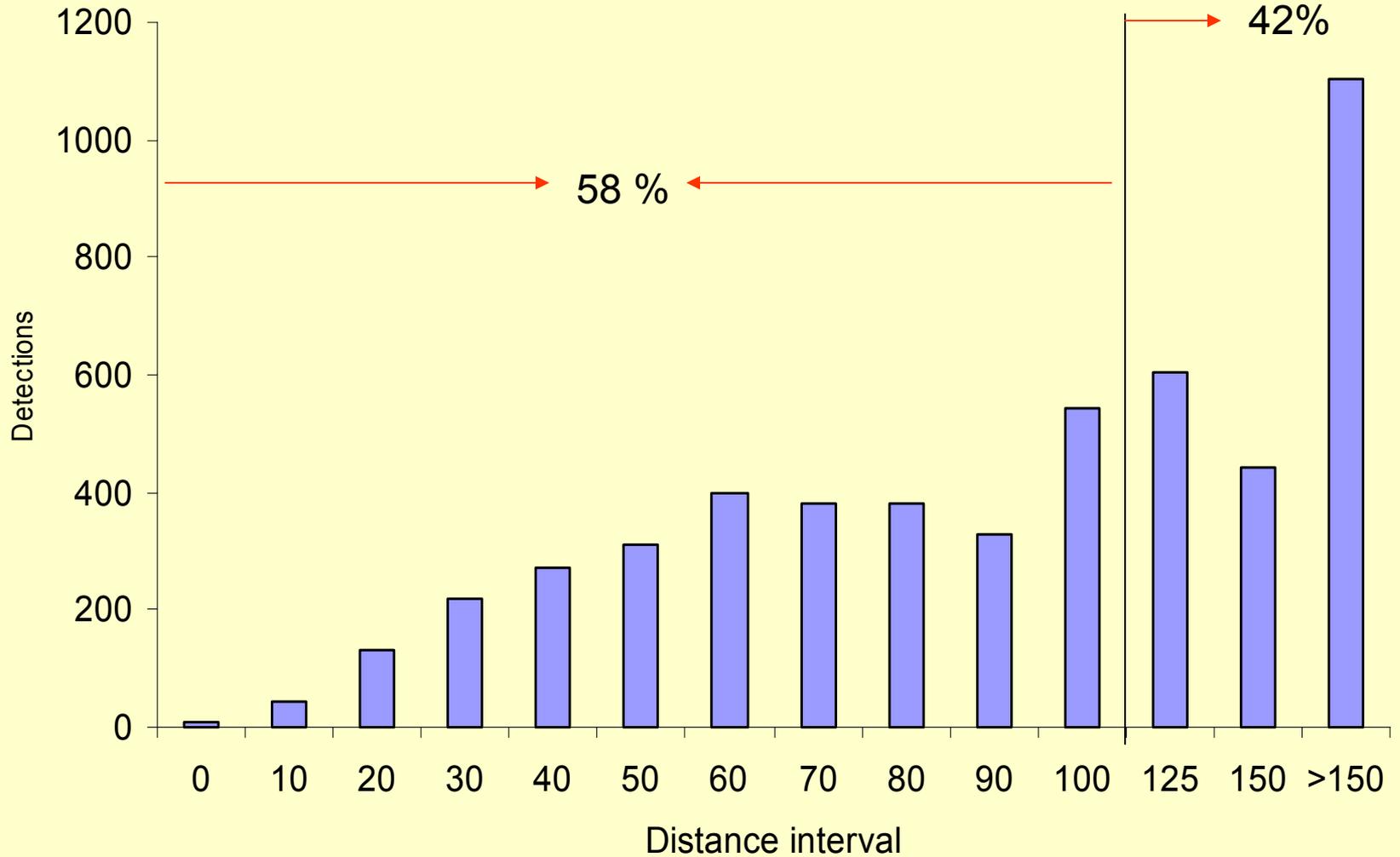
Detections by time interval: all data pooled 2001-2004



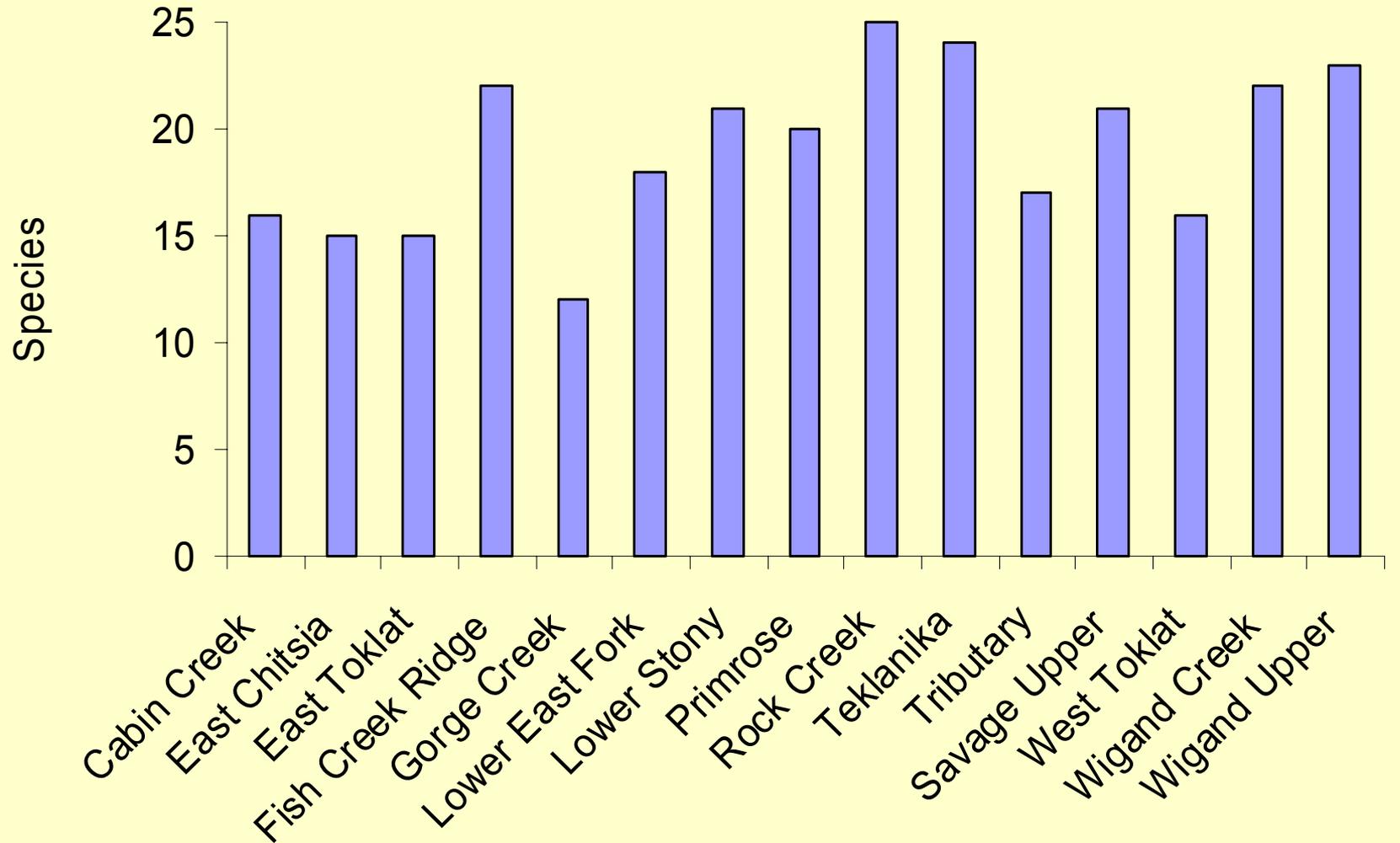
Detections by distance interval: all data pooled 2001-2004

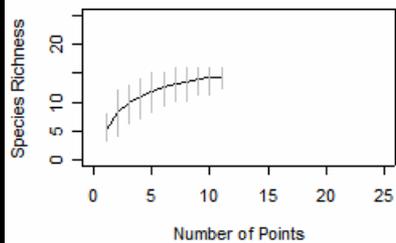
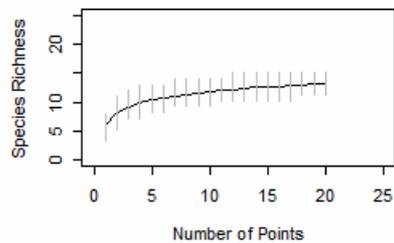
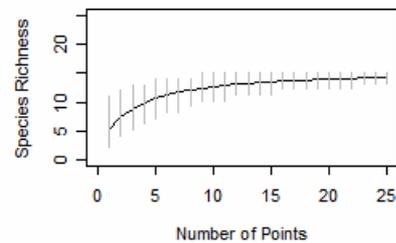
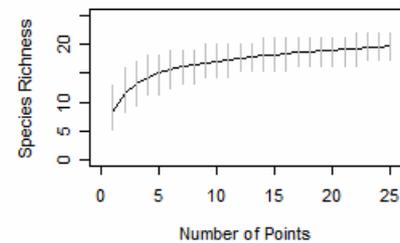
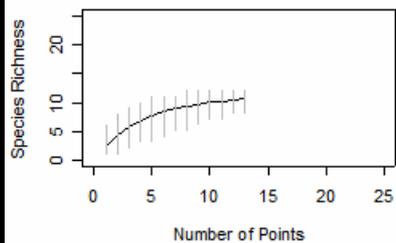
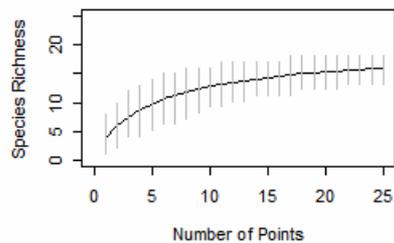
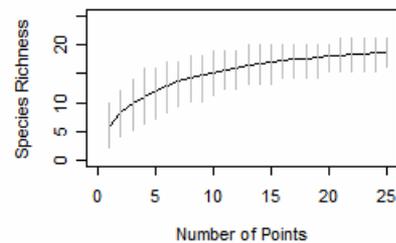
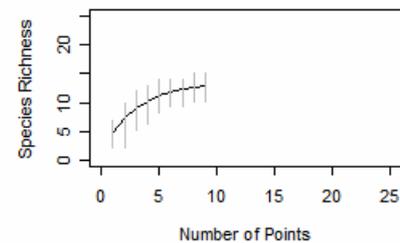
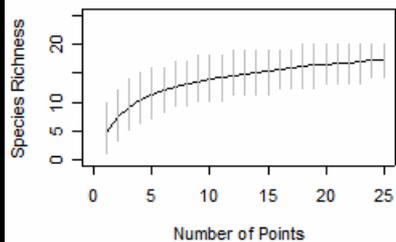
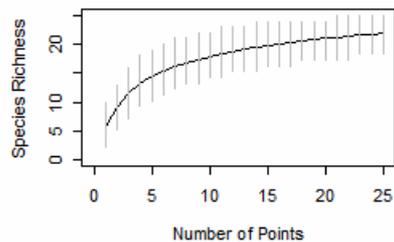
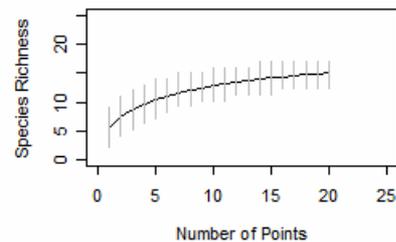
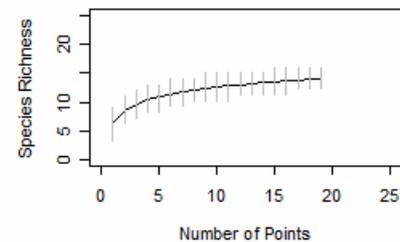
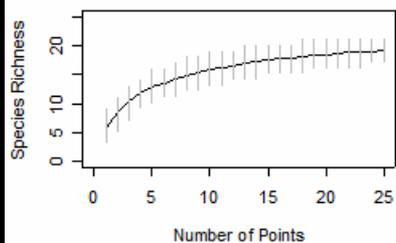
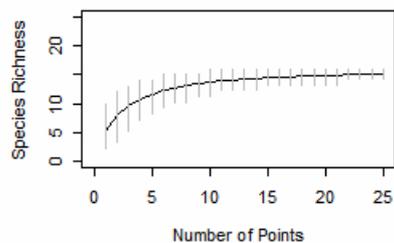
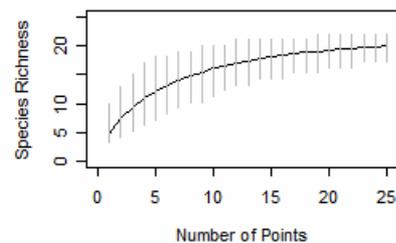
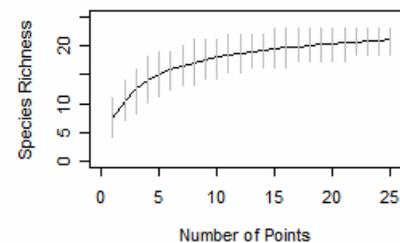


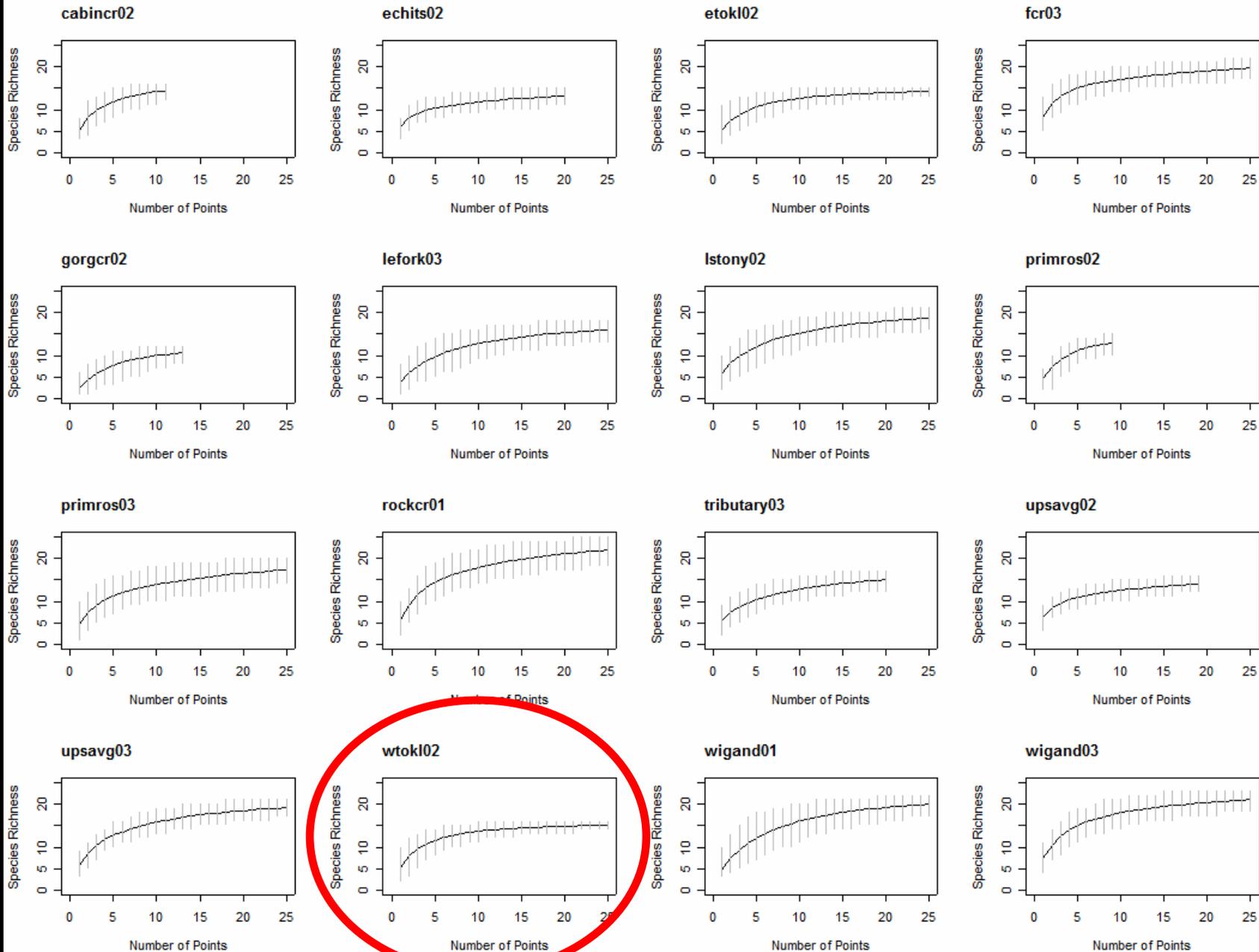
Detections by distance interval: all data pooled 2001 -2004

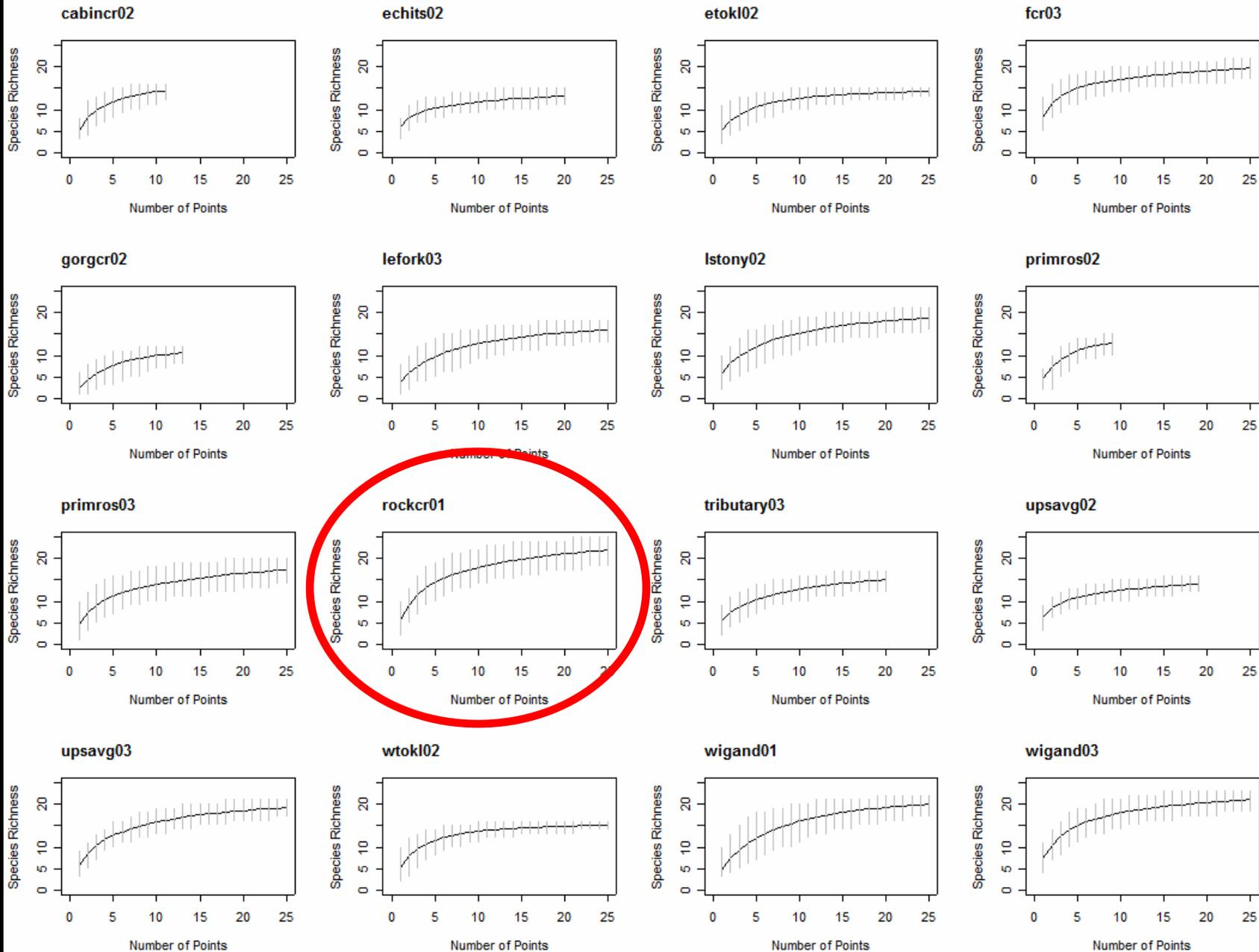


Species per grid

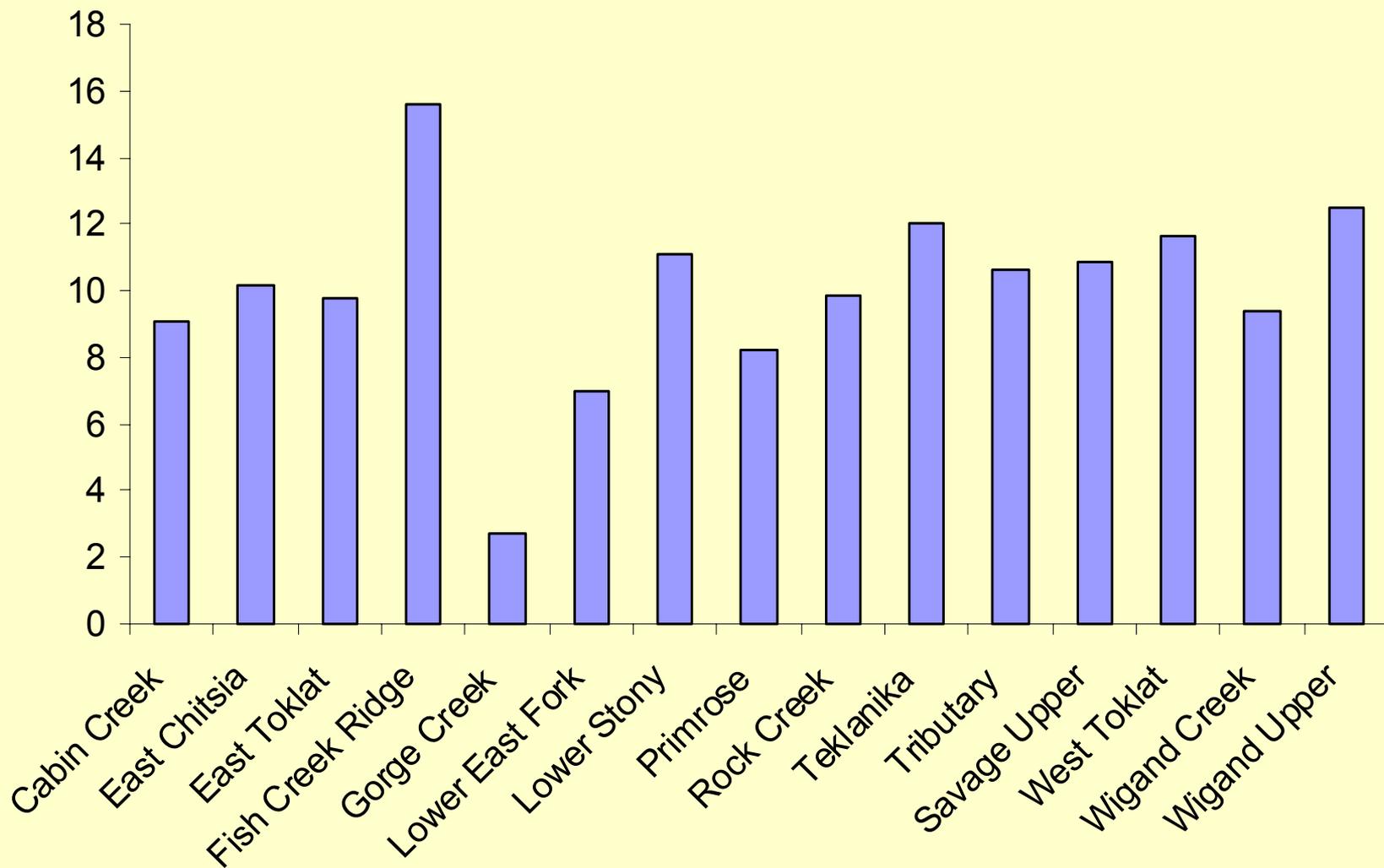


cabincr02**echits02****etokl02****fcr03****gorgcr02****lefork03****Istony02****primros02****primros03****rockcr01****tributary03****upsavg02****upsavg03****wtokl02****wigand01****wigand03**

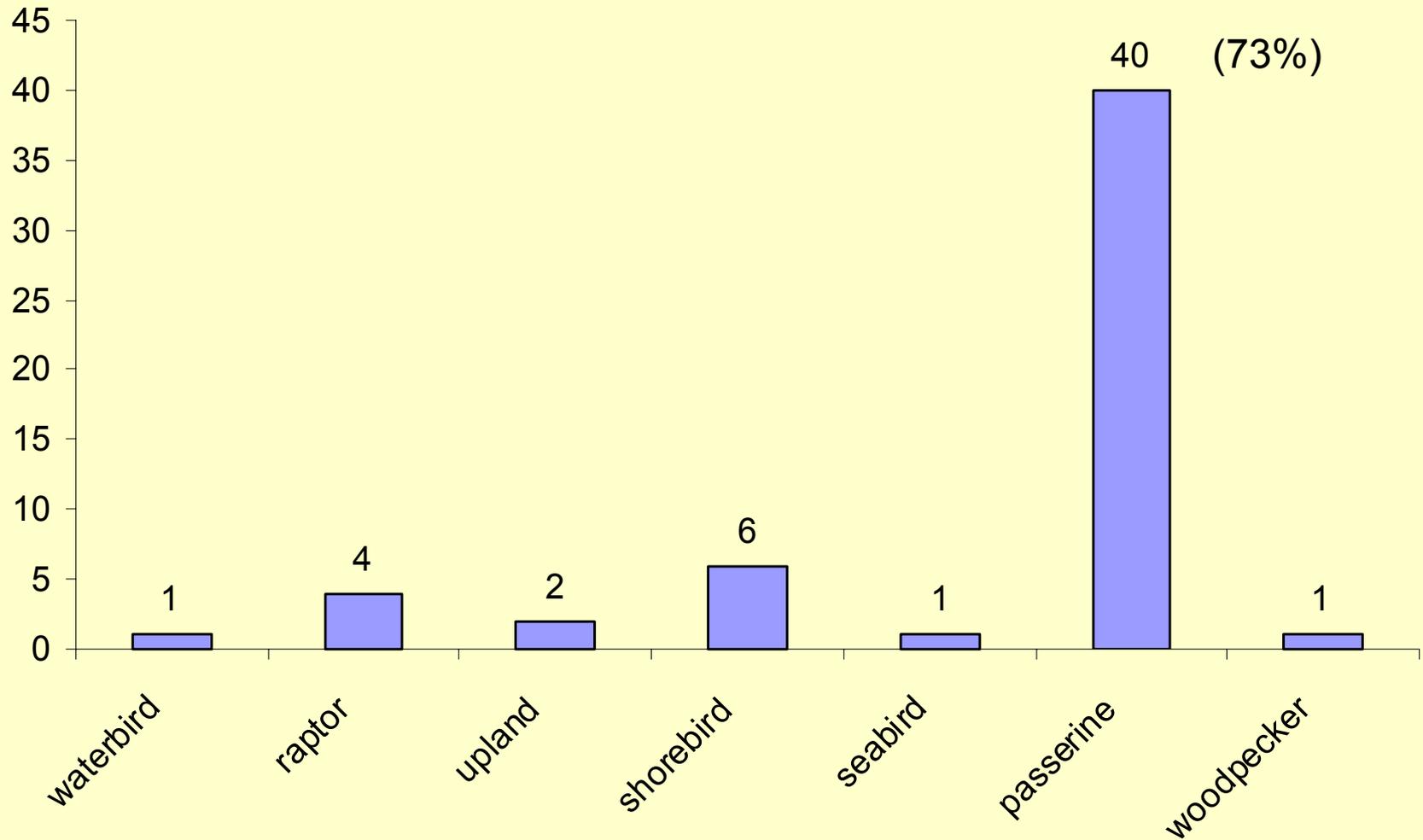




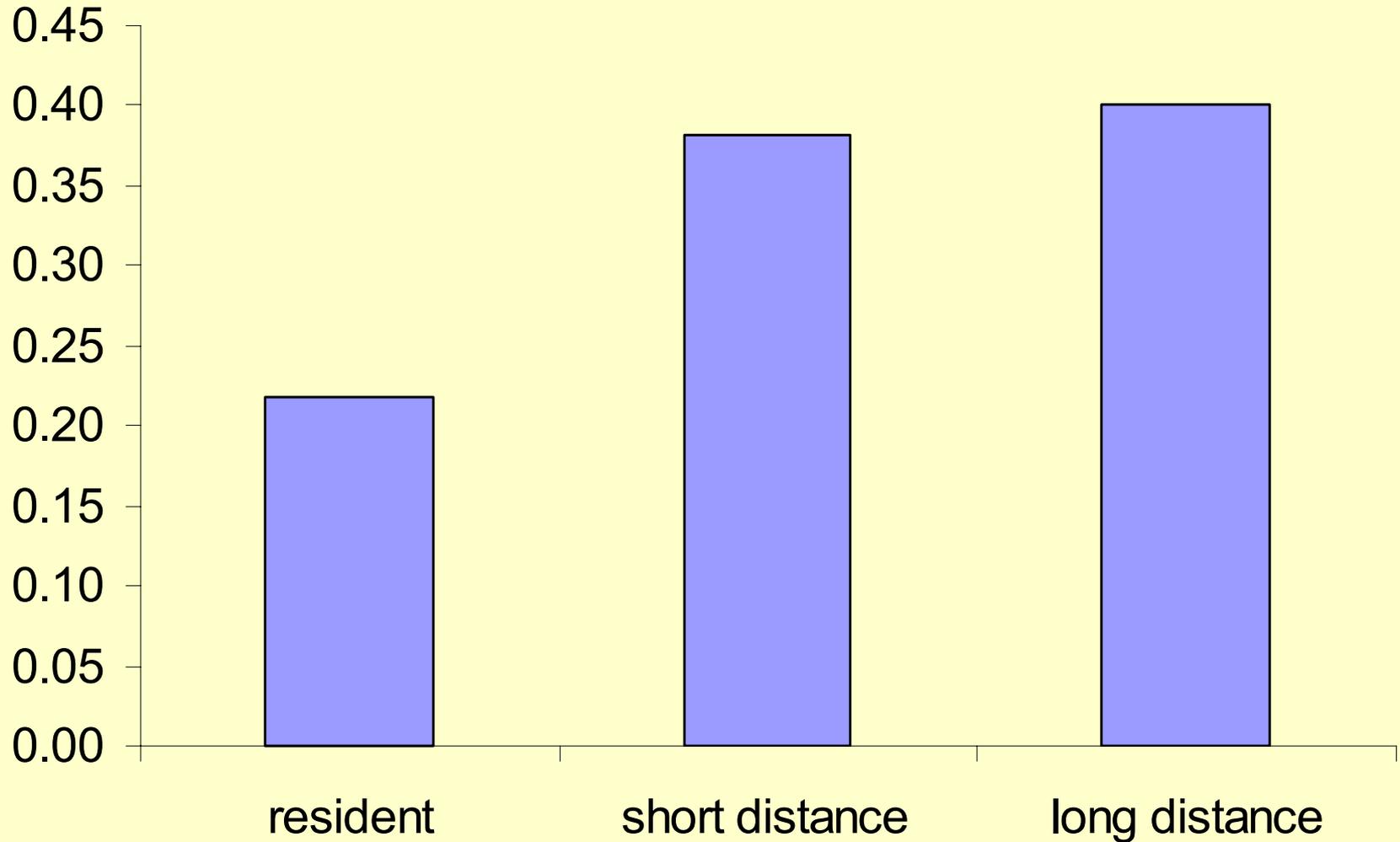
Detections, individuals per point by grid



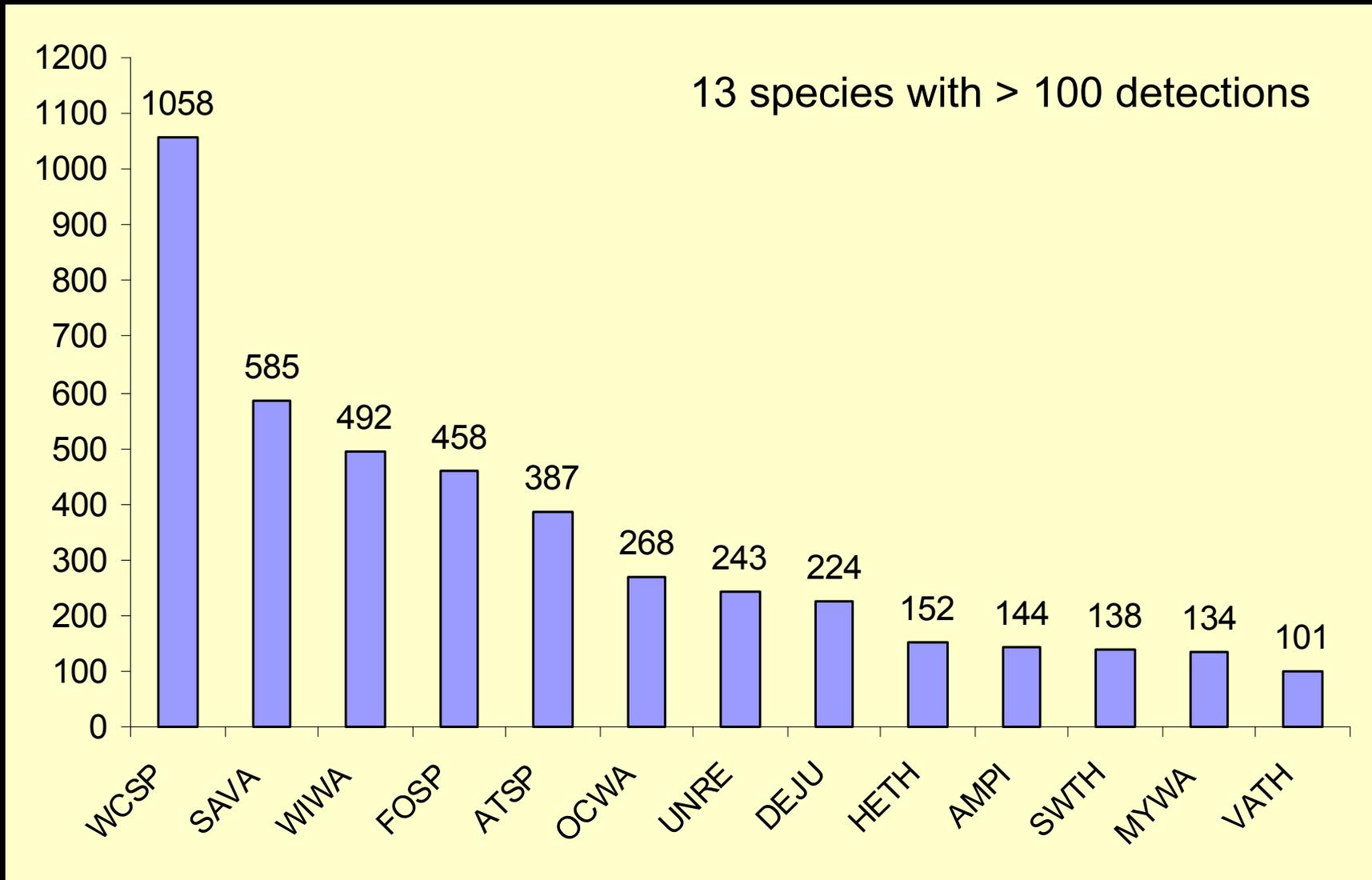
Species Composition: 54 species detected on points



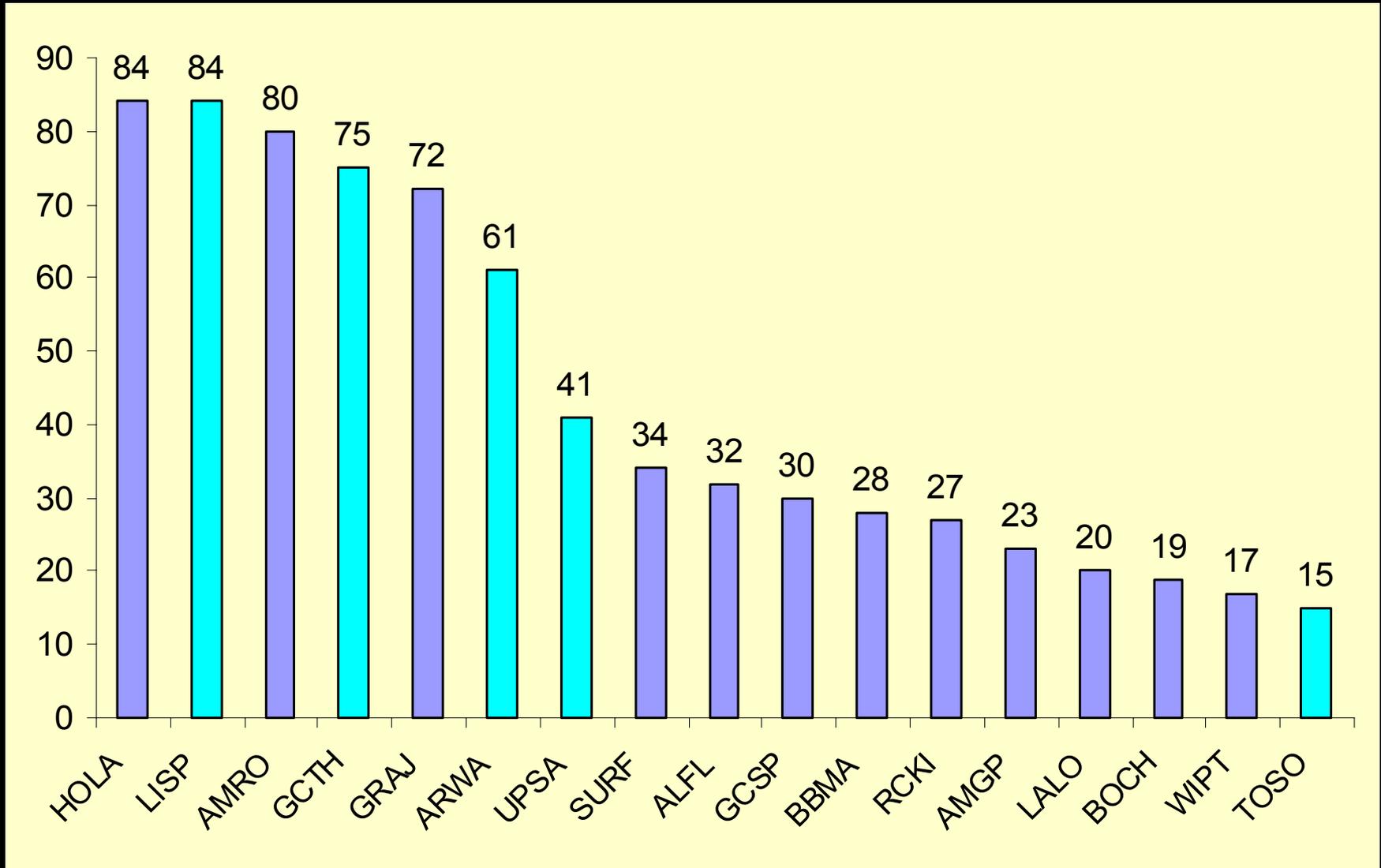
Migratory status



Most common species



Species with 15 - 85 detections, some surprises...



Proposed Monitoring Program: Denali

- ✓ Use minigrid sampling design.



Proposed Monitoring Program: Denali

- ✓ Use minigrid sampling design.
- ✓ Conduct variable circular plots at 200 points (8 grids) annually.



Proposed Monitoring Program: Denali

- ✓ Use minigrid sampling design.
- ✓ Conduct variable circular plots at 200 points each season.
- ✓ Follow standard operating procedures in the Central Alaska Network's Passerine Monitoring Protocol.



Proposed Monitoring Program: Denali

- ✓ Use minigrid sampling design.
- ✓ Conduct variable circular plots at 200 points each season.
- ✓ Follow standard operating procedures in the Central Alaska Network's Passerine Monitoring Protocol.
- ✓ Maintain long-term partnership with the Alaska Bird Observatory and Institute of Arctic Biology to monitor passerines in Denali.



Proposed Monitoring Program: Denali

- ✓ Use minigrid sampling design.
- ✓ Conduct variable circular plots at 200 points each season.
- ✓ Follow standard operating procedures in the Central Alaska Network's Passerine Monitoring Protocol.
- ✓ Maintain long-term partnership with the Alaska Bird Observatory to monitor passerines in Denali.
- ✓ Provide data to the statewide Alaska Landbird Monitoring Survey (ALMS).



Passerine Bird Monitoring Protocol

Guide to Standard Operating Procedures and Supplemental Materials

Before and After the Field Season

SOP#1

Before the Field Season

Appendix X.
Bird Species

Appendix X.
Data Forms

SOP#2

Hiring and Training Observers

Appendix X.
Training Manual

SOP#3

Preparing Maps, Images and Sampling Point Location Tables from GIS

SOP#8

After the Field Season

During the Field Season

SOP#4

Using GPS to Navigate and Mark Waypoints

SOP#5

Selecting Campsites and Establishing a Base-Camp

SOP#6

Conducting the Variable Circular Point Count

SOP#7

Marking Permanent Monitoring Points

Data Management, Analysis and Reporting

SOP#9

Data Management

SOP#10

Data Analysis

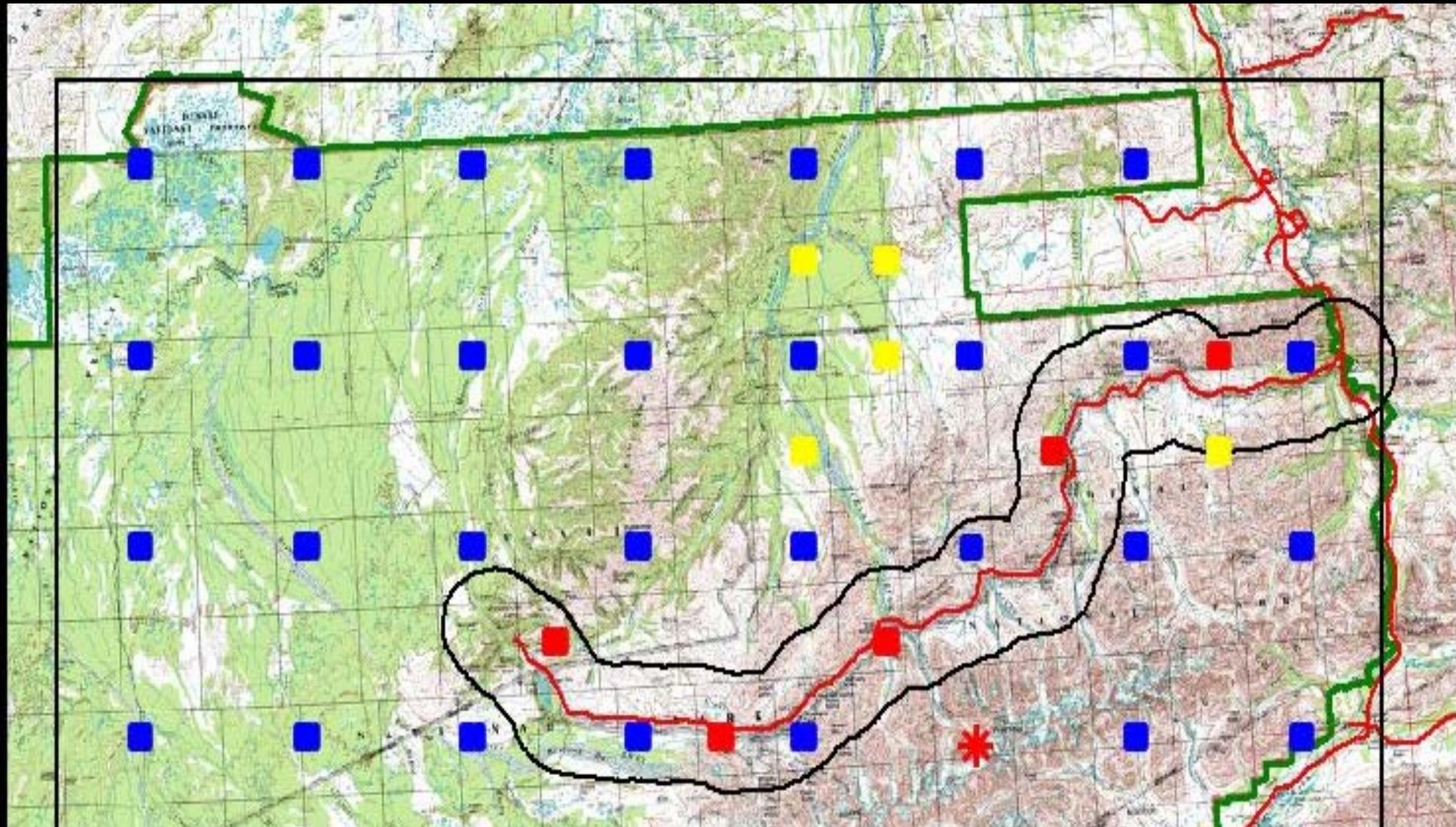
SOP#11

Reporting

SOP#12

Revising the Protocol

Proposed sampling universe



Panel	Sampling Occasion																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X					X	X					X	X					X	X
3		X	X					X	X					X	X					X
4			X	X					X	X					X	X				
5				X	X					X	X					X	X			
6					X	X					X	X					X	X		
7	X					X	X					X	X					X	X	
8	X													X						
9		X													X					
10			X													X				
11				X													X			
12					X													X		
13						X													X	
14							X													X
15								X												
16									X											
17										X										
18											X									
19												X								
20													X							

Where are we now?

- Developed long-term monitoring proposal.
 - Collaboration with NPS, USGS, UAF, and W.E.S.T. Inc.
 - Peer review in Winter 2005.
 - Review protocol after the peer review.
 - Implement program in Denali in 2005/2006.
 - Awaiting word from other CAKN parks for passerine monitoring work.

Where are we now?

- Winter 2005, data analysis and reporting plans with Ed Debevec, UAF and Karen Oakley
USGS:
 - Determine detection functions for different habitats and different species.
 - Calculate abundance estimates using DISTANCE.
 - Produce summary report.
 - Start work on bird-habitat relationships.

