

Descriptive data

SSA 200

Looking back

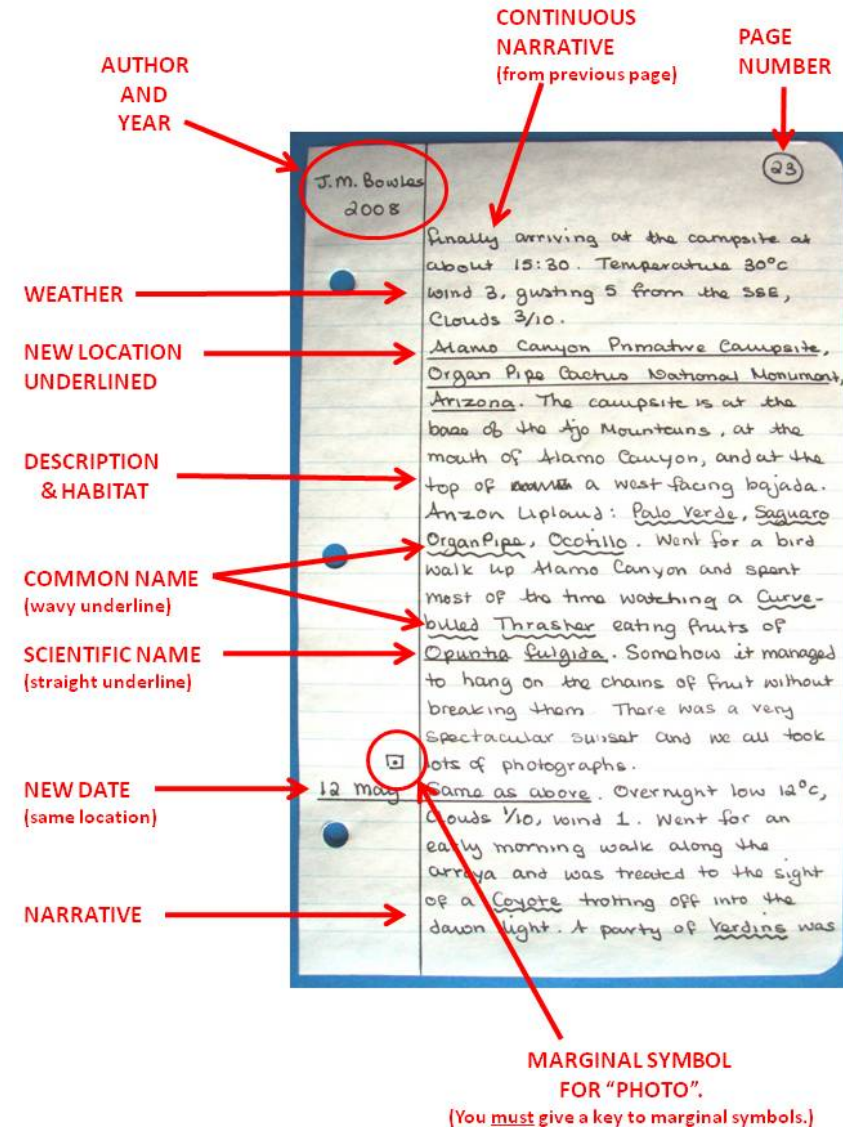
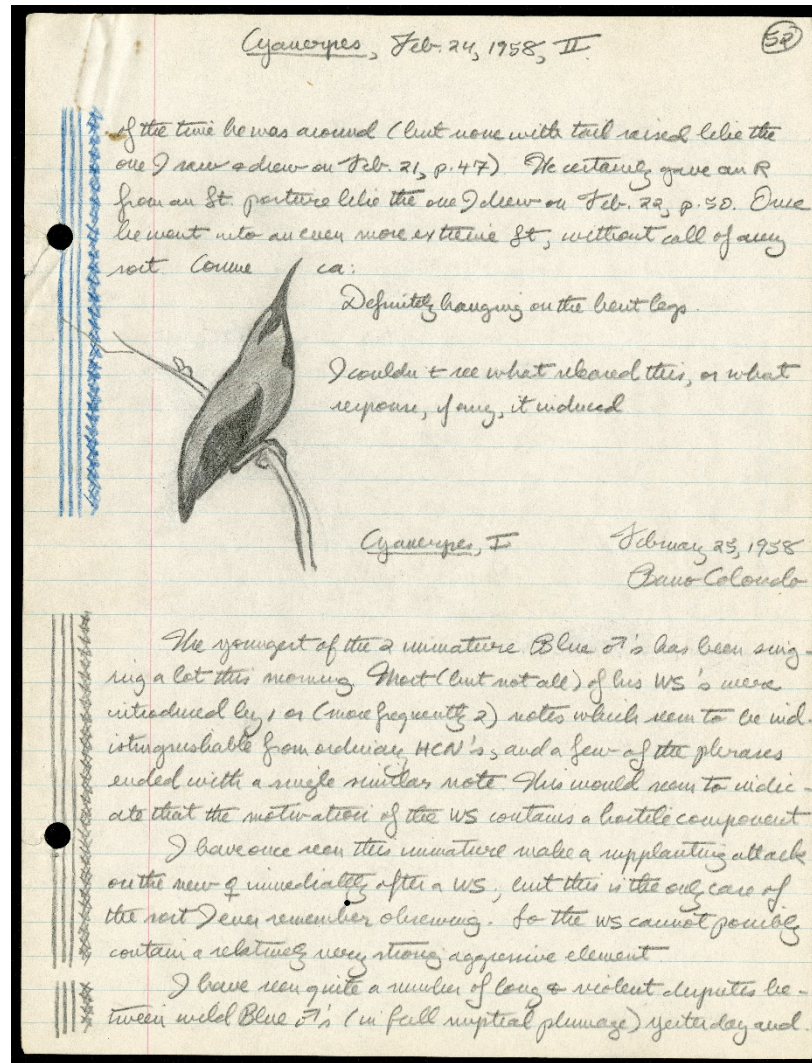
- Introduction to SSA course has content on how to conduct descriptive SSA analysis
- Use descriptive data to assess the current redundancy and resiliency

	Current population state	Future state	Current			
1	declining	extinct	% declining	% stable	% increasing	% extinct
2	stable	declining	37.5	37.5	25	0
3	increasing	increasing				
4	declining	extinct				
5	declining	declining	Future			
6	increasing	stable	% declining	% stable	% increasing	% extinct
7	stable	stable	25	25	25	25
8	stable	increasing				

A more quantitative approach...?

- Convert descriptors into categories or “states”
 - Words describing high abundance are grouped together; words describing moderate abundance are grouped together...etc.
 - “many”, “abundant”, “Plethora”... → same category
 - “some”, “several”, “moderate”... → same category
 - “Few”, “not abundant”, “scant”... → same category

Field notes or similar data sources



“data” conversion

Site		1993	1994	1995	
	1	many	many	many	ma
	2	few	few	few	few
	3	none	none	none	no
	4	few	several	many	ma
	5	few	several	several	se
	6	many	abundant	lots	lot
	7	lots	many	abundant	ab
	8	abundant	plethora	spuerflous	spi
	9	not abundant	scant	derth	de



Site		1993	1994	1995	
	1	3	3	3	
	2	1	1	1	
	3	0	0	0	
	4	1	2	3	
	5	1	2	2	
	6	3	3	3	
	7	3	3	3	
	8	3	3	3	
	9	1	1	1	

Example – pulling from field notes

- Descriptive accounts of what was observed

Site	1993	1994	1995	
1	many	many	many	ma
2	few	few	few	few
3	none	none	none	no
4	few	several	many	ma
5	few	several	several	sev
6	many	abundant	lots	lot
7	lots	many	abundant	ab
8	abundant	plethora	spuerflous	sp
9	not abundant	scant	derth	de

Example – how did the sites change?

- Descriptive accounts of what was observed

Site	1993	1994	1995	
1	many	many	many	ma
2	few	few	few	few
3	none	none	none	no
4	few	several	many	ma
5	few	several	several	sev
6	many	abundant	lots	lot
7	lots	many	abundant	ab
8	abundant	plethora	spuerflous	spi
9	not abundant	scant	derth	de

Moving from ‘few’ to ‘several’ at site 4 is called a “state transition”

Probability of transitions

- What is the probability of moving from category 1 to 2 or 1 to 3 or 1 to 0?

Site	1993	1994	1995	1996
1	3	3	3	1
2	1	1	1	1
3	0	0	0	0
4	1	2	3	1
5	1	2	2	1
6	3	3	3	1
7	3	3	3	1
8	3	3	3	1
9	1	1	1	1

6 total state 1 transitions

1->1 happened 4 times

1->2 happened 2 times

1->3 happened 0 times

1->0 happened 0 times

Linking state transitions to the environment

- Develop an assessment of species needs by linking status transitions to environmental variables
 - What environmental factors affect state transitions?
 - How do we estimate or quantify any potential relationships?

Regression modeling

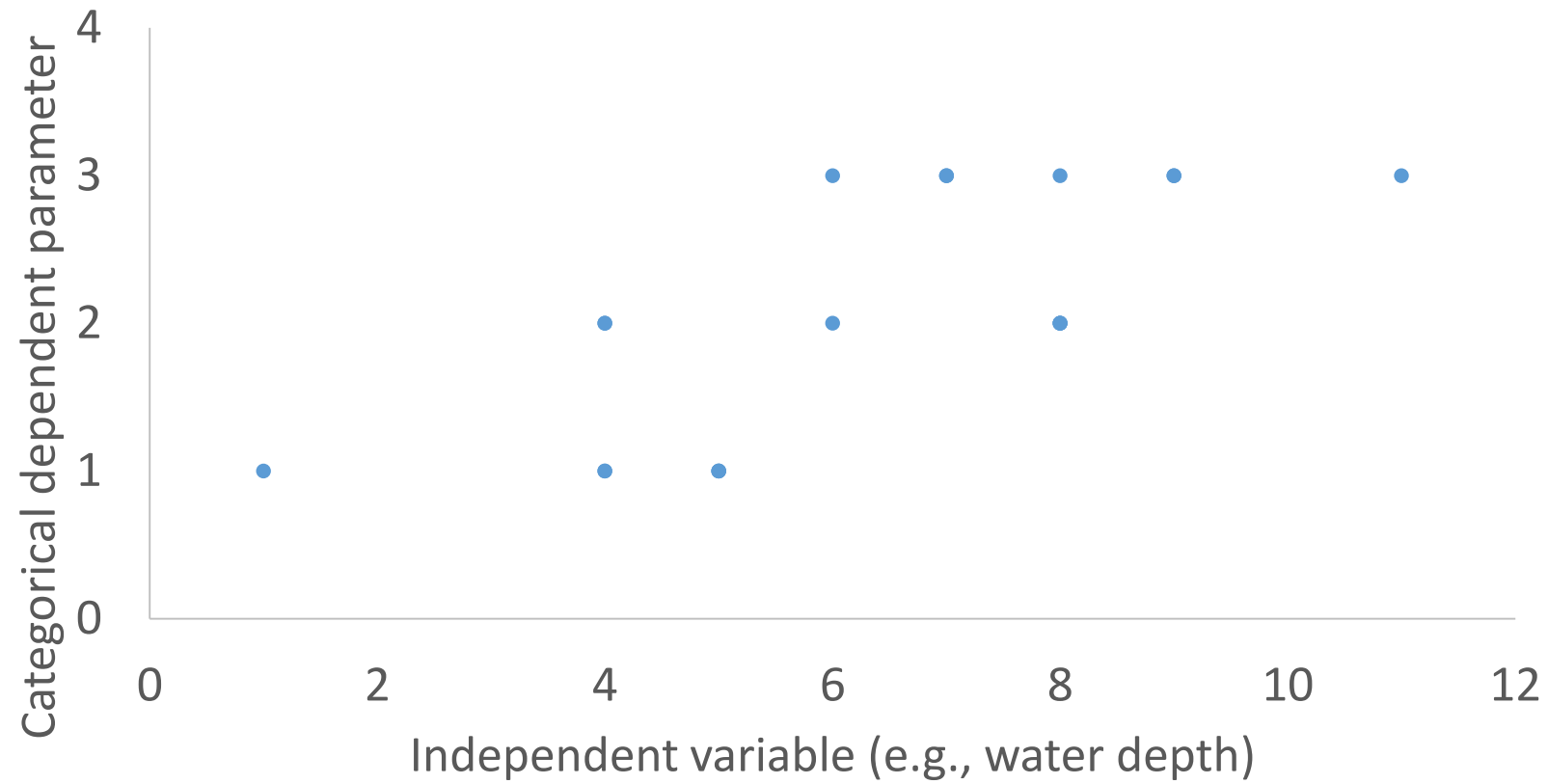
$$y = a + b_1x$$

- Abundance = minimum elevation + (0.237 x elevation)

$$y = a + b_1x + b_2z + b_3k$$

- Abundance = minimum elevation + (0.237 x elevation) + (0.002 x aspect) + (0.01 x canopy cover)
- With categorical data we can use a special type of regression called a Multinomial Regression

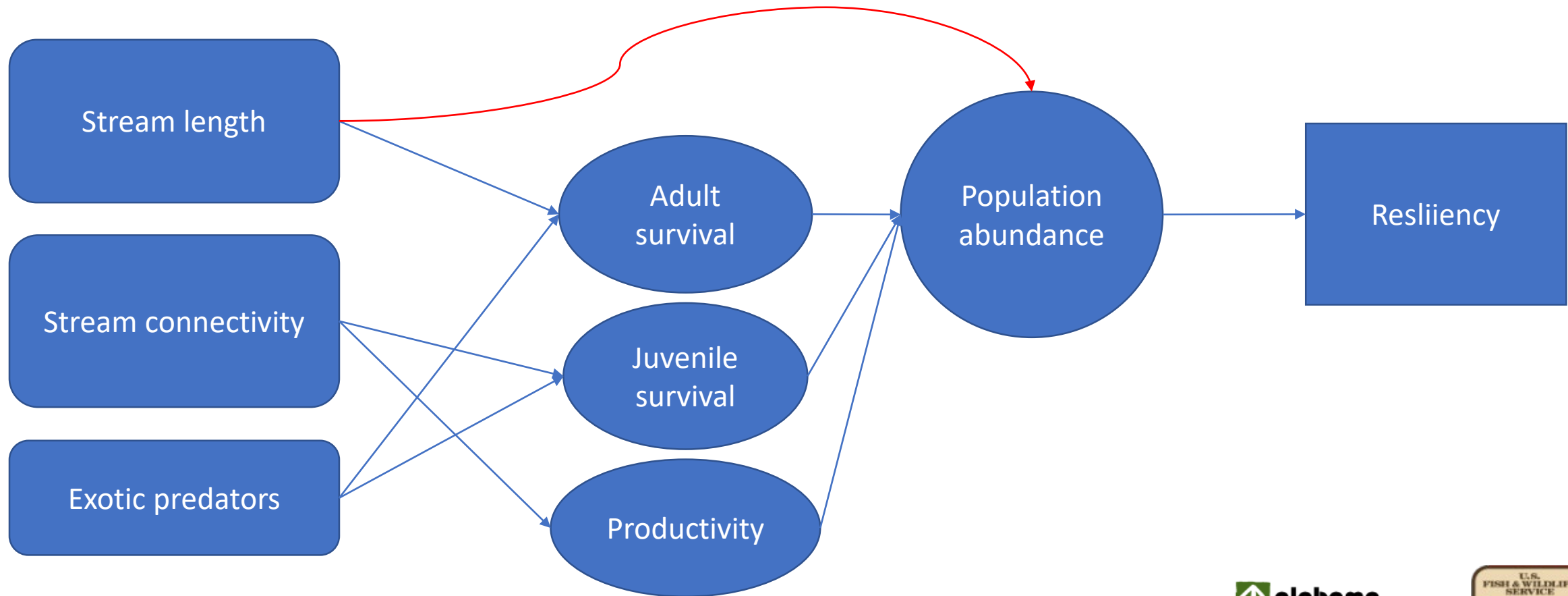
Categorical plot



Expert elicitation data

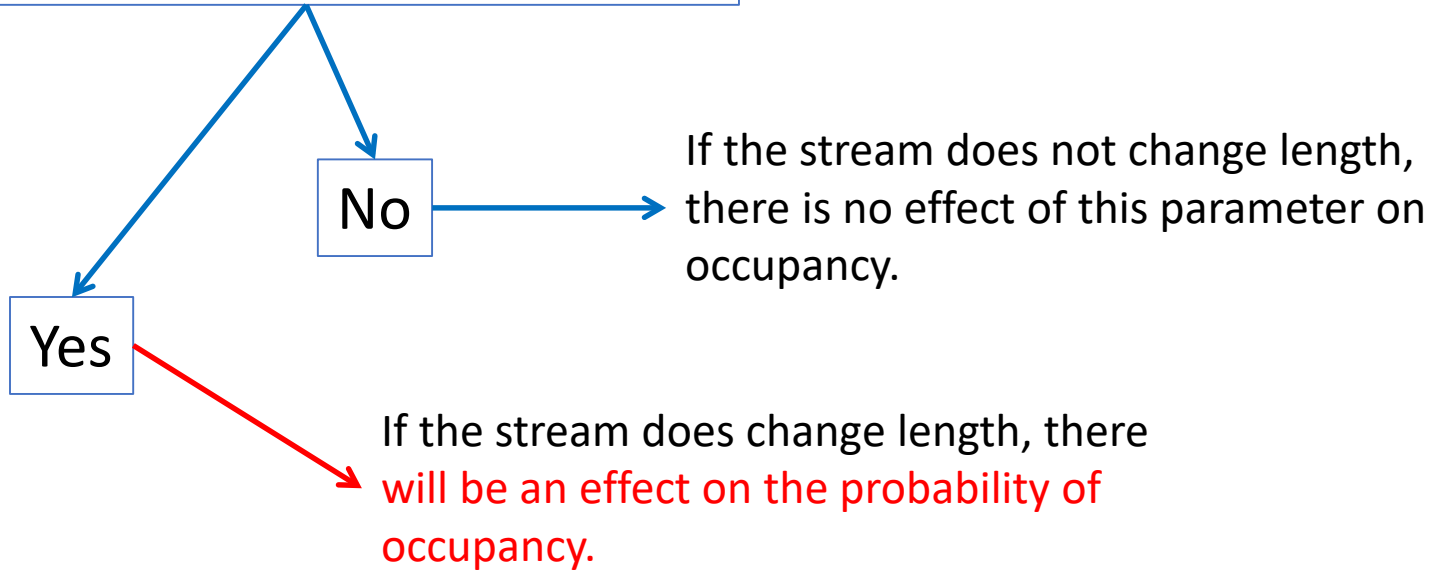
- In the absence of good quantitative data, an expert elicitation might be warranted
 - Use expert knowledge as the basis for establishing what a species needs
 - Crafting questions to assess functional relationships
 - E.g., asking for probability of y occurring at three or more values of x
 - Using variation among experts to “estimate” uncertainty and variability

Elicited conceptual model to establish species needs

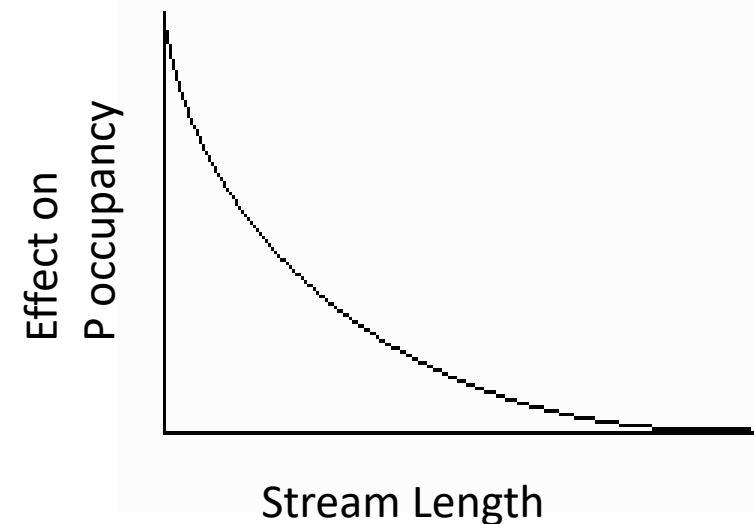


What is the stream length?
Stream Length
Change?

A stream may change length over time



We think the relationship between stream length and occupancy probability is curvilinear, a negative exponential relationship. The longer a stream is, the less it effects occupancy.



Headwater chub stream length and extinction risk

