Descriptive data

SSA 200

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

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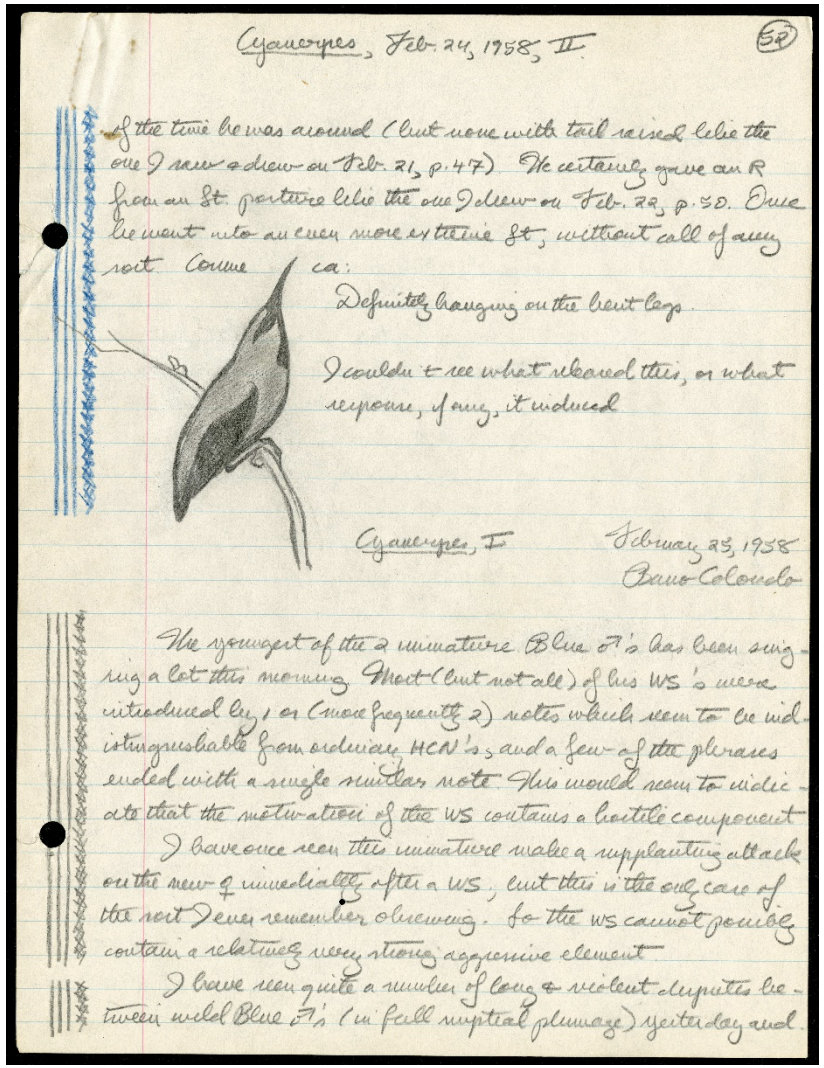
A more quantitative approach…?

- 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



Cyanerpes, Feb. 24, 1958, II

(52)

of the time he was around (but none with tail raised like the one I saw & drew on Feb. 21, p. 47). He certainly gave an R from an St. posture like the one I drew on Feb. 22, p. 50. Once he went into an even more extreme St, without call of any sort. Comme ca:

Definitely hanging on the bent legs.

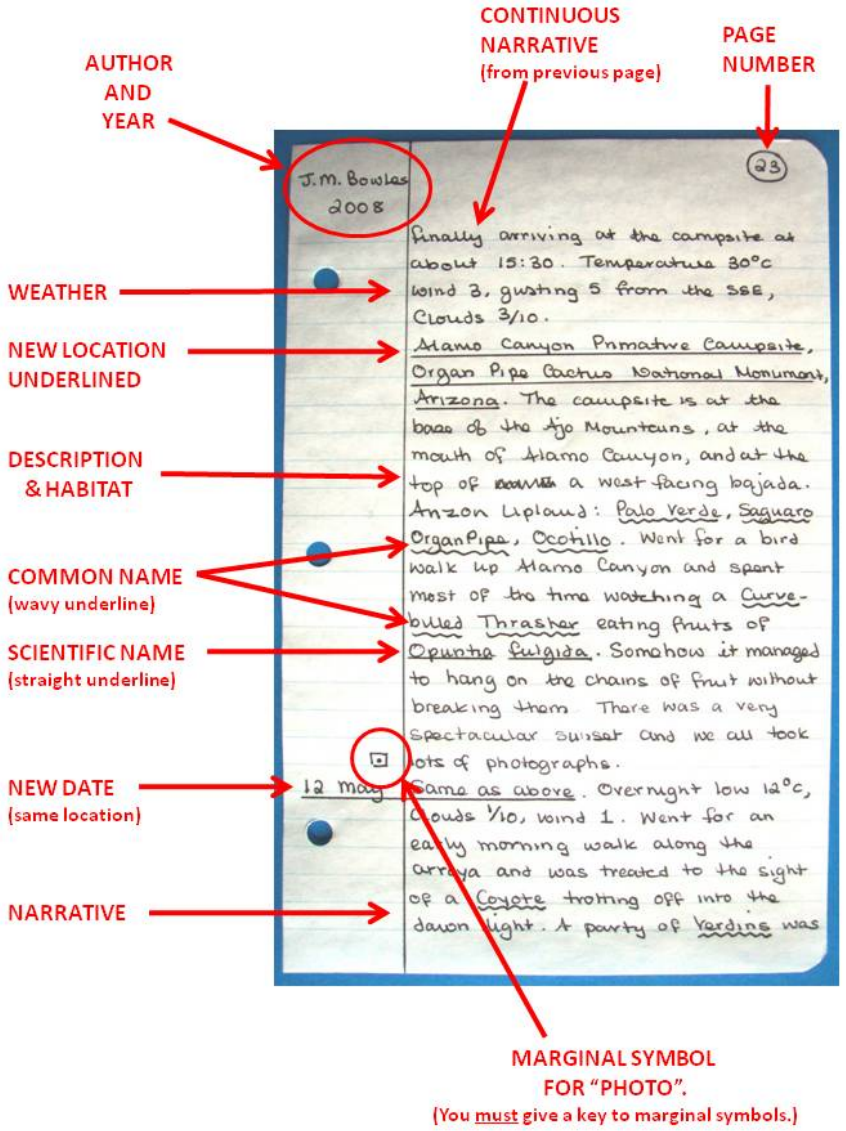
I couldn't see what released this, or what response, if any, it induced.

Cyanerpes, I — February 25, 1958 — Barro Colorado

The youngest of the 2 immature Blue ♂'s has been singing a lot this morning. Most (but not all) of his WS's were introduced by 1 or (more frequently) 2 notes which seem to be indistinguishable from ordinary HCN's, and a few of the phrases ended with a single similar note. This would seem to indicate that the motivation of the WS contains a hostile component.

I have once seen this immature make a supplanting attack on the new ♂ immediately after a WS, but this is the only case of the sort I ever remember observing. So the WS cannot possibly contain a relatively very strong aggressive element.

I have seen quite a number of long & violent disputes between wild Blue ♂'s (in full nuptial plumage) yesterday and



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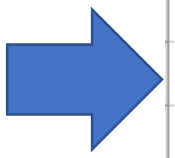
“data” conversion

Site	1993	1994	1995	
1	many	many	many	ma
2	few	few	few	fev
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	spı
9	not abundant	scant	derth	de



Site	1993	1994	1995	1
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	

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Example – pulling from field notes

- Descriptive accounts of what was observed

Site	1993	1994	1995	
1	many	many	many	ma
2	few	few	few	fev
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	spu
9	not abundant	scant	derth	de

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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	fev
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	spu
9	not abundant	scant	derth	de

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

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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	1
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	

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

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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

$$y = a + b_1 x$$

- Abundance = minimum elevation + (0.237 x elevation)

$$y = a + b_1 x + b_2 z + b_3 k$$

- 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

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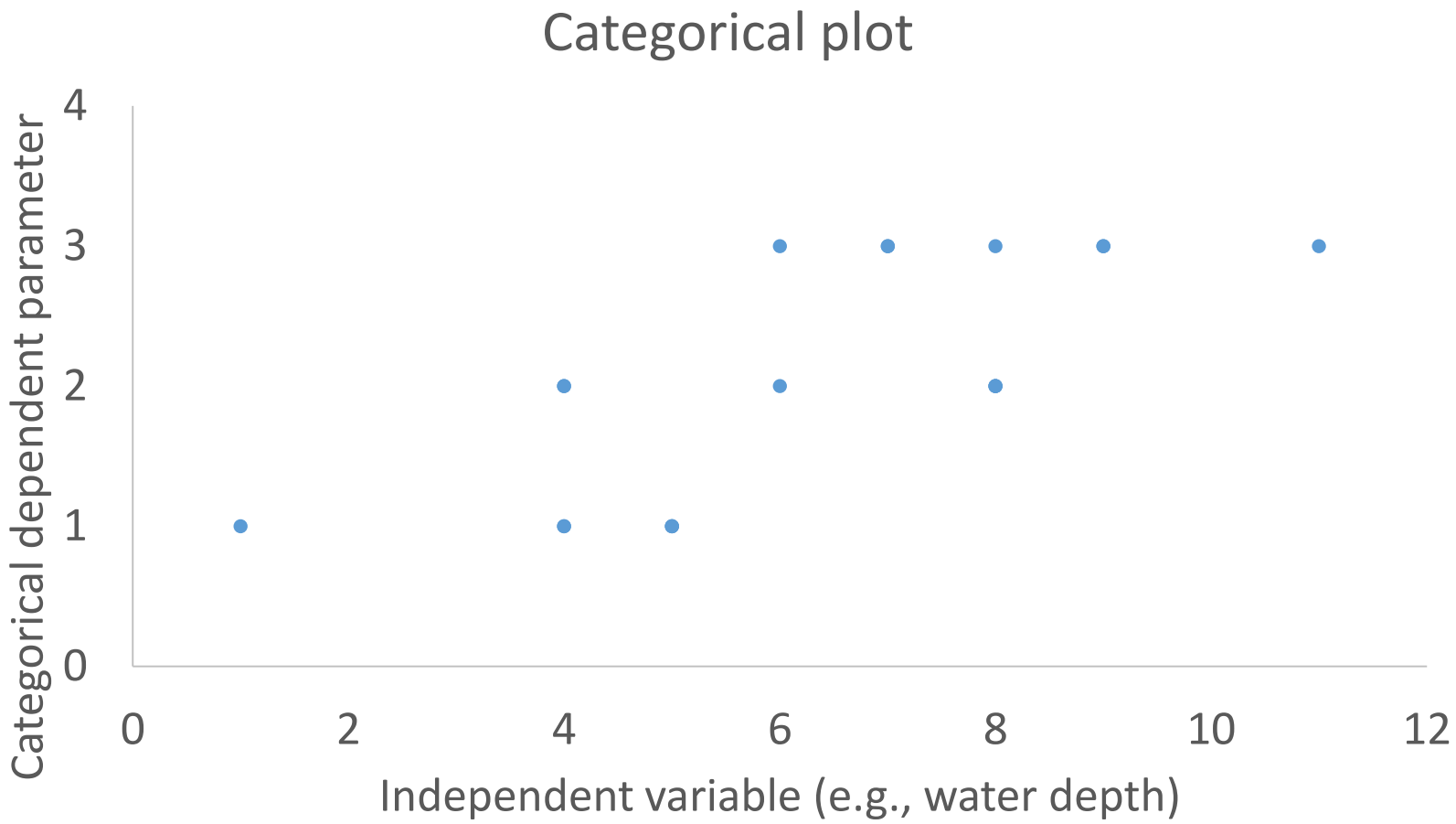

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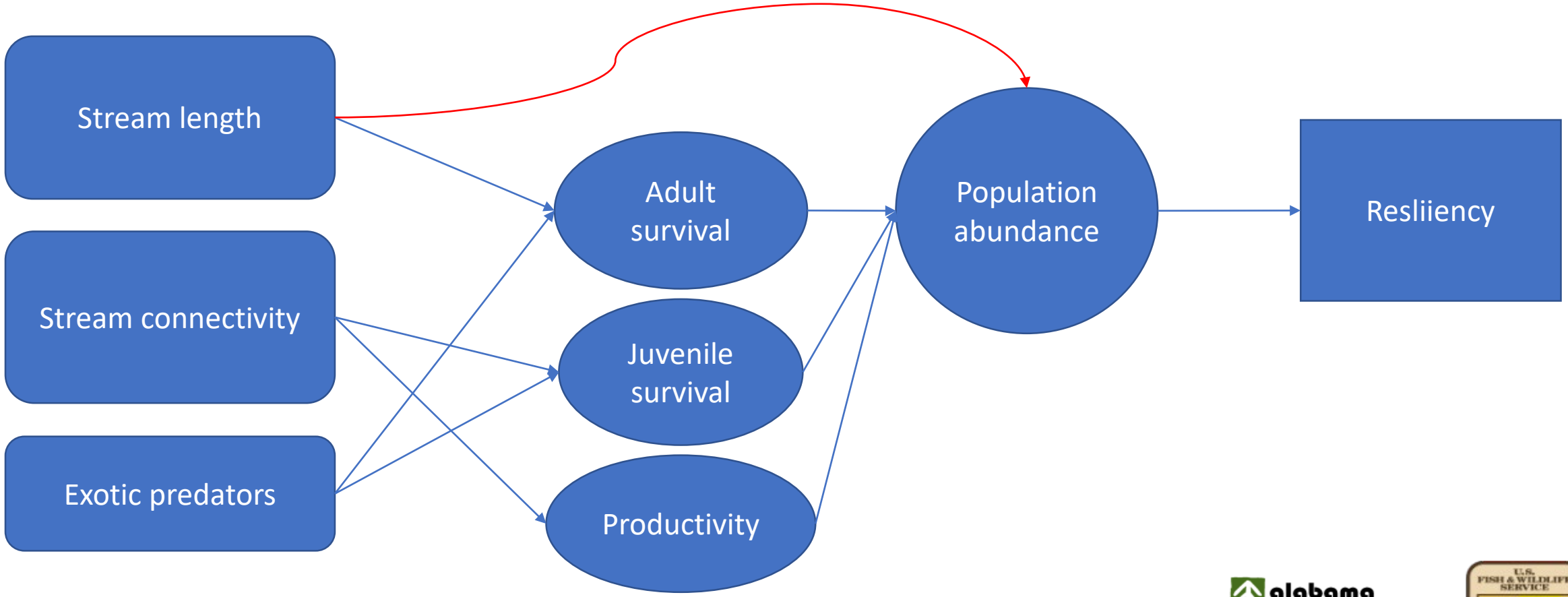
Expert elicitation data

- 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



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What is the stream length?
Stream Length
Change?

A stream may change length over time

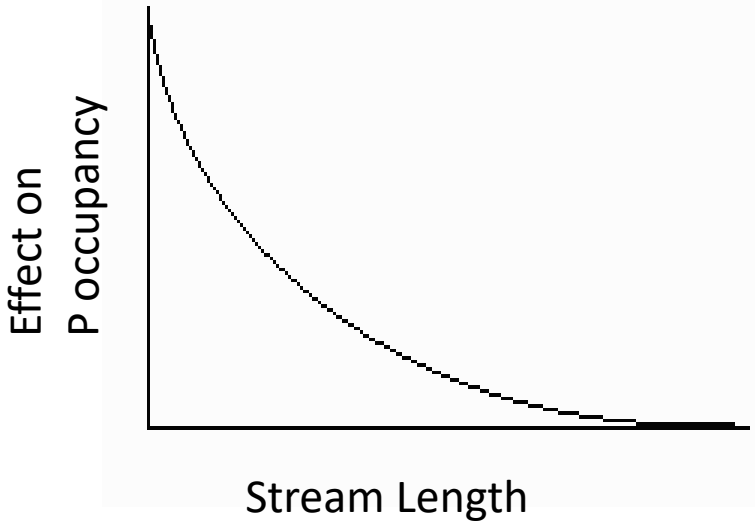
No

If the stream does not change length, there is no effect of this parameter on occupancy.

Yes

If the stream does change length, there will be an effect on the probability of occupancy.

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.



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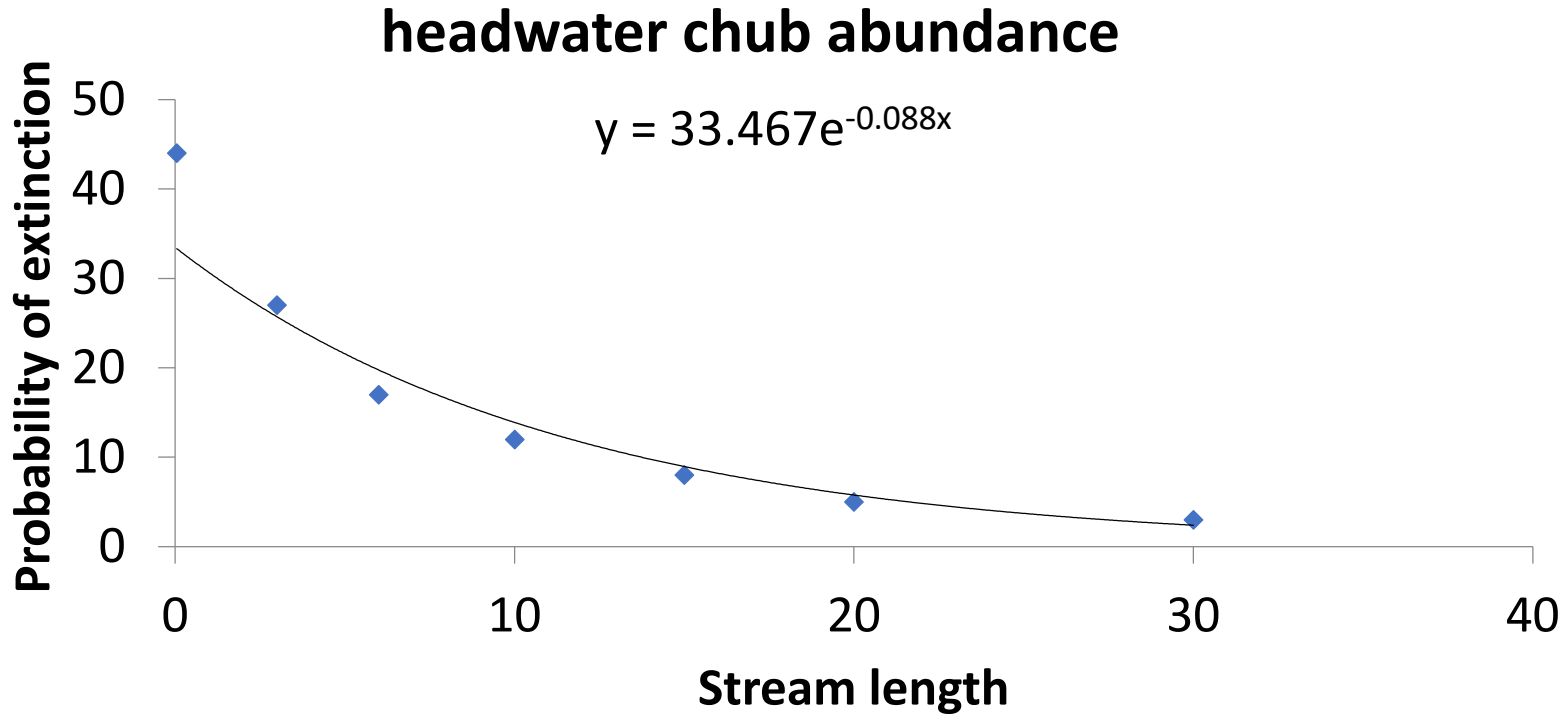
Headwater chub stream length and extinction risk



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