



# Creating an Effective and Winning Poster

## Topics:

- What is it?
- It's all about style
- What should a poster include?
- Examples
- Resources
- Bonus: Seven questions every good proposal MUST answer



# What is it?

- A poster is NOT a paper NOR a proposal
- It is a little of both!
- An Intermediate report on *your* research
- It does not have the same restrictions as either a paper or a proposal
  - Cost and schedule
  - The final answer
- It is a vehicle to *engage your colleagues* in discussing your research



# It is all about style....

- Fewest words – more figures
  - Words:figures:white space 25:50:25
  - You can be briefer in the poster because you will be present to explain and engage people
- Keep text to the bare essentials:
  - Abstracts are unnecessary
  - References are probably unnecessary
  - Use “Bullets” to convey points where ever possible
- Make the font and pictures legible from at least 4 feet away – including axis labels
- Plain English for none subject matter experts
- Keep it well organized – make obvious the point of each section of the poster
  - Boxed sections can draw people to key messages
- Left-to-right, top-to-bottom organization



# What should a poster include?

Seven and a half questions every good poster MUST answer

1. What hypothesis is being tested?
2. Why is it original?
3. Why is this research important?
4. Why is it important to JPL?
5. How did you test the hypothesis?
6. What results do you have?
7. What are the next steps?
8. What should we conclude?



# Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Godwin and Russell Borski

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## Introduction

Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information that might increase the ratio of female flounder is important for aquaculture.

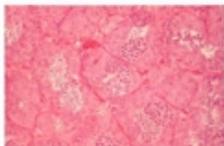
## Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

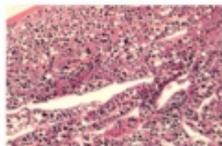
## Methods

- Southern flounder broodstock were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were weaned from a natural diet (rotifers/*Artemia*) to high protein pelleted feed and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal densities into one of three temperatures 18, 23, or 28°C for 245 days.
- Gonads were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

## Histological Analysis

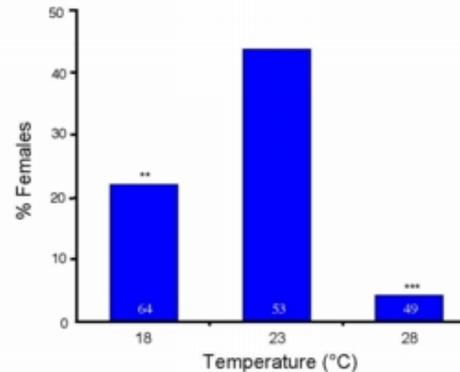


Male Differentiation



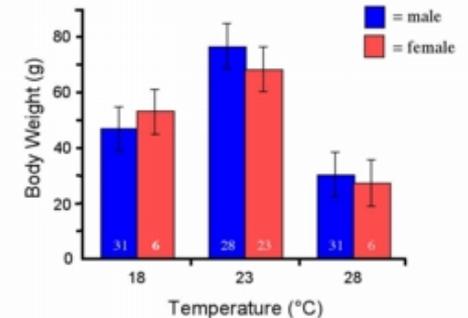
Female Differentiation

## Temperature Affects Sex Determination



(\*\*P < 0.01 and \*\*\*P < 0.001 represent significant deviations from a 1:1 male:female sex ratio)

## Growth Does Not Differ by Sex



## Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperature produced 4% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

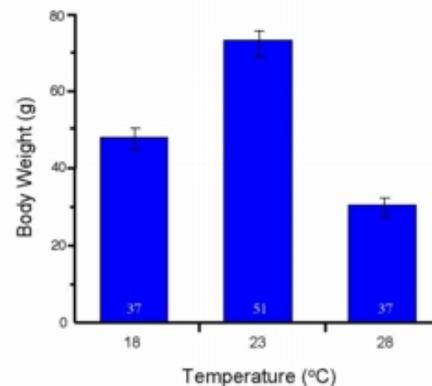
## Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

## Acknowledgements

The authors acknowledge the Saltonstall-Kennedy Program of the National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Lea Ware and Beth Shimps for help with the work.

## Rearing Temperature Affects Growth





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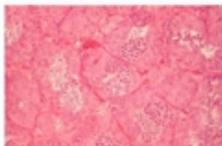


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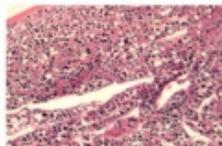
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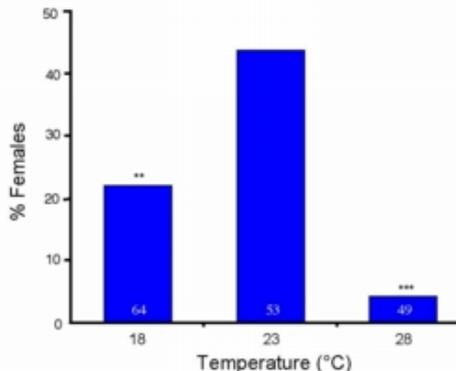


Male Differentiation



Female Differentiation

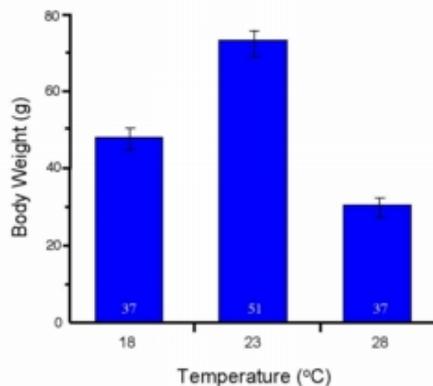
## Temperature Affects Sex Determination



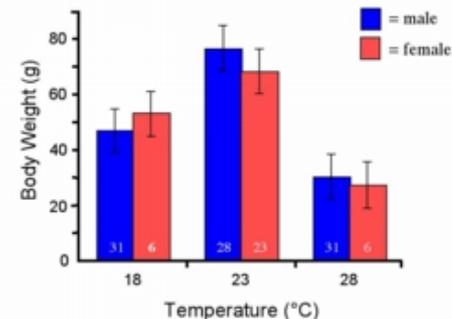
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## Rearing Temperature Affects Growth



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# Can Suburban Greenways Provide High Quality Bird Habitat?

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Christopher E. Moorman, Jamie H. Mason, Kristen E. Sinclair, Salina K. Kohut :: NC State University :: Department of Forestry & Environmental Resources  
[www4.ncsu.edu/~grhess/GreenwaysForWildlife](http://www4.ncsu.edu/~grhess/GreenwaysForWildlife)



## Birds of Conservation Concern in Decline

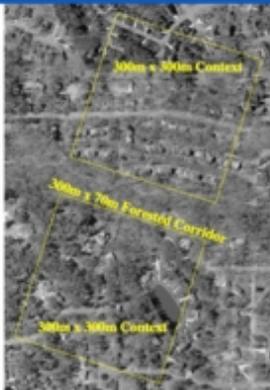
- Many bird species of conservation concern – including neotropical migrants, insectivores, and forest-interior specialists – decline with increasing human development
- Greenways might mitigate this effect
- Habitat patch size, vegetation composition & structure, and landscape context are key factors
- Standards are lacking for designing and managing suburban greenways as high quality habitat

## Objective: Greenways for the Birds

- Determine how development-sensitive forest birds are affected by
  - forested corridor width
  - adjacent development intensity
  - vegetation composition & structure
- Develop recommendations for greenway designers and planners

## Study Design & Independent Variables

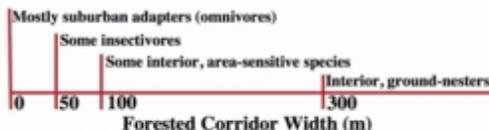
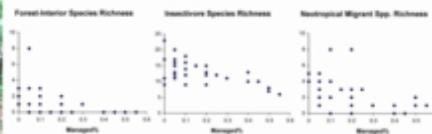
- Sampled 34 - 300m corridors in Raleigh & Cary, NC, USA
- Sampled range of
  - Forested corridor widths (20 – 1,200m)
  - Adjacent density (low density residential – office/commercial)
- Additional measures
  - Vegetation composition & structure in corridor
  - Land cover in 300m x 300m adjacent to corridor (context)
- Measured richness & abundance of
  - Breeding birds
  - Neotropical migrant birds during stopovers
  - Mammal nest predators



## Breeding Birds of Concern More Common in Wider Greenways with Less Managed Area Surrounded by More Forest Canopy



- 8-minute, 50m point counts at center of corridor
- Revisited 4 times during breeding season

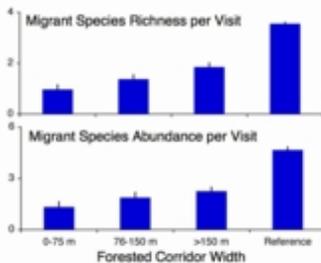


### Significant Predictors for Breeder Abundance

- |                  |                            |
|------------------|----------------------------|
| <b>Greenway:</b> | <b>Adjacent Landscape:</b> |
| (-) Managed Area | (+) Canopy Cover           |
| (+) Shrub Cover  | (-) Building Density       |
|                  | (-) Bare Earth             |

## Spring Neotropical Migrant Stopovers More Common in Wider Greenways with More, Taller Hardwood Trees

- 200m x 25m transects along one side of greenway path
- Revisited sites for two spring seasons and one fall season
- Width *not* significant, but trend consistent with other findings

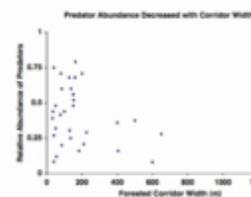


### Significant Predictors for Spring Migrant Abundance

- |                   |                            |
|-------------------|----------------------------|
| <b>Greenway:</b>  | <b>Adjacent Landscape:</b> |
| (+) % Hardwoods   | (-) Bare Earth             |
| (+) Canopy Height |                            |

## Nest Predators Less Common in Wider Greenways with Narrower Paths

- Five baited scent stations along each greenway segment
- Observed for 5 nights each



### Significant Predictors for Predator Abundance

- |                    |                            |
|--------------------|----------------------------|
| <b>Greenway:</b>   | <b>Adjacent Landscape:</b> |
| (-) Corridor width | (-) Building density       |
| (+) Trail width    |                            |
| (+) Mature forest  |                            |
| (+) Ground cover   |                            |
| (-) Vine cover     |                            |

## Greenways for Development-Sensitive Forest Birds Might Conflict with Intense Recreational Use

### People & Managers Prefer ...



- Good for walking, running, cycling, strollers, wheelchairs
- Easier to maintain, especially with higher intensity use

### Forest Birds Prefer ...



- Narrow path avoids splitting forested corridor
- Discourages heavy human use
- Fewer nest predators

## Potential Solution: Wide Corridor, Trail Near Edge

- Make corridors at least 50m wide; wider is better
- Don't split forested corridor
  - Keep trails as narrow as possible
  - Avoid wide grassy areas along trails within forested corridor
  - Locate trails near the edge of forested corridors

Technology. Government sponsorship acknowledged.



# Resources

- <http://www.ncsu.edu/project/posters/NewSite/>
- <http://people.eku.edu/ritchisong/posterpres.html>
- There are many more!!



# Seven Questions Every Good Proposal MUST Answer (after Mous Chahine)

- What are you trying to do?
- How is it done today?
- What are the limitations of the current practice?
- What is new in your approach and why do think it can succeed?
- How long will it take?
- How much will it cost?