

The background of the slide is an underwater photograph of a seagrass bed. The water is a clear, light blue-green. The seagrass consists of many long, thin, green blades that are swaying. A dark, semi-transparent diagonal shape, resembling a large triangle, cuts across the image from the top-left corner towards the bottom-right. The text is positioned within the dark area on the left side.

PIPEFISH PARENTAL CARE RESEARCH

WHAT ARE PIPEFISH?

- We are looking at *S. fuscus*
aka Northern Pipefish
 - One of their distinct trait is that males get pregnant
 - *S. fuscus* also have been found to mate monogamously



PIPEFISH IN NEW YORK CITY

- What do pipefish have to do with urban ecology?
 - *S. fuscus* are native to New York! That's what!
- Pipefish are an indicator of ecosystem health



NYC skyline taken by NewsWeek (2019)

WHY ARE WE STUDYING THEM?

- Studying male pregnancy is important for research into sexual selection
 - Sexual selection is the evolutionary preference of certain traits through competition for mates



Northern Pipefish, Hudson River Park (nd)

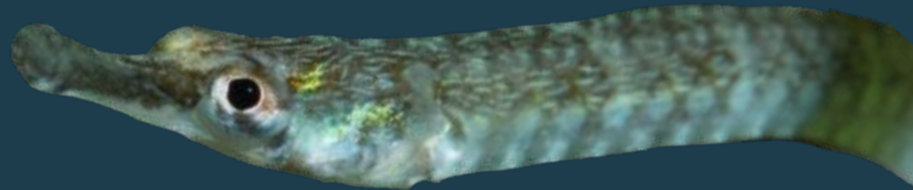
AIMS OF OUR RESEARCH

Aim 1:

We aim to investigate the level of male investment in *S. fuscus* reproduction.

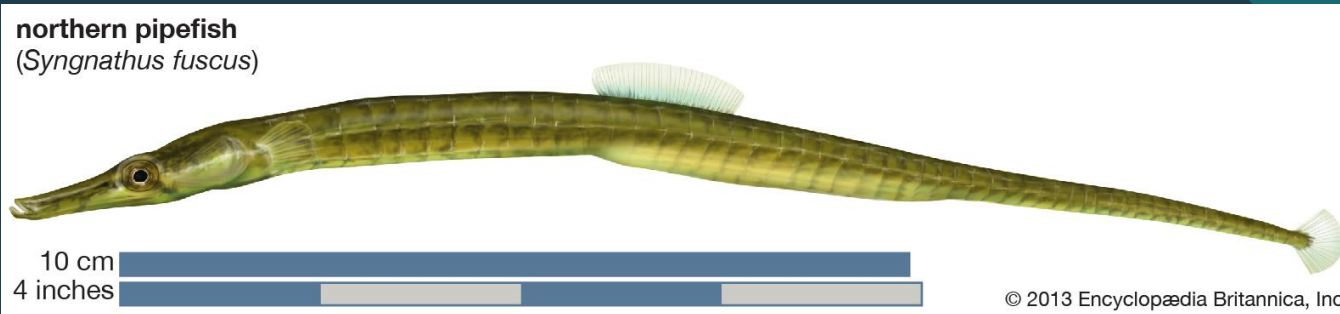
Aim 2:

We aim to confirm that *S. fuscus* is monogamous and hypothesize that it is due to lack of mate availability.



FORMS OF PARENTAL INVESTMENT

- Lecithotrophy: Embryo receives nutrition from yolk within the egg
- Patrotrophy: Nutrient transport from father to offspring during pregnancy



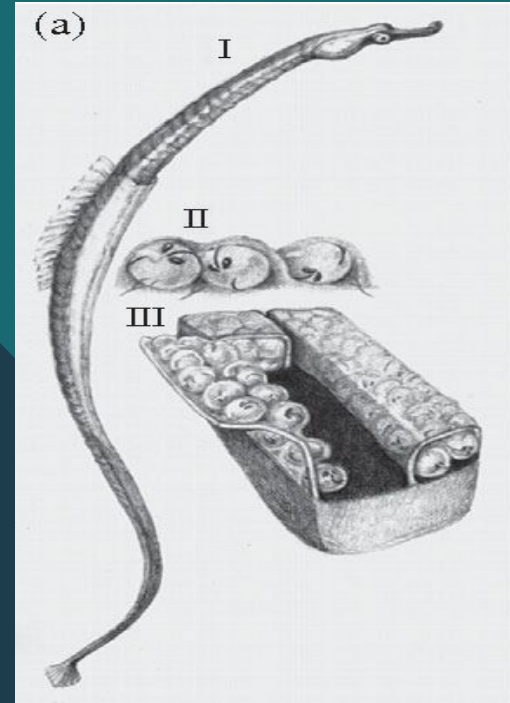
Pipefish,
Encyclopedia
Britannica (2014)

PATROTROPHIC INDEX & MALE INVESTMENT

- Lecithotrophic species' offsprings are ~70% the weight of their eggs
 - > 70% → Patrotrophy

Patrotrophic Index = Fry Weight/Egg Weight

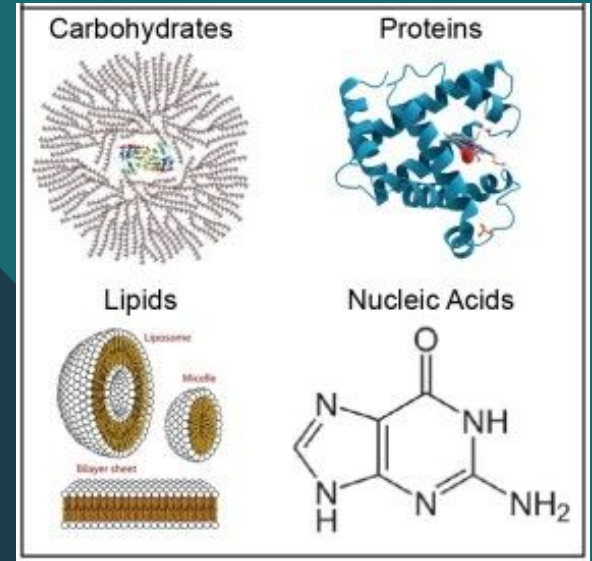
Male Investment = Fry Weight - Egg Weight



*Pregnant Male Pipefish,
Ripley & Foran (2006).*

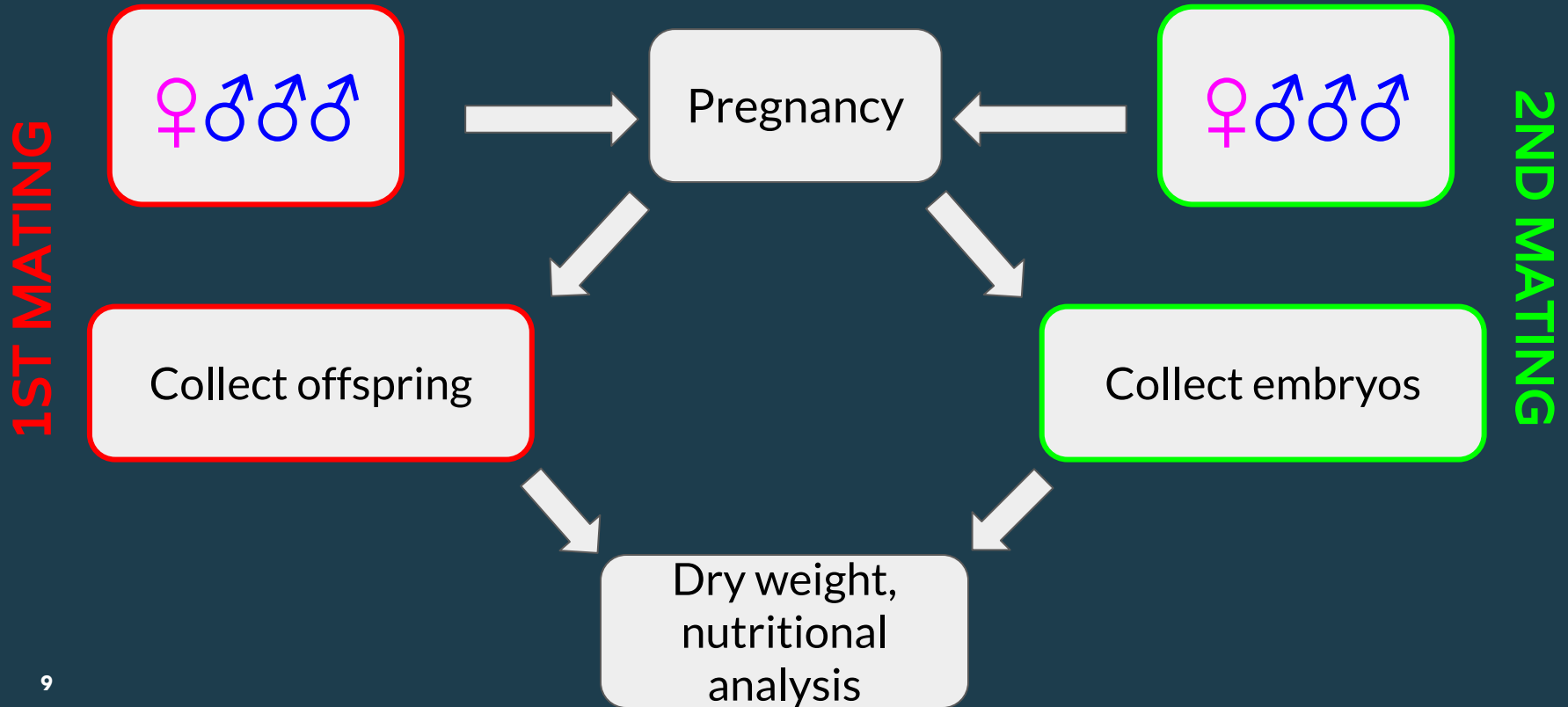
NUTRITIONAL ANALYSIS

- Nutrient poor eggs
- Determine the lipid, protein, and carbohydrate content of eggs and neonates
- Nutritional content in neonates equal or higher than content in eggs suggests male investment



*The Biomolecules of Life, N.A.
(2014).*

EXPERIMENTAL DESIGN: AIM 1



MONOGAMY

- *S. fuscus* appear to mate monogamously, contrary to other species of the same genus
- Monogamy despite high fecundity suggests that a polygamous mating strategy may be unfavorable or not possible
 - Low mate encounter rate



Northern Pipefish, N.J. Meadowlands Commission (2014).

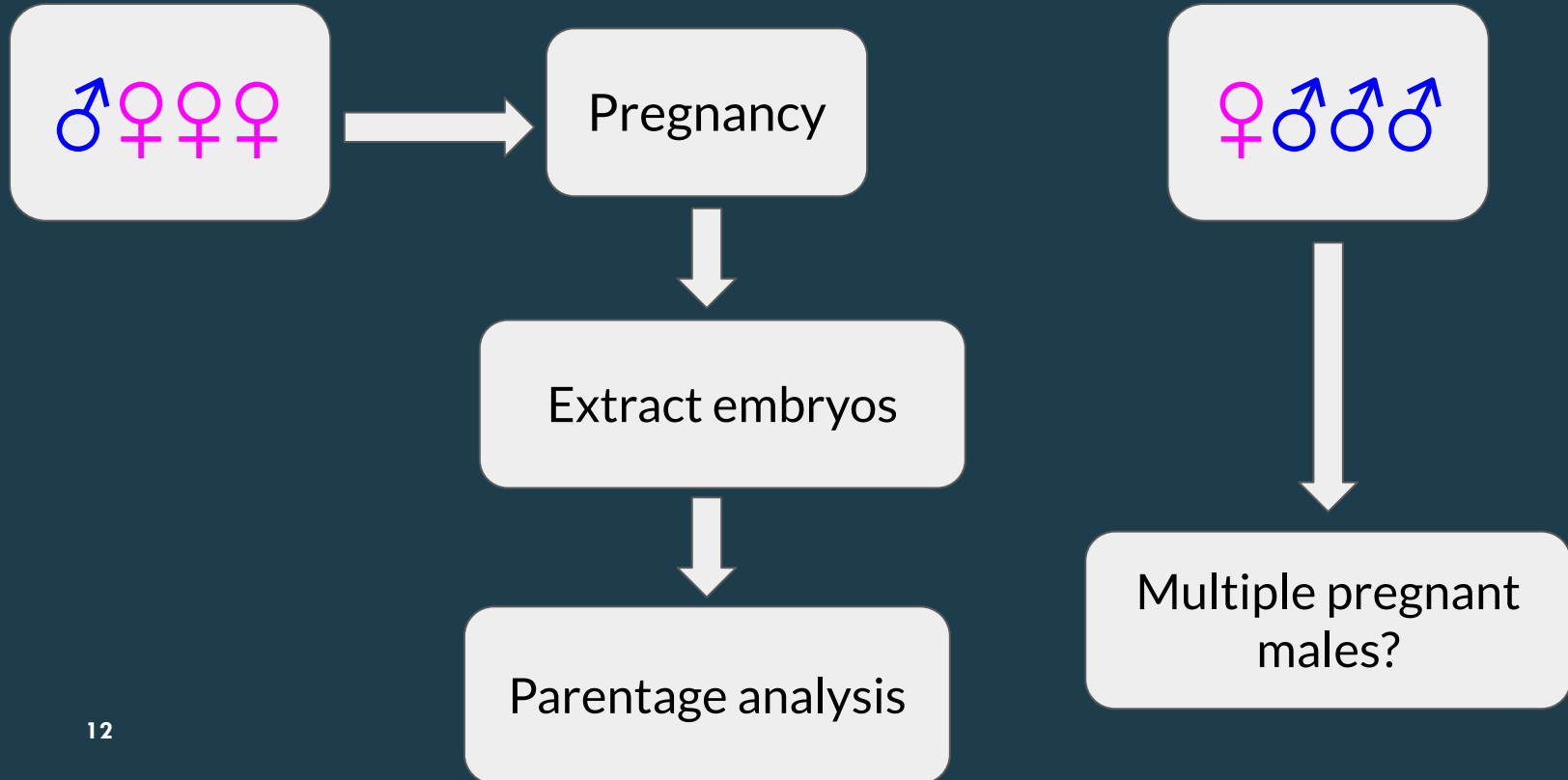
MONOGAMY

- Sex ratios will be manipulated to determine whether they will engage in polygamous mating when presented with higher partner availability
- Focal males and females will be held individually in tanks with 3 opposite sex possible mates
- Genotyping to determine parentage of offspring



A Northern Pipefish in Talbot Co., Maryland, J. Satchell (2016).

EXPERIMENTAL DESIGN: AIM 2





Thank You For Listening!
Any Questions?