AMPHIBIAN SAMPLING TECHNIQUES



WFS 433/533

LECTURE STRUCTURE

Amphibian Sampling

I. What is your Objective?

II. Sampling Methods

III. Sampling Designs

IV. Measuring & Marking

WHAT IS YOUR OBJECTIVE?

- (1) Species Occurrence
  - Post-metamorphs:
    - Call Surveys
    - Cover Boards
    - PVC Tubes
    - Area Searches
  - Larvae:
    - Minnow Traps
    - Dip Netting
      -Seines, etc.

eDNA

(2) Relative Abundance, Recruitment, Movement

- Post-metamorphs:
  - Above PLUS
  - Pitfall Sampling
- Larvae:
  - Above PLUS
  - Seine Netting
  - Enclosure Sampling

Mark-recapture

CALL SURVEYS

HTTPS://WWW.PWRC.USGS.GOV/NAAMP/INDEX.CFM?FUSEACTION=APP.PROTOCOLFRPROTOC.HTML

Begin: ≥ 30 minutes after sunset End: 1:00 am

Duration: 5 minutes

Abundance (by species):

0 = none heard
1 = individuals can be counted
2 = calls overlap but individuals can be distinguished
3 = calls overlap and individuals cannot be distinguished (full chorus)

COVER BOARDS

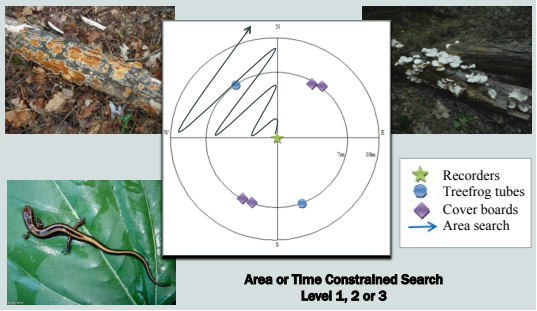
Wood vs Metal

2-4 weeks

COVERBOARDS

PVC TUBES

AREA SEARCHES

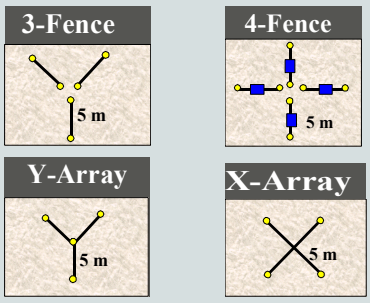


PITFALL TRAPPING

- Movement
- Interception

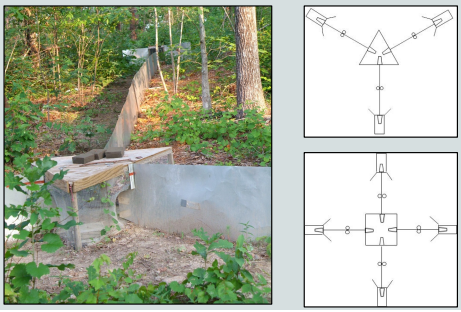
- Redirected Movement
- Capture

DRIFT FENCE AND PITFALL DESIGNS
STRAIGHT-LINE ARRAYS

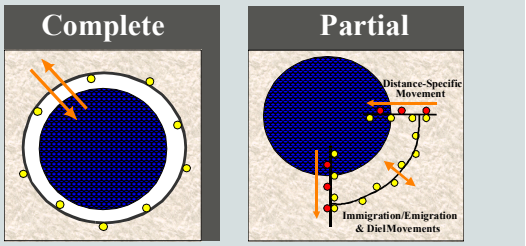


PITFALL TRAPS
X-ARRAY

BOX TRAPS
Y-ARRAY



DRIFT FENCE AND TRAP DESIGNS
CONTINUOUS AND PARTIAL DRIFT FENCES



Goals: Estimate Population Size and Composition
Estimate Directional Movement

AMPHIBIAN MARKING TECHNIQUES

IACUC

Amphibian Marking Techniques

General Biological Information

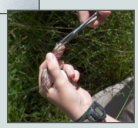
- Species, Age, and Gender
- Snout-vent Length (SVL)
- Weight
- Abnormalities
- Malformations, Tumors, Lesions, Parasites
- Batch or Individual mark

MASS MARKING TECHNIQUES
BATCH

Florescent Elastomers
- Injectable Liquid Elastomer (4 colors)
- $1000 Kit (1000 individuals)

Florescent Dyes
- Water resistant Dyes
- Powder and Shake-and-Bake
- Ultraviolet Light Sensitive
- $12/lb (1lb/100 individuals)

Toe-Clipping
- Mass-mark or uniquely ca. 2,000 individuals
- Rapid and inexpensive



TOE CLIPPING PROTOCOL
STEPS

STEP 1: Sterilization
- 0.01 % Chlorhexidine diacetate

STEP 2: Clip
- First Joint of Toe

STEP 3: Stop Bleeding
- Silver Nitrate Sticks

STEP 4: Store DNA
- Ice Bath
- Store <-70C

AMPHIBIAN MARKING METHODS

- Passive Integrative Transponder (PIT) Tags

Individual Marking Techniques

- **Passive Integrated Transponder (PIT) Tags**

- $4.00 - $6.00 per tag
- Readers $500+

PIT Tags

- New Antennae Technology

Individual Marking Techniques

- **Transmitters**

- $160 each
- Limited batteries life

TADPOLE SAMPLING

- **Different methods**
  - Seining
  - Dip netting
  - Kick netting
  - Trapping
  - Enclosure sampling
    - Core (stove pipes)
    - Boxes

Dr. William E. *Magnusson*
University of Amazonas, Brazil
Hypsiboas geographicus

DIP NETTING

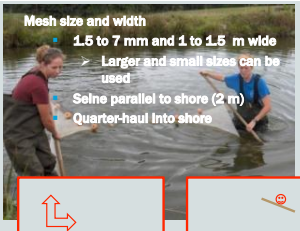
Dip Nets

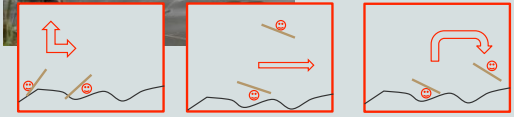
http://www.lokinets.com/

40 x 40 cm;
60 cm deep

KICK NETTING

SEINE SAMPLING





FUNNEL OR MINNOW TRAPS

Top Exposed

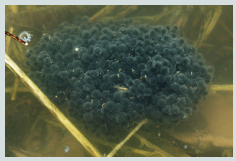
ENCLOSURE (QUADRAT) SAMPLING

Count number of larvae captured until none are captured for 10 consecutive dips.

EGG MASS SEARCHES

EGG MASS SEARCHES

Pickerel Frog



Southern Leopard Frog

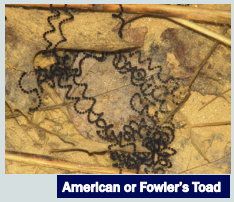
Walk Shoreline

Every 2 – 4 weeks during day

Spotted Salamander

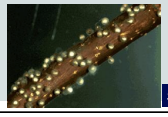
EGG MASS SEARCHES

Upland Chorus Frog



American or Fowler's Toad

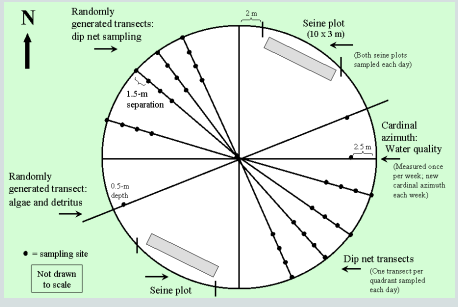
Successful Reproduction



Take Photos

Spring Peeper

LARVAL SAMPLING SCHEMATIC



World Organization for Animal Health

OIE Aquatic Code
Chytridiomycosis
Ranaviral disease
2008

Notifiable Diseases
Certification for Shipment
Schloegel et al. (2010)

International Transport of Animals

Disinfection: Johnson et al. (2003), Bryan et al. (2009), Gold et al. (2013)

$75/ bottle

- Bleach ≥4%
- EtOH ≥70%
- Virkon ≥1%
- Nolvasan >0.75%

Additional References

Chapter 7