RHODE ISLAND DIVISION OF PLANNING

Legislative Task Force

Meeting #4

Thursday December 19, 2013
8:00 – 10:00 AM

Conference Room C, 2nd Floor
Department of Administration
One Capitol Hill, Providence, RI

Agenda

8:00 Welcome and Overview of Agenda – *Kevin Flynn, DOP*

8:05 Amendments to meeting notes for 11.19.13 - All

8:15 Subject Topics and Technical Presentations:

1. Habitat Functions for Wetland Buffers

- **a.** Dr. Peter Paton, Professor of Wildlife Ecology, Department of Natural Resources Science, URI

8:55 **2.** Task Force Questions & Discussion of Presentation– *All - moderated by Kevin Flynn, DOP*

9:30 Lightening Summary on Wetlands - *Nancy Hess, DOP*

9:45 Next Steps – *Nancy Hess, DOP*
1. Topics Under Development & General Timeline
2. January 2014 meeting

10:00 Adjourn

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Task Force members in attendance were: Jim Boyd (Coastal Resources Management Council), Joseph Casali (Civil Engineer Representative), Russell Chateauneuf (Civil Engineering Representative), Janet Coit (DEM Director), Thomas D'Angelo (Builder's Trade Association), Gary Ezovski (Business Community Representative), Kevin Flynn (DOP-Associate Director), Vincent Murray (Municipal Representative – South Kingstown), Tom Kutcher (Wetlands Biologist), Eric Prive (Environmental Engineering Representative), Scott Rabideau (Business Community Representative), Leslie Taito (Office of Regulatory Reform).

The Division of Planning (DOP) and DEM also had several agency staff members present. From DEM, those present were Carol Murphy, Ernie Panciera, Terry Gray, and Alicia Good. Nancy Hess and Sean Henry were on hand from DOP.

Welcome and Introduction

Director Flynn began the meeting by introducing the meeting's presenters. Dr. Peter Paton is a wildlife ecology professor at the University of Rhode Island, whose specialty is the effects of humans on wildlife populations, and his presentation was an examination of the buffer zones around wetlands. Nancy Hess (DOP) also had a short presentation which was a culmination of the information presented to the task force thus far.

Wetlands Buffer Zones

Dr. Paton began his presentation by defining what "buffer zones" are: A vegetative area designed to protect both the water quality and movement corridors (and habitats) of wildlife species. In terms of wildlife protection, buffers function as travel corridors between habitats, nesting areas, access to resources, and more for many species. Dr. Paton also highlighted that the "habitat matrix", essentially the types of habitats surrounding the wetland, will have an effect on what types of species use that particular area. Using a local example, he stated "[a] fifty foot buffer in the middle of Cranston is going to have radically different wildlife than a fifty foot buffer in western Rhode Island." The buffers create "uplands", areas of habitat in close proximity to the wetland. Large percentages of reptile, avian, and amphibian species use the uplands as much as the wetland itself, all at different times of the year. Vernal pools are particularly important for these wildlife functions, because they do not retain water year-round and lack the presence of fish, which are predators for amphibians. There is also no buffer for vernal pools (referred to as "special aquatic sites" in Rhode Island law).

Dr. Paton offered a theory of wetlands regulation created by Ray Semlitsch called the life zone, which creates various buffers around a wetland that protects the surrounding core habitat, but still allows for some development within some of the buffers. The types of development allowed would typically be low-density housing, to minimize negative effects on the nearby habitats, and would be limited to a certain percentage of the total buffer zone. After detailing this theoretical regulatory route, members discussed vernal pool regulations at the local level and in surrounding states. Dr. Paton took several questions on the findings and examples he provided earlier in the presentation.

Wetlands Buffer Zones (cont'd)

After the discussion, Dr. Paton continued the presentation by outlining the current regulatory regime regarding vernal pools in Maine. In the Pine Tree State, vernal pools enjoy a 100 foot "envelope" on all sides in which no development can take place. Beyond that, there is a 750 foot buffer referred to as "critical terrestrial habitat" that must remain at least 75% undisturbed. There are also "significant vernal pools", which have a 250 foot "zone of consultation" around them. In the zones of consultation, no unreasonable disturbances can be made. Members then discussed the implications of this regime and compared it to aspects of current Rhode Island law and Dr. Paton fielded more questions pertaining to vernal pools and wildlife conservation considerations. Mr. Rabideau commented on the need for any plan the task force eventually presents to the legislative to be simpler and more predictable than the current regulations, and members talked about feasibility and how to make rules that provide adequate protection for the municipalities to be content with, that are simpler than current standards, and more predictable for the development and business communities to better navigate. Discussion continued in the area of vernal pools and the ways both Rhode Island and Massachusetts identify and classify vernal pools. Carole Murphy outlined the system Rhode Island has used to identify them. The members agreed that vernal pools are relatively special areas of environmental concern and need better protection than is provided under current state law.

Nancy's Top Ten Wetland Functions

Nancy Hess, DOP, next provided a summary of the task force's first two presentations (at the November and December meetings). To this end, she constructed a list of the ten most important functions and values of wetlands discussed to date:

1. Food chain and food diversity
2. Wildlife habitat
3. Fish and shellfish habitat
4. Flood storage
5. Erosion control
6. Water filtration and transformation
7. Groundwater recharge and discharge
8. Open space and aesthetics
9. Recreation
10. Education and research resources

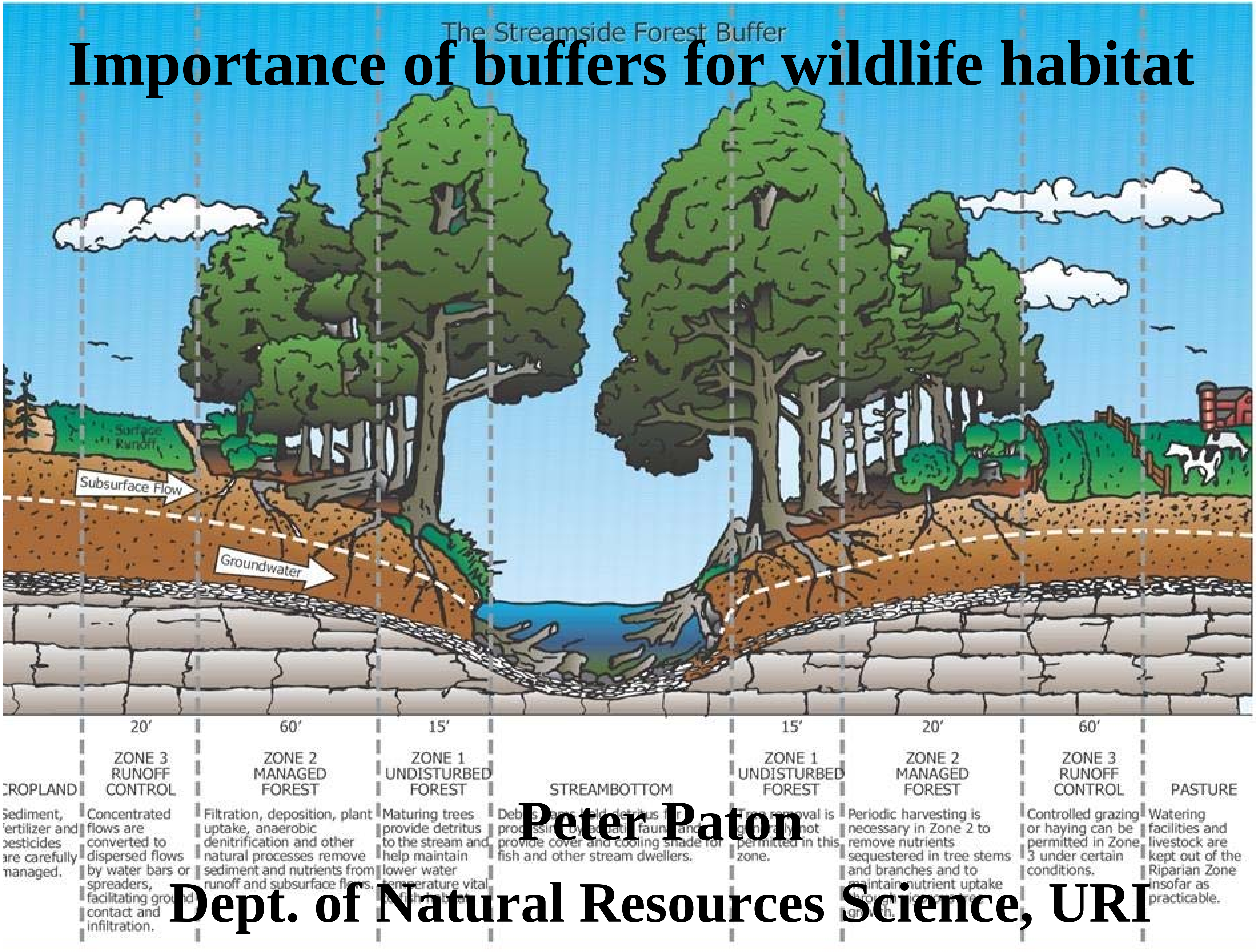
Next Steps and Next Meeting

Nancy Hess reviewed the tentative schedule of subject matter for the meetings to take place in 2014. A presentation on OWTS (Onsite Wastewater Treatment Systems) regulations is schedule for January, but future topics include regulatory platforms for other states, examining wetlands regulation at the municipal level, case studies involving wetlands regulatory friction points, and other areas. The next meeting was scheduled for January 21st, 2014 at the Department of Administration building

Adjourn

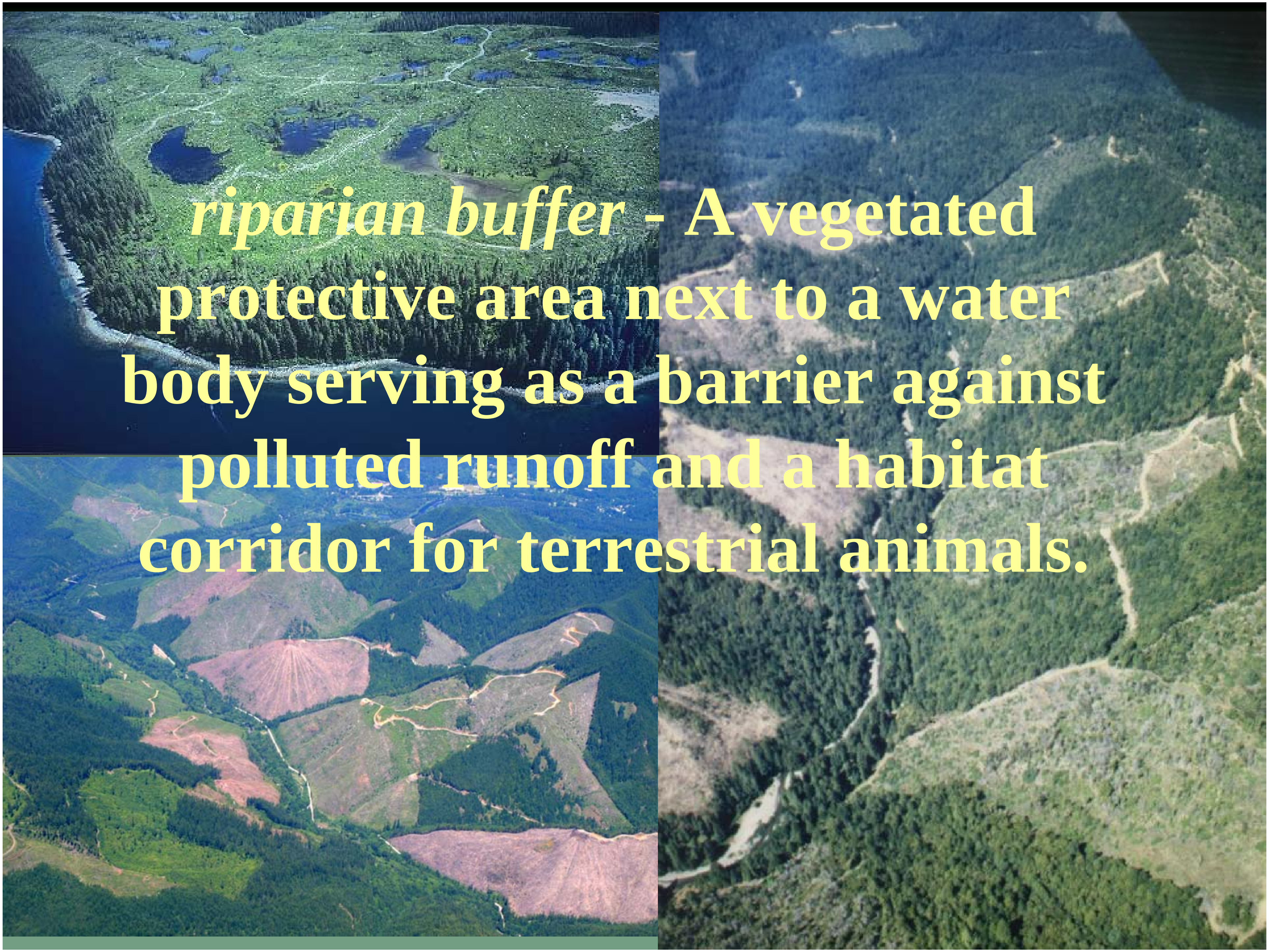
10:00 AM

Importance of buffers for wildlife habitat



Peter Paton

Dept. of Natural Resources Science, URI


riparian buffer - A vegetated protective area next to a water body serving as a barrier against polluted runoff and a habitat corridor for terrestrial animals.

Buffer Functions for Biodiversity:

-Travel corridors – restore connectivity

-Increase habitat area

Nesting habitat

Foraging habitat

Cover

-Protect sensitive habitats

-Increase access to resources

-Shade wetlands to maintain temperature

Wildlife use of the buffer will be a function of

- **Width**, which might be the most critical factor
- **Vegetative structure within buffer**
  – Overstory composition
  – Understory composition
- **Adjacent habitat/landscape structure**

Numbers of freshwater dependent species with upland requirements in Massachusetts.

	Species with Upland Requirements	Species Without Upland Requirements	Total MA Freshwater WD Species*	% MA Freshwater WD with Upland Requirements
Reptiles	9	1	10	90%
Amphibians	19			95%
Mammals	14			100%
Birds	23			55%
Totals	65			76%

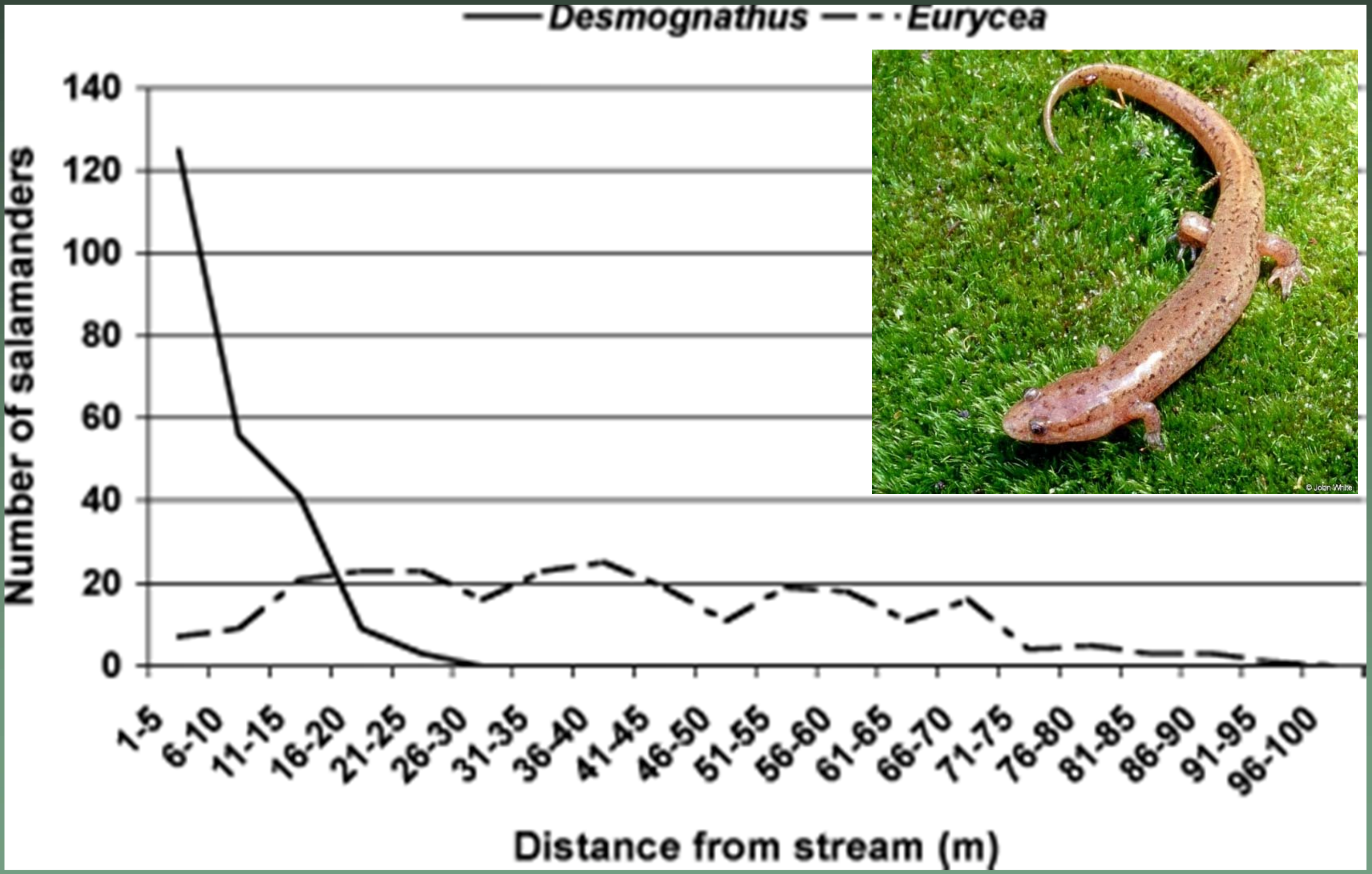
300 ft

Wildlife use of buffers, Boyd 2001

Wetland dependent species use beyond the wetland edge

	Edge to 100 ft.	Edge to 200 ft.	Edge to Beyond 200 ft.	Unknown	Totals
Reptiles	8	6	6	1	9
Amphibians	15	12	11	4	19
Mammals	10	8	8	4	14
Birds	17	12	9	6	23
Totals	50	38	34	15	65

Movement of stream salamanders



Crawford and Semlitsch 2006

Vernal Pools: Amphibian biology 101

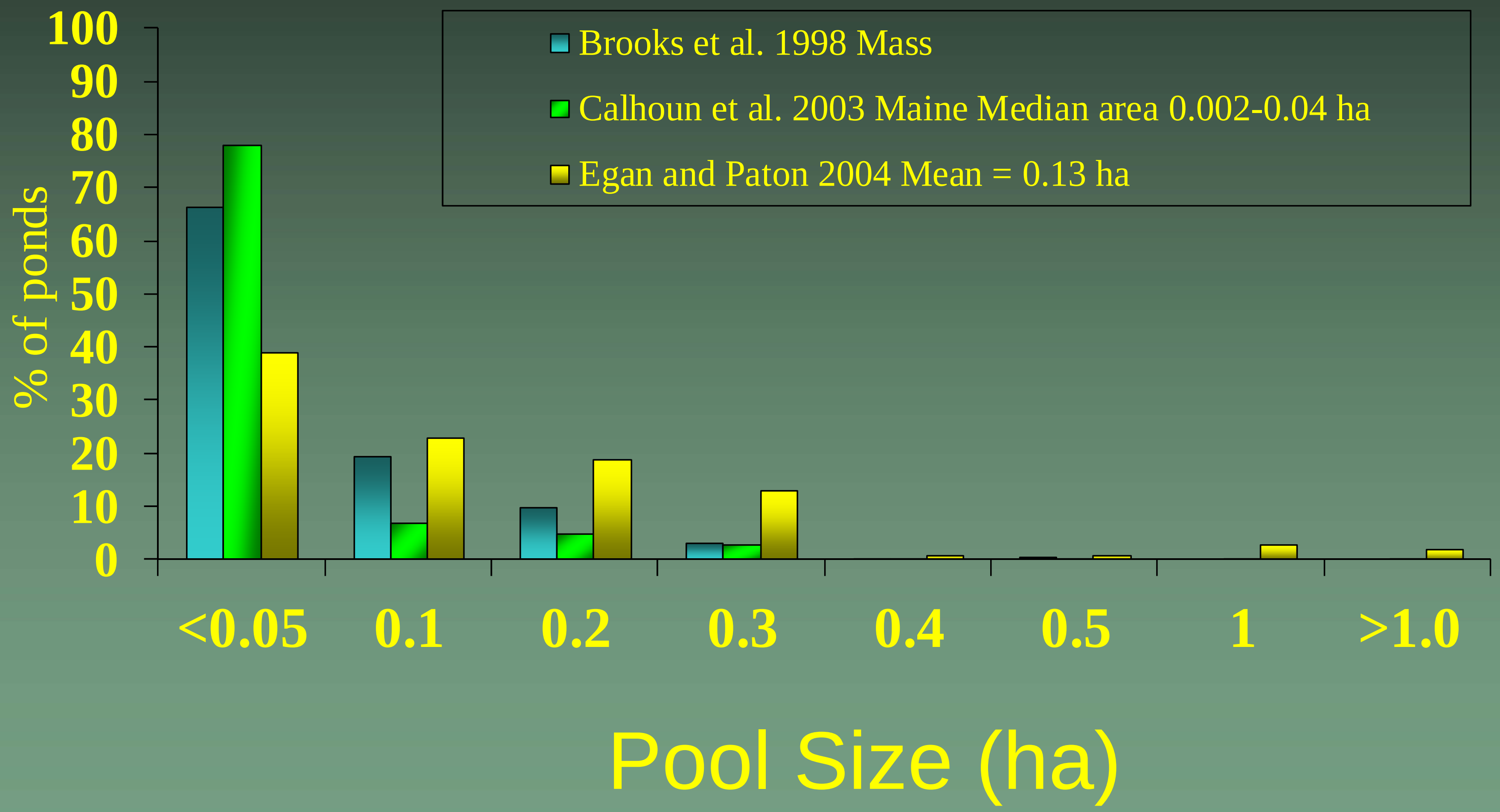
Pools that are seasonally flooded have fewer predators:

-fish

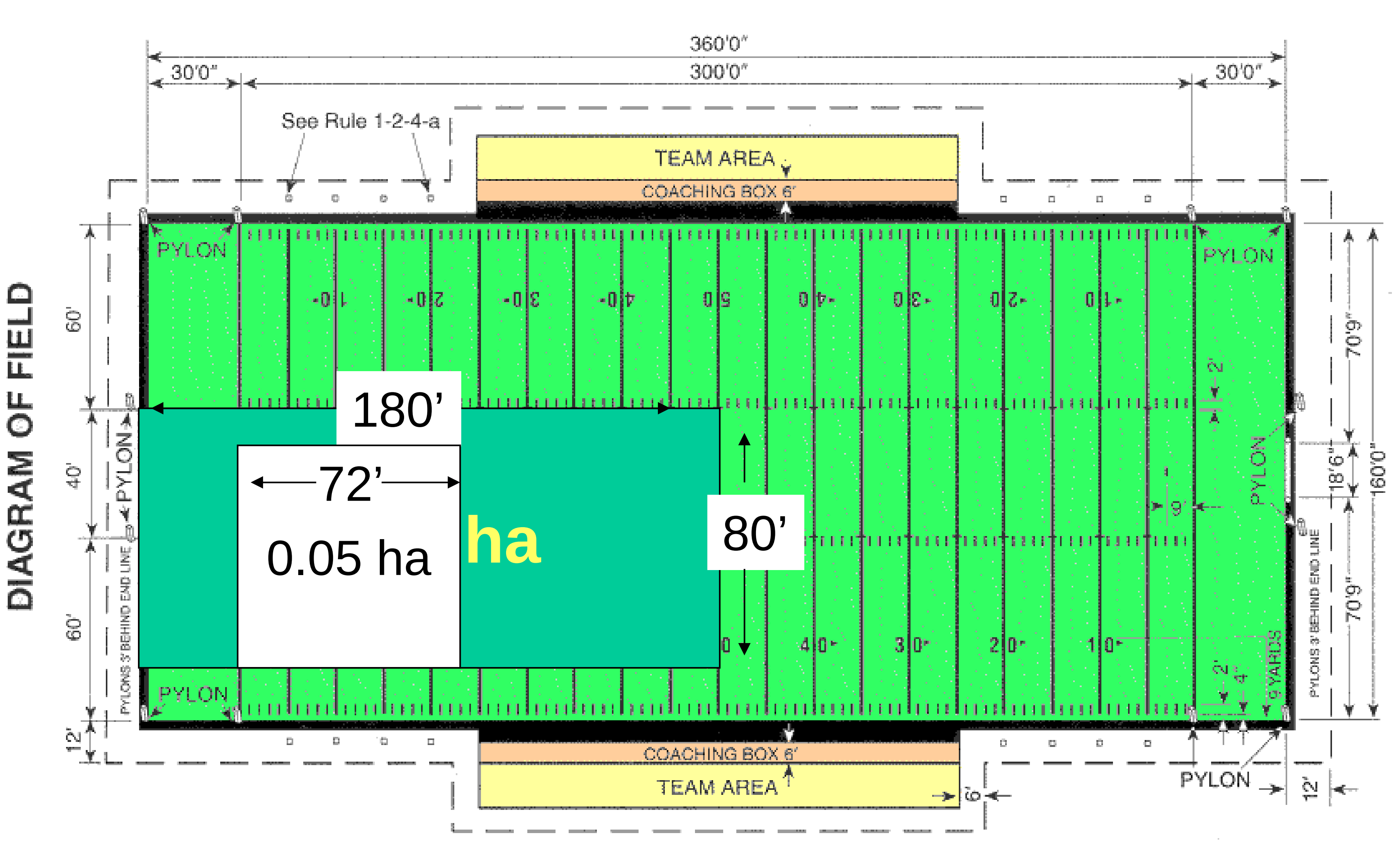
-Invertebrates

March **November**

In New England, vernal pools are small (<0.05 ha)



Football field = 0.54 ha (1.32 acres)



Temporal Segregation: Adults to Breeding Pools

Wood frog

Spotted salamander

Red-spotted newt

March

Spring peeper

Am. toad

Pickerel frog

April

May-June

Gray treefrog

Green frog

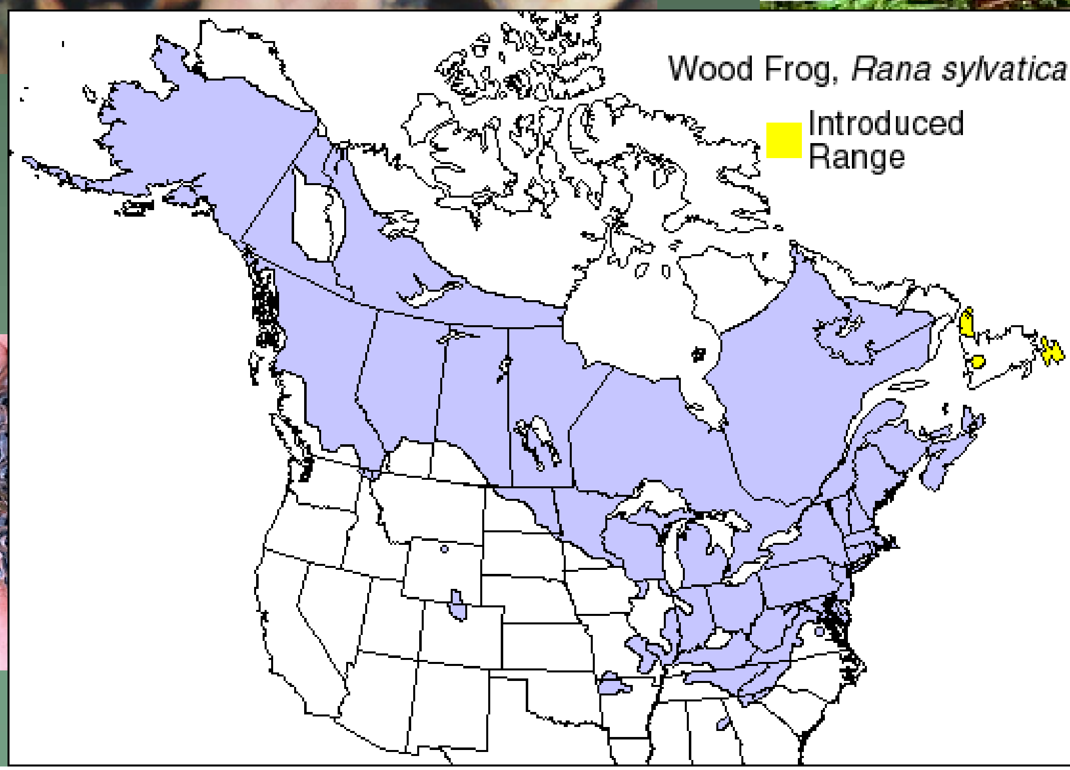
Am. Bullfrog

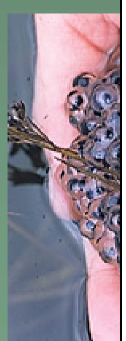
August

Marbled salamander

Frog

ates sylvaticus





Life cycle of Wood Frog

Emigration chronology for metamorphs at breeding ponds in Rhode Island

	1st	Median	90%	No. of days
Marbled Salamander	3-Jun	19-Jun	14-Jul	41
Wood Frog	15-Jun	27-Jun	31-Jul	46
Gray Treefrog	6-Jul	24-Jul	2-Aug	27
Spring Peeper	20-Jun	14-Jul	13-Aug	54
American Toad	22-Jun	26-Jul	19-Aug	58
Spotted Salamander	8-Jul	28-Jul	23-Aug	46
Pickerel Frog	18-Jul	5-Aug	26-Aug	39
Green Frog	**13-Jun**	**30-Jul**	**30-Aug**	**78**
Bullfrog	**22-Jul**	**27-Aug**	**16-Sep**	**56**
Red-spotted Newt	2-Aug	22-Sep	10-Oct	69

Duration in breeding ponds

Species	Minimum	Maximum
Gray treefrog	66	125
Spring peeper	81	138
Wood frog	112	144
Pickerel frog	103	168
Am Toad	99	174
Spotted Sal.	155	211
R-s Newt	190	255
Marbled Sal.	238	264
Green Frog	411	529
Am. Bullfrog	488	580

Mean maximum dispersal distances of adult amphibians from wetland edge

Mean minimum and maximum dispersal distances for amphibians and reptiles.

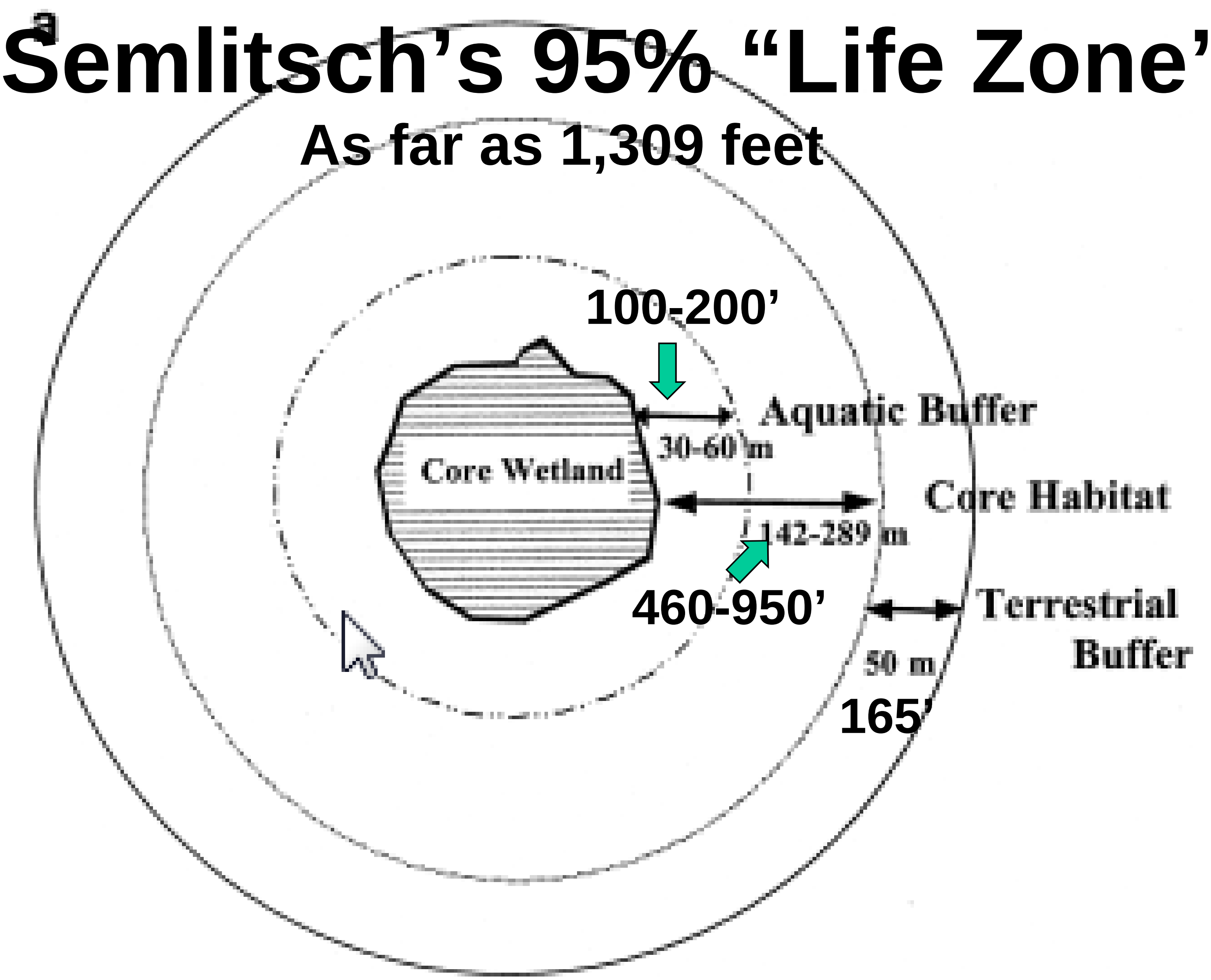
Group	Mean minimum (m)	Mean maximum (m)
Frogs	205	1207 ‘➡ 368
Salamanders	117	218
Amphibians	159	290
Snakes	163	304
Turtles	123	287
Reptiles	127	289
Herpetofauna	142	289

**Values represent mean linear radii extending outward from the edge of aquatic habitats compiled from summary data in Appendices 1 and 2.*

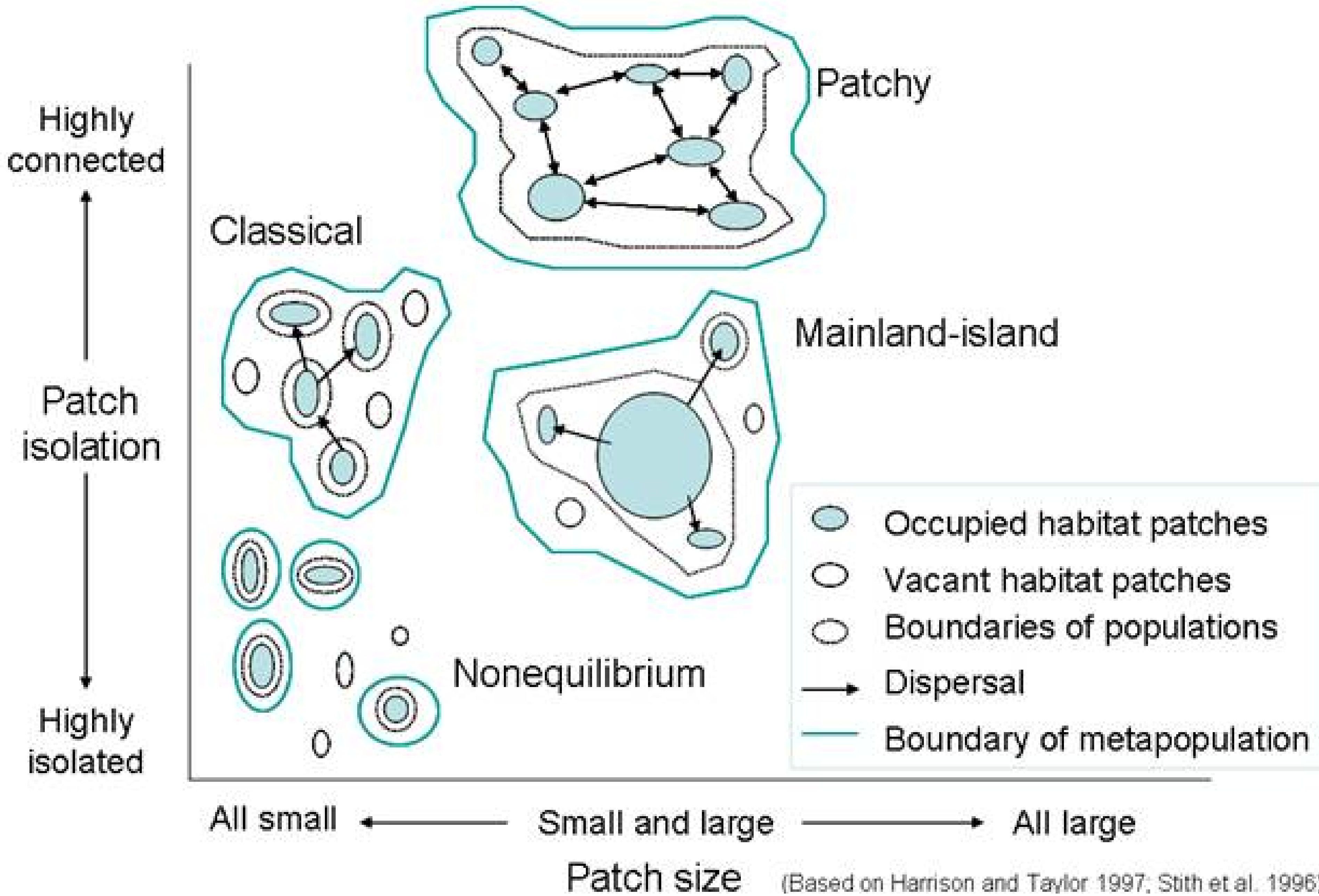
From Semlitsch and Bodie 2003. Con Bio. 17:1219-1228

Semlitsch's 95% "Life Zone"

As far as 1,309 feet



Metapopulation structure



Spotted Salamander
Ambystoma maculatum

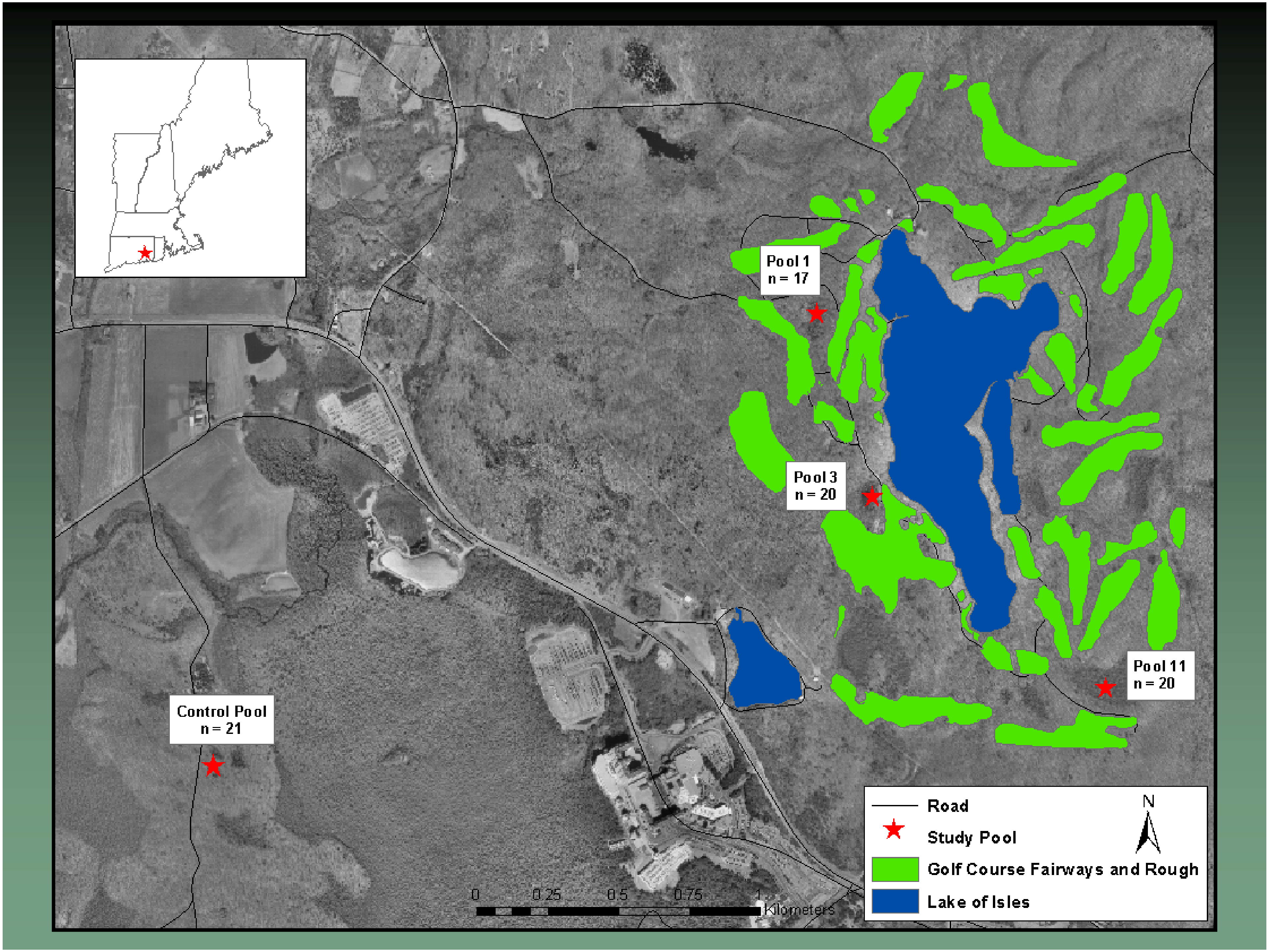
- Bi-phasic life history; mid-March to April in breeding ponds, most of year in terrestrial habitats

- Adults are fossorial

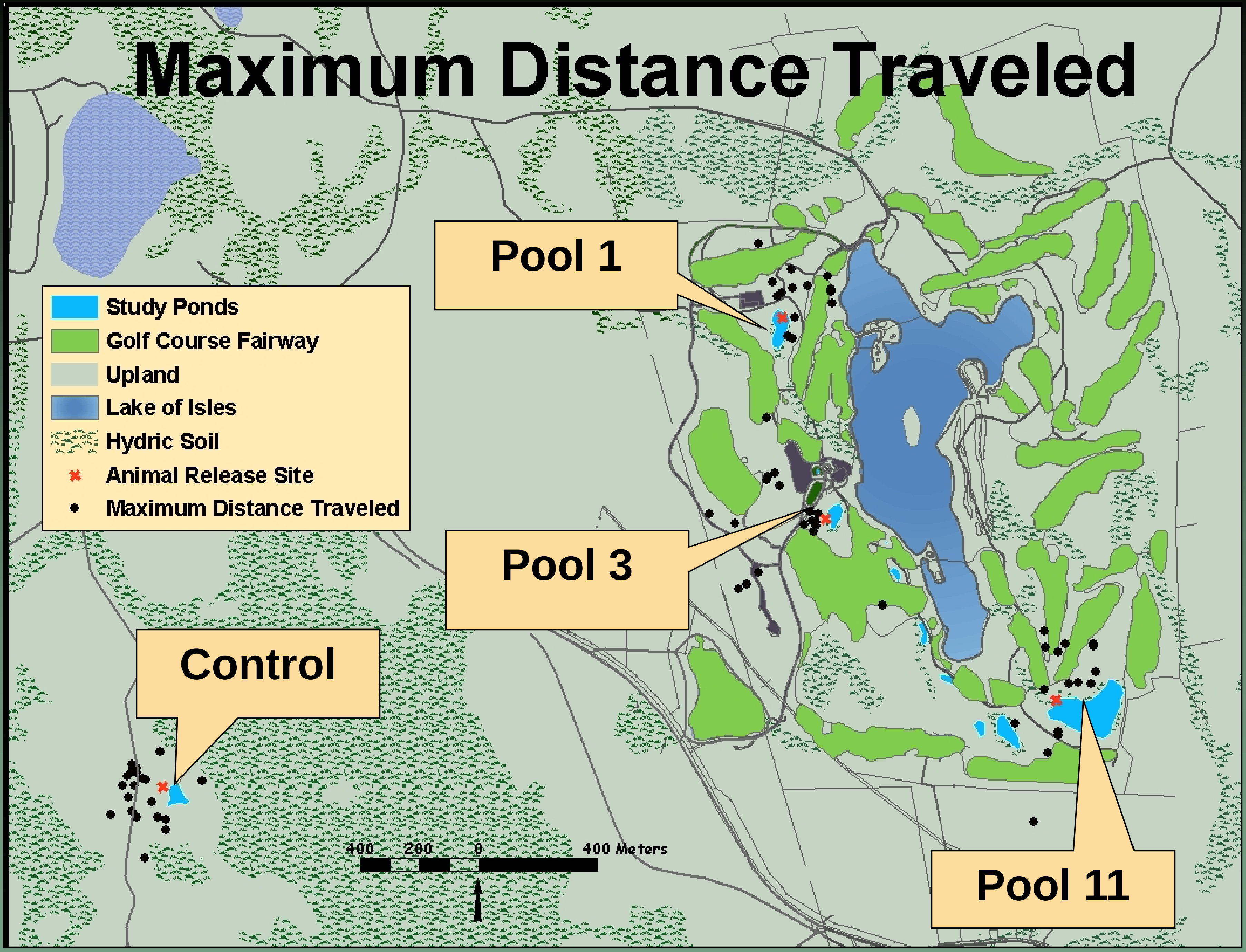
- Commonly found in small mammal burrows

Radio Transmitters

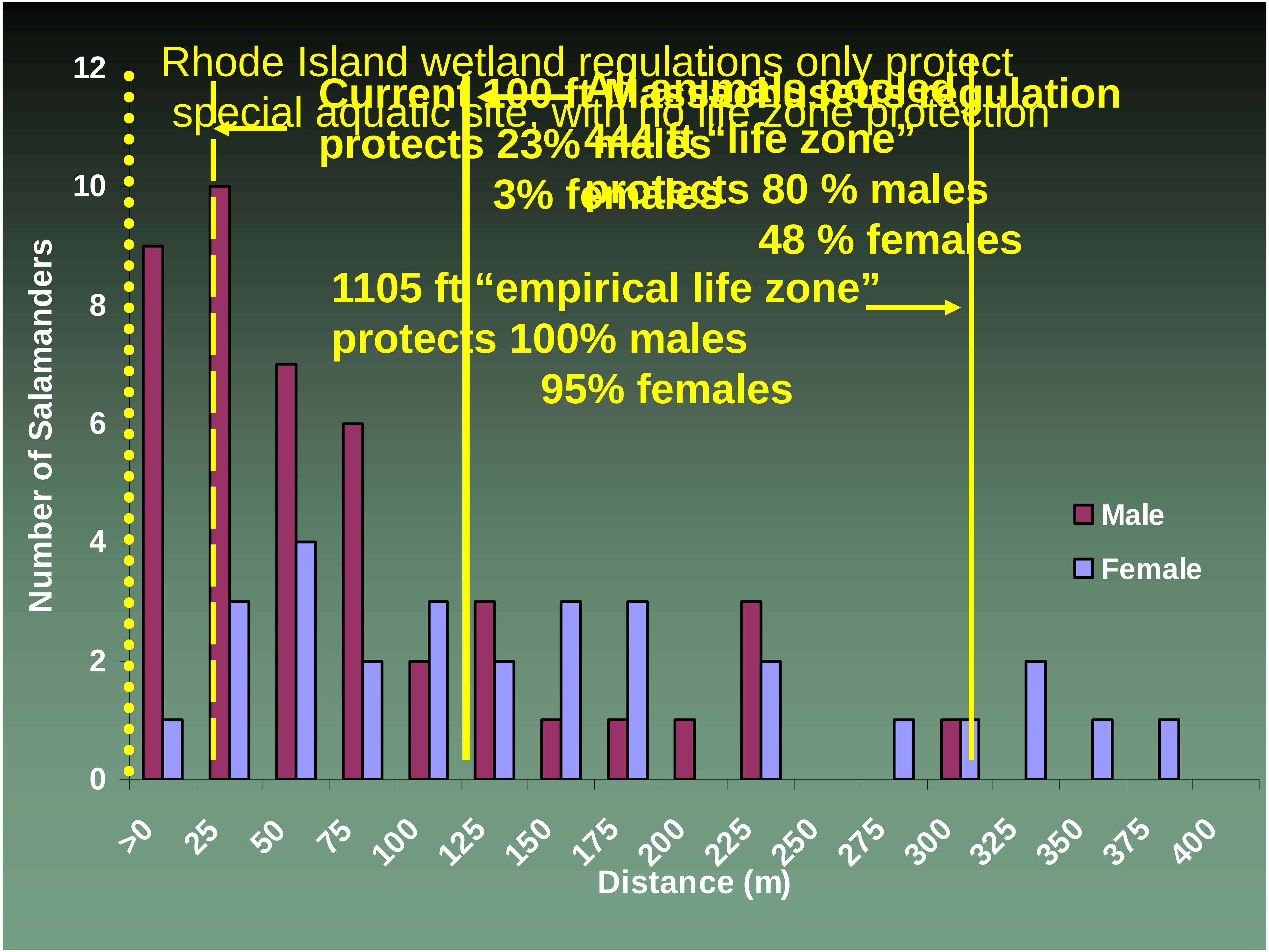
- Each weigh 1.7 g
- $\bar{x}$ = 8.79% of body mass
- Battery life of 5 months


Pool 1
n = 17
Pool 3
n = 20
Pool 11
n = 20
Control Pool
n = 21
Road
Study Pool
Golf Course Fairways and Rough
Lake of Isles
N
0 0.25 0.5 0.75 1
Kilometers

Maximum Distance Traveled



golf course vs. control, $p = 0.003$
females vs. males, $p = 0.003$



Rhode Island wetland regulations only protect special aquatic site, with no life zone protection
Current 100 ft Massachusetts regulation protects 23% males 3% females
All animals pooled 444 ft "life zone" protects 80 % males 48 % females
1105 ft "empirical life zone" protects 100% males 95% females
Number of Salamanders
0
2
4
6
8
10
12
>0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
375
400
Distance (m)
Male
Female

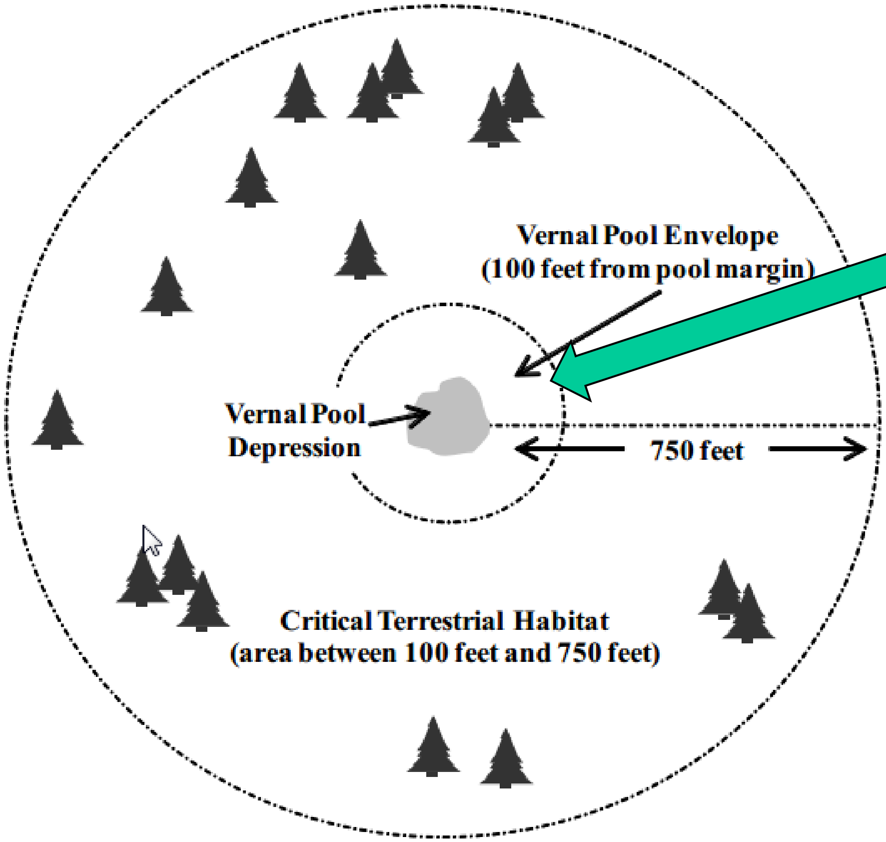


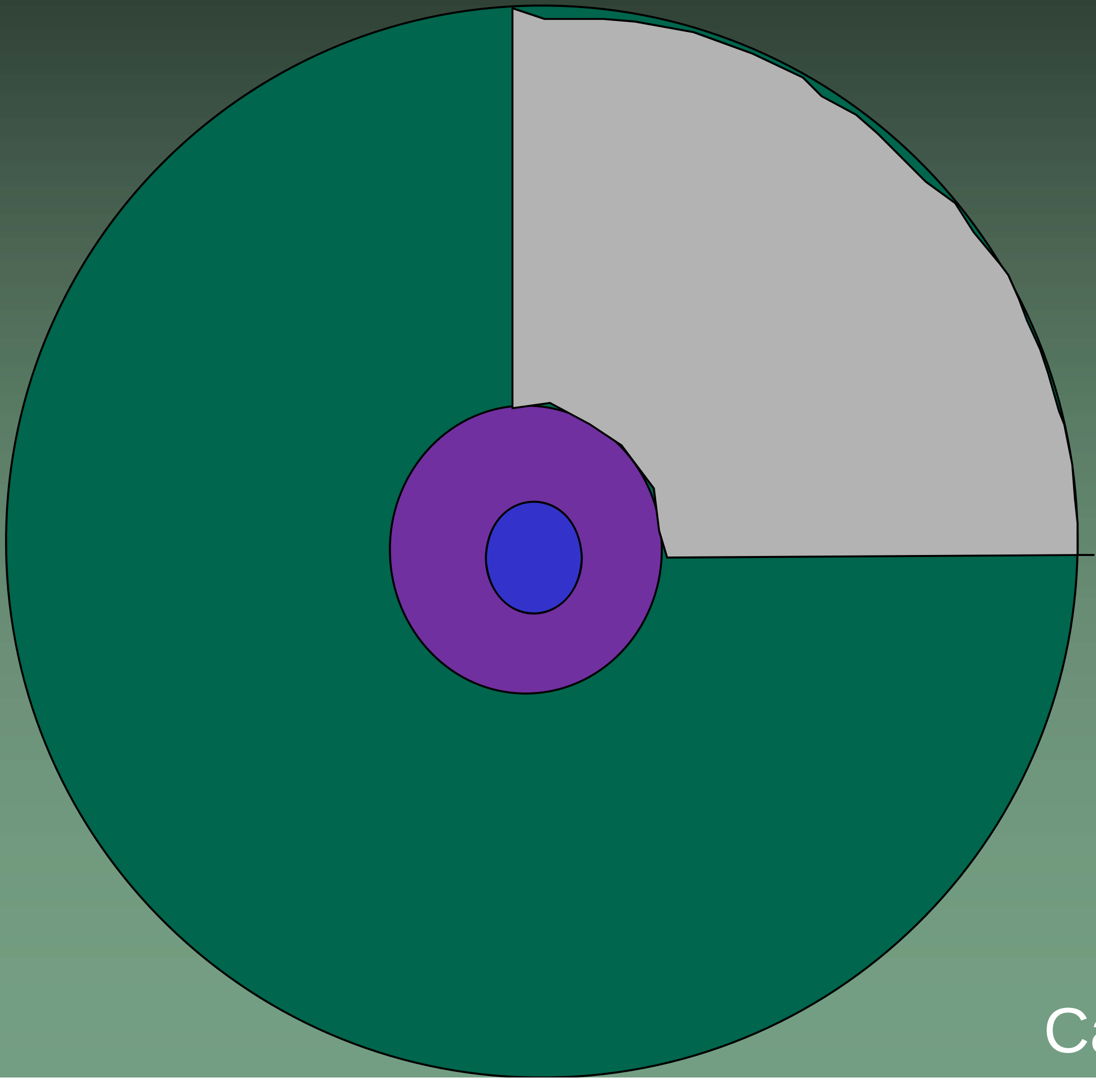
Figure 1: ACOE Vernal Pool Management Area is made up of the depression itself, the vernal pool envelope (area within 100 feet of the pool margin), and the critical terrestrial habitat (area between 100 and 750 feet from the pool margin).

No activities
Within 100’ VPE

>75% of CTH
Remains intact

Maine regulations

Best Management Practices for Vernal Pool Amphibians



Vernal pool:
no disturbance

Envelope (100’)
No development

Critical terrestrial habitat
100-750’, <25% developed area

Example of
<25% developed area

Calhoun and Klemens 2002

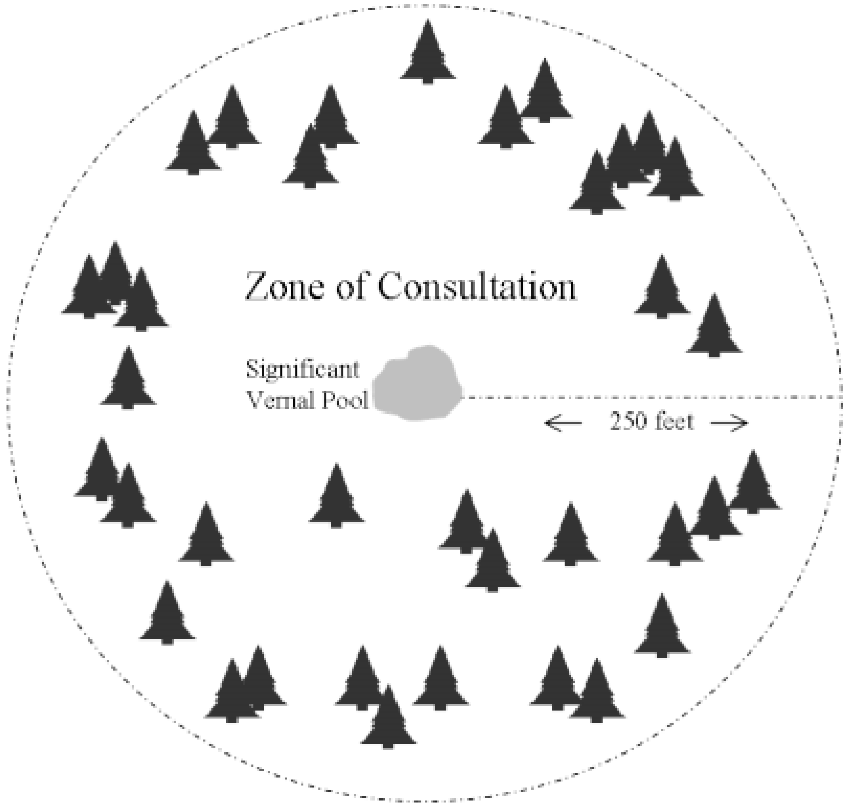


Figure 4: Regulated *Zone of Consultation* within 250 feet of a Significant Vernal Pool.

Vernal Pool: presence of
Fairy shrimp
Blue-spotted Salamander-10
Spotted Salamander-20
Wood Frog-40*
*# of egg masses to be
Classified as Significant

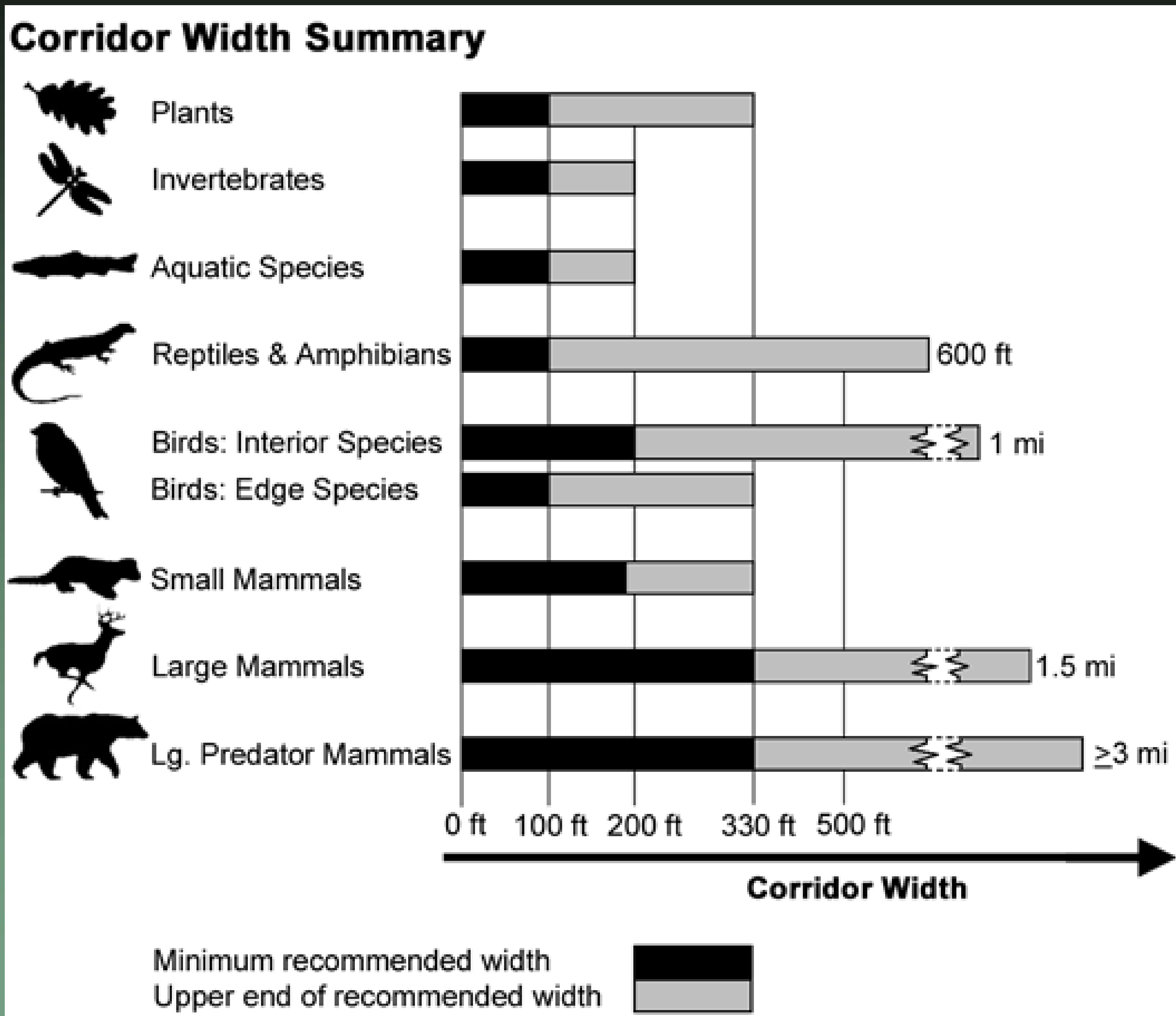
In Maine, no unreasonable impacts to significant
Vernal pool habitat* within Zone of Consultation

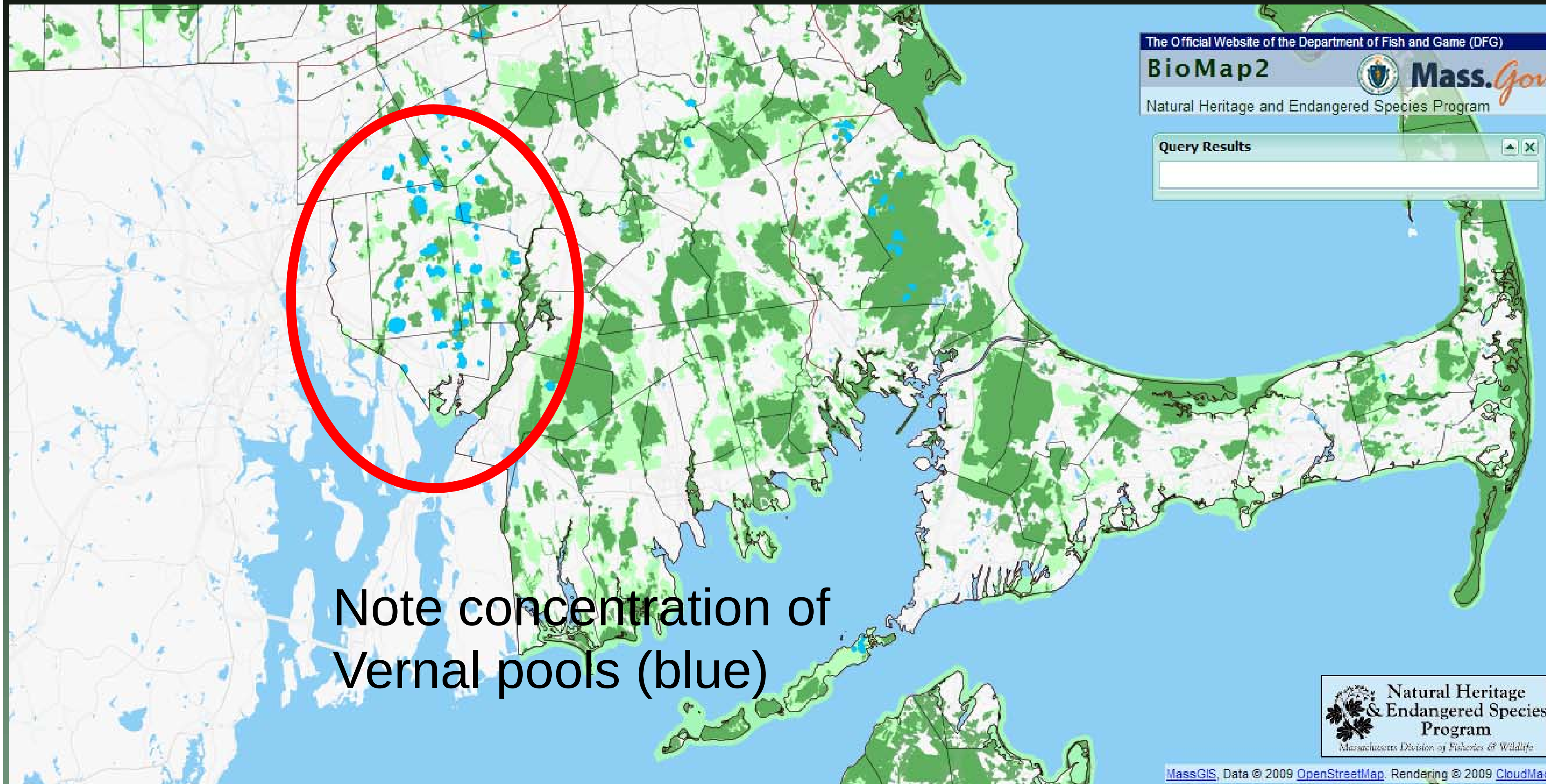
State	Pool size	Hydroperiod	Other	Buffer
Mass	¼ acre	2 continuous months with 6” depth	Free of fish	100’
Maine	Presence of fairy shrimp. Blue or spotted salamanders, wood frogs			100’ for VPE and 750’ critical terrestrial habitat

Habitat management within buffers

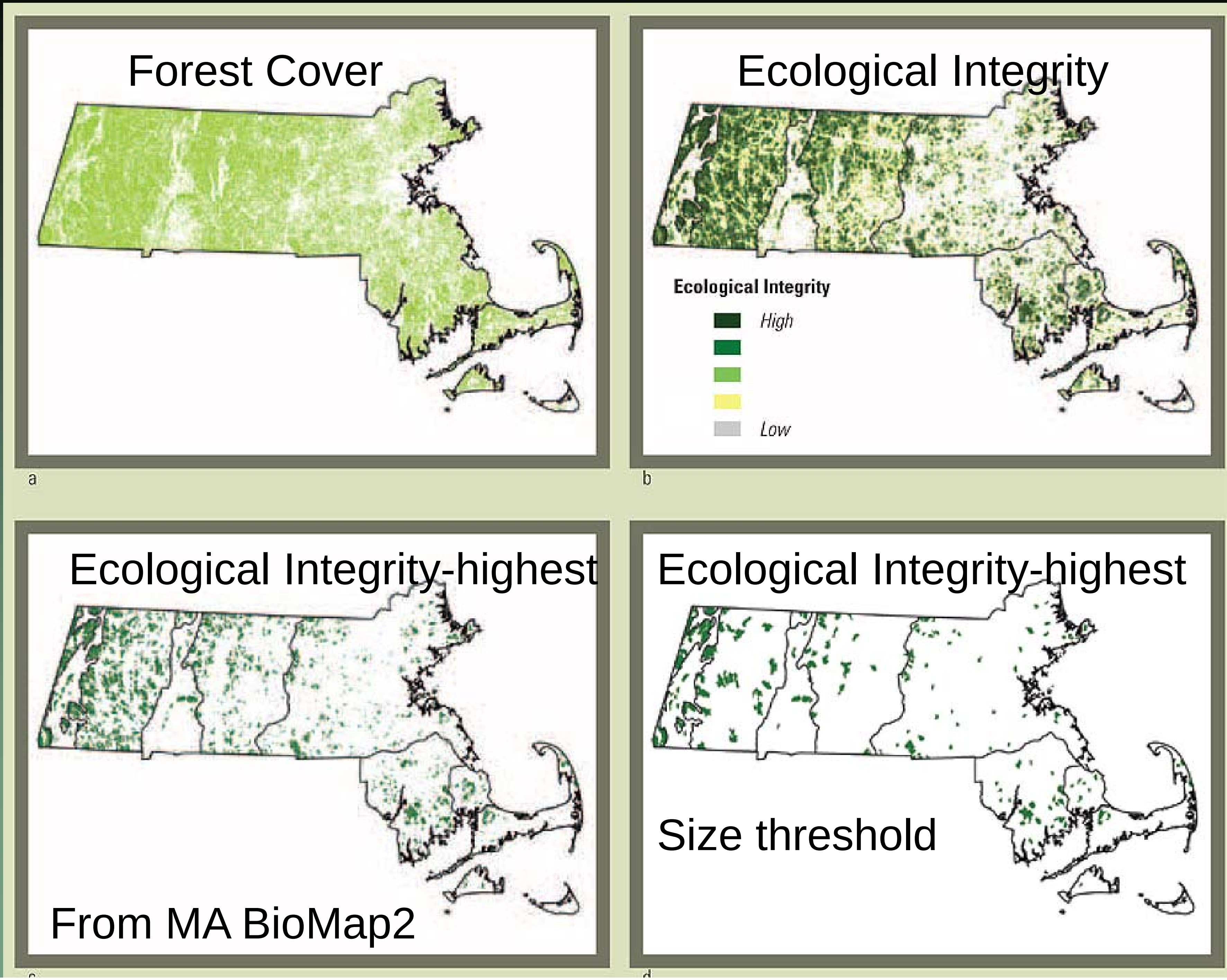
- Let the natural form dominate
  - Diversity
  - Horizontal structure
  - Vertical structure
- Go native and think seasonal
- Leave snags
- Leave woody debris
- Have fun with border (curves, shrubs)
- Supply rocks and stones

Bentrup. 2008. Conservation Buffers. USFS Gen Tech Rep.





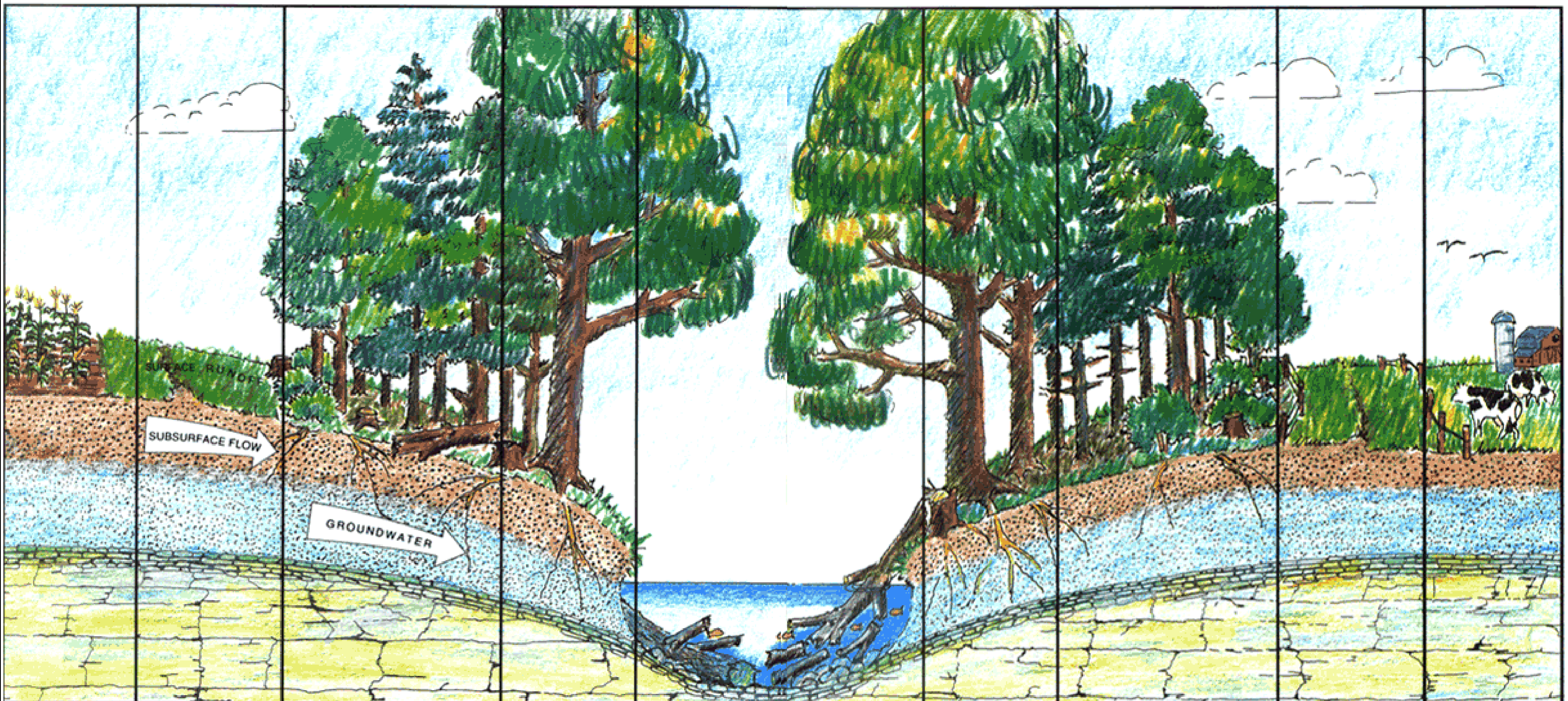
Note concentration of Vernal pools (blue)


Forest Cover
a
Ecological Integrity
Ecological Integrity
High
Low
b
Ecological Integrity-highest
From MA BioMap2
Ecological Integrity-highest
Size threshold

Example Ranges of Minimum Patch Area

Taxa	Patch Area
Plants	5 to ≥ 250 ac
Invertebrates	50 sq ft to ≥ 2.5 ac
Reptiles and Amphibians	3 to ≥ 35 ac
Grassland Birds	12 to ≥ 135 ac
Waterfowl	≥ 12 ac
Forest Birds	5 to ≥ 95 ac
Small Mammals	2.5 to ≥ 25 ac
Large Mammals	40 ac to ≥ 2 sq mi
Large Predator Mammals	3.5 to ≥ 850 sq mi

THE STREAMSIDE FOREST BUFFER



CROPLAND	ZONE 3 RUNOFF CONTROL (20')	ZONE 2 MANAGED FOREST (60')	ZONE 1 UNDISTURBED FOREST (15')	STREAM BOTTOM	ZONE 1 UNDISTURBED FOREST (15')	ZONE 2 MANAGED FOREST (60')	ZONE 3 RUNOFF CONTROL (20')	PASTURE
Sediment, fertilizer and pesticides are carefully managed.	Concentrated flows are converted to dispersed flows by water bars or spreaders, facilitating ground contact and infiltration.	Filtration, deposition, plant uptake, anaerobic denitrification and other natural processes remove sediment and nutrients from runoff and subsurface flows.	Maturing trees provide detritus to the stream and help maintain lower water temperature vital to fish habitat.	Debris dams hold detritus for processing by aquatic fauna and provide cover and cooling shade for fish and other stream dwellers.	Tree removal is generally not permitted in this zone.	Periodic harvesting is necessary in Zone 2 to remove nutrients sequestered in tree stems and branches and to maintain nutrient uptake through vigorous tree growth.	Controlled grazing or haying can be permitted in Zone 3 under certain conditions.	Watering facilities and livestock are kept out of the Riparian Zone insofar as practicable.

Questions?

Lightening Summary

Wetland Functional Values

- Food Chain /Food Diversity
- Wildlife Habitat
- Fish / Shellfish Habitat
- Flood Storage
- Erosion Control
- Water Filtration / Transformation
- Groundwater Recharge & Discharge
- Open Space / Aesthetics
- Recreation
- Education /Research

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Email: ppaton@uri.edu

Peter Paton grew up in Denver, CO and went to school at Lewis and Clark College (BS degree), Colorado State University (MS), and Utah State University (PhD). He's been at URI since 1995 and is currently a Professor of Wildlife Ecology. Peter's expertise is avian and amphibian ecology and he's primarily interested in the effects of humans on wildlife populations. Before coming to URI, Peter studied wildlife in Utah, Alaska, Oregon, California, and Hawaii.

EDUCATION

- Utah State University, Department of Fisheries and Wildlife Biology, Logan, Utah

Ph.D. in Wildlife Biology, 1994

- Colorado State University, Department of Fisheries and Wildlife, Fort Collins, Colorado

M.S. in Wildlife Biology, 1985

- Lewis and Clark College, Department of Biology, Portland, Oregon

B.S. in Biology, 1978

PROFESSIONAL EXPERIENCE
Appointments

2006-present: Professor and Chair, Department of Natural Resources Science, University of Rhode Island

2004-2005: Associate Professor and Chair, Department of Natural Resources Science, University of Rhode Island.

2001-2004: Associate Professor, Department of Natural Resources Science, University of Rhode Island

1995-2001:Assistant Professor, Department of Natural Resources Science, University of Rhode Island; duties include research, teaching (Field Ornithology, Wetland Wildlife Management, Conservation Biology), and service.

1994-1995: Research Scientist, Alaska Bird Observatory, supervised a project funded by the National Biological Service (NBS) to develop monitoring protocols for landbirds in the national parks in Alaska.

1990-1994: Graduate Research Assisant, Dept. of Fisheries and Wildlife Biology Utah State University; Studied breeding ecology of Snowy Plovers at Great Salt Lake for dissertation research.

1984-1990: Wildlife biologist, Redwood Science Laboratory U.S. Forest Service, Investigated the effects of timber harvesting practices on vertebrates (e.g., Spotted Owls, Marbled Murrelets, small mammals, herps).
1982-1984: Graduate Research Assistant,, Dept of Fisheries and Wildlife Colorado State University,. Investigated techniques to minimize the adverse effects of cattle egrets as an air-strike hazard in Hilo, Hawaii.

1980-1982: Research Associate: Dept. of Fisheries and Wildlife, University of Missouri-Columbia; Assisted in investigating the breeding ecology of the threatened Hawaiian Hawk.

1979-1980: Wildlife Biologist, U.S. Forest Service and U.S. Fish and Wildlife Service; studied endangered forest birds in the Hawaiian Islands.

PROFESSIONAL MEMBERSHIPS

- American Ornithologists' Union
- Cooper Ornithological Society
- Wilson Ornithological Society
- Association of Field Ornithologists
- Sigma Xi
- Society for the Study of Reptiles and Amphibians
- The Wildlife Society
- New England Esturine Research Society
- Society for Conservation Biology

Full Curriculum Vitae:
http://cels.uri.edu/nrs/docs/faculty/Peter%20W.%20C.%20Paton/Paton_CV_long_7-18-06.pdf