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Rhode Island BioBlitz 2015: Summary Report

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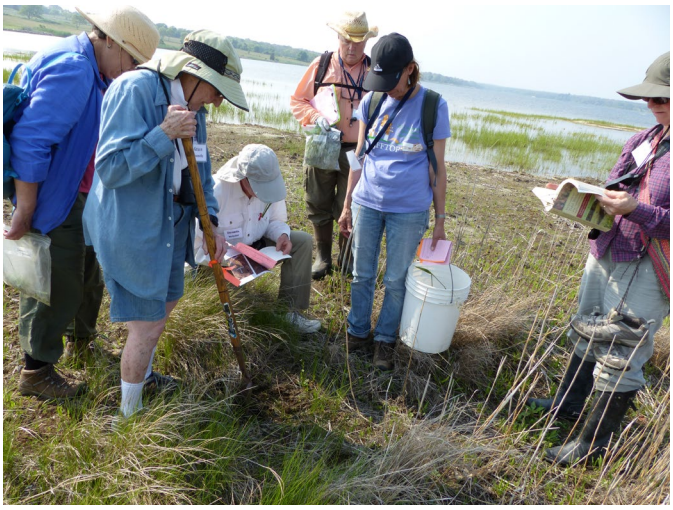
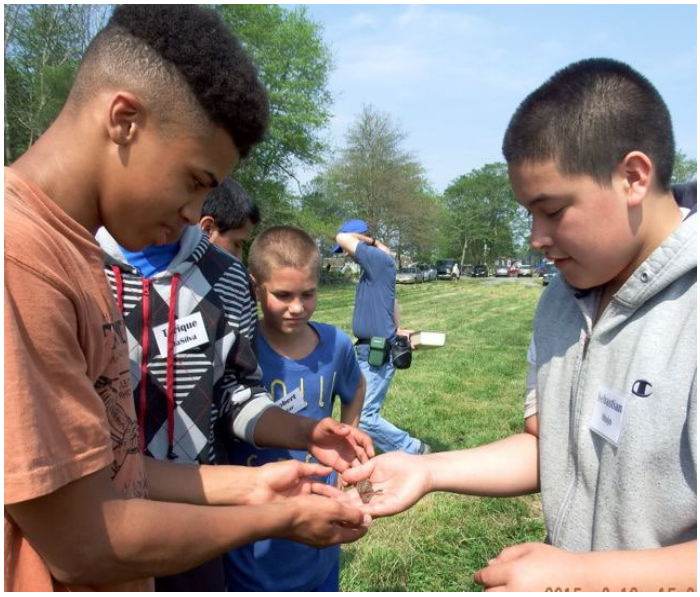
May 25, 2016

The **16th annual Rhode Island BioBlitz** was held in Little Compton on Friday, June 12 and Saturday, June 13, 2015. The event took place at Dundery Brook Preserve, Marvel Preserve, and Goosewing Beach. During this 24-hour period, 215 volunteer naturalists documented 1,203 species of animals and plants. This was the third-highest species count and second-highest number of participants in Rhode Island BioBlitz history and individual records were also set by a couple taxonomic teams. The festivities included an innovative **Little Compton Nature Day** on Saturday, which saw community groups set up next to BioBlitz and the whole town invited to celebrate the local environment and the beneficial achievements of conservationists who have worked so hard in Little Compton. The whole program was made possible by extraordinary contributions of time, money, and other support from residents and businesses, other conservation groups, and town officials. Attendance included 26 school children and 17 college students.





What is a Bioblitz? In a BioBlitz, volunteer naturalists, working in teams, have 24 hours to tally as many species of animals and plants as they can on a particular parcel of land. The idea was pioneered by Harvard "ant man" E.O. Wilson and others in 1996 and now BioBlitzes are held all across the United States and around the world. The Rhode Island Natural History Survey organized the first Rhode Island BioBlitz in 2000 in Roger Williams Park, Providence. There 31 volunteers found 665 species. Results and pictures of past BioBlitzes can be seen at **www.rinhs.org/whatwedo/bioblitz** or you can watch a short video made at the 2010 BioBlitz on Block Island at **www.youtube.com/rinaturalhistory**

As with all the Rhode Island BioBlitz events, the goals of the Little Compton bioblitz included:

1. demonstrate that biodiversity is important right here at home, not just in distant rain forests or coral reefs, etc., and great diversity can be found almost anywhere;
2. by example, show the public how field biologists and naturalists learn about species and the environment;
3. encourage communication and learning among diverse people--from scientists to amateur naturalists to school kids--who nonetheless share a curiosity about biodiversity and the local environment;
4. survey the species on the property for the benefit of the landowner for planning and conservation purposes.
5. celebrate the conservation achievements in town and demonstrate the importance of a healthy, attractive environment to health, the economy, and community.

Results: In just 24 hours, 215 people found 1,204 species of animals and plants. The results are tallied by taxon (plural "taxa"), a category of phylogenetically (evolutionarily-related) organisms (see the entire list at the back). We set new records for a Rhode Island bioblitz for fish and vertebrates, the latter resulting from the coincidence of good fish, bird, and mammal counts. The full species list can be downloaded as an Excel file from **rinhs.org/bioblitz-2015-little-compton/**

The diversity of fish habitats was truly remarkable and the fish team took full advantage of rocky and sandy shores, open ocean, large brackish/freshwater ponds, small streams, and small ponds.

Here's the list of fish: alewife, american eel, atlantic silverside, banded killifish, black sea bass, bluefish, bluegill, brown bullhead, four spined stickleback, golden shiner, large-mouth bass, mosquito fish, mumichug, nine-spined stickleback, northern sea robin, oyster toadfish, pumpkinseed, rainwater killifish, rock gunnel, sculpin (grubby), scup, sheepshead minnow, small mouth bass, smooth dogfish, striped killifish, summer flounder, three spined stickleback, and white perch. Particularly notable was the discovery of mosquito fish (*Gambusia holbrooki*) in Bumblebee Pond, part of the Dundery Brook system. This fish is native to the southern U.S. but has been introduced widely by humans in the mistaken belief it will help control mosquitoes (it eats ANY small aquatic organisms, including mosquito larvae AND the native organisms, such as damselflies, that usually prey on mosquitoes). The fish team also contributed RI BioBlitz's first ever count of a cephalopod mollusk: a longfinned squid.

Grass shrimp (*Palaemon vulgaris*) with crab leech (*Myzobdella lugubris*) from Tunipus Pond

More remarkable than record species counts in certain taxa was fact that we exceeded the RI BioBlitz average in 45 out of the 59 categories that we count, in eight cases beating the average by more than 200%! Some of the best performing taxa were algae (94 species versus 46 on average), mosses (60 versus 24 average), fungi (73 versus 33 average), and of course crustaceans (27 species versus a RI BioBlitz average of just 12).

The 168 species of moths found, 50% above the BioBlitz average, are worth special note.

The list of particularly noteworthy natural communities must be led by the beach, dune swales, and hudsonia (beach heather) barren, all located on the barrier between Quicksand Pond and the sea. Also, note the wet forest that the boardwalk runs through, which contributed to fish, insect, bird, and herptile diversity. The marsh at the back (North) side of the pond at the Ponderosa is worth further investigation because it contained rare and otherwise interesting plants.

We found five plants listed as rare by the Rhode Island Natural Heritage Program:

Carex albicans	Covered Sedge	State Concern
Hottonia inflata	Featherfoil, Water-violet	State Concern
Platanthera flava	Tubercled or Pale Green Orchis/orchid	State Endangered
Ptilimnium capillaceum	Atlantic Mock Bishop's-weed	State Concern
Ranunculus sceleratus	Cursed Crowfoot	State Concern

Of the 292 species of vascular plants discovered, 19 are known invasive species, including all the major players: porcelain-berry, Ampelopsis, Japanese barberry, autumn olive, Japanese hops, yellow iris, privet, Japanese honeysuckle, Morrow's honeysuckle, purple loosestrife, eulalia silver-grass, reed canary-grass, Phragmites reed, creeping buttercup, common buckthorn, glossy buckthorn, multiflora-rose, Rosa rugosa, gray florist's willow, and European bittersweet. Approximately 25 more plants are non-native but not invasive.

One notable beetle is the goldsmith beetle (*Cotalpa lanigera*), found on the barrier beach in front of Quicksand Pond. Though not currently state listed, it has been in decline regionally and is listed on the Rhode Island Wildlife Action Plan.

One notable, rare butterfly is Henry's elfin (*Deciduphagus henrici*), found near Bumblebee Pond. This species is listed as of State Concern. It is a holly feeder and indicative of holly forest, a rare natural community statewide but iconic of Little Compton.

Among the herptiles, a spotted turtle (*Clemmys guttata*), protected under state law, was spotted at the Dundery Brook preserve. This is great habitat for this vernal pool species and it was gratifying to find it.

We found eight birds listed by Rhode Island as rare:

great blue heron	State Concern
great egret	State Concern
black-crowned night-heron	State Concern
glossy ibis	State Concern
osprey	State Concern
piping plover	Federal Threatened
least tern	State Threatened
Acadian flycatcher	State Concern

The rare species discoveries are gratifying but not surprising. The plants, birds, and turtle are predominantly wetland/shore species and the event site includes notable wetlands. The Henry's elfin should be thought of being as iconic of Little Compton as are the town's oak-holly forests. These rare species observations will be added to the Rhode Island Natural Heritage Database maintained by RINHS and used by agencies and conservationists to manage natural resources.

Discussion: It is important to remember that BioBlitz is primarily an educational and outreach activity and is not organized to produce statistically robust results about biodiversity. Nonetheless, in Rhode Island the BioBlitz methodology is similar from year to year and site to site and we can account for variations in team skills and effort from year to year by standardizing results using a factor based on perennially strong teams such as vascular plants.

Beach heather (*Hudsonia tomentosa*)

Through the BioBlitz, a picture emerges of Little Compton as a place that is somewhat homogenous at a large scale but has great diversity at a fine scale. Though only two taxa exceeded the previous BioBlitz records, many taxa were very well represented and exceeded the BioBlitz average. One way to understand this is by reflecting on Little Compton's long and continuing agricultural history. Agriculture, at least at the relatively small, pre-industrial scale, creates a diversity of micro-habitats such as bare soil, wet meadows, woodlots and hedgerows, walls, farm ponds, barns, and other structures. As agricultural activity waxes and wanes and products and practices come and go from fashion, agricultural landscapes are further diversified with patches of natural community succession: rough pastures, shrubland, and secondary forest. Though commercial agriculture is not as widespread in Little Compton now as it was in the past, land management practices with aesthetic goals, such as horse stables, hobby farming, and aesthetic mowing continue to sustain many of the same types of habitat patchiness and similarly foster species diversity.

One environmentally deleterious effect of widespread, albeit low-intensity human activity is the spread of invasive species, which BioBlitz found in abundance in Little Compton. Species often become invasive because of adaptations to disturbance: prolific seed, high dispersal, tolerance of poor soils, etc., the same disturbances that foster native species diversity.

One feature from Little Compton that exemplifies the effect of the human hand on the landscape is Bumblebee Pond. This pond contributed significantly to the observed fish, insect, and plant diversity though it is an historic impoundment of Dundery Brook and sustains the state's only known population of the introduced, and environmentally deleterious mosquito fish.

As the BioBlitz results show, Little Compton is a place where human activity is very much a part of the present-day "natural" landscape. This is different from the human impact at an urban site or a rural site such as at the 2009 Glocester BioBlitz at the Sprague Farm preserve. There humans had

left a great mark through farming in the 18th century but had since been largely absent and their activity was not a significant determinant of the habitat and species diversity in the present-day.

Based on the results of the 2015 Rhode Island BioBlitz, we can identify opportunities for conservationists and others thinking about the future of the Little Compton community.

- Develop messages about the area that give due consideration to both historic and current human activity in creating a distinctive biological character. Human activity is very much part of—and not apart from—the Little Compton environment.

- Encourage continued small scale agricultural or agriculture-like land use as a way to sustain diversity.

- As human activity has negative effects as well as positive, invasive species management needs to be prominent in every land stewardship plan.

- The high biodiversity at a small scale could make Little Compton a good place for future environmental education and applied science investigations...a good "living laboratory."

- One focus for education or other field activities could be aquatic habitats, which Little Compton has in great diversity and abundance.

Revisiting Bumblebee Pond in October to further investigate the mosquito fish discovery.

2015 Rhode Island BioBlitz Results Summary:

	site
subviral particles	0
viruses	1
archaea	0
bacteria	1
protozoa	29
all monos	31
algae	94
mosses	60
vascular plants	292
all plants	446
lichens	78
fungi	73
all mycota	151
Parazoa-Radiata	2
non-mollusk Lophotroch worms	6
Mollusks	13
Platyzoa	6
non-arthro Ecdysozoa (inc Nematode	2
Echinoderms	0
non-arthropod inverts	29
spiders and kin	35
crustaceans and kin	27
all non-hexapod arthros	62
EPMT (ephemerop, plecop, megalop, trichop)	3
Odonata	20
Coleoptera	66
Diptera	18
Orthoptera	2
Hemiptera-Homoptera	4
other misc. orders	8
all other insect orders	121
butterflies	24
moths	168
all leps	192
ants	4
bees and wasps	10
all hymenoptera	14
all insects	327
all arthropods	389
all invertebrates	418
primitive chordates	1
reptiles	6
amphibians	8
reptiles and amphibs (herps)	14
fish	28
birds	95
mammals	19
all vertebrates	157
TOTAL species	1203
participants	215

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