

# Science Notes

## Fourth annual bioblitz focuses on marine resources at Biscayne National Park

By Astrid Rybeck, Susan Gonshor, Kirsten Leong, and Elaine Leslie

**ON 30 APRIL 2010, SCIENTISTS AND CITIZENS** converged on Biscayne National Park in southern Florida to take stock of the life-forms inhabiting one of the largest marine parks in the National Park System. This event was the latest installment of the fruitful partnership between the National Park Service and the National Geographic Society, which signed an agreement in 2006 to conduct species inventories in a different park each year for 10 years leading up to the centennial celebration of the National Park Service in 2016. These rapid inventories, or “bioblitzes,” log life-forms in an area over a short period of time. The Biscayne event concluded after just 24 hours, resulting in a productive partnership among resource managers, scientists, educators, and the public that advanced the cause for stewardship and preservation of this marine park.

Biscayne National Park is covered by the shallow nursery waters of Biscayne Bay and the coral reef-sustaining waters of the southern Atlantic Ocean. Because this was the first bioblitz to be held in an almost entirely marine-based environment, organizers had many logistical challenges to overcome. National Park Service staff coordinated boat transportation to shuttle hundreds of participants to park islands and underwater inventory sites and managed shuttle buses to accommodate thousands of interested participants in one small visitor parking area. A year’s worth of hard work, planning, and creativity resulted in a well-considered network of schedules, routes, buses, and boats to meet these challenges.

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Mark Lewis, superintendent of Biscayne National Park, and John Francis, National Geographic Society vice president of research, conservation, and exploration, pass the official bioblitz flag to Darla Sidles, superintendent of Saguaro National Park, hosts of the next National Park Service–National Geographic Society bioblitz in fall 2011. The 24-hour Biscayne bioblitz brought together scientists, students, and the public to explore, inventory, and learn about the park’s four major ecosystems.

### Species counts

This focused endeavor brought together a record number of more than 170 scientists and experts from numerous disciplines, including National Geographic Explorer-in-Residence and renowned ocean scientist Sylvia Earle, 1,300 students and educators from elementary to university levels, the public, 200 volunteer event “ambassadors,” and more than 40 partner organizations that worked to discover, map, and count every living plant and animal species within the 173,000-acre national park.

Water- and land-based science and education activities were conducted throughout the park’s four major ecosystems: mangrove shoreline, estuarine bay, islands, and coral reefs. Although species counts and verification continue, scientists and other participants have documented a preliminary (December 2010) tally of 828 species, 324 of which are new listings on the park’s official species list, as shown in table 1 (page 22).

Among the most notable and unexpected findings is that made by Dr. William Miller, tardigrade expert from Baker University. Dr. Miller is believed to have discovered a new species of tardigrade, or “water bear,” in the park. He is working with park resource managers to confirm and submit his findings for peer review. In addition, the bioblitz afforded the



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The Biscayne bioblitz combined scientific species inventories and identification with citizen science and education activities not only to make new discoveries but also to create lasting connections between participants and the park. Clockwise from top: (1) Students search for life during a marine inventory. (2) A scientist shares stories with students about species collected during water-based inventories. (3) Using a variety of collection techniques, bioblitz participants found 324 species new to the park. (4) Local students from neighboring communities participated in Biodiversity University, an interactive education program created by Biscayne's interpretive staff. Students earned their "diplomas" by completing biodiversity-related activities. (5) A scientist leads students on a plant identification walk.



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first opportunity for algae to be specifically surveyed in the park and for numerous rare butterfly and bird species to be recorded.

### Student experiences

Complementing the bona fide scientific research, Biscayne's interpretive staff developed a creative, education-based program called "Biodiversity University," which took the classroom outdoors. This hands-on experience encouraged students to "earn" various levels of "degrees" depending on the

number of activities they successfully completed. The activities, or "courses," had themes that ranged from understanding the meaning of biodiversity to using mapping and inventory or counting skills to explore patterns between the location and type of habitat and the species that use that habitat. Biodiversity University was so popular that it is being considered as a permanent component of future bioblitzes.

**Table 1. Preliminary species count, Biscayne National Park bioblitz**

Taxa Group	Total Species	New to Park List
Amphibians	4	
Birds	88	3
Corals	52	26
Fish	163	2
Fungi	7	7
Insects	39	37
Mammals	8	
Nonvascular plants	44	44
Other invertebrates	200	185
Reptiles	9	
Vascular plants	214	20
Total	828	324

### Outcome

The scientific, educational, and social benefits resulting from the bioblitz continue to be felt. Teachers, students, and locals went into the field to explore and document park resources with scientists, and many new volunteers were introduced to the diverse service opportunities available at Biscayne National Park. To be sure, these stewards collected useful scientific data, but perhaps more important are the valuable and lasting connections that participants formed with the environment.

### Discovering biodiversity in national parks

Bioblitzes conducted in partnership with the National Geographic Society are one type of biodiversity discovery activity the National Park Service uses to engage the public in gaining a solid understanding of the resources this bureau is charged with protecting and of the vast research potential offered by national parks. Other types of activities include the more comprehensive inventories of

park biodiversity, known as All-Taxa Biodiversity Inventories (ATBIs), which augment basic inventories conducted by networks of the NPS Inventory and Monitoring Program nationwide.

As part of an NPS commitment to strengthen the connection between science and education and to engage youth in parks, the NPS Natural Resource Program Center recently hired a national coordinator to provide support and technical assistance for biodiversity discovery activities Service-wide, including the next National Geographic/National Park Service-sponsored bioblitz, to be held at Saguaro National Park, Arizona, in fall 2011.

Biodiversity discovery activities put education and citizen science in the forefront of the NPS agenda, connecting youth with nature and history, increasing science literacy, and offering opportunities for the public to “give back” through volunteerism. By widening the public’s understanding of the stewardship role they play in protecting the environment, both within and beyond park boundaries, we are working to advance the national park idea as we enter our second century of existence. The recent bioblitz at Biscayne National Park proved that these goals are attainable—even within a 24-hour period.

### About the authors

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