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Natural Resource Stewardship and Science

Planning and Conducting a BioBlitz Event at a National Park Service Unit

Natural Resource Report NPS/HTLN/NRR—2015/935





ON THIS PAGE
Photographs of George Washington Carver National Monument (2013) and Buffalo National River (2014) BioBlitz events
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ON THE COVER
Photographs of George Washington Carver National Monument (2014) BioBlitz event
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Planning and Conducting a BioBlitz Event at a National Park Service Unit

Natural Resource Report NPS/HTLN/NRR—2015/935

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Natural Resource Stewardship and Science
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All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

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Contents

Page

Figures v

Tables vii

Executive Summary viii

Acknowledgments ix

I. Background and Objectives 1

Introduction and Objective 1

I.A. Relationship with NPS Inventory and Monitoring (I&M) efforts 1

I.B. Relationship with NPS policy and initiatives 2

I.C. Promoting interdisciplinary collaboration 2

II. BioBlitz Overview 3

III. Planning and Conducting a BioBlitz 4

III.A. Initial Phase of BioBlitz planning process 4

III.A.1. Identify interdisciplinary team 5

III.A.2. Identify potential groups of focus species/sites for park 5

III.A.3. Develop park specific guidance for scientific research and collections 5

III.A.4. Identify scientists for selected focus species/sites 6

III.A.5. Identify funding requirements and sources for funding 7

III.B. Planning and conducting an individual BioBlitz. 8

III.B.1. Identify scope, focus species group/sites of interest, tentative event dates, and potential team leaders 10

III.B.2. Contact potential team leaders 10

III.B.3. Select final focus species groups/sites 11

III.B.4. Secure funds necessary to meet funding requirements 11

III.B.5. Send out official team leader letter 11

III.B.6. Identify key park personnel 12

III.B.7. Identify logistical requirements 13

III.B.8. Develop team member recruitment material 13

III.B.9. Confirm approved NPS RPRS permit for each team leader 15

III.B.10. Recruit volunteer team members 15

Contents (continued)

Page

III.B.11. Send out reminders, confirm staffing/emergency information, and print forms 15

III.B.12. Morning of BioBlitz event preparations 16

III.B.13. BioBlitz fieldwork and educational program 17

III.B.14. Post-BioBlitz Activities 17

Literature Cited 19

Appendix A A-1

Accessing Integrated Resource Management Applications (IRMA) Data Store and NPSpecies databases A-1

To access IRMA: A-1

To access NPSpecies: A-2

Appendix B B-1

Figures

Page

Figure 1. Overview of the steps involved in the initial planning phase for many BioBlitz events. 4

Figure 2. Overview of the steps involved in planning and conducting an individual BioBlitz event. 8

Figure 2 (continued). Overview of the steps involved in planning and conducting an individual BioBlitz event. 9

Figure A-1. Search screen for a specific park from IRMA. A-1

Figure A-2. Search results screen for a specific park in IRMA. A-2

Figure A-3. NPSpecies home page. A-3

Figure A-4. NPSpecies search screen. A-3

Figure A-5. Park species list. A-4

Figure A-6. Park species list. A-5

Figure A-7. Example of a recruitment poster for display at local, regional, and national professional conferences for recruiting professional scientists and students. A-6

Figure A-8. Example of a team leader initial contact letter. A-7

Figure B-1. Example of a team leader invitation letter for an upcoming event. B-7

Figure B-2. Template for and example of team leader biographical information. B-8

Figure B-3. Example of a Volunteer Job Description. B-9

Figure B-3 (continued). Example of a Volunteer Job Description. B-10

Figure B-4. Volunteer Services Agreement for Natural Resources Agencies (optional form 301A) B-11

Figure B-4 (continued). Volunteer Services Agreement for Natural Resources Agencies (optional form 301A). B-12

Figure B-5. NPS photo release form. B-13

Figure B-6. Study datasheet template. B-14

Figure B-7. Site datasheet template. B-15

Figure B-8. Taxa datasheet template B-16

Figure B-9. Nativeness definitions from page 10 of the NPSpecies User Guide (NPSpecies 2014) B-17

Figure B-10. Abundance definitions from page 12 of the NPSpecies User Guide (NPSpecies 2014) B-18

Figures (continued)

Page

Figure B-11. Example of team member letter.....B-19

Figure B-12. Example of BioBlitz schedule. B-20

Figure B-13. Example of team sign-in sheet.....B-21

Tables

Page

Table B-1. Checklist that can be used for planning and conducting a BioBlitz event. B-2

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event. B-3

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event. B-4

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event. B-5

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event. B-6

Executive Summary

A BioBlitz is a short-term event where National Park Service (NPS) staff, professional scientists, students, and citizen scientists work together to find and identify as many different species within a park as possible using scientific methods. These events provide opportunities for the discovery of understudied biota in national parks and sharing of these opportunities through scientific research, grants, and environmental education.

Historically, the large iconic NPS/National Geographic Society BioBlitz events held near major population centers have involved extensive planning, major funding sources, public involvement, multiple partners, and substantial park and volunteer participation. For most NPS units, events of this scale are simply not feasible given constraints on personnel and fiscal resources. Conducting multiple, smaller BioBlitz events allows parks to grow their natural resource knowledge base while making science fun for a new generation of citizen scientists, thereby helping to engender park stewards - important goals in the Director's Call to Action, NPS 2016 Centennial, and the Revisiting Leopold report.

In addition, these events help "bridge the gap" between broad based biodiversity inventories and intensive vital signs monitoring. Planning and conducting BioBlitz events help park interpretive staff integrate information available from I&M inventories and promote interdisciplinary collaboration with professional and network scientists.

The objective of this plan is to provide a step-by-step guide for planning and conducting a BioBlitz event in a small- to medium-size NPS unit that: 1) focuses on a few, under-studied taxa groups or habitats; 2) accommodates 20-40 volunteers per event; and 3) requires minimal park staff involvement and funding per event.

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I. Background and Objectives

Introduction and Objective

A BioBlitz is a short-term event (less than 48 hours) where National Park Service (NPS) staff, professional scientists, teachers, students, and citizen scientists work together to find and identify as many different species within a park as possible using scientific methods. These events provide opportunities for the discovery of biota in national parks and sharing of these opportunities through scientific research, grants, and environmental education for professional scientists, citizen scientists, and park staff. They also provide students with opportunities to meet and work with professional scientists and state or federal agencies that could potentially lead to new interests and/or careers in natural resources.

The National Geographic Society (NGS) has partnered with the NPS in the support and execution of iconic BioBlitz events in NPS units near major population centers such as Washington, D.C., San Francisco, and New Orleans (http://www.nationalgeographic.com/explorers/projects/bioblitz/ and http://www.nature.nps.gov/biology/biodiversity/bioblitz.cfm). These efforts involve extensive planning, major funding sources, public involvement, multiple partners, and substantial park and volunteer participation. For most NPS units, however, events of this scale are simply not feasible given constraints on personnel and fiscal resources. Therefore, a less complex and resource intensive model has been developed and is provided in this plan. Other parks, notably Great Smoky Mountains, have an ongoing All Taxa Biodiversity Inventory (ATBI) (http://www.dlia.org/atbi/). Many NPS parks conduct various biodiversity events including large non-NGS BioBlitz events, annual butterfly and/or bird counts, and multi-park, system-wide ecological studies. Additional information on biological diversity studies can be found in the 2014 special issue of *Park Science* at: (http://www.nature.nps.gov/ParkScience/Archive/PDF/ParkScience31(1)SpecialIssue2014.pdf).

Our objective is to provide a step-by-step guide for planning and conducting a BioBlitz event in a small- to medium-size NPS unit. It outlines a simple approach that: 1) focuses on a few, under-studied taxa groups or habitats; 2) can accommodate 20-40 volunteers per event; and 3) requires minimal park staff involvement and funding per event. Conducting multiple, smaller BioBlitz events allows all parks to grow their natural resource knowledge base while making science fun for a new generation of citizen scientists, thereby helping to engender park stewards - two important goals in the Director's Call to Action.

I.A. Relationship with NPS Inventory and Monitoring (I&M) efforts

To address the lack of scientific information about the status and trends of natural resources under NPS stewardship, the NPS established the Natural Resource Inventory and Monitoring (I&M) program in 2001. Inventory and Monitoring networks now provide over 270 national park units with site-specific scientific information. Baseline inventories conducted by I&M focused on vertebrate animal and vascular plant species. I&M further conducts long-term monitoring of important indicators of ecosystem health, or "vital signs."

Park records exist of historical biological surveys and many are included in the NPS's Integrated Resource Management Applications (IRMA) and NPSpecies databases. Despite these efforts, many

species go undiscovered or have never been targeted for species-specific information (e.g., adult aquatic invertebrates, pollinators, land snails, and terrestrial and aquatic mites). In the words of Dr. David Bowles, NPS HTLN Aquatics Program Leader, "In conservation biology, you can't protect something if you don't know it's there."

BioBlitz events and citizen scientists help provide a relatively low-cost means to help "bridge the gap" between broad based biodiversity inventories and intensive vital signs monitoring. They also help verify and update existing park data residing in the NPS's IRMA and NPSpecies databases.

I.B. Relationship with NPS policy and initiatives

A BioBlitz provides a variety of possibilities to engage the public in park inventories, particularly of lesser-known taxonomic groups, and addresses the NPS Call to Action item "Next Generation Stewards" (NPS 2013), which emphasizes citizen involvement in biodiversity discovery in national parks. As we near 2016, conducting BioBlitz events is a cost effective means of meeting the NPS Centennial goals to "connect with and create the next generation of park visitors, supporters, and advocates" (NPS 2015).

As mentioned in the Revisiting Leopold report (National Park System 2012), the purpose of I&M science interpretation and education is to share credible scientific information that is engaging, thought provoking, and actionable in a way that fosters understanding of and care for NPS resources. Interpretation and education should also help "steward NPS resources for continuous change….in order to preserve ecological integrity… (and) provide visitors with transformative experiences…" (National Park System 2012).

I.C. Promoting interdisciplinary collaboration

Integrating information available from I&M inventories and conferring with network scientists are opportunities that promote interdisciplinary collaboration between network scientists and park staff. It has been noted that these events help promote communication between multiple divisions within the park including superintendent's office, resource management, maintenance, law enforcement, and administration. Increased outside collaboration includes universities, local communities, schools, and non-profit organizations. Integral to a successful BioBlitz, this communication is vital to achieving the goal of providing authentic science based experiences that contribute to achieving stewardship among the volunteers.

II. BioBlitz Overview

A BioBlitz event is conducted within NPS park boundaries on a specific date where teams will collect, identify, and count as many focus species as possible using scientific methods. NOTE: The term "species" used throughout this document, represents taxa identified to its lowest taxonomic level.

BioBlitz teams should be limited to a designated team leader and no more than 10 volunteer team members, depending on the team leader's preference. The team leader must be a professional scientist (36 CFR 2.5) in order to conduct research in the park. Team members may include teachers, students, and interested adults. Suggested minimum age is 12, as younger children may have difficulty completing necessary field activities. Team leaders should establish the schedule and methodologies to be used, lead the fieldwork, provide equipment and supplies, and identify lab facility needs.

An orientation meeting held prior to fieldwork welcomes participants, provides additional information (including safety information), and ensures collection of all necessary volunteer forms. Volunteers then break into teams where team leaders discuss schedule, methods, data recording, and equipment use. BioBlitz fieldwork begins as instructed by the team leader.

Lab facilities can be made available for processing collected specimens and for educational programs. A camera adapted microscope connected to a laptop and projector is suggested. This makes findings easily viewed by participants and visitors. Opportunities can be made available for BioBlitz related workshops and exhibits for other visitors. A meeting (open to the public) can be held for the team leaders and/or members to present findings, share experiences, and provide feedback for future BioBlitz events.

While awaiting receipt of team leader data, press releases can be developed and posted on park and social media websites reporting the number of participants (volunteers and NPS staff), a preliminary list or number of species, and any public interest highlights, with explanation that specimen identification will be ongoing and the number of species is likely to increase. Thank-you correspondence can also be sent to team leaders and members.

Final data results can be published in an NPS publication, making it a permanent record of the park, and then entered into the NPS's IRMA and NPSpecies databases. In order to maximize public outreach and community involvement, press releases can be developed that provide the final results. These can be submitted to local and regional news media, the NPS natural resource newsletters and magazines, and posted on park and social media websites. A video can be produced from the BioBlitz and uploaded to the park and NPS YouTube websites. An example video showing fieldwork and educational program can be seen at https://www.youtube.com/watch?v=UJllzkqnIX4.

III. Planning and Conducting a BioBlitz

This section is divided into two parts. Part A activities are performed during the initial planning phase and provide the foundation for many BioBlitz events. Part B describes the activities involved in planning and conducting an individual BioBlitz event and is repeated for each BioBlitz.

III.A. Initial Phase of BioBlitz planning process

The initial phase of planning includes: 1) identifying an interdisciplinary team, 2) developing a master list of potential groups of focus species/sites for a park, 3) developing park specific guidance for scientific research and collections, 4) identifying a pool of professional scientists capable of serving as team leaders, and 5) identifying funding requirements and sources (Figure 1). Initial planning may need periodic re-assessment as new information is gained.

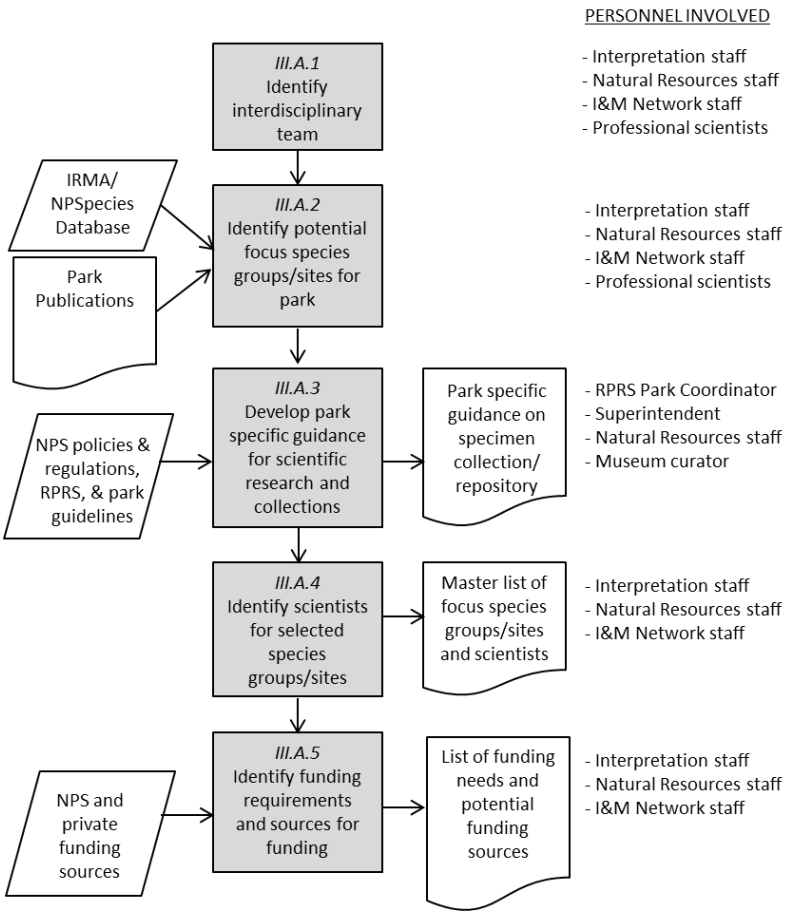


Figure 1. Overview of the steps involved in the initial planning phase for many BioBlitz events.

III.A.1. Identify interdisciplinary team

To begin, it is important to identify interdisciplinary team members who are knowledgeable of the park's natural resources. This team conducts research and summarizes natural resource information about the park, and contributes their personal knowledge and expertise.

The interdisciplinary team should include at a minimum park staff from interpretation and natural resources, scientists from the I&M network, and local scientific experts. All NPS units with significant natural resources are included in one of 32 Inventory and Monitoring Networks (http://science.nature.nps.gov/im/index.cfm). Network scientists visit parks regularly to collect natural resource scientific data and are familiar with park resources and management priorities. In our experience, interaction among team members promotes communication between park staff and the NPS I&M scientists that leads to greater knowledge and appreciation of both park and network resources. Oftentimes, this process initiates an enduring dialogue.

III.A.2. Identify potential groups of focus species/sites for park

Next, it is important to identify information gaps in a park's biodiversity knowledge base. Information gaps may be from understudied taxa, or understudied areas within the park.

The NPS's IRMA Data Store and NPSpecies databases document the state of knowledge regarding a park's biodiversity in the form of documents, publications, data sets, and species lists. It is suggested the IRMA and NPSpecies databases (https://irma.nps.gov/App/), park publications, NPS staff, and other professional scientists be queried for all information known about a specific park. See Appendix A for detailed instructions on accessing IRMA Data Store and NPSpecies databases.

From the knowledge base gained above, the team then identifies specific groups (e.g. snails, fungi) and/or specific habitats (e.g. springs) for future BioBlitz events. This 'master' list is revised when new species groups/sites are identified, removed, or more information becomes known. Special attention should be given to any state or federally listed rare species or sensitive habitats requiring protection.

III.A.3. Develop park specific guidance for scientific research and collections

A clear and concise research and collection policy is necessary to avoid confusion regarding how, what, where, and when team leaders may collect specimens; and their intended use and preservation. Team leaders must be from a "reputable scientific or educational institution or a State or Federal agency" (36 CFR 2.5) in order to conduct scientific research in the park. In addition, an NPS Research Permit and Reporting System (RPRS) research permit is required in order to collect specimens within the park boundaries. The NPS Institutional Animal Care and Use Committee (IACUC) guidance should also be included if collections involve vertebrate animals to ensure Animal Welfare Act (AWA) regulations are followed (http://www1.nrintra.nps.gov/brmd/wildlifehealth/iacuc/index.cfm).

Early in the planning process, the park staff (NPS RPRS permit coordinator, natural resource manager, museum specialist, and superintendent) should review the following NPS policies for scientific research and collections, and develop park specific guidance for general collection

guidelines. More specific guidance can be tailored to the selected focus species groups/sites if needed.

- NPS Management Policies 2006 (http://www.nps.gov/policy/MP2006.pdf)
- Code of Federal Regulations (36 CFR 2.5, 36 CFR 2.1, 43 CFR 24)
- Director's Orders #78 (http://www.nps.gov/policy/DOrders/DO78.htm)
- NPS Research Permit and Reporting System (https://irma.nps.gov/rprs/Home)

Pay special attention to specimen repository requirements for the park. This will help ensure scientists collecting in the park have clear guidance when applying for NPS RPRS permits, conducting scientific research and collections, and proper handling of collected specimens. This will also prevent potential delay in approving permits prior to a planned BioBlitz event. I&M Network staff and professional scientists can also be consulted for guidance development.

Update guidance when changes are made to RPRS or specimen collection/repository park guidance.

III.A.4. Identify scientists for selected focus species/sites

The team should begin developing a list of professional scientists (i.e. potential team leaders) who may be interested in conducting research on the identified focus species groups/sites. Members of the team that identified the knowledge gaps may also be willing to serve as team leaders, or will likely know local colleagues capable of serving as team leaders. Revise the list when new scientists are identified, removed, or more information becomes known about the scientists. Other sources for potential team leaders include:

- Colleges and universities – these may be local or international depending on focus species and available funding. Again, permitting requires a "reputable scientific or educational institution or a State or Federal agency."
- Federal natural resource agencies such as the National Park Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, and U. S. Forest Service.
- State natural resource agencies.
- Referrals from known professional scientists.
- Previous BioBlitz/Biodiversity events.
- Scientists who have conducted studies in similar habitats.
- Peer reviewed publication authors.
- Local, regional, and national conferences.

Poster presentations at local, regional, and national professional conferences, outlining the opportunities available at BioBlitz events, are great ways to recruit potential professional scientists and students. See Appendix A, Figure A-7 for an example poster.

Once potential scientists have been identified, contact them to determine their interest in participating in an event. When soliciting interest, be sure to include an explanation of their responsibilities and

associated information surrounding the event (see Appendix A, Figure A-8 for an example letter). Responsibilities include:

- Obtaining an NPS RPRS permit and understanding what is involved in obtaining that permit.
- Leading teams in fieldwork.
- Handling of collected specimens.
- Reporting data to the park in a timely manner.
- Agreeing to be a park volunteer with limited or no funding available.
- Presenting findings in an educational forum (optional).

III.A.5. Identify funding requirements and sources for funding

BioBlitz funding may be necessary depending on the complexity of the event and distance traveled by the professional scientists. Funding needs might include housing, supplies, and travel reimbursement for scientists, food for volunteers, printing costs, promotional material, specimen curation costs, transportation, and additional staffing. Identification of funding sources and applications should occur early in the process, allowing time to meet grant source deadlines and staff budgeting.

The following are potential sources for funding a BioBlitz event:

- Park non-profit "Friends" organizations
- National Park Foundation (http://www.nationalparks.org/) offers many funding opportunities including the *Ticket to Ride* transportation program (http://www.nationalparks.org/our-work).
- Partnering with state and federal agencies
- Partnering with non-government organizations such as The Nature Conservancy or Audubon Society
- One time small grants from park funds
- National Geographic Society (http://www.nationalgeographic.com/explorers/projects/bioblitz/)
- National Park Service Natural Resources Management special projects (http://www.nature.nps.gov/)
- The Nature Fund for National Parks, Inc. (http://naturefund4parks.org/about-us/organization/)
- National Science Foundation Systematics and Biodiversity Science (SBS) division (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503618)
- North American Association for Environmental Education (http://www.naaee.net/)
- Project Wet (http://www.projectwet.org/)
- Project Learning Tree (https://www.plt.org/)

III.B. Planning and conducting an individual BioBlitz.

Figure 2 outlines the steps in planning and conducting an upcoming BioBlitz event and are repeated for each event. Also, see Table B-1 in Appendix B for a planning checklist of the activities.

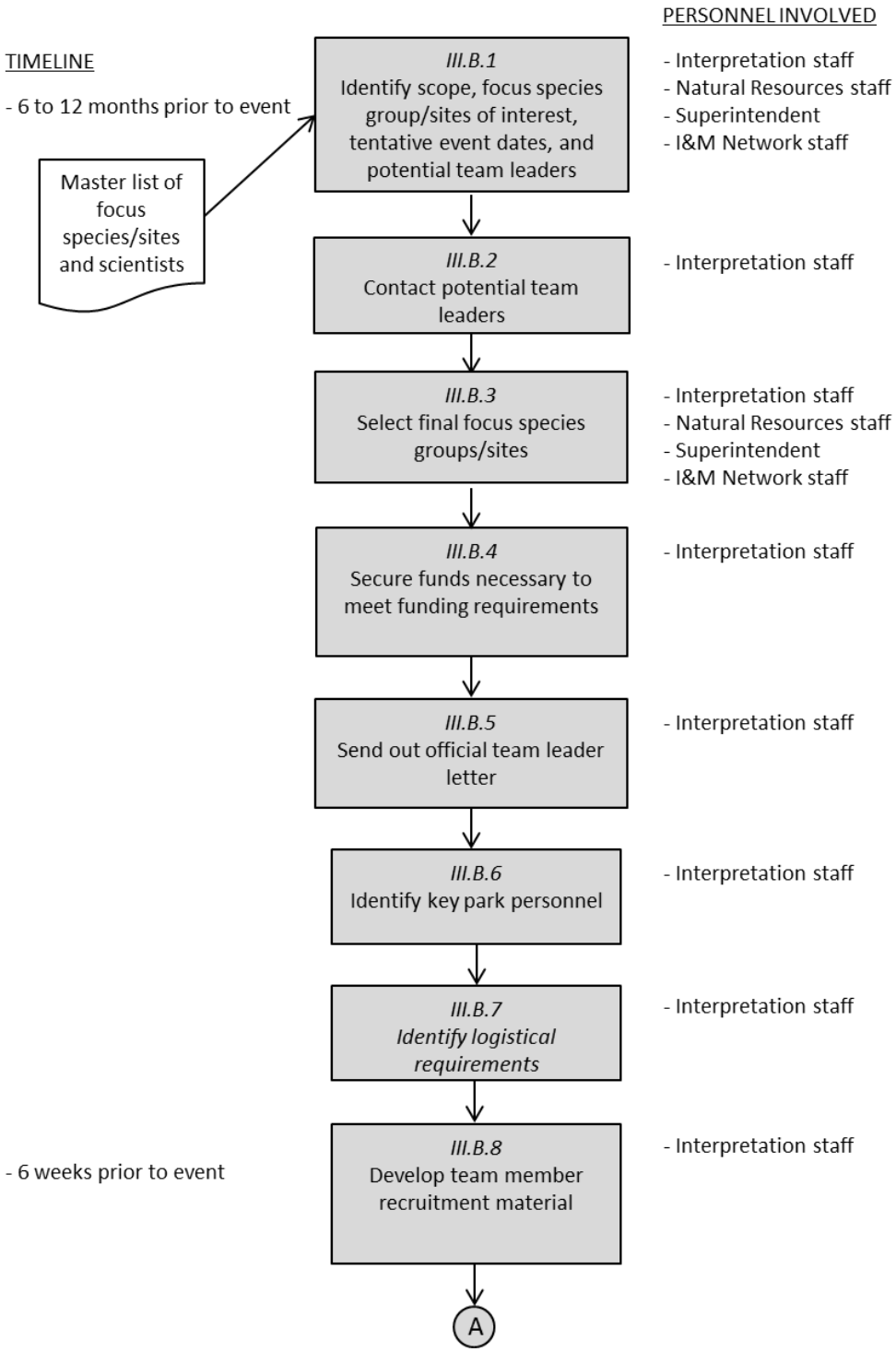


Figure 2. Overview of the steps involved in planning and conducting an individual BioBlitz event.

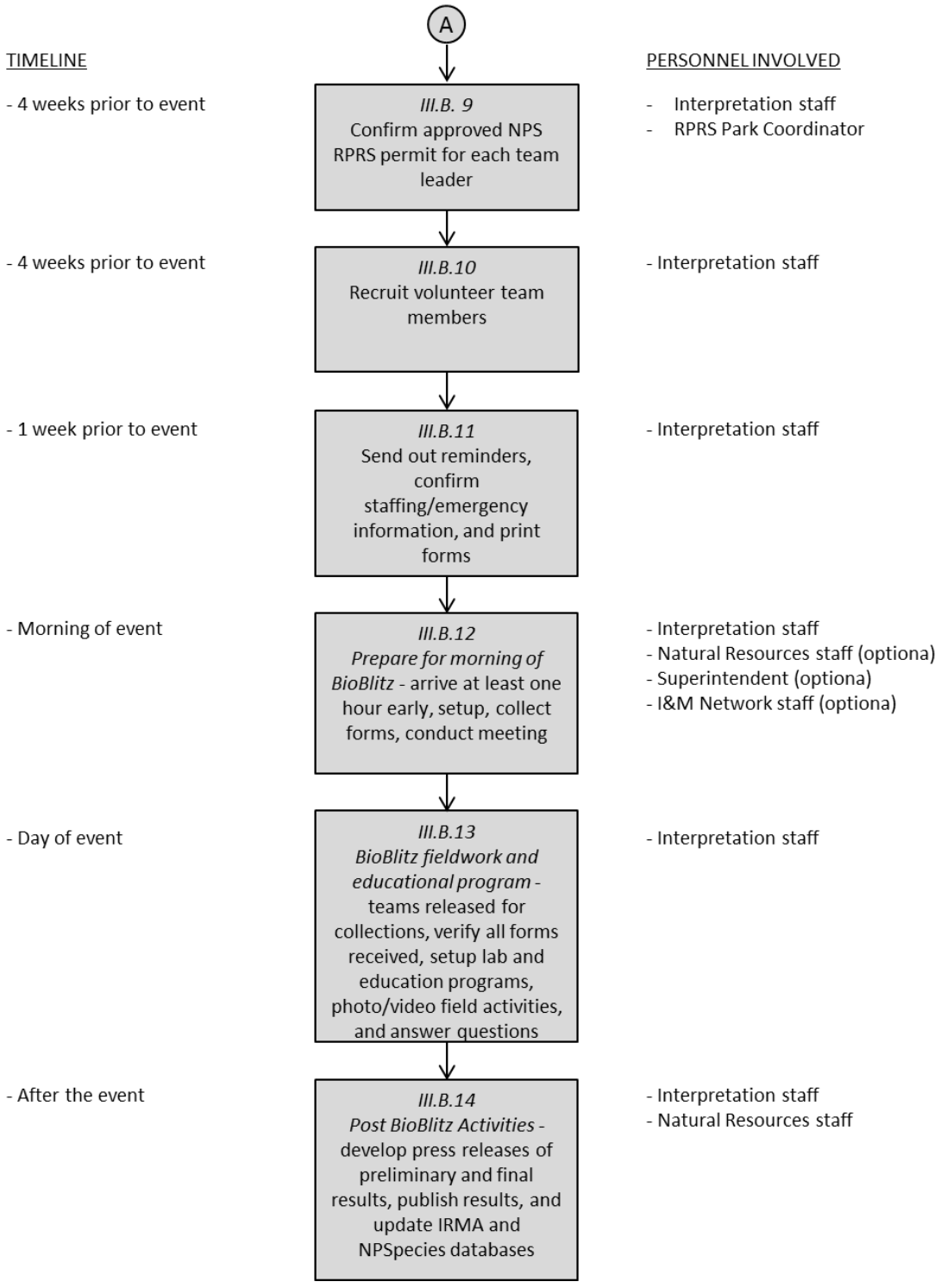


Figure 2 (continued). Overview of the steps involved in planning and conducting an individual BioBlitz event.

III.B.1. Identify scope, focus species group/sites of interest, tentative event dates, and potential team leaders

Six to 12 months prior to the BioBlitz event, determine the desired scope of the event (i.e. the desired number of teams and team members), focus species group/sites of interest, tentative dates, and potential team leaders.

Allowing up to 6 months prior to the event, identify one to four (1-4) focus species groups/sites of interest from the master list, taking into consideration optimum sampling season compatibility. Optimum sampling season is of great importance when selecting focus species, as not all species can be successfully collected at all times of the year.

Next, identify at least two tentative dates for the BioBlitz, taking into consideration the optimum sampling season, weather conditions, and other events that might be held in conjunction with the BioBlitz (e.g., National Public Lands Day, annual interpretive programs, YCC educational days, summer camps). Also, take into consideration the schedules of public/private schools and/or universities (e.g. breaks, holidays, and testing). For some parks, the event date may need to be planned 12 months in advance in order to set the special event calendar and budget for the upcoming fiscal year.

Make note of any special attention that should be given to rare and/or state and federally listed species or habitat that could potentially be found in the park to ensure protection of the species and its location(s).

Next, from the master list of experts, identify potential team leaders with the appropriate qualifications for selected focus species group/sites. We suggest providing the RPRS park coordinator a list of the potential team leaders for information purposes and request immediate notification if there are any problems associated with permit applications.

III.B.2. Contact potential team leaders

Contact team leaders by either phone, email, or mail to determine their interest, availability, and to confirm the focus species' optimum sampling season. Effective team leaders are essential for a successful event. To be effective, team leaders need a clear understanding of their obligations that include:

- Leading volunteers in fieldwork and the collection of biological data using scientifically sound methods, clear communication, and working with varied ages and backgrounds.
- Inspiring curiosity, awareness, and appreciation of a park's natural resources.
- Providing needed equipment, lab facilities, and supplies, or request assistance from the park.
- Establishing the schedule and methodologies to be used for fieldwork.
- Submitting detailed information on the study, site, and taxa collected by a park-determined number of days after the BioBlitz (we suggest a maximum of 90 days). Confirmed findings may be published in some form by the NPS and entered into the NPSpecies database when the park feels the majority of the specimens have been identified. *Note: the NPS publication is a snapshot of the known taxa information obtained during the BioBlitz, but the park should not be the*

official keeper of the team leader's data. If inquiries are made regarding the data, they should be referred to the team leader for more detail.

III.B.3. Select final focus species groups/sites

Once responses have been received from interested team leaders, select the final focus species groups, recognizing this is an iterative process. For example, travel costs may prohibit recruiting team leaders with the appropriate qualifications, resulting in a different choice of focus species group. Or, the focus species group may not be active / present on the BioBlitz date (e.g. hibernating animals). In some cases, selecting a focus species may not be reasonable. In these cases, pitfall traps may be used in different habitats throughout the park to collect a variety of taxa (e.g. small insects, animals, reptiles and amphibians) that would otherwise be hard to capture. If vertebrates are collected, IACUC guidelines must be followed.

III.B.4. Secure funds necessary to meet funding requirements

Confirm availability of and secure the necessary funds to meet funding requirements, especially in regards to park staffing and team leader's travel expenses.

III.B.5. Send out official team leader letter

Email/mail an official letter (see Appendix B, Figure B-1) to the team leader informing them of their responsibilities, providing them with official forms/templates, and requesting a confirmation of their participation. *Based on our experience, this is an important step in formalizing the agreement so both parties are committed to the event.* Obtain a written acceptance (an email is acceptable) and biographical information from each team leader *before proceeding with further planning*. The team leader's biographical information is to recruit team members.

At a minimum, the team leader letter and attachments should contain the following documents to ensure the team leader is informed and has a copy of the required forms. See Appendix B for a sample of each document referenced below:

- Team leader letter (Figure B-1)
- Team leader biographical information template/example (Figure B-2) that includes field gear requirements and potential safety hazards
- NPS RPRS permit application information that includes park specific guidance for scientific research and collections. The permit application information can refer the team leader to the RPRS website (https://irma.nps.gov/rprs/Home)
- It is suggested that park and event specific guidance also be included. *It is important to stress to the scientist that a park approved NPS RPRS permit must be obtained as soon as possible. It is also important to reiterate the park specific guidance on scientific research and collections as well as specimen repository and IACUC requirements*
- Park brochure
- VIP forms:
    - Volunteer Job Description (Figure B-3) that includes potential safety hazards

- Volunteer Services Agreement for Natural Resources Agencies (optional form 301A, Figure B-4)
- NPS Photo Release form (Figure B-5)

- Study, Site, and Taxa datasheet template (Figures B-6 through 8). The team leader should be informed that:
  - Specific study and site data must be collected on the day of the event (e.g., GPS coordinates, site descriptions, weather). *Note: locations of any state or federally listed rare species or sensitive habitats requiring protection should not be made public*.
  - Data must be submitted to the park within a park determined number of days after the conclusion of the BioBlitz (suggest a maximum of 90 days).
  - Data may be published in an NPS report and entered into the NPSpecies database when the park feels the majority of the specimens have been identified.
  - Definitions for Nativeness and Abundance can be found in Figures B-9 and B- 10. The definitions are taken directly from the NPSpecies User Guide (https://irma.nps.gov/content/npspecies/Help/).

III.B.6. Identify key park personnel

Identify key park personnel including the event coordinator, responsible for planning and conducting the event, and safety coordinator, responsible for safety of participants. Additional staffing requirements can be identified at this time (e.g., Superintendent, maintenance, and administration).

The *event coordinator* will manage communications among support staff and be a primary point of contact for volunteers; ensure all VIP forms have been completed, signed, and received before activities begin; and ensure that team members between the ages of 12 through 16 have an accompanying adult who has signed a VIP form.

The *safety coordinator* should be engaged throughout the planning of the event. In the design phase, a safety coordinator will ensure all proposed field activities can be conducted safely and the VIP Job Description addresses all potential hazards. The day of the event, the safety coordinator should provide a safety briefing that identifies potential hazards, provides instructions on what to do in case of an emergency, and outlines the system to communicate with team leaders throughout the day.

Other key personnel may include:

- Speakers involved in the orientation meeting. Before each BioBlitz event, it is suggested there be a 30-minute meeting of all participants that includes a welcome by park staff, introductions of scientists and park staff coordinators, and a safety talk.
- Park staff to unlock and lock gates and facilities before and after all activities surrounding the event including nocturnal sampling.
- Person(s) to photograph and/or film the event. Note: park staff, volunteer, or a contactor may be used.
- Person(s) to set up, tear down, and clean up the day of the event. Note: park staff, volunteer, or a contactor may be used.

III.B.7. Identify logistical requirements

Identifying logistical needs for the event is important for a successful outcome. *To the extent possible, this information should be provided to volunteers prior to the event*. Logistical considerations may include:

- Parking areas, meeting location, lunch area, laboratory/educational program facility (may include water, sinks, electricity, microscopes, and hand lenses), tents, and portable toilets.
- Tables, chairs, audio visual needs (projectors, screens, and microphones), portable generators, electrical outlets, extension cords, coolers, water coolers, fans, heaters, lighting, all-terrain vehicles, and carts.
- Signage and maps to ensure volunteers can find event location and meeting places.
- Group transportation requirements (vans/buses) if sampling is not within walking distance of meeting location.
- Educational programs/workshops/exhibits to be provided the day of the event.
- Food and water for participants. If high heat is anticipated for the event, it is suggested water and/or electrolyte replenishing drinks be provided as a safety precaution. Snacks might also be made available.

III.B.8. Develop team member recruitment material

Our experience suggests limiting teams to 10 members. A suggested minimum age requirement is 12, as younger children may have difficulty completing necessary field activities. Given that scientific research is being conducted and the results may become part of the permanent record, it is important that team members focus on the fieldwork. The team leader can help identify the requirements for team members (e.g. able to carry gear, walk off trail, and get wet). Volunteers who are ages 12 through 16 are required to obtain parent/guardian written permission (see Volunteer Services Agreement form, Appendix B, Figure B-4) and be accompanied by an adult.

Six weeks prior to the BioBlitz event and prior to publicizing the event and recruiting team members, the following information should be organized:

- List of contacts (organizations, media, schools) for mailing of flyer and press releases

- Park website and social media content ready to be uploaded once recruitment begins
- Presentations on the BioBlitz event that can be given to classes and organizational/group meetings
- Directions or map to park
- Map of park with parking, meeting, lunch, and laboratory locations indicated
- Informational flyer and press release that includes the following information:
    - Date and time of BioBlitz event
    - Park name and location
    - Brief explanation of BioBlitz and information on ecological importance of focus species (optional)
    - Professional scientists name, title, affiliation, city, state, and focus species
    - Event coordinator contact information (name, phone number, email address, and website, if available)
    - Basic information needed that day such as what to wear (hat, shoes, outerwear, sunscreen, and insect spray) and items to bring (water and lunch), as not everyone will read the Job Description, schedule, or VIP forms before the day of the event
    - Colorful photos representative of focus species
    - Registration deadline (optional) may be required if large pools of volunteers are available to draw from and/or teams may fill up quickly
    - Results from previous events if this is not the first (optional)
- Team member recruitment packages:
    - All team members will be volunteers; therefore, NPS park procedures for volunteer participation should be followed.
    - The following suggested materials, at a minimum, should be ready to send out either as part of pre-registration or upon request once the recruitment campaign begins:
        - Team member letter (Figure B-11)
        - Informational flyer (see above) that can be used by the team member to recruit others by posting or emailing
        - Team leader(s) completed biographical information sheet(s) (Figure B-2)
        - Park brochure
        - BioBlitz schedule (Figure B-12)
        - Volunteer Job Description (Figure B-3)
        - VIP forms (Figures B-4 and B-5)

III.B.9. Confirm approved NPS RPRS permit for each team leader

At least 4 weeks prior to the BioBlitz event, the event coordinator should contact the park's NPS RPRS permit coordinator and obtain a copy of each team leader's approved NPS RPRS permit that has all signatures in place. Retain a copy for your files. If the team leader has not submitted the application, contact the team leader to ensure timely submission and commitment by the scientist. *Note: Our experience suggests that team leaders may require encouragement and/or assistance in obtaining a permit.*

III.B.10. Recruit volunteer team members

At least 4 weeks prior to the BioBlitz event, begin the initial recruitment campaign and *re-submit information periodically up until day before the event*. Publicity includes:

- Updates to the park website and social media sites with event information, including forms, and *frequent posts on social media sites up until day before event*.
- Press releases to local television stations, radio stations, and newspapers, allowing time for calendar of events deadlines and including an invitation for reporters to attend the event.
- Flyers or presentations to the following suggested contacts, taking into consideration school schedules and allowing time for calendar-of-event deadlines:
    - Social media websites in area including city, state, and federal parks
    - Surrounding universities, colleges, and public/private schools
    - Home school groups
    - Government agencies (state and federal)
    - Volunteers.org
    - Funding sources websites, if any used
    - National Public Lands Day website, if event held in conjunction
    - Professional scientific organizations (e.g. American Fisheries Society, Entomological Society of America, and The Wildlife Society) including college student chapters
    - Organizations/clubs/programs open to the public such as Audubon Society, Master Naturalists Program, Native Plant Society, Sierra Club, watershed groups, and Boy/Girl Scouts.

III.B.11. Send out reminders, confirm staffing/emergency information, and print forms

One week prior to the BioBlitz event:

- Re-submit publicity information to above contacts, as applicable, and possibly re-invite media reporters.
- Prepare team sign-in sheet for day of event that includes a space for volunteer name, contact information, whether minors (ages 12 through 16), adult's accompanying minors (ages 12 through 16), how volunteer found out about event, and whether VIP forms have been received (Figure B-13). Pre-fill with names of any pre-registered volunteers and indicate receipt of VIP forms. *Note: make spaces large enough for volunteers to write contact information legibly*.

- Remind team leaders and any pre-registered team members to:
  - Re-read the schedule of the event and job description, paying special attention to the safety information.
  - Complete, sign, and bring VIP and photo release forms the day of the event.
  - Bring water and a lunch, if required.
- Remind team leaders to:
  - Bring a signed copy of their NPS NRPS permit and to have it with them at all times when collecting.
  - Coordinate place and time to meet the morning of the event.
  - Request that the team leader provide any PowerPoint presentation files to the event coordinator ahead of time.
- Confirm what park staff will be working the day of the event, their responsibilities, and coordinate to ensure someone is available to:
  - Unlock gates and facilities at least 1 hour prior to meeting to allow team leaders, staff, and exhibiters time to setup.
  - Lock gates and facilities after the event.
  - Welcome the volunteers, register team members, and present a safety briefing.
  - Set up sound and audiovisual equipment and ensure that it is working properly.
  - Ensure any water and food items have been purchased and set up.
- Obtain a list of emergency telephone numbers and ensure radios are working properly and are available for use the day of the event.
- Print a copy of the Job Description and blank copies of the VIP forms for volunteers that did not pre-register or bring their own copies.

III.B.12. Morning of BioBlitz event preparations

On the morning of the event, the event coordinator should:

- Arrive at the park at least one hour prior to the event in order to set up the event.
- Ensure the park gate and facilities have been unlocked.
- Ensure all volunteers sign the team sign-in sheet and provide legible name and contact information (Figure B-13).
- Ensure all volunteers have completed, signed, and turned in their VIP forms before fieldwork begins. *Take note of any medical conditions indicated on page 2 of the Volunteer Services Agreement for Natural Resources Agencies (optional form 301A) and communicate this information to the team leader and safety coordinator*.
- Indicate on the team sign-in sheet whether completed and signed VIP forms have been received (Figure B-13).

- Ensure adults are present for team members ages 12 through 16, that they are aware of their responsibilities, and that they have signed and submitted the above VIP forms.
- Direct the volunteers to the orientation meeting area.
- Conduct an orientation meeting that includes introductions of and welcome from park staff, a safety briefing, a review of the schedule of events and expectations. Also, be sure to collect all Volunteer agreement and photo release forms. After the orientation meeting, team leaders can instruct members regarding methodology, field equipment use, and other field operations.

III.B.13. BioBlitz fieldwork and educational program

Once the meeting is adjourned, the team members become the responsibility of the team leaders and fieldwork may begin. Park staff is available to continue with other BioBlitz responsibilities such as:

- Verifying all forms have been received.
- Setting up lunch area, lab facilities, and educational program activities.
- Photographing/filming BioBlitz fieldwork activities in the field and during educational program.
- Answering questions about the BioBlitz from visitors or participants. *Note: it is suggested that a count be kept of the visitors that participate in the educational program or ask questions about fieldwork activities in the field, and that those numbers are included in event press releases and publications.*

III.B.14. Post-BioBlitz Activities

While awaiting team leader data:

- Develop press releases using preliminary results of BioBlitz; including how many participated in the event (all volunteers, visitors, and NPS staff), a preliminary list or number of species, and any public interest highlights, with explanation that specimen identification will be ongoing and the number of species is likely to increase.
- Submit volunteer hours, names, and contact information to volunteer coordinator to ensure park receives Annual Volunteer Report credit and volunteer receives invitation to recognition event.
- Update park website/Facebook page with preliminary results and remove event announcement information.
- Send thank you letters to team leaders and members.

Once team leader data have been received:

- Write and publish NPS report.
- Update IRMA and NPSpecies databases with confirmed results.
- Include the event as a service-learning project on Centennial reporting websites.
- Develop press release with details and submit to the following suggested media:
    - Local television stations, radio stations, and newspapers
    - Funding sources

    - Partners
- Include information in NPS newsletters and magazines such as Park Science, NPS Call to Action newsletter, and I&M national and network newsletters.

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Appendix A

Accessing Integrated Resource Management Applications (IRMA) Data Store and NPSpecies databases

To access IRMA:

- Go to IRMA website (https://irma.nps.gov/App/),
- Using the Select **Search>Data Store>Quick** from drop down menus at top of page,
- Data Store Search screen will appear,
- Check the box **Filter by NPS Unit(s):** to see a list of the parks (see Figure A-1).
- Selected your park then use the right arrow to place your park name in the **Selected Units (drop)** window on the right.
- Click **Search**

A list of search results (Figure A-2) will appear that shows where the document is stored, type of document, document, description, and number of files used to store the document. To download a copy of this list to either EXCEL or EndNote:

- Select **Download**
- Select format as either Excel spreadsheet (.xlsx) or EndNote (.enw)
- The file will be automatically downloaded to your computer.

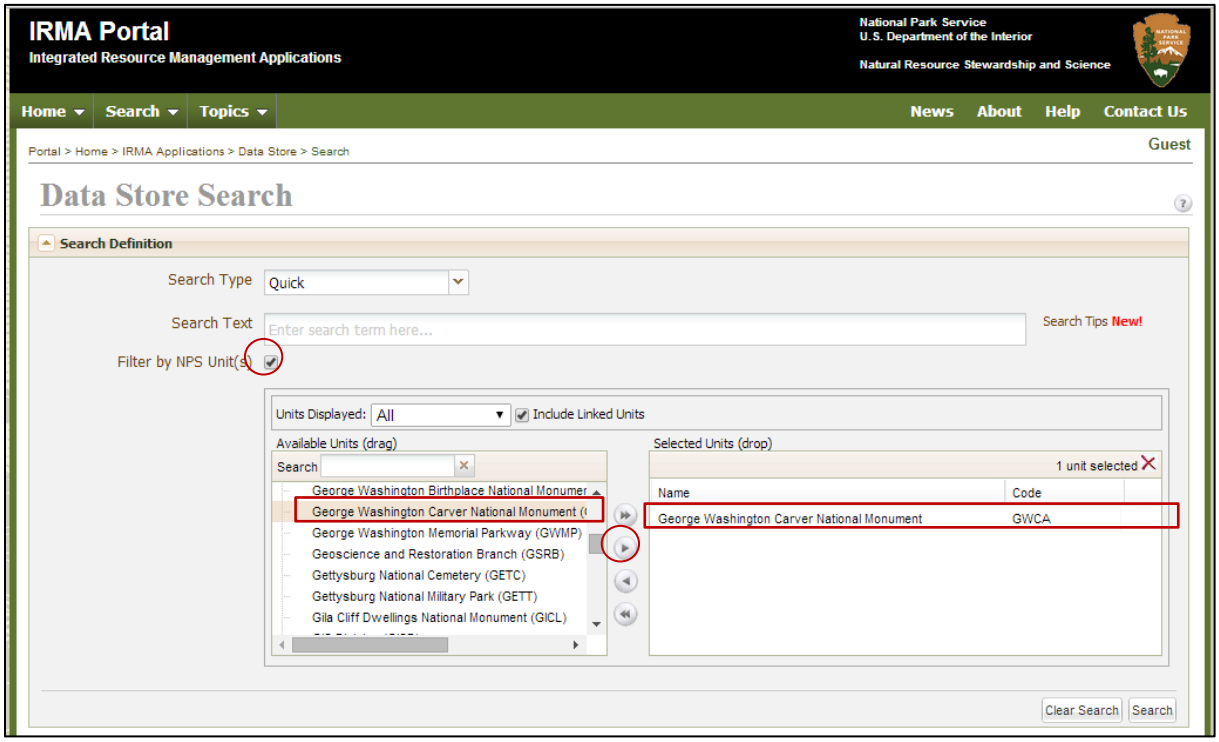


Figure A-1. Search screen for a specific park from IRMA.

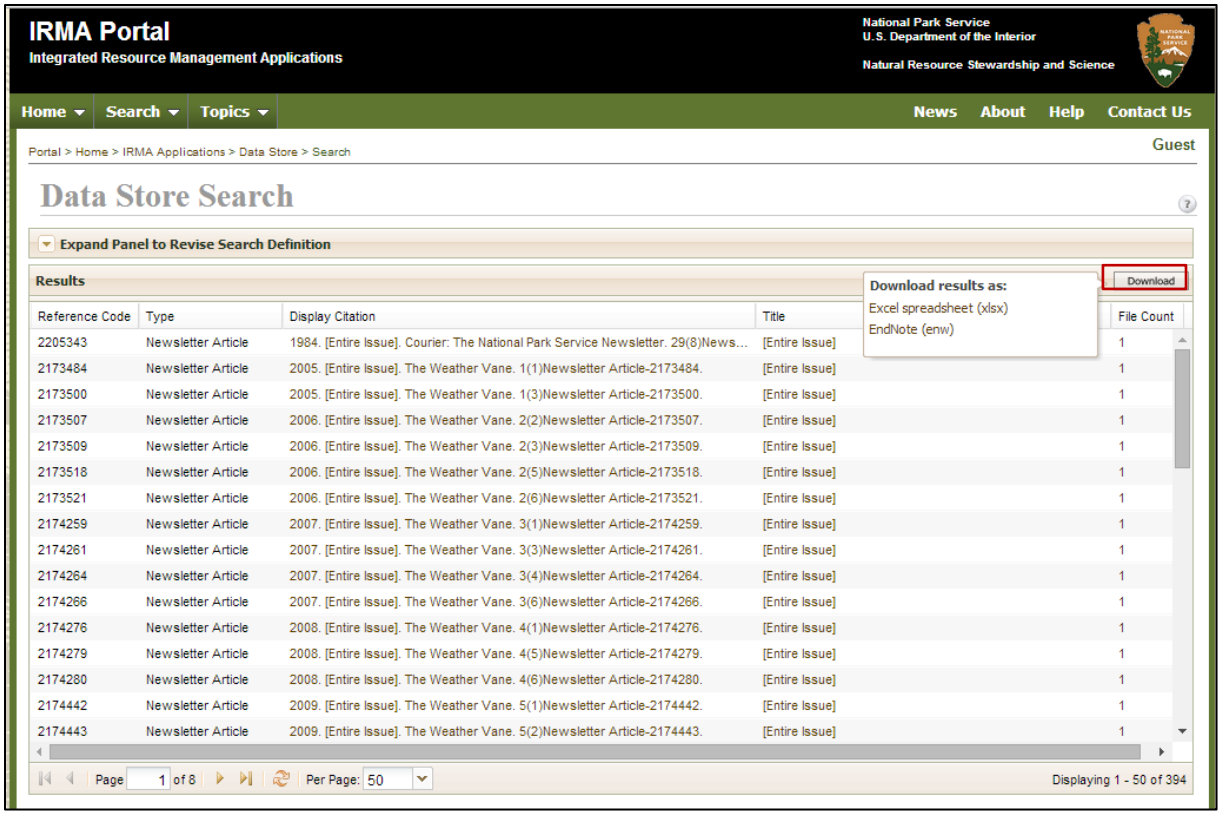


Figure A-2. Search results screen for a specific park in IRMA.

To access NPSpecies:

Next, select **Search>NPSpecies** on the drop down menu on the IRMA home page to display the NPSpecies home page (Figure A-3). Then select **Get a Park Species List**. This will take you to the NPSpecies home page (Figure A-4) where you can select your park. Leave **Category** blank in order to get all documented species for your park. To the right of **Results**, select **Full list with details** in order to get threatened and endangered species type and ranking information. Then click **Search**.

A list of search results (Figure A-5) will appear that shows all details available about the species documented in your park. By selecting D**ownload,** you can save the data as a Microsoft EXCEL document or by selecting **Report/PDF;** you can view a report on the screen then save it in various formats (Figure A-6) including Adobe Acrobat .pdf format.

NOTE: Special attention should be given to any rare and state and federally listed species or habitat.

Once you have collected the information from IRMA and NPSpecies, determine the species category (i.e., non-vascular plants, fungi, etc.) that has not been documented in your park.

Once you have established the species categories (focus species groups), speak with your natural resources and Inventory and Monitoring Network staff to determine what species groups would be applicable to your park and its optimum sampling season. They may suggest other scientists that

might have additional information about the species groups or site. The natural resources staff may even have sites within the park that are lacking natural resource information and instead of focus species groups you could identify a focus site or multiple sites.

Keep an ongoing list of your focus species groups and any information related to it including optimum sampling season, scientist-conducting research on this species groups, and state and federal protection status. This list will be used to select your focus species groups for each future BioBlitz event and should be updated as new information is provided.

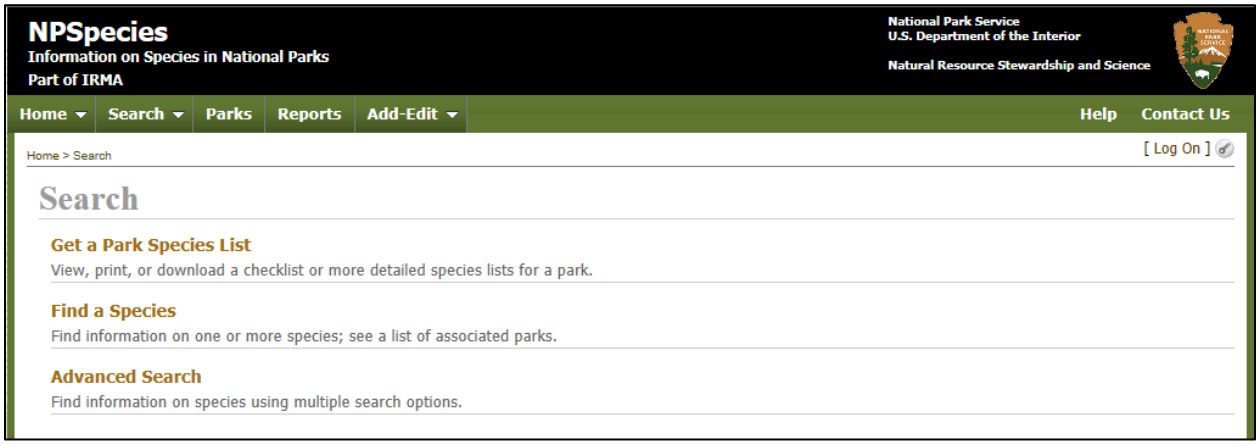


Figure A-3. NPSpecies home page.

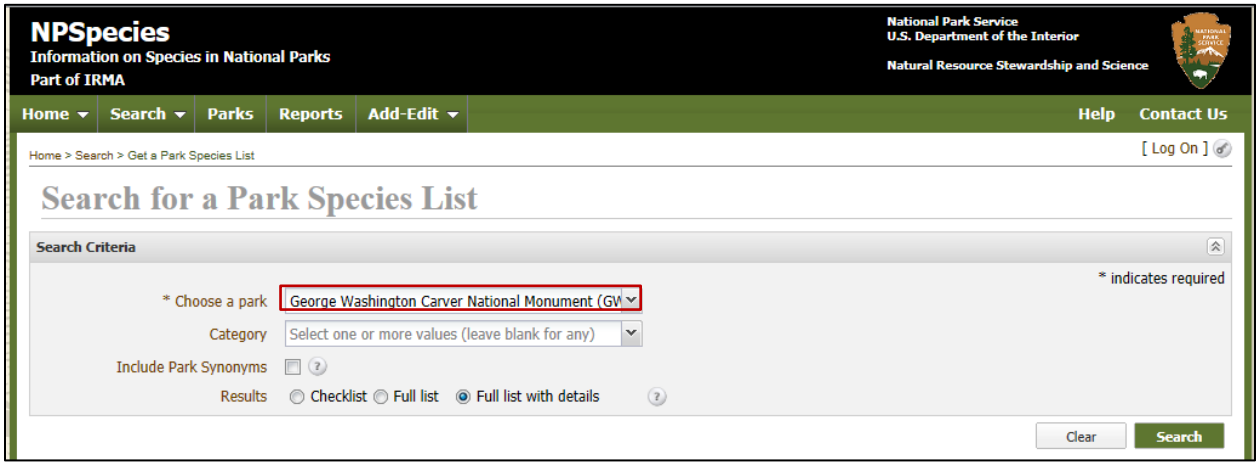


Figure A-4. NPSpecies search screen.

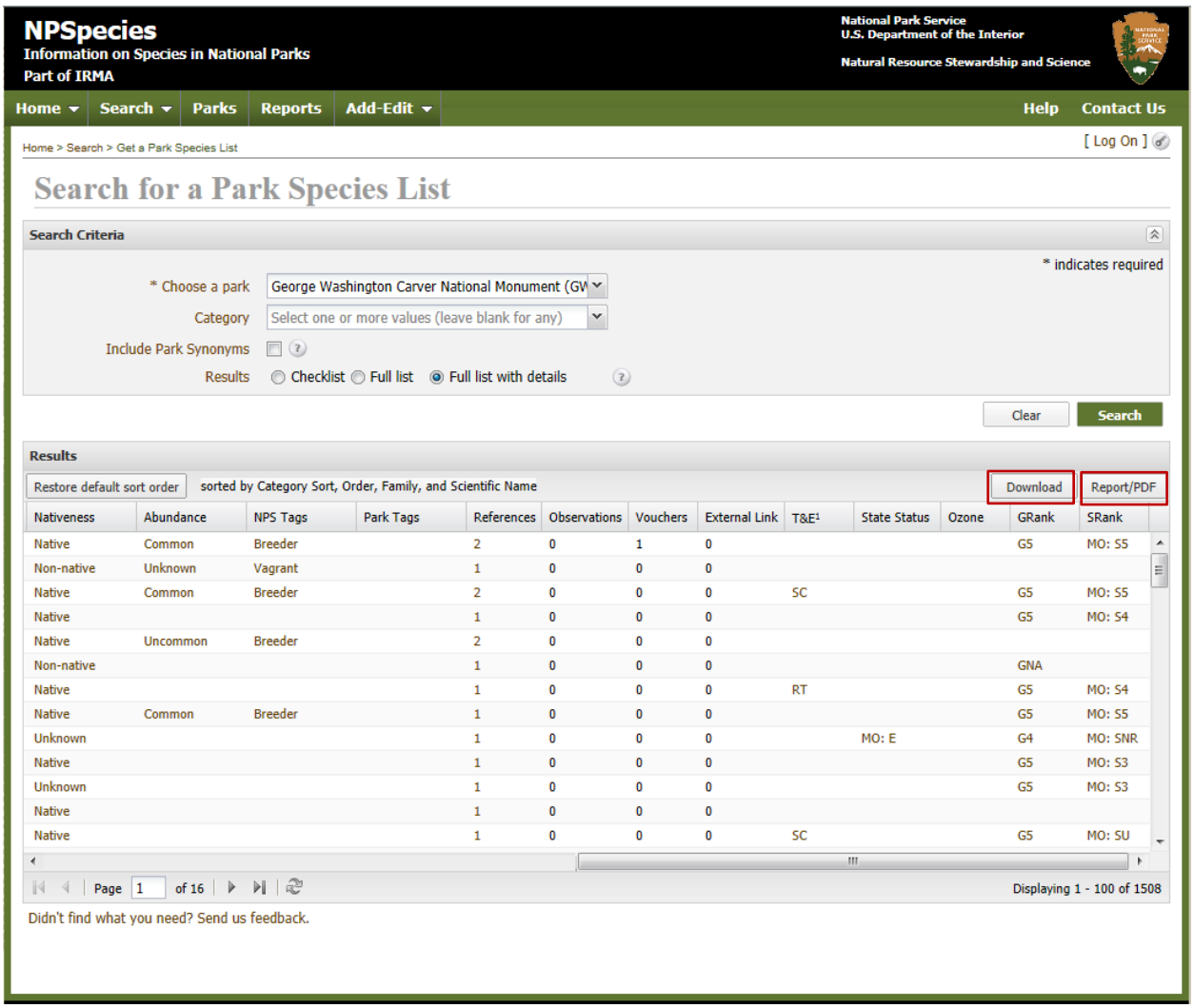
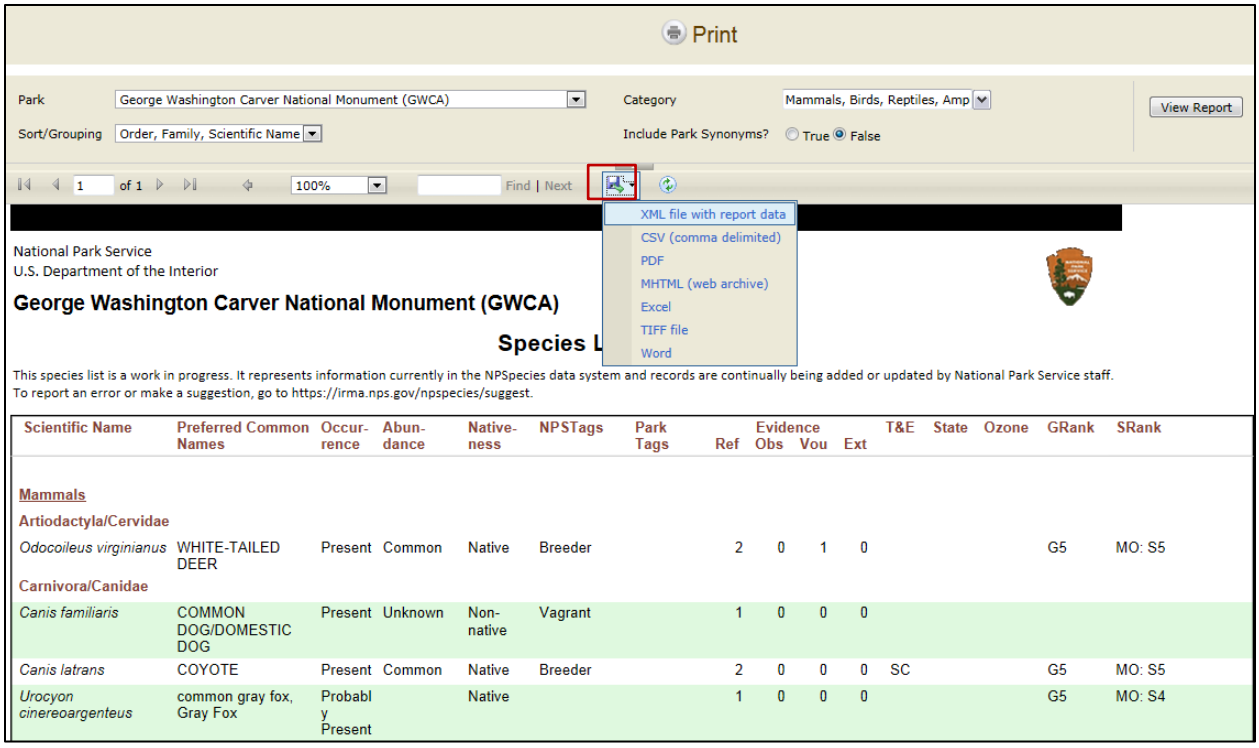


Figure A-5. Park species list.



Scientific Name	Preferred Common Names	Occur-rence	Abun-dance	Native-ness	NPSTags	Park Tags	Ref	Evidence Obs	Vou	Ext	T&E	State	Ozone	GRank	SRank
Mammals															
Artiodactyla/Cervidae															
Odocoileus virginianus	WHITE-TAILED DEER	Present	Common	Native	Breeder		2	0	1	0				G5	MO: S5
Carnivora/Canidae															
Canis familiaris	COMMON DOG/DOMESTIC DOG	Present	Unknown	Non-native	Vagrant		1	0	0	0					
Canis latrans	COYOTE	Present	Common	Native	Breeder		2	0	0	0	SC			G5	MO: S5
Urocyon cinereoargenteus	common gray fox, Gray Fox	Probably Present		Native			1	0	0	0				G5	MO: S4

Figure A-6. Park species list.



Figure A-7. Example of a recruitment poster for display at local, regional, and national professional conferences for recruiting professional scientists and students.

National Park Service
U.S. Department of the Interior

<<USE PARK LETTERHEAD>>

Date: <<date>>
Re: Interest in participating in a future BioBlitz Event

<<Park name>>, located in <<city>>, <<state>> is in the preliminary stages of planning for a BioBlitz event.

Recently, our park staff identified a list of focus species/sites that are under studied at our park. You have been identified as a professional scientist that studies one of our selected species. Would you be interested in volunteering to participate in our upcoming BioBlitz? If so, what time of year would be the optimum time for sampling?

A BioBlitz is an 8-hour event in which teams of volunteer scientists, NPS staff, teachers, students, and other citizen scientists from the surrounding area work together to find and identify as many specimens within our taxonomic focus groups using scientific methods.

BioBlitz teams will be limited to a team leader and 10 other members with you designated as a Team Leader. Team Members have to be age 12 and up in order to participate.

As the Team Leader you will be asked to:

- establish the schedule and methodologies to be used and lead the collections,
- provide sampling equipment and supplies (some minimal funding might be available),
- identify lab facility needs (some facilities are available, contact us for further details),
- obtain a required NPS RPRS collection permit as soon as possible (further information is attached), and
- submit a Study, Site, and Taxa Count datasheet within 90 days of the conclusion of the BioBlitz (see the attached template as an example). The data will be published in an NPS National Resource Data Series report and enter the data into the NPSpecies database which is a component of the NPS Integrated Resource Management Application (IRMA).

For further information on our park, please see http://www.nps.gov/<<park code>>.

Please let us know as soon as possible if you are interested in participating and do not hesitate to contact us if you have any questions.

We look forward to your help in making our BioBlitz event a great success.

Respectfully,
<<name>>
<<title>>, <<park>>
<<address>>
<<city, state, zip>>
<<phone>>
<<email address>>

Figure A-8. Example of a team leader initial contact letter.

Appendix B

Checklist for planning and conducting an individual BioBlitz event

Ref	*Activities Description (see referenced paragraph or figure for more detail)*	Proposed Date of Completion	Completed (√)	Date Completed	Initials
B.1	***Identify scope, focus species group/sites of interest, tentative event dates, and potential team leaders***				
	Identify desired number of teams and team members				
	- Number of teams: _____				
	- Number of team members per team: _____				
	Identify 1-4 potential focus species groups/sites of interest from master taxa list				
	- Focus species group/site #1: _____				
	- Focus species group/site #2: _____				
	- Focus species group/site #3: _____				
	- Focus species group/site #4: _____				
	Note any rare and/or state and/or federally listed species or habitat in park				
	Identify at least two tentative dates				
	- Tentative date #1: _____				
	- Tentative date #2: _____				
	Identify potential team leaders				
	- Team leader #1: _____				
	- Team leader #2: _____				
	- Team leader #3: _____				
	- Team leader #4: _____				
	Provide list of potential team leaders to RPRS park coordinator, request notification of application problems				
B.2	***Contact potential team leaders*** *(via phone, email, or mail)*				
	Team leader #1: _____				
	Team leader #2: _____				
	Team leader #3: _____				
	Team leader #4: _____				
B.3	***Select final focus species group/sites from team leader responses***				
	Focus species group/site #1: _____				
	Focus species group/site #2: _____				
	Focus species group/site #3: _____				
	Focus species group/site #4: _____				
B.4	***Secure funds necessary to meet funding requirements***				
	Funding source #1: _____				
	Funding source #2: _____				
	Funding source #3: _____				

Table B-1. Checklist that can be used for planning and conducting a BioBlitz event.

Ref	*Activities Description (see referenced paragraph or figure for more detail)*	Proposed Date of Completion	Completed (√)	Date Completed	Initials
B.5	***Send out official team leader letter***				
	Attachments include:				
	- Team Leader invitation letter (*Figure B-1*)				
	- Team Leader Biographical information template (*Figure B-2*).				
	- RPRS permit application information				
	- Park specific guidance for scientific research and collections				
	- Park brochure				
	- Volunteer Job Description (*Figure B-3*)				
	- Volunteer Services Agreement for Natural Resources Agencies (*Figure B-4*)				
	- NPS Photo Release form (*Figure B-5*)				
	- Study, Site, and Taxa datasheets template (*Figures B-6 through 8*)				
B.6	***Identify key park personnel***				
	Determine park staffing requirements:				
	- Event coordinator: _____				
	- Safety coordinator: _____				
	- Emergency plan contingencies				
	· Person to provide emergency medical services: _____				
	· Contact information: _____				
	· Radios to be used? _____, number needed? _____				
	- Additional staff scheduled or overtime needed: _____				
	- Speakers for orientation meeting: _____				
	- Welcome volunteers: _____				
	- Introduce team leaders and park staff coordinators: _____				
	- Give safety talk: _____				
	- Unlock/lock gates and facilities (nocturnal sampling): _____				
	- Unlock/lock gates and facilities (day of event): _____				
	- Photographer/videographer: _____				
	- Setup, tear down, and cleanup: _____				
B.7	***Identify logistical requirements***				
	Arrange for the following facility/equipment needs:				
	- Parking				
	- Orientation meeting location				
	- Lunch area (outside or inside location if inclement weather)				
	- Laboratory/educational program facility (i.e., water, sinks, electricity, microscopes, and/or hand lenses)				
	- Tents as cover for sun or inclement weather				
	- Restrooms (may include portable toilets)				
	- Tables				

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event.

Ref	*Activities Description (see referenced paragraph or figure for more detail)*	Proposed Date of Completion	Completed (√)	Date Completed	Initials
	- Chairs				
	- Audio visual needs (projectors, screens, and microphones)				
	- Electrical outlets, extension cords, and/or lighting				
	- Coolers for food, water, and ice				
	- Fans and/or heaters				
	- All-terrain vehicles and/or carts				
	- Signage and maps to event location and meeting places				
	- Group transportation requirements (vans/buses)				
	- Setup needed for educational programs/workshops/exhibits				
	- Food and water (may include electrolyte replenishing drinks)				
B.8	***Develop team member recruitment material (6 weeks prior to event)***				
	Prior to recruitment, develop:				
	- List of contacts (organizations, media, schools, etc.) for mailing of flyer and press releases				
	- Park website and social media content				
	- Presentations on the BioBlitz event				
	- Directions or map to park				
	- Map of park with parking, meeting, lunch, and laboratory facilities location indicated				
	- Informational flyer				
	- Press releases				
	- Team Member recruitment packages that include:				
	· Team member letter (*Figure B-11*)				
	· Informational flyer				
	· Team Leader biographical information sheet (*Figure B-12*)				
	· Park brochure				
	· Schedule (*Figure B-13*)				
	· Job Description (*Figure B-3*)				
	· VIP forms (*Figures B-4 and 5*)				
B.9	***Confirm approved NPS RPRS permit for each team leader (4 weeks prior to event)***				
	Team leader #1: _____, Permit #: _____				
	Team leader #2: _____, Permit #: _____				
	Team leader #3: _____, Permit #: _____				
	Team leader #4: _____, Permit #: _____				
B.10	***Recruit volunteer team members (4 weeks prior to event)***				
	Update park website and social media sites with event information (include forms)				
	Send press releases out allowing time for calendar of evens deadlines (include invitation to reporters)				
	Send out flyers or giving presentations to the following suggested contacts:				
	- Social media websites in area including city, state, and federal parks in area				

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event.

Ref	*Activities Description (see referenced paragraph or figure for more detail)*	Proposed Date of Completion	Completed (√)	Date Completed	Initials
	- Surrounding universities, colleges, and public/private schools				
	- Home school groups				
	- Government agencies (state and federal)				
	- Volunteers.org				
	- National Public Lands Day, if event held in conjunction				
	- Professional societies				
	- Organizations/clubs/programs open to public				
B.11	***Send out reminders, confirm staffing/emergency information, and print forms (1 week prior to event)***				
	Re-submit publicity information to above contacts				
	Prepare Team sign-in sheet for day of event				
	Remind Team Leaders and any pre-registered Team Members to:				
	- Re-read schedule and job description				
	- Complete, sign, and bring VIP and photo release forms the day of the event				
	- Bring water and a lunch, if required				
	Remind Team Leaders to:				
	- Bring a signed copy of their NPS NRPS permit and have with them at all times when collecting				
	- Coordinate place and time to meet the morning of the event				
	- Request power point presentation files ahead of time				
	Confirm park staffing requirements for day of event				
	- Unlock/lock gates and facilities				
	- Welcome volunteers, register Team Members, and present a safety briefing				
	- Setup sound and audiovisual equipment and that it is working properly				
	- Ensure any water and food items have been purchased and setup				
	Obtain a list of emergency telephone numbers and ensure radios are working properly				
	Print off a copy of the Job Description and blank copies of the VIP forms				
B.12	***Morning of BioBlitz event preparations***				
	Arrive at the park at least one hour prior to the event				
	Ensure the park gate and facilities have been unlocked				
	Ensure all volunteers sign the Team sign-in sheet (Figure B-14)				
	Ensure all volunteers have completed, signed, and turned in their VIP forms				
	Note any medical conditions on VIP form and communicate information to the team leader/safety coordinator				
	Indicate on the Team sign-in sheet whether VIP forms have been received (Figure B-14)				
	Ensure adults are present for Team Members ages 12 -16, adults have signed and submitted VIP forms				
	Start meeting at designated time ensuring all park staff and volunteers are present				
B.13	***Day of Event - BioBlitz collections and educational program***				
	- Verifying all forms have been received				
	- Set up lunch area, lab facilities, and educational program activities				

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event.

Ref	*Activities Description (see referenced paragraph or figure for more detail)*	Proposed Date of Completion	Completed (√)	Date Completed	Initials
	- Photograph/videotape BioBlitz collections in the field and during educational program				
	- Answer questions about the BioBlitz by visitors or participants				
	- Keep count of number of visitors participating in educational program				
B.14	***Post BioBlitz Activities***				
	While awaiting Team Leader Data				
	- Develop press releases of preliminary results				
	- Submit volunteer hours, names, and contact information to volunteer coordinator				
	- Update park website/Facebook page				
	- Send out thank you letters to Team Leaders and Members				
	Once Team Leader data has been received				
	- Write and publish NPS report				
	- Update IRMA and NPSpecies databases with results				
	- Develop press release with details and submit to the following suggested media:				
	· Local television stations, radio stations, and newspapers,				
	· Funding sources,				
	· Partners,				
	· NPS newsletters and magazines				
	- Include event as a service-learning project on Centennial reporting websites, etc.				
Additional comments:					

Table B-1 (continued). Checklist that can be used for planning and conducting a BioBlitz event.

National Park Service
U.S. Department of the Interior

<<USE PARK LETTERHEAD>>

Date: <<date>>
Re: BioBlitz Event on <<date>> at <<Park name>>, located in <<city>>, <<state>>

We would like to thank you for volunteering to participate in our upcoming BioBlitz on <<date>> at <<Park name>>, located in <<city>>, <<state>>. If you are still able to attend, please provide us a biographical information sheet (Attachment 1) and begin your application for an NPS RPRS permit as soon as possible (https://irma.nps.gov/rprs/Home). Before submitting your permit application, we suggest you contact the NPS Park Permit Coordinator, <<name>> at <<phone number>> or <<email address>> to discuss your collection methods and receive park specific guidance.

As a reminder, a BioBlitz is an 8-hour event in which teams of volunteer scientists, NPS staff, teachers, students, and other citizen scientists from the surrounding area work together to find and identify as many specimens within our taxonomic focus groups using scientific methods.

BioBlitz teams will be limited to a team leader and 10 other members with you designated as a Team Leader. Team Members have to be age 12 and up in order to participate. Ages 12-16 must be accompanied by an adult.

As the Team Leader, you will be asked to:

- provide a biographical information sheet that will be used to recruit team members (Attachment 1),
- establish the schedule and methodologies to be used and lead the collections,
- provide sampling equipment and supplies (some minimal funding might be available),
- identify lab facility needs (some facilities are available, contact us for further details),
- obtain a required NPS RPRS collection permit as soon as possible (https://irma.nps.gov/rprs/Home)
- follow park specific guidance for scientific research and collections permit (Attachment 2),
- read the Volunteer Job Description and complete and sign the Volunteer Services Agreement and Photo Release forms (see Attachments 3-5), and
- submit a Study, Site, and Taxa Count datasheet within a park determined number of days of the conclusion of the BioBlitz. The data will be published by NPS in some form and entered into the NPSpecies database, which is a component of the NPS Integrated Resource Management Application (IRMA) (see Attachments 6-8).

For further information on our park, please see http://www.nps.gov/<<park code>>.

Please let us know as soon as possible if you are unable to participate and do not hesitate to contact us if you have any questions.

We look forward to your help in making our BioBlitz event a great success.

Respectfully,
<<name>>
<<title>>, <<park>>
<<address>>
<<city, state, zip>>
<<phone>>
<<email address>>

Figure B-1. Example of a team leader invitation letter for an upcoming event.

Water Mite BioBlitz
Buffalo National River
October 18, 2014
Tony Bend Education and Research Center near Rush, Arkansas

Focus Species: Water Mites
Team Leader: Andrea Radwell (University of Arkansas, Fayetteville, AR)



Dr. Andrea J. Radwell
Research Assistant Professor
University of Arkansas
Department of Biological Sciences
Insect Rearing Building, Room 1
Fayetteville AR 72701
Phone: 479-575-7720
Email: aradwell@uark.edu
Website: http://watermites.uark.edu

Team Leader Biography *(brief biographical background that includes current place of employment, research focus, educational background and other interests)*: Andrea is interested in the biodiversity of freshwater organisms of North America and works as a research scientist at the University of Arkansas. The focus of her research is the study of water mites that are found in streams, rivers, lakes, ponds and wetlands. Water mites are abundant and diverse in healthy aquatic ecosystems and play an important role of controlling insect populations though parasitism and predation. She has worked to document water mite diversity across North America, with particular interest in those found in the Ozark and Ouachita mountains of Arkansas and Missouri. For the past ten years, she has included citizen scientists in her research and believes that engaging the public in science encourages support of sound public policy to conserve and protect our natural resources. She holds a B.S. in Biological Sciences and an M.A. in Education from Northwestern University, and an M.S. and Ph.D. in Biological Sciences from the University of Arkansas, Fayetteville.

BioBlitz Study Summary *(brief description of study that includes habitat, study objectives, collection methods, clothing and equipment needs, and any safety concerns)*: The purposes of this collection effort are to obtain specimens of water mites for further study and to introduce citizen scientists to an important and beneficial component of aquatic ecosystems. Collected specimens will become part of the record of the biological diversity of the site. Participants may observe collection from streamside or enter the water for direct involvement in collection. Those who would like to wade should bring a suitable pair of water shoes or wading boots. Small shovels, trowels, and nets will be provided. We expect to spend the early part of the day collecting samples that will be processed in the afternoon. Participants are welcome to assist with picking water mites from the samples, a process that that can be quickly learned. Microscopes will be provided to examine some of the specimens that are collected. Since there are many water mite species in North America that are not described, it is likely participants will see species that are new to science.

Figure B-2. Template for and example of team leader biographical information.

Volunteers In Parks

Job Description Sheet

Volunteers assist the National Park Service in many ways including visitor center operations, resource management projects, research work, cultural and natural history programs, clerical assistance, historic restoration, park maintenance, and more.

All VIPs must be provided with a Job Description Sheet.

Job Title: BioBlitz Team Leader, <<park>>

Job Description:
The BioBlitz volunteer team leader will lead teams of 8-10 citizen scientists during this outdoor event. The goal of the BioBlitz is to collect vital data during an 8-hour period within your taxonomic focus groups using scientific methods.

Skills Needed / Preferred:

- walking, lifting up to 20 pounds (estimated for some projects)
- use of basic tools
- working outdoors in a variety of weather conditions
- basic knowledge of the life of the park

Goals / Outcomes of Job:
Organize, lead, and assist citizen scientists in collection of biological specimens using scientific methods to help increase the knowledge of biodiversity within the park.

Benefits to Volunteers (note training if applicable):

- Gain scientific knowledge and experience with the National Park Service; ability to "give back" to the National Park Service; opportunity to stay fit by conducting various light duties
- Must attend pre-event safety meeting, morning (9am) of <<date>> at park.

Safety Notice:
Natural Resource VIPs will be working outdoors in a variety of weather conditions, including hot & sunny days, stormy weather, rain, cold, etc. There is potential for excessive exposure to sun, so the VIP must take precautions, including sunscreen, a hat, and limited time in the sun. There is a potential for becoming dehydrated or overheating, so the VIP should carry plenty of water (provided) and drink regularly while working outdoors at the park.

Other safety hazards include snakes, ticks, chiggers, mosquitoes, poison ivy, briars, lifting heavy items without assistance. Please use common sense and take every precaution and keep yourself safe. If in doubt, please check with park staff. The VIP must not work outdoors in the likelihood of lightning, whether or not a storm is in progress. In an emergency, VIPs should take shelter inside the visitor center. If Newton County is under a severe weather warning (tornado, thunderstorm, excessive heat) from the National Weather Service, VIPs should not be working anywhere outdoors. Shelter should be taken immediately.

Figure B-3. Example of a Volunteer Job Description.

Minimum Commitment:
<<date>> all day possibly into early evening

Location of Position:	**Supervisor:**	**Phone Extension:**
Park grounds, locations TBD	<<supervisor name>>	<<phone number>>

Firearms Statement:
Under 43 C.F.R. § 20.511, Departmental volunteers in the course of their official duties are prohibited from possessing firearms on property under control of the Department. Because of the stated purpose of the sponsors of Section 512 to provide uniformity under applicable state law from bureau-to-bureau, the potential liability issues that could result, and the absence of any criminal penalties applicable to this regulation, this Departmental policy continues to apply to all NPS/FWS employees and volunteers during their official duties. Volunteers who are not on official duty may possess firearms on Departmental lands under the same conditions applicable to members of the general public, according to P.L. 111-24, Section 512. For this purpose, volunteers are considered the same as other employees when engaged in their official activities.

Figure B-3 (continued). Example of a Volunteer Job Description.

OMB 0596-0080 (Expires 12/2013)

Volunteer Services Agreement for Natural Resources Agencies
for Individuals or Groups

Please print when completing this form (Attach a separate sheet for those data that do not fit in the allowed spaces).

Site Name/Project Leader	Agency	Reimbursement *(if any)*

Name of Volunteer or Group Leader – Last, First, Middle	Age (If Individual Agreement) ☐ Under 18 ☐ 18-25 ☐ 26-55 ☐ 56 and Older

Are you a U.S. Citizen? ☐ Yes ☐ No Visa Type	Email Address	Home Phone	Mobile Phone

Street Address	City	State	Zip

IF VOLUNTEER IS UNDER AGE 18 – Name of Parent or Legal Guardian	Home Phone	Mobile Phone	Email Address

Street Address	City	State	Zip
		0	

I affirm that I am the parent/guardian of the above named volunteer. I understand that the agency volunteer program does not provide compensation, except as otherwise provided by law; and that the service will not confer on the volunteer the status of a Federal employee. I have read the attached description of the service that the volunteer will perform. I give my permission for _____ to participate in the specified volunteer activity sponsored by _____ at _____

(Name of Sponsoring Organization, if applicable) *(Name of Volunteer Duty Station)*

From _____ to _____ _____ _____

(Date) *(Date)* *(Parent/Guardian Signature)* *(Date)*

Emergency Contact Name	Home Phone	Mobile Phone	Email Address

Street Address	City	State	Zip

GOVERNMENT OFFICIAL COMPLETES THIS SECTION

Description of service to be performed. *Include details such as time and schedule commitment, use of personal equipment, government vehicle, skills required (note certifications if necessary), level of physical activity required, etc. Attach the complete job description and job hazard analysis to this form. If this is a group agreement, the leader is to provide the group name, a complete list of group participants to be attached to this form, and parental approval (above) completed for each volunteer under the age of 18.*

Under 43 C.F.R. § 20.511, Departmental volunteers in the course of their official duties are prohibited from possessing firearms on property under control of the Department. Because of the stated purpose of the sponsors of Section 512 to provide uniformity under applicable state law from bureau-to-bureau, the potential liability issues that could result, and the absence of any criminal penalties applicable to this regulation, this Departmental policy continues to apply to all NPS/FWS employees and volunteers during their official duties. Volunteers who are not on official duty may possess firearms on Departmental lands under the same conditions applicable to members of the general public, according to P.L. 111-24, Section 512. For this purpose, volunteers are considered the same as other employees when engaged in their official activities.

Government Vehicle required? ☐ Yes ☐ No	☐ Valid State Driver's License ☐ International Driver's License
Personal Vehicle to be used? ☐ Yes ☐ No	Please verify that the volunteer is in possession of one of these documents. DO NOT keep a copy of the document for his/her file.

Optional Form 301a (09/2010)
USDA-USDI

Figure B-4. Volunteer Services Agreement for Natural Resources Agencies (optional form 301A).

OMB 0596-0080 (Expires 12/2013)

I understand that I will not receive any compensation for the above service and that volunteers are NOT considered Federal employees for any purpose other than tort claims and injury compensation. I understand that volunteer service is not creditable for leave accrual or any other employee benefits. I also understand that either the government or I may cancel this agreement at any time by notifying the other party.

I understand that my volunteer position may require a reference check, background investigation, and/or a criminal history inquiry in order for me to perform my duties.

I understand that all publications, films, slides, videos, artistic or similar endeavors, resulting from my volunteer services as specifically stated in the attached job description, will become the property of the United States, and as such, will be in the public domain and not subject to copyright laws.

I understand the health and physical condition requirements for doing the work as described in the job description and at the project location, and certify that the statement I have checked below is true:

☐ I know of no medical condition or physical limitation that may adversely affect my ability to provide this service.

☐ I do know of a medical condition or physical limitation that may adversely affect my ability to provide this service and have explained it to _____.
(Name of Agency Official)

I do hereby volunteer my services as described above, to assist in agency-authorized work. I agree to follow all applicable safety guidelines.

_____ _____
(Signature of Volunteer) *(Date)*

The above - named agency agrees, while this arrangement is in effect, to provide such materials, equipment, and facilities that are available and needed to perform the service described above, and to consider you as a Federal employee only for the purposes of tort claims and injury compensation to the extent not covered by your volunteer group, if any.

_____ _____
(Signature of Government Representative) *(Date)*

Termination of Agreement

Volunteer requests formal evaluation ☐ Yes ☐ No Evaluation Completed _____
(Date)

Agreement terminated on _____ _____
(Date) *(Signature of Government Representative)*

Public Burden Statement

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596- 0080. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (USDI) prohibit discrimination in all programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA and USDI are equal opportunity providers and employers.

Privacy Act Statement

Collection and use is covered by Privacy Act System of Records OPM/GOVT-1 and USDA/OP-1, and is consistent with the provisions of 5 USC 552a (Privacy Act of 1974), which authorizes acceptance of the information requested on this form. The data will be used to maintain official records of volunteers of the USDA and USDI for the purposes of tort claims and injury compensation. Furnishing this data is voluntary, however if this form is incomplete, enrollment in the program cannot proceed.

Figure B-4 (continued). Volunteer Services Agreement for Natural Resources Agencies (optional form 301A).

National Park Service
U.S. Department of the Interior

Photo Release Form

I hereby grant the National Park Service permission to use my likeness in a photograph in any and all publications for Government or nongovernment purposes, including web site entries, without payment or any other consideration in perpetuity. I understand and agree that these materials will become the property of the National Park Service and will not be returned.

I hereby irrevocably authorize the National Park Service to edit, alter, copy, exhibit, publish or distribute this photo for purposes of publicizing the National Park Service's programs or for any other lawful purpose. In addition, I waive the right to inspect or approve the finished product, including written or electronic copy, wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of the photograph.

I hereby hold harmless and release and forever discharge the National Park Service from all claims, demands, and causes of action which I, my heirs, representatives, executors, administrators, or any other persons acting on my behalf or on behalf of my estate have or may have by reason of this authorization.

I am 18 years of age or older and am competent to contract in my own name. I have read this release before signing below and I fully understand the contents, meaning, and impact of this release. I agree to indemnify and hold the Government harmless for any and all losses, claims, expenses, suits, costs, demands and damages or liabilities on account of personal injury, death, or property damages of any nature whatsoever and by whomsoever made, arising out of the photographed activities in which I am taking part.

Signature/Date

Printed Name/Date

Address

City State Zip Code

Phone

If the person signing is under age 18, there must be consent by a parent or guardian, as follows:

I hereby certify that I am the parent or guardian of _____, named above, and do hereby give my consent without reservation to the foregoing on behalf of this person.

Parent or Guardian's Signature/Date

Parent or Guardian's Printed Name/Date

Privacy Act Statement: This information is provided to comply with the Privacy Act (PL 93-579). 5 U.S.C. 301 and 7 CFR 260 authorizing acceptance of the information requested on this form. The data you furnish will be used only to provide the National Park Service with contact information pertaining to this release form.

EXPERIENCE YOUR AMERICA™ 08/2006

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

Figure B-5. NPS photo release form.

StudyID	**PARKYYYY_MMDD_AAA**: PARK= 4 letter park code (see park code DropDownValues worksheet), YYYY=4 digit year, MM=2 digit month, DD=2 digit day, AAA=team leader initial
StudyStartDate	**Date study to begin** (MM/DD/YYY)
StudyEndDate	**Date study to end** (MM/DD/YYY)
ParkCode	Four letter park code
ParkName	Offical park name
ParkLocation	City and state where park is located
TaxaComName	Common name of focus species
NPSStudy#	Permit number assigned by park contact
NPSPermitNo	Date permit approved
NPSPermitDate	Date permit expires
StudyTitle	Permit study title
SpecimenPreservation	Preservation methods submitted on park permit application
PIName	Primary investigator name
PIInitials	Primary investigator initials (3 letters if possible)
PITitle	Primary investigator title
PIAffiliation	Primary investigator affiliations (school, organization, agency)
PIAddress1	Primary investigator's contact address
PIAddress2	Primary investigator's contact address (optional)
PICityStateZip	Primary investigator's city/state/zip
PIPhone	Primary investigator's phone number
PIEmail	Primary investigator's email address
PIWebsite	Primary investigator's website (optional)
Comments	Additional comments

Figure B-6. Study datasheet template.

StudyID	From previous worksheet (STUDY DATA)
SiteNumber	999=3 digit unique number for each site or habitat, 001-999
SiteStartDate	Date site study to begin (MM/DD/YYY)
SiteEndDate	Date site study to end (MM/DD/YYY)
UTMeasting	Convert all coordinates to UTM easting and northing
UTMnorthing	Convert all coordinates to UTM easting and northing
Datum	Include Datum (Example: NAD83)
Zone	Include Zone (Example: 15North)
Decimal Degrees (Latitude)	Convert all coordinates to decimal degrees. Units used by NPSpecies.
Decimal Degrees (Longitude)	Convert all coordinates to decimal degrees. Units used by NPSpecies.
Datum	Include Datum (Example: WGS83)
Location Error (meters)	Information needed by NPSpeices
GPSSource	Include source of coordinates (Field GPS Unit, Ref Literature, Topo Map, Historic Data, Mapping Software)
OtherInfo	Optional
Site Description	Description of site including habitat and general location within park.
PI_xrefID	Primary Investigator cross reference sample identifier (optional)
Collectors	Collector's initials
CollMethod	Collection method
CollComments	Collection comments
%CloudCvr	Percent cloud cover
Wind	Wind intensity (calm, light, moderate, gusty)
Precip	Type of precipitation (none, rain, sleet, snow)
PrecipInt	Precipitation intensity (N/A, light, moderate, heavy)
OtherWeather	Optional
PhysicoP01	Physical/Chemical measurements such as DO (% or mg/L), pH, water &
PhysicoU01	air temperature (°C), specific conductance (µS/cm), turbidity (ntu), etc.
PhysicoV01	PhysicoP=parameter, PhysicoU=unit of measure, PhysicoV=value measured, 99=2 digit unique number for each parameter.

Figure B-7. Site datasheet template.

<<park name>> BioBlitz <<YYYY>> taxa count, <<team leader's name>>

<<For each species identified, provide the following information. Transpose table into horizontal as shown below.>>

Study Site ID	<<StudyID>>_<<SiteNumber>>
PI Reference ID	<<PI_xrefID>>, primary Investigator cross reference sample identifier (optional)
PI Tag	Primary Investigator taxa name (optional)
TSN	ITIS/NPSpecies no.
Scientific Name	Lowest level taxonomic name
Class	
Order	
Family	
Common Name	
Occurrence	Present (this will always be "Present" since it was found in park)
Nativeness	Native, Non-native, Unknown (see Nativeness worksheet for definition)
Abundance	Abundant, Common, Uncommon, Rare, Occasional, Unknown (see Abundance worksheet for definition, note different definition for Animals and Plants)
Count	number of organisms observed or collected

Study Site ID	PI Reference ID	PI Tag	TSN	Scientific Name	Class	Order	Family	Common Name	Nativeness	Abundance	Count
<<data for one species per line>>											

Figure B-8. Taxa datasheet template.

2.2. Park Nativeness

Park Nativeness is required: all park species records must have one value assigned to become an approved record.

Label	Definition	Comments
Native	Species naturally occurs or has occurred in the park or region	Naturally occurring includes species present in North America prior to European colonization. Includes endemic and indigenous species.
Non-native	Species occupies or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities. Exotic species are also commonly referred to as nonnative, alien, or invasive species	Non-native or exotic species are defined in NPS Management t Policies 2006 (section 4.4.1.3): "Exotic species are those species that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities. Exotic species are also commonly referred to as nonnative, alien, or invasive species. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem at that place. Genetically modified organisms exist solely due to human activities and therefore are managed as exotic species." Note: there are many species from within the U.S. that may be native in some parts of the country but are nonnative/invasive in others. This can occasionally even occur within the same park. .
Unknown	Native status of the taxon is not known, or ambiguous evidence exists	
null (blank)	Unassigned	Allowed if the park species record status is draft, in review, or inactive

2.2.2. Associated Park Nativeness Tags

The following tags are supplemental to Park Nativeness and provide additional information. More than one Nativeness Tag can be selected.

Figure B-9. Nativeness definitions from page 10 of the NPSpecies User Guide (NPSpecies 2014).

2.3. Park Species Abundance

Abundance is not a required field, and can only be assigned if a species is "Present in Park." In general, a selected value should apply (although there are numerous exceptions) to abundance in the most suitable habitat of the species, and at time that the species is engaged in its principal or most important behavior in the park (e.g., breeding, migrating, hibernating).

No supplemental tags are associated with abundance.

Label	Definition	Comments
Abundant	Animals: May be seen daily, in suitable habitat and season, and counted in relatively large numbers. Plants, Chromista, Protozoa, and Fungi: Large number of individuals; wide ecological amplitude or occurring in habitats covering a large portion of the park.	
Common	Animals: May be seen daily, in suitable habitat and season, but not in large numbers. Plants, Chromista, Protozoa, and Fungi: Large numbers of individuals predictably occurring in commonly encountered habitats but not those covering a large portion of the park.	
Uncommon	Animals: Likely to be seen monthly in appropriate habitat and season. May be locally common. Plants, Chromista, Protozoa, and Fungi: Few to moderate numbers of individuals; occurring either sporadically in commonly encountered habitats or in uncommon habitats.	
Rare	Animals: Present, but usually seen only a few times each year. Plants, Chromista, Protozoa, and Fungi: Few individuals, usually restricted to small areas of rare habitat.	
Occasional	Animals: Occurs in the park at least once every few years, varying in numbers, but not necessarily every year. Plants, Chromista, Protozoa, and Fungi: Abundance variable from year to year (e.g., desert plants)	
Unknown	Abundance unknown.	

12

Figure B-10. Abundance definitions from page 12 of the NPSpecies User Guide (NPSpecies 2014).

National Park Service
U.S. Department of the Interior

<<USE PARK LETTERHEAD>>

Date: <<date>>
Re: BioBlitz Event on <<date>> at <<Park name>>, located in <<city>>, <<state>>

We would like to thank you for your interest in our upcoming BioBlitz. A one day BioBlitz will be conducted on <<date>> at <<Park name>>, located in <<city>>, <<state>>.

The BioBlitz will be an 8-hour event in which teams of volunteer scientists, park staff, teachers, students, and other citizen scientists from the surrounding area work together to find and identify as many specimens within our taxonomic focus groups using scientific methods.

A BioBlitz team will be made up a Team Leader and a combination of volunteers to include teachers, students, and other volunteer citizen scientists from the surrounding area. Teams will be limited to 10 members each. The BioBlitz Team Leaders are listed below. For information on each Team Leader, please see the attached information sheets.

- <<name>>,<<title>> (<<affiliation>) – <<*focus species common name*>>
- <<name>>,<<title>> (<<affiliation>) – <<*focus species common name*>>

Team Leaders are professional scientists and are responsible for establishing the schedule and methodologies to be used, leading the collections, and providing sampling equipment and supplies.

Please note the minimum age requirement is 12 years of age. For ages 12-18, an adult (age 19 or older) must be present during all activities. The accompanying adult will be required to complete the same forms as the participant.

Please read the following attached documents carefully and take special note of any safety information.

- Volunteer Job Description – Please read as this describes your duties as a volunteer for this event.
- VIP forms - These forms are *required to be completed* in order for you to participate in the event. Please download the form, complete, sign, and bring with you the day of the event. *NOTE: It is a fillable.pdf form, but cannot be saved.*
    - Volunteer Services Agreement for Natural Resources Agencies
    - Photo Release Form

For further information, see the following website:

- <<website link>>

Please do not hesitate to contact us if you have any questions. We look forward to your help in making this a successful BioBlitz.

Respectfully,
<<name>>
<<title>>, <<park>>
<<address>>
<<city, state, zip>>
<<phone>>
<<email address>>

Figure B-11. Example of team member letter.

George Washington Carver National Monument
BioBlitz 2014 Schedule - September 27, 2014

Saturday, September 27, 2014 - 9:00am to 4:00pm

- Time and Location: meet at 9:00am upstairs in the Visitor Center lab classroom
- Completed and signed VIP form will be collected at this time.
- Welcome and BioBlitz introductions
- Safety briefing
- Team Leaders will discuss schedule, methods, data recording, and equipment use (including any safety requirements).
- Teams will depart from here for field sampling.
- Please bring a lunch, snacks, and appropriate field gear (see Safety Notice below).
- A water bottle, ice, and water will be provided.

ATTN Team Leaders: Any teams needing to setup sampling equipment Friday evening for nocturnal sampling can do so once VIP form has been collected for all participants and a safety briefing given. Please let us know ahead of time so we can make prior arrangements with the park staff for Friday evening.

Saturday, September 27, 2017

- After collections are completed, meet upstairs in the Visitor Center lab classroom.
- Team Leader and/or Members will process samples, present findings, share experiences, and provide feedback for future BioBlitz events. A camera adapted stereoscope will be setup for projecting specimens for your use and educational purposes.

NOTE: Park staff will be available during the event to provide help and answer questions.

Contact info:

- George Washington Carver National Monument Visitor Center, gwca_interpretation@nps.gov, 417-325-4151
- Theresa Johnson, Theresa_Weiss-Johnson@partner.nps.gov, 417-839-5749 (cell)
- Jan Hinsey, Jan_Hinsey@nps.gov, 417-849-5228 (cell/txt)

Safety Notice:
Natural Resource VIPs will be working outdoors in a variety of weather conditions, including hot & sunny days, stormy weather, rain, cold, etc. There is potential for excessive exposure to sun, so the VIP must take precautions, including sunscreen, a hat, and limited time in the sun. There is a potential for becoming dehydrated or overheating, so the VIP should carry plenty of water (provided) and drink regularly while working outdoors at the park.

Other safety hazards include snakes, ticks, chiggers, mosquitoes, poison ivy, briars, lifting heavy items without assistance. Please use common sense and take every precaution and keep yourself safe. If in doubt, please check with park staff. The VIP must not work outdoors in the likelihood of lightning, whether or not a storm is in progress. In an emergency, VIPs should take shelter inside the visitor center. If Newton County is under a severe weather warning (tornado, thunderstorm, excessive heat) from the National Weather Service, VIPs should not be working anywhere outdoors. Shelter should be taken immediately.

Figure B-12. Example of BioBlitz schedule.

BioBlitz Team Leaders and Members - *<<park name and location>>, <<date>>*

Please print clearly.

No.	Name	Email address or phone number	How did you hear about the BioBlitz?	Age 12-18?	Adult present?	RCVD signed VIP forms		
						VSA	Ph Rel	Rcvd by
1								
2								
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Figure B-13. Example of team sign-in sheet.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior

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