

National Park Service
Inventory and Monitoring Division



Safety—Version 1.0

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This standard operating procedure (SOP) provides description and guidance on safety for landbird monitoring in National Park Service units, as conducted by contractors and cooperators for the Gulf Coast Network (GULN). Throughout this protocol's implementation, the network places a high priority on the occupational health and safety of its employees, cooperators, contractors, and volunteers. In this SOP, instructions are provided for safety roles, risk identification and abatement, and emergency response procedures for the Gulf Coast Network and the National Park Service (NPS). Three Job Hazard Analyses (JHAs) are included as appendices at the end of this SOP.

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Introduction

Landbird monitoring in Gulf Coast Network (GULN) parks can be a challenging physical activity, with likely exposure to high heat, high humidity, hidden hazards under water or mud, venomous snakes, stinging insects and harmful vegetation. Prior to field sampling, several hours of driving may be required to reach the park. Access to some field locations will require boat operation. Field personnel must remain vigilant to the safety risks they face as they drive to and from the field site and complete the required field tasks.

This SOP establishes safety parameters and guidelines for personnel involved in the GULN Landbird Monitoring Project. The topics covered include: field personnel roles and responsibilities, safety training needs, Job Hazard Analyses (JHAs), and how to respond to a medical emergency. All NPS staff participating in landbird monitoring must be familiar with these procedures and sign the acknowledgment form at the end of each JHA (see Appendices A, B, and C in this document). The Gulf Coast Network staff is responsible for ensuring that contractors and cooperators possess the skills necessary for successful and safe field operation. While the network staff will provide procedural guidance, contractors are required to maintain a safe working environment, provide training, and provide safety equipment. All participants are expected to make personal safety a priority at all times while engaged in the sampling project.

Involvement of Contractors or Cooperators

This SOP is written from the perspective of field work being completed by either NPS staff or non-NPS contractors or cooperators. If non-NPS, the leading organization is responsible for establishing and adhering to their own safety protocols and guidelines, in addition to following the policies and expectations of the network (as listed in this SOP) and the park where the work is conducted. In the event that GULN staff are conducting the field work, the field personnel must follow the standards and practices listed in this SOP.

Safety Roles and Responsibilities

Protocol Lead

The GULN protocol lead serves as the primary contact for contractors and cooperators who conduct the field sampling. The protocol lead will ensure that these non-NPS personnel are aware of any specific safety concerns at the parks where they will be conducting the surveys and provide the contact information for the appropriate park resource manager, who becomes their park Person of Contact (POC). If field work is conducted by GULN staff, the protocol lead ensures that GULN field personnel have park POC information and are in communication with parks.

Field Personnel

Field personnel refers to the individuals who will perform the landbird monitoring field data collection. In most cases, one person completes data collection on their own, because this minimizes disturbance to birds. There will be occasional quality-control sampling events that have two crew

members recording data independently. When the crew is one person, he or she is the crew leader and the designated ‘observer’ during data collection. When there are two crew members, one is the crew leader (the person usually responsible for data collection) and both are observers.

The field crew leader is responsible for coordinating safety and contact procedures with the park POC and also relaying relevant information to the GULN protocol lead about their schedule for park visits. Timely check ins between contractor or cooperator and the park POC not only establish the field-work schedule and timing, but also allow for updates regarding park safety and field-work regulations, policies and current advisories. In the event the Gulf Coast Network conducts field work, a GULN-designated field crew leader coordinates visits through the park POC and completes and files a Trip Plan prior to departure (see In-Office Safety Preparations later in this SOP for details).

While conducting field work, the field crew leader and all other participants are responsible for being aware of safety information and following guidance relevant to sampling visits. They must remain cognizant of the hazards associated with the sampling activities and associated travel and act in a safe manner during the performance of activities. All members of a sampling crew are expected to stay together throughout the sampling visit, and they all must carry cell phones or another method of communication in the rare case where there is no strong cell coverage, with park and local emergency numbers on hand. All crew members, NPS employees, and other personnel are required to follow safety guidelines provided through training and on-site briefing and must comply with all regulations and policies regarding field work posted by the park they are working in.

Required Safety Trainings, Materials and Trip Preparations

General Safety Training

Safety is a Gulf Coast Network and NPS priority. Network policies require all network NPS staff maintain certification in First Aid, complete Defensive Driving and Operational Leadership courses per the network schedule, and maintain a valid state motor-vehicle operator’s license. Network staff is provided network-sponsored Red Cross First Aid training in CPR, automated external defibrillators (AED) and First Aid every two years. Outside of the network, the Gulf Coast Network expects all participants to meet their own organization’s specific safety training requirements. This includes personnel from other federal agencies (e.g., participating U.S. Fish and Wildlife Service [USFWS] staff or USGS staff), state agencies, non-governmental agencies or academic institutions.

In-Office Safety Preparations

In the weeks prior to the sampling event, the field crew leader contacts the park POC to schedule the visit and to learn of any changes to park policy, safety requirements and local conditions. The field crew leader will provide any other participants with the relevant information. If work is conducted by the Gulf Coast Network, the crew leader completes the GULN park visit Trip Plan (Figure S1.1). The crew leader also ensures that one copy is filed in the network office and the other is in the vehicle. Printed and up-to-date directions to the nearest hospital are also stored in the vehicle.

LOCATION: _____ **Date:** _____

PERSONS IN FIELD

Name	Phone Numbers (work and cell)
<i>Crew Leader:</i> _____	_____
<i>Crew Members:</i> _____	_____
_____	_____
_____	_____
_____	_____

CONTACT PERSONNEL

Network Point of Contact: _____	Work and cell # _____
Park Point of Contact: _____	Work and cell # _____
Additional Park POC: _____	Work and cell # _____

ITINERARY

Mode of Travel (vehicle make/model/color/plate #): _____

Route: _____

DATE	Departure Location & Time	Arrival Location & Time	Objective

Notes:

Figure S1.1. Example of the GULN Trip Plan. If GULN employees are conducting field work, this plan must be completed before each park visit for monitoring breeding landbirds. This document is kept on file at the GULN office and in the travel vehicle.

On-Site Crew Safety Briefing or Self-Review

When the crew has more than one person, an on-site crew orientation and safety meeting directly precedes the sampling event. The crew leader conducts this meeting to ensure all participants are aware of the sampling procedures and the potential hazards. If the same field crew is working together across many sampling events, the briefing can be a simple check-in about: (1) sunscreen and insect repellent application; (2) hydration needs; (3) the possible safety risks during sampling, such as venomous snakes, heat exhaustion, stinging insects, and harmful plants; and (4) cell phones being on hand with important numbers already saved on them. If the crew consists of one person, they must review the same safety information on their own before conducting field work.

Job Hazard Analysis

An important tool used to promote safe conduct is the Job Hazard Analysis (JHA, formerly called a job safety analysis). This approach is consistent with NPS Directors Order 50 and Reference Manual 50B for Occupational Health and Safety (NPS 2008). The JHA process is to: (1) identify hazards associated with field and laboratory settings, as appropriate; and (2) develop approaches to mitigate those hazards.

Three JHAs have been developed for use with the landbird monitoring protocol: one for driving safety, one for field sampling, and one for boat operation (see Appendices A, B, and C). Once per year, all GULN personnel involved must review and sign all JHAs. This acknowledges the participant's agreement to follow all safety guidelines during sampling.

Responding to a Life-Threatening Medical Emergency

- Call 9-1-1 or the park emergency number. Administer first aid to the best of your knowledge, ability, and training. If appropriate, transport to an emergency room. If field work is completed by GULN staff, the field vehicle will contain printed directions to the nearest hospital and emergency numbers, which are updated and printed every January, prior to field sampling, by the protocol lead or designated field crew leader. Non-NPS personnel conducting field work are expected to provide their own copies of the hospital directions and emergency numbers. These items are listed on the supplies and equipment checklists used before each field event.
- As soon as it is practical to do so, inform the park's emergency contact and the GULN office of the incident.
- For injured NPS employees and NPS volunteers, complete workers' compensation paperwork within 48 hours of incident. Non-NPS crew members (i.e., contractors and cooperators) must follow their organization's procedures for documenting accidents.

Responding to Non-Emergency Incidents

- For a non-emergency incident that may require medical attention, injured field personnel must prioritize their need for care, and as soon as possible, inform their supervisor according to their organizations' procedures. If the injured party is a contractor or cooperator, they must also inform their contact in the Gulf Coast Network immediately after the incident. If the Gulf Coast Network cannot be reached, inform the park's emergency contact.
- For injured NPS staff and NPS volunteers, complete workers' compensation paperwork within 48 hours of incident. Non-NPS crew members (i.e., contractors and cooperators) must follow their organization's procedures for documenting accidents.
- Injured crew members should seek medical attention, if needed.

NOTE: Never discard original paperwork related to workers' compensation claims (including information from doctor's visits, CA-1, CA-2, CA-16 or CA-17 forms).

Safety Considerations for Field Work

The Gulf Coast Network monitors landbirds in six National Park System units: Big Thicket National Preserve (BITH), Gulf Islands National Seashore (GUIS), Jean Lafitte National Historical Park and Preserve (JELA), Palo Alto Battlefield National Historical Park (PAAL), , San Antonio Missions National Historical Park (SAAN) and Vicksburg National Military Park (VICK). Many of the safety considerations are shared across the six parks, but some are specific to a given park, as detailed later in this document.

Excessive Heat and Sun

Overexposure to heat and sun can cause dehydration, heat exhaustion, or heat stroke. All are serious conditions that can be life threatening and must be avoided. When working in hot weather, be sure to drink plenty of water and eat foods that can replace electrolytes.

NOTE: Signs of heat stroke include hot, red or spotted (usually dry) skin, and the sufferer may be mentally confused, delirious, having convulsions, or unconscious. If heat stroke is suspected, seek immediate medical attention.

Weather

Weather conditions can be hazardous and can change quickly. The field crew leader is responsible for planning their day according to the local weather forecast and updating plans accordingly. Individual team members are responsible for being aware of their surroundings and changing conditions, and for consulting with the crew leader if plans need to change.

Thunderstorms

Storms that produce strong winds and lightning are dangerous and should be avoided in the field. If caught in a lightning storm, seek shelter in a building or car as soon as possible. If no shelter is available, spread out and move to an open space. Squat low to the ground on the balls of your feet

with your hands on your knees (do **not** lie flat on the ground). Avoid high elevations, conductive materials, and tall structures such as trees or telephone poles. If you are in the open and feel your hair stand on end (indicating lightning is about to strike), immediately make yourself the smallest target possible and minimize contact with the ground.

NOTE: A person struck by lightning can often be revived by prompt administration of CPR and oxygen.

Ticks

Several species of ticks can be encountered in the GULN parks where landbirds are monitored. Of primary concern are ticks that carry the following diseases: (1) Rocky Mountain spotted fever, with symptoms that include sudden onset of fever, headache, and muscle pain, followed by development of spotted rash at wrists or ankles; and (2) Ehrlichiosis, with similar symptoms except there is often no rash around the tick bite. Note that the presence or absence of a rash is not a diagnostic feature to distinguish any of the tick-borne diseases (CDC 2017a).

The deer tick or blacklegged tick (*Ixodes scapularis*), which transmits Lyme disease, could also be in any of the six targeted GULN parks. There are, however, few incidents of Lyme disease reported for those areas, relative to the northeast and upper midwestern United States. Symptoms of Lyme disease are similar to Ehrlichiosis, except that a “bull’s eye” rash forms at the site of the bite in 70–80% of cases (CDC 2017a).

Mosquitos

The main mosquito-borne diseases of concern in GULN parks are dengue fever, West Nile virus and several forms of encephalitis, such as St. Louis encephalitis or eastern equine encephalitis. The latter three diseases are caused by the same family of viruses and can produce similar, flu-like symptoms. Only about 20% of humans who get West Nile show any symptoms at all, and the most severe, potentially fatal cases are generally restricted to the elderly. Dengue fever also has mild to unnoticeable symptoms in most cases, but sometimes can cause excruciating pain or hemorrhaging. The only GULN park where dengue fever is considered a risk is Palo Alto Battlefield National Historical Park in Brownsville, Texas. Another mosquito-borne disease of concern is Zika virus, which is transmitted by *Aedes aegypti* or *Aedes albopictus*. These two mosquito species both have geographic distributions that span all GULN parks, but the risk is highest in Palo Alto Battlefield NHP. In late November 2016, mosquito-transmitted Zika was recorded in Brownsville, resulting in a CDC travel warning to that area (CDC 2017b). In late August 2017, however, the Zika-related travel warning to Brownsville was lifted.

Most people infected with Zika are asymptomatic, but some may exhibit flu-like symptoms. Once infected, a person can spread the disease through blood transfusion or sexual transmission. The spread of Zika virus is of particular concern for pregnant women because there is potential for microcephaly and other brain defects in infants whose mothers are infected during pregnancy. Refer to [the Centers for Disease Control \(CDC\) webpage](#) for current advisories and distributions of these and other mosquito-borne diseases.

Chiggers

Chiggers are the parasitic larvae of several species of mites in the family Trombiculidae. They are common throughout the Southeast and are typically too small to see with the naked eye. They feed by inserting their mouthparts into the skin and injecting enzymes that dissolve skin cells. Their bites leave itchy spots that sometimes take weeks to heal. Bites are often in dense patches where clothes are constricted. Washing the skin with warm soapy water immediately after field work will remove most chiggers and reduce the number of bites. To prevent multiple attacks following a single field excursion, any clothes that were worn in the field should be washed before wearing again. Chiggers are not known to be vectors of diseases in the United States.

Precautions to Minimize Risks of Ticks, Mosquitos or Chiggers

- Clothes treated with tick and insect repellents have been found to be fairly effective. Monitoring staff will be provided with DEET and permethrin and encouraged to treat their clothing with permethrin periodically throughout the summer. Monitoring staff should carefully follow the application instructions on the spray bottles to ensure their safety. Permethrin will remain active for several weeks and through several washings.
- Monitoring staff should take additional precautions to protect themselves from mosquitos, ticks and chiggers, including tucking pants in socks and tucking in shirts. Long sleeves and gaiters (especially when treated with permethrin) have been found to help. Monitoring staff may consider other barrier devices such as RynoSkin™, Under Armor®, elastic bands, and duct tape, when they are an option.
- Check clothes and skin for ticks regularly throughout the day and then inspect your entire body at the end of the day. Ticks typically need to be embedded for at least 24 hours for disease transmission to occur; therefore, the earlier ticks are found and removed, the lower your chances are of acquiring a tick-borne illness.
- If you find a tick that is already embedded, use fine-tipped tweezers or a spoon-shaped tick remover to firmly grasp the tick close to your skin. Slowly and steadily pull the tick's body away from your skin. Do not twist or jerk the tick, as it may break off the head and leave it embedded. Be careful not to crush the tick's body to minimize the chances of it regurgitating fluids into the wound. Clean the bite area with soap and water once the tick is removed. Do not use heat or harsh fluids to get ticks to back out of skin.

Considerations for Using Repellents Containing DEET

- DEET products have been widely used for many years; these products have occasionally been associated with some adverse reactions. Frequently reported reactions involve skin or eye irritation. There have been reports of central nervous system problems.
- By using products with lower concentrations of DEET and by applying as little of the product as needed for your outdoor work, you can reduce your exposure to DEET.

- Products with about 20–30% DEET are considered effective for most insects, but do not seem to be effective against some species of ticks (e.g., *Ixodes scapularis*).
- Generally, products with about 20–30% DEET are considered safe for adults (except for those with allergies to DEET products) when applied as directed.

Considerations for Using Repellents Containing Permethrin

- Products containing permethrin are for use on clothing only—not for use on skin. If permethrin is used improperly (e.g., sprayed directly on the skin), it can have negative health effects.
- Permethrin kills ticks that come in contact with treated clothing and one application lasts two weeks or more. Do not treat the clothing more than once every two weeks.
- Carefully read and follow manufacturer’s instructions for application, and refer to the Material Safety Data Sheet (MSDS) if you have questions.
- Do not apply while clothing is being worn.
- Apply to clothing item in a well-ventilated outdoor area, protected from wind. Take care to avoid spraying permethrin around domestic cats, as permethrin is highly toxic to them.
- Moisten the fabric with permethrin until the fabric darkens in color—do not over-saturate the fabric.
- Allow clothing item to dry outdoors for at least two hours before wearing (four hours in humid conditions).
- Keep treated clothes in a separate bag for storage and transport.
- Launder treated clothing separately from other clothing.

For more information on permethrin, see the [EPA repellent-treated clothing webpage](#).

Poisonous or Otherwise Harmful Plants

Poison Ivy and Its Relatives

Poison ivy (*Toxicodendron radicans*), Atlantic poison oak (*Toxicodendron pubescens*), and poison sumac (*Toxicodendron vernix*) are three closely related plant species of the GULN region that can cause itchy rashes or, occasionally, severe allergic reactions following skin contact. For most GULN parks, one or more of these species may be present and can be very abundant in localized areas. Abundance of poison ivy, poison oak, or poison sumac is not a justification for failing to sample a bird monitoring point.

Precautions to Minimize Poison Ivy Risks

- Avoid skin contact with any part of the poison ivy, poison oak or poison sumac plant. If the plant's density is such that complete avoidance is impossible, use a pre-exposure cream and wear long sleeves, long pants, hats, and work gloves.
- After working in an area with abundant poison ivy, poison oak or poison sumac, gently wash exposed skin in cool water with poison ivy soap (e.g., Tecnu) and change into fresh field clothes. Clothes that have been in contact with the plants should be washed thoroughly before reuse.
- If anyone has a minor allergic reaction, use an itch-relief cream such as cortisone cream, Benadryl cream, or calamine lotion. If a severe allergic reaction occurs, seek medical attention and notify the protocol lead as soon as possible. If the individual is an NPS employee or NPS volunteer, they should also file a workers' compensation claim.

Other Plants That Are Potentially Harmful If Carelessly Touched or Ingested

All GULN parks have some plants with thorns, spines or prickles. If members of the field crew exercise caution when traveling to and from bird survey points, the risks associated with these plants are minimal (e.g., scratches, torn clothing). At Palo Alto Battlefield NHP, however, the thorn-scrub habitat is dominated by thorny shrubs, cacti, and yuccas. Many of the park's plant species present their spines at or near eye-level, such that all crew members should consider the optional but recommended use of protective glasses. Most other plants in GULN parks are safe to touch, but some are potentially toxic if ingested. Both for safety and protection of park resources, it is never advisable for field personnel to eat wild plants while working in a national park, regardless of their confidence in plant identification.

Venomous and Non-venomous Snakes

The following species of venomous snakes may occur in GULN parks: copperheads (*Agkistrodon contortrix contortrix* or *A. c. laticinctus*), cottonmouths (*A. piscivorus piscivorus* or *A. p. conanti*), diamondback or timber rattlesnakes (*Crotalus adamanteus*, *C. atrox*, or *C. horridus*), pygmy rattlesnakes or massasauga (*Sistrurus catenatus tergeminus*, *S. c. edwardsii* or *S. miliarius*), and coral snakes (*Micrurus fulvius* or *M. tener*). To avoid snakebites, pay attention to where you put your hands and feet, and remain at a safe distance from any snakes you see (at least one full length of its body). If you hear the rattle of a rattlesnake, freeze, locate the snake visually and back away slowly. Note that many snake bites are purely defensive and contain no venom. Bites from immature snakes are much more likely to contain a dangerous amount of venom than bites from adult snakes. An online article by Texas Parks and Wildlife is a useful resource for identifying many of the venomous snakes in the GULN region and dealing with their bites (Texas Parks and Wildlife 2017).

Copperhead snakes may be found in a range of habitats including rocky outcrops, floodplains, and the edges of swamps or other waterbodies. These species may occur in the GULN parks of San Antonio Missions National Historical Park, Big Thicket National Preserve, Jean Lafitte National Historical Park and Preserve, and Vicksburg National Military Park. Copperhead bites are not typically considered life threatening, and in most cases antivenin is not administered.

Cottonmouths are typically associated with wetland habitats and may be found in all sampled parks except Palo Alto Battlefield NHP. Cottonmouth bites that are defensive typically do not contain venom. However, cottonmouth bites are capable of delivering a lethal dose.

Rattlesnakes may be encountered in a diversity of habitats from scrublands, grasslands, woodlands, forests and even wetland habitats in the south. The three species of diamondback or timber rattlesnakes occur in the GULN region, and collectively, their ranges cover all GULN parks. Western diamondback rattlesnakes (*Crotalus atrox*) are almost certain to be encountered on visits to Palo Alto Battlefield NHP. Rattlesnakes are capable of delivering a lethal dose of venom and can be aggressive. The western diamondback, in particular, is responsible for more fatal snake-bites than any other North American snake (Powell et al. 2016).

Pygmy rattlesnakes are also in a variety of habitats from arid to wet, but within a given habitat, they are often associated with water. The combined range of the two species intersects all GULN parks except San Antonio Missions NHP and Vicksburg NMP. Their bites are low in venom and rarely cause fatalities.

Coral snakes may be encountered in habitats including pinewoods, open areas that are dry or sandy, and moist, lowland areas. Collectively for the two species, their ranges intersect all GULN parks except Jean Lafitte National Historical Park and Preserve, and Vicksburg NMP. Of the venomous snakes in GULN parks, coral snakes may be the least likely to bite, but bites are still possible if snakes are handled or harassed. Their venom is a dangerous neurotoxin.

Procedures Following a Potentially Venomous Snake-bite

- Treat all bites as if envenomation has occurred, which means field crew must respond rapidly and the victim must reach the nearest medical facility as quickly as possible.
- One person on the field team is assigned to use the radio or cell phone to call for assistance. This person should identify the call as a snakebite incident and identify the victim's location and the closest possible point of access for responders.
- Prior to departure from the field site, quickly remove the victim's rings, watches and shoes, before swelling begins. If the bite is on the arm, bind it loosely to the body to restrict motion. Reassure the victim they will be OK and maintain calm. Do not use thin circulation restrictive cords, do not pack with ice, and do not attempt to cut open or otherwise enlarge the fang punctures.
- Depart the site by leading the victim toward proper medical treatment facilities. Move as slow as necessary to maintain a normal heart rate for the victim. Do not wait for assistance, as it delays proper medical treatment.

Bees and Wasps

Bees and wasps are present in all GULN parks, and in most cases, the risk of getting stung during field work is similar to the risk of getting stung when outdoors for other reasons. Extra vigilance is

required, however, around large palmetto leaves at Jean Lafitte NHP&P, because wasps can build nests on the leaf undersides.

If someone is stung by a bee or wasp, they should ensure the insect is no longer on them (most bee and wasp species can sting more than once) and inspect the injury. Benadryl and a cold compress may bring relief. If the stinger is left behind, it should be scraped off of the skin. Tweezers should not be used, as this squeezes the venom sack and worsens the injury. If the victim develops hives, asthmatic breathing, tissue swelling, or a drop in blood pressure, the crew should seek medical help immediately. If any monitoring staff members know they are allergic to bee or wasp stings, they should inform the field crew leader before field work begins. They should also make sure to carry appropriate medications. If they carry an epinephrine injector (EpiPen), they should make sure all members of their field team know where it is carried and how to administer it.

If a swarm of aggressive bees is encountered, following these instructions will reduce the potential for serious harm:

- Run away quickly and in as straight a line as possible.
- Protect your head, face and airways as you run; avoid flailing your arms and do not jump in water for protection.
- Seek shelter in a vehicle or building only if bees can be kept out.
- If a person is stung numerous times, seek medical attention even if no signs of allergy are observed.

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Appendix A: Driving Safety JHA

Job Hazard Analysis Introduction

- Job Title (and number if applicable): Driving Safety
- Date Written: 21 August 2012
- Date Revised: 27 July 2017
- Title of Person Who Does the Job: All Gulf Coast Network employees
- Analysis By: Robert Woodman, edited by Jane Carlson
- Supervisor: Martha Segura
- Park: Gulf Coast Network Parks
- Division: Inventory and Monitoring
- Approved By: Martha Segura
- Required or Recommended Personal Protective Equipment:
 - Two or more high-visibility safety road vests
 - Functioning seatbelts for all passengers

Table A-1. Driving Safety Job Hazard Analysis datasheet.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Vehicle Maintenance including pre-driving inspections	Vehicle malfunctions leading to breakdown, injury or accident In the event of a breakdown, lack of crucial equipment that might be needed Accidents or injuries caused from unsecured items	Take the vehicle in for regular scheduled maintenance or when any problem arises with vehicle performance. Familiarize yourself with the tire jack, spare tire, tools and other vehicle equipment. Ensure that there is an unused accident reporting form in the vehicle, including several witness statement forms. Check that the vehicle has appropriate equipment such as a first-aid kit, safety vests, flares, cones, and an ice scraper. Do a walk around of vehicle. Inspecting for damage and potential hazards. Secure all items that might become projectiles in the event of a crash.
Driving to and from destination on paved roads	Accidents from following a vehicle too closely or driving too fast for conditions Collisions with other vehicles or animals and/or driving off road surface due to inattention Head-on collisions due to driving when visibility is impaired due to elements (rain, fog, smoke, snow)	Obey speed limits and slow down if road conditions become slick or congested with traffic Pay attention at all times. Do not talk on a cell phone or text while driving. Choose the safest route such as a road with a divider stripe and passing lanes. Be especially careful on curves and stay within your lane. If you must drive a road without a lane divider, reduce speed and allow at least 4 seconds between you and the vehicle ahead of you.
Driving to and from destination on unpaved or damaged roads	Accidents (collisions, driving off road)	Reduce speed. On very bad roads, scout ahead if in doubt. Report hazards such as fallen trees to park dispatch.
Driving to and from destination on slippery roads (rain, ice, snow)	Accidents (collisions, driving off road)	Reduce speed. Engage proper equipment such as 4-wheel drive. Be prepared to stop in a safe location.
Driving to and from destination at night	Potential for collisions with pedestrians, animals and other obstacles that are not visible Accidents due to fatigue	Turn headlights on; keep windshield clean. Schedule trip to ensure driver is well rested. Pull over and rest if sleepy.
Towing trailer	Collisions due to extra weight of load, extra length and greater stopping distances Back-up problems	Reduce speed. Allow four or more seconds between you and the vehicle ahead of you to allow stopping time. Practice backing up with a trailer in a safe environment such as an empty parking lot.

Sequence of Basic Job Steps	Potential Hazards	Recommended Action or Procedure
Emergency or breakdown	Exposure due to being stranded Being hit by passing vehicles	If possible, pull off road. If there is risk of being hit by passing traffic, turn on four-way flashers. Use cones or flares to provide a buffer around your vehicle. If you need to stand on or near roadway, wear a safety road vest.
Parking	Collision with rocks, pedestrian or other hazard while backing into or out of a parking site Exhaust system igniting a grass fire Parked vehicle moving on its own	Park off of the road or in a designated parking area. Find a safe location to park that will provide safe exiting. Put transmission in Park. If parking on a slope, set parking break. Ensure that fuels are clear beneath vehicle so as not to start a fire. Use a backer to guide you into a safe place that will be easy to pull forward out of later. Use mirrors and back-up camera (if present) or look over your shoulder. If no backer is available, look behind the vehicle before backing.
Driving—physical and mental fatigue	Accident results from falling asleep at the wheel	Get needed rest. Avoid driving when tired and take breaks as needed. Be particularly cautious when driving late at night. If a replacement driver is available, trade off driving when you start to feel tired. If no replacement driver is available, pull off the road and take a break or a nap. Plan the trip so that no person will be driving more than 10 hours. Plan the trip so that no person will be driving after working 10 hours in the field.

Acknowledgment

We, the undersigned crew leader and crew members acknowledge reviewing and discussing this JHA and being given the opportunity to propose revisions to improve safety. We understand the provisions of this JHA and will fully adhere to all recommended actions and procedures.

PRINT NAME

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Appendix B: General Field Work JHA

Job Hazard Analysis Introduction

- Job Title (and number if applicable): General fieldwork JHA
- Date Written: 19 July 2014
- Date Revised: 22 September 2017
- Title of Person Who Does the Job: GULN and NPS staff, contractors, cooperators
- Analysis By: Robert Woodman, edited by Martha Segura and Jane Carlson
- Supervisor: Martha Segura
- Park: all GULN parks
- Division: GULN Inventory and Monitoring
- Approved By: Martha Segura
- Required or Recommended Personal Protective Equipment:
 - Field clothing appropriate to the weather and sampling activities. This includes long pants, long-sleeve shirts, wide-brimmed hats, appropriate foot-gear (leather or similar hiking boots if dry conditions and rubber boots/wader if wet), sun-block and bug-repellent.
 - First-Aid kit.
 - Individuals with known allergies to bees must carry an epinephrine injector.
 - Snake chaps are recommended when working in habitats where venomous snakes are common (namely Palo Alto Battlefield NHP).
 - Protective eye-wear are recommended when working in tangled and higher-profile spiny and thorny vegetation (namely Palo Alto Battlefield NHP).
- Required Standards and General Notes:
 - Refer to each protocol's Safety SOP for additional information and GULN field work guidance on a particular project.
 - Refer to park-specific safety policies, alerts, and notices.
 - Drive and hike carefully.
 - Bring all necessary equipment into the field.

- Drivers must have current state-issued driver's license to operate government vehicles on public roads.
- GULN coordinates or provides access to Defensive Driving training for GULN NPS staff.
- Specific other standards for park locations may include Department of the Interior (DOI)/NPS small – boat operation, US-DOI-NPS chain-saw operation, operation of off-road vehicles (4x4 quad UTV, etc.) training and certification
- All GULN-conducted field sampling activities are performed by teams of two or more people.
- Required Tools and Equipment:
 - Equipment and supplies for planned sampling tasks in the field.
 - Communications equipment including cell phones.
 - Park maps, compass and hand-held GPS units.
- Required Training and Preparation:
 - Participation in ongoing team mentoring and training on field work procedures and safety in the field (GULN NPS staff).
 - Reading of GULN safety procedures in Safety SOP and review of park-specific emergency contact list and procedures.
 - Participation in on-site safety briefing about park-specific risks, understanding of how to make emergency contact calls using available communications equipment, understanding of how to use supplied GPS units, understanding of how to reach and leave field site using maps and route plans.
 - Current certification in GULN – mandated general First Aid training.

Table B-1. Work Safety Job Hazard Analysis datasheet.

Sequence of Job Steps	Potential Hazards	Safe Action or Procedure
1. Prior to departing from the office, file a trip plan	1a. No specific hazards associated	Records team trip destination(s), schedule, and Point-of-Contact at GULN / on park with contact schedule and chain
2. Driving to/from site	2a. Car Accident	Wear seatbelt at all times. Drive only on established roads, follow all driving laws and park in a safe location that will not obstruct traffic. Do not use cell phone or other device while driving. Avoid traveling during inclement weather. Drive slowly during icy/snowy conditions, especially around curves. Use 4WD when necessary. Slow down where large animals may be present to allow for reaction time.
	2b. Unimproved roads	Maintain a safe speed for the road condition. Use 4WD when necessary. Move sharp rocks out of road. Ensure that tires are properly inflated and check for tire damage regularly. Always have a fully inflated spare tire and all equipment necessary for changing a tire.
	2c. Fatigue	Do not drive if fatigued. Pull over to rest or have another member of the crew drive.
	2d. Boat travel	See Boat Travel JHA
3. On-park safety briefing	3a. No specific hazards associated	The briefing establishes member roles and responsibilities, team tasks and task sequence, and anticipated location-specific faunal, plant and environmental hazards, communications & contact procedures.
4. Hiking or use of off-road vehicle to access sampling sites	4a. Steep, rugged and/or slippery terrain.	Wear sturdy, well-fitting boots with good traction. When walking off-trails, take care to assess terrain conditions in order to determine the safest route. Move slowly and deliberately through the habitat. Walking sticks may help to increase stability and push vegetation out of the way.
	4b. Loss of orientation	Ensure all crew members are knowledgeable with map, compass, and GPS. Keep track of current position, vehicle location, and pay attention to landmarks along your way. Use established trails when possible.

Sequence of Job Steps	Potential Hazards	Safe Action or Procedure
	4c. Encounters with venomous snakes	Venomous snake encounters are possible at bird monitoring sites. Prior to the sampling event, put on appropriate boots. Know and review snakebite First-Aid procedures before sampling. During the sampling event, look and listen for snakes as you move through vegetation and around objects. Never reach into holes or cavities in or under trees, ground objects, coverboards, rock ledges or other likely snake hideouts. Avoid disturbing venomous snakes and do not handle them for any reason. If bitten by a venomous snake, follow appropriate snakebite First-Aid procedures as listed in in Protocol SOP for Safety. Get medical help immediately—inform assisting personnel of the type of snake involved.
5. Trail and off-trail field work	5a. Hazards due to walking and load-carrying on and off-trails include risks imposed by rough terrain, treacherous footing, obstacles in path, sliding down slopes and on rough surfaces	Wear clothing appropriate to the task(s) being performed. Use caution and look before you step. Exercise special care when stepping over obstructions and on sloped, slippery, muddy and loose terrain. Use teamwork to carry heavy and bulky items and carry heavy objects on your down-slope side when possible. Use additional protective gloves and clothing where appropriate.
	5b. Hazards due to exposure to weather	Be aware and informed of expected weather conditions. Dress appropriately for prevailing weather and temperature conditions. Avoid prolonged exposure to extreme sun and wear sun block greater than SPF-30. Keep hydrated and be alert for heat exhaustion and heat stroke in hot, humid conditions. Be alert for hypothermia in cold or wet conditions. Take a break in the shade when feeling over-heated.
	5c. Hazards due to site flora and fauna include biting and stinging insects, contact with poisonous / toxic plants, encounter with venomous and other biting animals.	Know the park-specific hazardous plants, animals and arthropods (See protocol SOP: Safety). Wear insect repellent and long-sleeve shirts and long pants. Avoid undue contact with spiders, centipedes, and other hazardous arthropods. Frequently check body for ticks during work and after leaving the field site. Treat bites with antiseptic ointment or alcohol, wash bites with soap and water.

A safely and effectively performed GULN field-work event consists of the GULN field team:

1. Getting completely organized and fully-oriented to the planned tasks. The team knows the anticipated task sequence, locations, timelines, travel responsibilities, major anticipated conditions and potential hazards. Team members know what their roles are in the effort and what to prepare for.
2. Properly establishing emergency notification and communications procedures, event routes, and POC for both GULN and the park.
3. Driving to and from the park in a safe and successful manner without injuries or loss or damage to property.
4. Holding the pre-work field safety briefing such that all members are properly informed on local hazards and applicable park procedures.
5. Traveling within parks to the sampling location, successfully collecting data, and returning to the team vehicle without injury or incident.
6. If adverse weather develops, successfully addressing these factors while completing field tasks.
7. Completing post-event activities (off-loading, cleaning and storing equipment, attending to personal clean-up and treatment, where desired, for contact with insects and plants) at the GULN offices without injury or incident.

JHA Instructions (general instructions from worksheet)

- Identify the location of the work project or activity, the name(s) of people involved in the process, the date(s) of acknowledgment, and the name of the appropriate supervisor approving the JHA. The supervisor acknowledges that all participants have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.
- Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).
- Identify all known or suspect hazards associated with each respective task or procedure listed. For example:
 - Research past accidents and incidents.
 - Research the Health and Safety Code, or other appropriate literature.
 - Discuss the work project or activity with participants.
 - Observe the work project or activity.

- A combination of the above.

Emergency Evacuation Instructions

- Work supervisors and other personnel are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a participant becomes seriously ill or injured at the worksite.
- Be prepared to provide the following information:
 - Nature of the accident or injury (avoid using victim's name).
 - Type of assistance needed, if any (ground, air, or water evacuation).
 - Location of accident or injury, best access route into the worksite (road name or number), identifiable ground or air landmarks.
 - Radio frequencies.
 - Contact person.
 - Local hazards to ground vehicles or aviation.
 - Weather conditions (wind speed and direction, visibility, temperature).
 - Topography.
 - Number of individuals to be transported.
 - Estimated weight of individuals for air or water evacuation.
- The items listed above serve only as a guideline for the development of emergency evacuation procedures.

Acknowledgment

We, the undersigned crew leader and crew members, acknowledge reviewing and discussing GULN safety practices for bird monitoring, as also outlined in the JHA. In signing below, we agree to fully adhere to all recommended actions and procedures for safe sampling.

PRINT NAME

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Appendix C: Watercraft Operations JHA

Job Hazard Analysis Introduction

- **Job Title** (and number if applicable): Watercraft operation
- **Date Revised:** 22 September 2017
- **Title of Person Who Does the Job:** All Boat-Trained Gulf Coast Network employees
- **Prepared By:** Stacy Surgenor, Mammoth Cave National Park; Revised by Whitney Granger
- **Supervisor:** Martha Segura
- **Park:** Gulf Coast Network Parks
- **Division:** Inventory and Monitoring
- **Approved By:** Martha Segura
- **Required and/or Recommended Personal Protective Equipment:**
 - one personal flotation device (PFD) for every person on board
 - one Type IV throwable PFD
 - paddle
 - fire extinguisher
 - anchor and rope
 - visual distress signals
 - complete tool kit
 - first aid kit
 - bilge pump/bailer
 - Extra food and water
 - foul weather clothing
 - compass

Table C-1. Powered Watercraft Job Hazard Analysis datasheet.

Topic	Safety Item	Procedure
General operation of a powered watercraft (PW)	Responsibility for watercraft operation	The OPERATOR of the vessel is ultimately responsible for safe operation of watercraft including safety of the crew.
General operation of a PW	Authorized operators of park watercraft	All operators of park-owned watercraft must be graduates of the USDOJ MOCC with current certification. All operators must review the JHA "Watercraft Operation". Cooperators are required to provide a copy of the MOCC Certificate prior to operating park watercraft.
General operation of a PW	Authorized operators of non-park watercraft	All operators of non-park watercraft must be graduates of a boating safety course equivalent to the USDOJ MOCC with current certification. All operators must review the JHA "Watercraft Operation". Cooperators and contractors are required to provide a copy of the boating safety certificate prior to operating non-park watercraft.
General operation of a PW	Crew size	Do not exceed the maximum gross weight for the vessel. If possible, do not operate watercraft while alone.
General operation of a PW	Tobacco	Use of tobacco products in park watercraft and in government-owned vehicles is prohibited.
General operation of a PW	Float plans	All operators must complete and file a float plan for all watercraft operations with park resource and law enforcement staff and the GULN program coordinator. Float plans must be completed prior to departure except in emergency situations where response time is essential. Float plans must be submitted to the acting network Point of Contact and delivered to park law enforcement one business day prior to scheduled departure.
General operation of a PW	Pre-departure check	Inspect boat, trailer, and tow vehicle prior to departing boat storage area. The following items will be inspected prior to connecting the boat to the tow vehicle: trailer tongue latch, wiring harness, safety chains, hull integrity, navigation lights, battery and connections, fuel tanks, fuel hoses and connections, outboard mounting hardware, engine oil level (4-stroke only), drain plugs, trailer tires, lug nuts, transom straps, outboard transom support.
General operation of a PW	Trailing	Only vehicles equipped with frame-mounted receiver hitches are permitted to tow watercraft, DO NOT USE BUMPER HITCHES TO TOW PARK WATERCRAFT. Ensure trailer hitch size and receiver hitch ball sizes are equal. Securely connect wiring harness. Securely connect safety chains, cross chains. Inspect brake lights, park lights, and turn signals prior to departure. PERSONAL VEHICLES WILL NOT BE USED TO TOW PARK WATERCRAFT.

Topic	Safety Item	Procedure
General operation of a PW	Launching	Wear appropriate footwear, be aware of slick conditions. Do not step between tow vehicle and trailer unless vehicle transmission is in park (manual transmission in gear) and parking brake is set. Designate ONE person to give signals to tow vehicle driver, unless driver requests a second person to assist. Use clear hand signals or verbal commands. The TOW VEHICLE DRIVER is responsible for ensuring all those in the vicinity of the moving vehicle and trailer are in a safe location.
General operation of a PW	Launching at ferry sites	Pull vehicle and boat to parking lot or an area out of the path of traffic to ready the boat for launching. Wait until no traffic is present before attempting launch. Ask ferry operator to move ferry to provide space for launching boat. IF FERRY TRAFFIC ARRIVES WHILE YOU ARE IN THE PROCESS OF LAUNCHING THE BOAT, CONTINUE LAUNCHING PROCEDURE IN A NORMAL FASHION, DO NOT RUSH. If you have mechanical difficulty, do not spend more than 10 minutes attempting to start the outboard. If the cowling must be removed, pull the trailer back to the parking area and address any repairs.
General operation of a PW	Boarding/deboarding vessel	Wear proper footwear, Ensure you have the attention of all persons in the vessel before boarding. Put on a PFD BEFORE boarding vessel. Secure vessel before deboarding. Do not carry heavy items in and out of vessel, hand items to someone on shore or in the vessel. Use caution when climbing out of vessel onto mud/sand shore. Wear PFD at all times where repeated entry and exit cycles are required (data collection, etc.)
General operation of a PW	Operation of Powered watercraft	The operator is responsible for the operation of the vessel. If possible, designate at least one experienced crewmember as a lookout.
General operation of a PW	Emergency kill switch	Emergency kill switch must be securely fastened to the operator by the clip. DO NOT stuff the cord into a pocket.
General operation of a PW	Rules of the road	Yield to all non-powered watercraft. Use extreme caution in blind curves or during periods of restricted vision (fog, night). Slow to idle speed when passing non-powered watercraft or anchored/drifted boats.
General operation of a PW	Mechanical failures	Operators should have a basic knowledge of mechanical failures. Do not attempt field repair of major mechanical failures (cylinder heads, rotating assembly, cooling system, lower unit, engine electrical systems, etc). REPORT ALL MECHANICAL FAILURES, EQUIPMENT DEFECTS, DAMAGE, AND RELATED PROBLEMS TO THE PROGRAM MANAGER WITHIN ONE DAY OF THE OCCURRENCE. Breakage is expected and does not necessarily indicate misuse or abuse.
General operation of a PW	Control of vessel	The operator of the vessel is ultimately responsible for the safety of the crew, the vessel, and the safety of others on the water.

Topic	Safety Item	Procedure
General operation of a PW	On-water Towing	Operators of non-emergency park watercraft are NOT authorized to tow any watercraft. Attempt rescue of passengers if situation is life threatening but do not exceed your vessel's gross weight rating. Offer to call for competent assistance if towing is required.
General operation of a PW	Loading boat onto trailer	Boat operator should use discretion with regard to speed required to drive boat onto trailer. Tilt propeller outboards into highest position and lock before removing trailer from water.
Personal injury	PPE	Operator and all passengers are required to wear a minimum USCG-approved PFD. PFD must be international orange in color with SOLAS reflective tape (excluding covert law enforcement operations, refer to 485 DM 22.4(7)).
Personal injury	Inflatable PFDs	Inflatable PFDs will NOT be worn as a substitute for a standard Type I, II, or III PFD. Inflatable PFDs may be kept on board the vessel.
Personal injury	Issuance of individual PPE	Operators who spend a significant amount of time (> 4 days/month) using park watercraft will be issued a Type III PFD. The PFD should be "customized" with safety equipment (whistle, distress signal, sharp knife, flashlight or chemical lights). PFD's must not be structurally altered.
Personal injury	Failure to wear PFD	PFD's must be donned PRIOR TO BOARDING THE VESSEL.
Personal injury	Defective PFD's	Any PFD with a structural defect (cuts, tears, holes, etc.) will be immediately removed from service and subsequently destroyed prior to disposal by cutting all straps and cutting an "X" figure into every flotation panel with a sharp knife. Type V exposure suits will have the arms and legs cut off.
Personal injury	Storage of PPE	Do not store PFD's in a boat or vehicle. PFD's will be hung indoors to allow drying and to prevent damage. Do not use Type IV PFDs as seat cushions.
Personal injury	Equipment storage	All equipment not in use must be securely stowed away to prevent shifting during travel. PFD's, paddles, nets, rope, seats, and other lightweight gear must be stored in closed compartments within the vessel or within the tow vehicle while trailering.
Personal injury	Injuries	Contact park Law Enforcement and Emergency Services via cell phone or radio to notify of nature and severity of injury within park. Outside of a park, attempt to call local emergency responders (911 if available). If vessel is operable, begin traveling toward assistance. If vessel is not operable, and emergency responders cannot be reached, administer first aid and attempt to stabilize victim, deploy visual distress signal.
Personal injury	On-board fires	Use extreme caution around electrical connections and fuel vapor sources. Remove portable fuel tanks/cans from area around battery prior to working with connections. Disconnect negative cable from battery when performing maintenance repairs. In case of outboard engine fire, DO NOT remove cowl.

Topic	Safety Item	Procedure
Personal injury	Run aground	Assess the situation. If vessel is caught on obstruction in deep water, attempt to reverse. Use paddle/boat hook to push off. Deploy anchor and attempt to pull vessel free. If vessel is stuck in soft mud/sand in shallow area, use caution, you may become stuck and/or drown. If vessel is stuck on sand/gravel/cobble/boulder bar, disembark all passengers. Raise outboard. Attempt to pull vessel with rope attached to sturdy anchor points (bow eye). If vessel cannot be moved, call for assistance. If vessel can be freed, carefully inspect for hull damage/leaks.
Personal injury	Disabled vessel	Radio or call for assistance. When possible, paddle vessel to water's edge and secure. Do not allow boat to drift downstream.
Personal injury	Capsized or sinking vessel	Take head count in water, get to shore. Call or radio for help, deploy visual distress signals.
Environmental Hazards	Heat	Drink plenty of fluids during hot weather, use a high-SPF sunscreen, wear polarized glasses to reduce glare and improve vision of submerged obstructions
Environmental Hazards	Cold	If the sum of the ambient air temperature and water temperature is less than 100°F, a class V exposure device must be worn.
Environmental Hazards	Weather	Check weather forecast prior to departure. If you are caught in a thunderstorm, get to shore immediately, secure the vessel, and exit.
Environmental Hazards	Suspension of privileges	All boat operators are subject to inspection to ensure they are following proper procedures for watercraft operations. Failure to comply with procedures or knowingly operating without required equipment may result in suspension of privileges.

Acknowledgment

We, the undersigned crew leader and crew members acknowledge reviewing and discussing this JHA and being given the opportunity to propose revisions to improve safety. We understand the provisions of this JHA and will fully adhere to all recommended actions and procedures.

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