

National Park Service
Inventory and Monitoring Division



Safety—Version 1.0

Meiman, J. 2019. Safety—Version 1.0. Gulf Coast Network Standard Operating Procedure NPS/GULN/SOP—SEA01. Gulf Coast Network, Lafayette, Louisiana.

This standard operating procedure (SOP) provides description and guidance on safety for seagrass 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

Seagrass monitoring in Gulf Coast Network (GULN) parks can be a challenging physical activity, with likely exposure to high heat, high humidity, sun, and hidden hazards under water or mud. All sampling requires boat or airboat operation. Field personnel must remain vigilant to the safety risks they face as they travel to and from the field sites and complete the required field tasks.

This SOP establishes safety parameters and guidelines for personnel involved in the GULN Seagrass 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 seagrass monitoring must be familiar with these procedures and sign the acknowledgment form at the end of each JHA (see Appendices A, B and C). 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 fieldwork being completed by contractors or cooperators, not NPS staff. As per Director's Orders 50B "When work is performed by others, such as contractors, the contracting officer will determine that the person in charge of the work develops appropriate JHAs for the work to be performed. This information will be provided to the contracting officer or contracting officer representative as part of the accident prevention plan. It will be approved/accepted by the contracting officer/contracting officer representative prior to permitting the contractor to proceed with the work."

The network staff will only collaborate with cooperators or contractors who have demonstrated they have experience safely conducting seagrass monitoring or research in the northern Gulf of Mexico. A cooperator or contractor safety plan will be submitted and approved by the Gulf Coast Network prior to any work. It will be the responsibility of the cooperator or contractor to abide by their own safety program and to coordinate directly with the park staff on park-specific safety procedures. In the event that NPS staff will participate in field or laboratory activities, NPS staff will adhere to the cooperator/contractor safety program and the network's internal standards and practices listed in this SOP.

The cooperator will be cognizant of potential hazards and provide mitigation measures in its safety documents and training. The Gulf Coast Network recognizes that the cooperator will have a greater understanding of potential hazards than the network as they are professionals in this work. 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 assisting the cooperators with the fieldwork, 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).

Principal Investigator

The cooperator or contractor is responsible for planning and logistics, and direction of all non-NPS staff in the execution of this protocol and associated SOPs. The principal investigator will work with the network to make sure all necessary permits are submitted and activities coordinated with the park. The principal investigator is responsible for all personnel training and institutional safety requirements.

Field Personnel

Field personnel refers to the individuals who will perform the seagrass monitoring field data collection. 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 fieldwork schedule and timing, but also allow for updates regarding park safety and fieldwork regulations, policies and current advisories.

While conducting fieldwork, 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 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 fieldwork 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 Gulf Coast Network staff participate in field sampling with the cooperator, they will use the GULN Trip Plan (Figure 1).

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

On-Site Crew Safety Briefing or Self-Review

The cooperator must conduct a safety briefing prior to entering the field. All cooperators are selected based on their experience and expertise in conducting seagrass monitoring or research in the northern Gulf of Mexico. Therefore, the briefing can be a simple check-in about: (1) sunscreen; (2) hydration needs; (3) safe boat operations; and (4) safe field operations when conducting seagrass sampling.

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 when GULN staff travel to the field sites to participate in sampling: 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. Non-NPS personnel conducting fieldwork are expected to provide their own copies of emergency numbers and directions to the nearest hospital(s). 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 the 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 Fieldwork

The Gulf Coast Network monitors seagrass in two National Park System units: Gulf Islands National Seashore (GUIS) and Padre Island National Seashore (PAIS). The safety considerations are shared across the two parks

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. Use of sunscreen of SPF 30 or higher is recommended.

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 out of the boat as soon as possible 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.

Mosquitos

The main mosquito-borne diseases of concern in GULN parks where seagrass is monitored are West Nile virus and several forms of encephalitis, such as St. Louis encephalitis or eastern equine encephalitis. These 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. Another mosquito-borne disease of potential 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 neither of the parks where seagrass monitoring occurs are in the highest risk area. The network will continue to refer to the [Centers for Disease Control \(CDC\) webpage](#) for current advisories and distributions of these and other mosquito-borne diseases.

Precautions to Minimize Risks of Mosquitos

- It is recommended that field personnel prevent mosquito bites by using a repellent such as DEET.

Considerations for Using Repellents Containing DEET

- DEET products have been widely used for many years; these products have occasionally been associated with 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.
- Generally, products with about 20–30% DEET are considered safe for adults (except for those with allergies to DEET products) when applied as directed.

Bees and Wasps

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

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 fieldwork 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.

Stingrays and Sharks

All crew members must be alert to the possibility of the presence of stingrays or sharks. If either species is present, fieldwork is delayed until they have left the area. When entering the water, crew members will use a pole to explore the area near the boat if the bottom can not be seen due to poor visibility. If walking on the bottom, shuffle feet to avoid stepping on a stingray and to scare them out of the area. Any crew member that is stung by a stingray must be taken for medical evaluation immediately.

Literature Cited

Centers for Disease Control (CDC). 2017b. Zika Virus. Available at: <https://www.cdc.gov/zika/> (last accessed October 2017).

National Park Service. 2008. National Park Service occupational health and safety program reference manual 50B. Available at: <https://www.nps.gov/policy/RM50Bdoclist.htm> (last accessed October 2017).

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.

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

SIGNATURE

DATE

_____	_____	_____
_____	_____	_____
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_____	_____	_____
_____	_____	_____

Appendix B: General Fieldwork 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.
- Required Standards and General Notes:
 - Refer to each protocol's Safety SOP for additional information and GULN fieldwork 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 2+ 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 fieldwork 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.

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.
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.

Sequence of Job Steps	Potential Hazards	Safe Action or Procedure
2. Driving to/from site	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. Use of boat to access sampling sites	4a. Wet and/or slippery surfaces	Wear well-fitting shoes with good traction. Take care to assess conditions in order to determine the safest route. Move slowly on the boat and to board the boat.
	4b. Loss of orientation	Ensure all crew members are knowledgeable with map, compass, and GPS. Keep track of current position, boat launch location, and pay attention to landmarks along your way.
5. Fieldwork	5a. 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.
	5b. Water sampling	Staff are required to wear PFD at all times. Extra care will be taken when leaning out of the boat to measure or collect samples.
	5b. Snorkelling	Personnel participating in snorkelling will be made aware of boat hazards such as propellers, exhaust pipes and sharp edges. A spotter will be assigned who will alert the snorkeler of dynamic hazards such as a drifting boat or jellyfish. The snorkeler will wear protective clothing such as a wetsuit to avoid over exposure to the sun, stinging sea creatures, or cool water temperatures. Water shoes or boots may be worn for protection against oyster shells, stingrays, or other underwater hazards.

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 the Gulf Coast Network 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 guidelines for the development of emergency evacuation procedures.

Acknowledgment

We, the undersigned crew leader and crew members, acknowledge reviewing and discussing GULN safety practices for seagrass 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

SIGNATURE

DATE

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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 (general operation).

Safety Item	Procedure
Responsibility for watercraft operation	The OPERATOR of the vessel is ultimately responsible for safe operation of watercraft including safety of the crew.
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.
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.
Crew size	Do not exceed the maximum gross weight for the vessel. If possible, do not operate watercraft while alone.
Tobacco	Use of tobacco products in park watercraft and in government-owned vehicles is prohibited.
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 network Point of Contact and delivered to park law enforcement one business day prior to scheduled departure.
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.
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.
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.
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.

Safety Item	Procedure
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.)
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.
Emergency kill switch	Emergency kill switch must be securely fastened to the operator by the clip. DO NOT stuff the cord into a pocket.
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.
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.
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.
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.
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.

Table C-2. Powered Watercraft Job Hazard Analysis (personal injury).

Safety Item	Procedure
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)).
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.
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.
Failure to wear PFD	PFD's must be donned PRIOR TO BOARDING THE VESSEL.

Safety Item	Procedure
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.
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.
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.
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.
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.
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.
Disabled vessel	Radio or call for assistance. When possible, paddle vessel to water's edge and secure. Do not allow boat to drift downstream.
Capsized or sinking vessel	Take head count in water, get to shore. Call or radio for help, deploy visual distress signals.

Table C-3. Powered Watercraft Job Hazard Analysis (environmental hazards).

Safety Item	Procedure
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
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.
Weather	Check weather forecast prior to departure. If you are caught in a thunderstorm, get to shore immediately, secure the vessel, and exit.
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.

PRINT NAME

SIGNATURE

DATE

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