

Initial Survey Instructions for Current (Tier I) Surveys for Big Branch Marsh National Wildlife Refuge Inventory and Monitoring Plan

May 2016



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Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological data and guards against information loss over time. The Initial Survey Instructions (ISI) format was developed to assist refuges in recording important biological survey information prior to the development of an approved, site-specific protocol. ISIs function as the initial step in the development of formal survey protocols for surveys that are included in the Current (Tier I) group of the refuge Inventory and Monitoring Plan (IMP). ISIs are also linked to and expand upon the information included in the Planning and Review of Inventory and Monitoring on Refuges (PRIMR) database which tracks the biological program of a refuge.

The information provided in an ISI is as thorough and complete as possible, in the absence of a formal survey protocol. There may be survey methods developed by refuge staff for a specific, local purpose, general methods derived from primary literature, or regional or national programs with protocols not yet approved by the National Wildlife Refuge System.

ISIs are updated over time so they will have a version number indicating whether a major or minor change has occurred (e.g., version 1.0, major change to 2.0; version 1.0, minor change to 1.1).



Survey Instructions

Red-cockaded Woodpecker Nest Monitoring

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

- Serve as Initial Survey Instructions (ISI) (701 FW 2), and an initial step in development of formal NWRS survey protocols;
- Capture information valuable in development of Inventory and Monitoring Plans (IMP);
- Augment survey information in the Planning and Review of Inventory and Monitoring ([PRIMR](#)) database;
- Reveal multi-refuge and landscape-level data inference opportunities.

Using the Initial Survey Instructions Field Form

Staff should use this tool for all on-going surveys, particularly those high priority refuge-based surveys where protocols are not available, and followed by cooperative and/or coordinated surveys with important refuge-specific elements of implementation. The information provided in the ISI form should be as thorough and complete as possible; however it is acceptable to leave fields or sections empty if particular survey information is unknown. Provide completed forms to your I&M ecologist, who will archive the it on [Fishnet](#) and link it to the survey record in PRIMR for long-term reference. Regional I&M staff ecologists can assist refuge staff with completing the Survey Instructions. If the Survey Instructions are updated over time, we recommend saving updates as versions (e.g., version 2.0).

Survey name:

Red-cockaded Woodpecker Nest Monitoring

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR

Background/Survey Justification:

The Red-cockaded Woodpecker (RCW, *Picoides borealis*) is a federally and state listed endangered species and is identified as a species of conservation concern in the Louisiana Comprehensive Wildlife Conservation Strategy (Louisiana Department of Wildlife and Fisheries, Louisiana Wildlife Action Plan website: www.wlf.louisiana.gov/wildlife/wildlife-action). A recovery plan has been prepared for the species (USFWS 2003). Big Branch Marsh NWR is designated as a support population for the RCW with a recovery goal of 20 active clusters; therefore an active population

management program is currently underway. The Big Branch Marsh population of RCWs is the only known viable population in Southeast Louisiana (USFWS 2011). Demographic monitoring is critical to assess the overall health of a given population and to assist managers in making informed habitat management decisions (e.g., foraging and nest habitat management, predator control). Individual birds and their habitat (see 2.01 Red-cockaded Woodpecker Habitat Monitoring, FF04RLBM00-013) are monitored closely during the nesting season. This survey was selected because the monitoring and management of RCWs, in accordance with the species recovery plan, is legally mandated (USFWS 2003a). This monitoring effort is currently conducted on the refuge.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

Red-cockaded Woodpecker (RCW, *Picoides borealis*)

Target habitat(s): (if applicable)

Pine forest and mixed pine forest habitats suitable for RCW nesting and foraging on the refuge.

Survey objectives: (Your primary survey objectives, i.e., what questions do you hope to address with this survey?).

The red-cockaded woodpecker (RCW) nest monitoring program consists of two objectives: 1) annual cavity tree inspections and 2) intensive monitoring of active RCW clusters.

Section 2. Survey Design

For Collaborative Surveys

☒ **This survey is part of a collaborative State, Regional, or National survey:**

Coordinating organization(s) and contact information:

At this time the Louisiana Department of Wildlife and Fisheries (LADWF) is monitoring the status of the RCW population on the refuge as part of the implementation of the RCW Recovery Plan (FWS 2003). Contact info: Eric Baka, Red-cockaded Woodpecker Safe Harbor Coordinator,
Louisiana Dept. of Wildlife and Fisheries, 1995 Shreveport Hwy, Pineville, LA 71360, (318) 487-588, fax (318) 487-5886.

Is there an established protocol for the survey? ☒ Yes ☐ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

Protocol follows the guidance in the RCW recovery plan (FWS 2003) and protocols defined by LADWF.

Are there refuge-specific elements of implementation? ☒ Yes ☐ No (☐ Not Sure)

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ **This survey has refuge-specific design elements:**

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

RCW survival surveys have been conducted annually since 2006.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☐ Plot ☒ Point ☒ Other:

Sampling units are each individual bird monitored for survival.

Do sampling units remain fixed (i.e., same location from year to year)?

☐ Yes ☒ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

The RCW clusters on the refuge will be considered as one population. The refuge currently has 17 active clusters. The number of cavity trees available, including artificial cavities is over 100. Active cavity trees will be located and mapped annually and bird roosting locations will be attempted to be located annually by the biology staff. Big Branch currently has 5001 acres managed for the RCW, and an additional 265 acres managed as pine savanna North of Pacquet Road, where BA of pine trees will remain near 20-30 sq ft.

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

Birds are monitored annually from February to July as part of the requirements in the 2003 Recovery Plan.

Section 3. Survey Methods

Primary metrics collected:

For Cluster survey Inventory

- (1) status (active, inactive) of all cavities and cavity trees,
- (2) number of suitable cavities,
- (3) need for artificial cavities,
- (4) need for predator/competitor control devices,
- (5) need for thinning to minimize SPB risk,
- (6) need for monumentation of cluster and/or cavity trees, and
- (7) any fire, wind, soil and/or related natural damage and/or any human-caused damage.

Demographic Monitoring:

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

All cavity trees will be marked with a permanent tag and with a band of white, nontoxic paint. A numbered metal tag will be placed at both breast height and at the base of each cavity tree. The location of all cavity trees will be identified on a map. For each cavity tree total height of tree cavity and number and orientation of each cavity opening will be recorded. GPS locations of each cavity tree will be recorded.

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

Cavity trees need to be located and verified before nesting season. A banding permit is required for any banding or handling of RCW birds. GIS maps should be constructed to show the location of cavity trees from previous inventories.

Describe equipment used during the survey:

Cluster Survey/Inventory: GPS, white paint, maps, camera, bark removal tool, nails, ID aluminum tags, diameter tape, clinometer, clipboard, note book.

Group Demography Monitoring: appropriate banding equipment, climbing ladder and associated equipment. A “peeper” camera can be used to observe activity within cavities to minimize bird disturbances.

Describe detailed methodology (field and lab procedures):

The red-cockaded woodpecker (RCW) nest monitoring program consists of two major areas: 1) annual cavity tree inspections and 2) intensive monitoring of active RCW clusters. RCW nest surveys are conducted in accordance with Henry (1989) methods. Each breeding season all clusters are revisited and inventoried. Any new clusters discovered are added to the inventory. The red-cockaded woodpeckers in each cluster are color-banded in order to determine the group composition. During the breeding season, each cluster is checked on a weekly cycle for a nest from April through July and once a nest is located the number of eggs present is recorded. Nests are checked regularly until nestlings hatch and when old enough, each nestling is color-banded as well. Each red-cockaded woodpecker is banded with the cluster's unique color combination on one leg and an individual color-band and a numbered U.S. Geological Survey aluminum band on the other leg. Approximately 3 weeks after banding the nestlings, the cluster is revisited and an early morning follow of the group is conducted in order to determine the number of young that fledged is and verified making up the group composition. During these checks the sex of the young since only juvenile males have a red-crown patch on the top of their head which is visible until their first molt.

Cluster Survey/Inspection:

MIL(Management Intensity Level) 1-2 - All active clusters will be inspected at least once every two years. Recruitment clusters will be inspected annually.

MIL 3-4 - All active and recruitment clusters will be inspected annually during the breeding season.

These inspections are prescriptive inspections, used to classify cluster status and develop treatments and modifications of treatments to maintain suitable nesting habitat. As a minimum, biological assessment personnel will record the following data:

- (1) status (active, inactive) of all cavities and cavity trees,
- (2) number of suitable cavities,
- (3) need for artificial cavities,
- (4) need for predator/competitor control devices,
- (5) need for thinning to minimize SPB risk,
- (6) need for monumentation of cluster and/or cavity trees, and
- (7) any fire, wind, soil and/or related natural damage and/or any human-caused damage.

This information will be summarized annually and used to schedule actions to ensure creation and maintenance of suitable nesting habitat.

Group Demography Monitoring:

MIL 1-3 - A twenty-five (25%) percent sample, but not less than 25 groups annually, will be monitored.

MIL 4 - All groups will be monitored annually.

Monitoring activities are done annually at sample clusters to determine group composition, size, and productivity. The following data will be recorded at sample clusters during pre-nesting and post-nesting roost counts:

- (1) number of birds present
- (2) nesting activity
- (3) number of fledglings (if possible to determine).

Who conducts the surveys (Include staff, interns, contractors, etc... if primary surveyors):

Wildlife biologists (refuge staff when available) will conduct the following surveys and monitoring programs to: (1) assess population size and trend, (2) evaluate site specific, habitat-altering, project impacts, (3) prioritize management actions in RCW clusters, and (4) scientifically determine group and population demographics. The intensity and interval of survey and monitoring programs is determined by population size and trend as measured by number of active clusters (see Big Branch Marsh NWR Inventory Plans). Wildlife biologists with banding permits are responsible for the banding of RCWs. Wildlife biologists, refuge staff, interns, students and volunteers support the identification, location, status and condition of RCW nesting cavity trees (Cluster Survey/Inspection above) on the refuge. An intern is specifically assigned by the refuge to provide support to the wildlife biologist in the banding and monitoring of individuals RCWs (Group Demography Monitoring above).

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

Data collected is compiled in Microsoft Xcel spreadsheets and word documents.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

Data will be stored on the refuge server.

Describe procedure for verifying/checking/securing the data:

Data is housed and verified by the LADWF. A copy of the final data set is provided to the refuge.

Describe methods/software used in data analysis:

Excel – summary statistics.

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

A final report of population monitoring data for the year is provided by the LADWF in compliance of the Recovery Plan (FWS 2003).

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

None.

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

None.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. USFWS. 2003. Recovery plan for the Red-cockaded Woodpecker (*Picoides borealis*): second revision. US Fish and Wildlife Service, Atlanta, GA. 296 pp.
2. USFWS. 2011. Habitat Management Plan Big Branch Marsh National Wildlife Refuge. Lacombe, LA
3. Henry, VG. 1989. Guidelines for preparation of biological assessments and evaluations for the red-cockaded woodpecker. US Fish and Wildlife Service, Southeast Region, Atlanta, GA.

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

Version Tracking

You can use the table below to track updates to the Survey Methods Record.

Version	Completed by	Date	Comments/material updated
1.0	SWilder	9/23/2015	Reviewed by BBM Refuge Manager and LADWF as part of IMP process.

Maps and Appendices:

You can insert maps and any appendices of information (e.g., progress tables, timelines, budgets, activity logs, etc...) directly into this document (Insert in Word document version or Attach to Adobe version).



Survey Instructions

Hazardous Fuels Treatment and Fire Effects Monitoring

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

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Using the Initial Survey Instructions Field Form

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Survey name:

Hazardous Fuels Treatment and Fire Effects Monitoring

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR;

Background/Survey Justification:

Fire is a natural process that plays a critical role in the ecosystem dynamics within Big Branch Marsh NWR. Historically, frequent lightning fires and anthropogenic fires burned the pine forests and marsh that cover the north shore of Lake Pontchartrain promoting fire-maintained systems. Currently, many areas on and off the refuge have not been burned for over 30 years. Wildfires on or near the refuge

are actively suppressed due to the intense level of urban development surrounding the refuge. Where fire has not been introduced, accumulations of fuels have occurred and vegetation composition has changed from the historic open pine with herbaceous understory to a more shrub and hardwood dominated understory system. Increased woody growth can lead to increased fireline intensities, flame heights and fire behaviors as grass and herbaceous dominated vegetation is replaced with taller woody growth leading to more challenging fire suppression efforts, especially in the wildland-urban interface, thus making fuels hazardous. Hazardous fuel abundance estimates include measuring the amount of fine and coarse woody debris, live fuel abundance, as well as duff and litter amounts. Fuel loads are estimated using Brown's Fuel Transects, Photopoints, and Cover plots as described in the monitoring protocols in the Southeast Region Monitoring Hazardous Fuel Treatment Field Guide and Regional Plan (USFWS 2013b, 2013c).

The fire management goal of the refuge is to apply prescribed burns on a two to three year cycle to reduce the threat of accumulating fuels to wildlife and humans on and near the refuge. This survey was selected because the information from these monitoring activities provides fuel inventory information as well as an assessment of treatment effectiveness following management applications. Monitoring includes impacts from wildfires that occur on the refuge.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

All species/taxa/communities, specifically Red-cockaded Woodpeckers (*Picoides borealis*).

Target habitat(s): *(if applicable)*

All refuge habitats, including Red-cockaded Woodpecker habitat, pine forest habitat and pine savanna habitats.

Survey objectives: *(Your primary survey objectives, i.e., what questions do you hope to address with this survey?)*.

1. The monitoring activities are designed to assess the long term goals of the prescribed fire program as stated in the Fire Management Plan and Fire Effects Monitoring Plan (USFWS 2007c and USFWS 2010 respectively).

Section 2. Survey Design

For Collaborative Surveys

☐ This survey is part of a collaborative State, Regional, or National survey:

Coordinating organization(s) and contact information:

At this time, this monitoring effort is not coordinated amongst refuges but there is a regional (and national) effort to coordinate the protocols, data archive and analysis in the near future.

Is there an established protocol for the survey? ☒ Yes ☐ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

Are there refuge-specific elements of implementation? ☐ Yes ☐ No (☐ Not Sure)

If yes, also specify refuge-specific details in the section below.

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ This survey has refuge-specific design elements:

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

The first fire effects monitoring plots were established in 2004 at Big Branch Marsh NWR. This program has been running continuously since 2004.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☒ Plot ☐ Point ☐ Other:

Plots are identified by a center point. The GPS location of the center point is kept in the GIS files at the refuge.

Do sampling units remain fixed (i.e., same location from year to year)?

☒ Yes ☐ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

Plots are located in selected burn units within each fire management unit of the refuge. To date 16 burn units are sampled. Units identified for sampling were selected to meet overall refuge fire management objectives as stated in the BBM Fire Management Plan (FWS 2007) and BBM Fire Effects Monitoring Plan (FWS 2010). The center point of each plot are used at the center point of each element of data collected: photo points, burn severity, fuel loading (coarse woody debris), duff and litter measures and vegetation abundance (live and dead). In the near future, several of the established fire monitoring plots will be also used as the center point for the Red-cockaded Woodpecker habitat inventory.

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

An attempt is made to sample fire monitoring plots pre- and post-burn within the calendar year of the scheduled burn but if the burn does not take place within three years the plot is revisited. This ensures that any plot is visited every three years regardless of burn schedule and pre-burn data is available (although it may be up to three years before burn). Post-burn sampling occurs within the year of the burn at a minimum. Ideally post-burn sampling should occur twice; 1) within one month post-burn and 2) within one year post-burn (and within same growing season). Further description of survey timing is provided in the protocols described in the Southeast Regional Hazardous Fuels Treatment Monitoring Field Guide (FWS 2013).

Section 3. Survey Methods

Primary metrics collected:

Specific monitoring metrics include; 1) fuel moisture throughout the prescribed fire season to determine prescribed fire treatment parameters are met, 2) collecting on-site weather, fire behavior and smoke observations during prescribed burn treatments to determine fireline intensity, 3) measuring changes in fuel loads pre- and post- prescribed fire treatments to determine treatment effectiveness, 4) estimating live and dead standing vegetation abundance pre- and post- prescribed fire treatment to monitor treatment effectiveness, 5) collecting burn severity measures indicating the severity across a prescribed fire treatment site or in the burned area of a wildfire, 6) collecting vertical fuel structure using photo points to document overall habitat vegetation structure change over time and 7) conducting post burn assessments of prescribed and wildfires on refuge resources of concern. This monitoring effort follows standard methods described in the Region 4 Guide to Hazardous Fuel Treatment and Fire Effects Monitoring Guide (USFWS 2013).

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

The center point of each plot is identified by a three foot metal fence post and painted orange, red or yellow. Each center point is gps and the location stored in the refuge GIS layers.

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

Fuel Moisture Data: 1) turn on drying oven and let it stabilize to 90 degrees celcius, weigh fuel cans with lids as pre-sample can weights, identify cans for sampling, prepare data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), use same scale for pre- and post sampling weights.

On-site Weather, Fire Behavior and Smoke Observations: 1) obtain belt fire weather kit and other weather tracking equipt, 2) prepare data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), 3) attend fire briefing, 4) confirm locations with incident commander/fire boss for data collection locations and burn objectives, 5) obtain fire radio for weather transmissions, 6) obtain proper PPE, 7) obtain personal items- snacks, lunch, water etc., 8) obtain timer for fire behavior observations

Fuel Load Measures (Coarse Woody Debris and Litter/Duff Measures): 1) obtain appropriate data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), 2) equipment needed for fuel loading measures: 0.25 in. diameter by 3 in. long dowel, 1.0 in. diameter by 3 in. long dowel, 75-foot tape, Clipboard, Compass, Clear plastic six-inch ruler (w/0.1 in. gradations), Diameter tape, caliper, yardstick or similar (w/0.1 in. gradations- for measuring large log diameter), Field Notebook, FL cheat sheet, Hard hat, Pencils/pens, Small stakes or rebar, Survey flags, and 3) camera and GPS (optional).

Live and Dead Vegetation Abundance: 1) obtain appropriate data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), 2) equipment needed: 75-foot tape, Clipboard, Compass, yardstick or similar for 3ft radius measure, Field Notebook, Hard hat, Pencils/pens and 3) camera and GPS (optional).

Burn Severity: 1) obtain appropriate data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), 2) equipment needed: meter tape used for measuring desired plot radius, 3) GPS and Camera (optional).

Photo Points: 1) obtain appropriate data sheets (housed on refuge server under fire effects monitoring folder in SELA FIRE), 2) equipment needed: Camera, vertical scale board (build your own instructions in Southeast Region Hazardous Fuels Treatment Field Guide (FWS 2013), compass, meter tape to measure 30ft radius.

Burn Assessments: 1) clipboard and data sheet (notebook) to describe overall burn patterns from treatment or wildfire.

Describe equipment used during the survey:

See preparatory section above.

Describe detailed methodology (field and lab procedures):

For specific guidance on field techniques please see descriptions for each monitoring variable as described in the Southeast Region Hazardous Fuels Treatment Monitoring Field Guide (FWS 2013).

Who conducts the surveys (Include staff, interns, contractors, etc... if primary surveyors):

Refuge staff, interns, students and volunteers collect data. Refuge Fire Management Staff (AFMO) provides oversight and data quality responsibility.

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

All fire monitoring data is entered into FFI software, a data storage, analysis and reporting software. Reports created from FFI are constructed for Word, Excel or other formats as needed. All raw data can be downloaded from FFI as an excel spreadsheet or Microsoft access table.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

All fire monitoring data is housed on refuge server under fire effects monitoring folder in SELA FIRE.

Describe procedure for verifying/checking/securing the data:

All data entry is verified by the Regional Fire Ecologist stationed at SELA or the Refuge Fire Management staff (AFMO). Copies of the data are uploaded to the shared drive on the refuge server under appropriate folders. The refuge server is backed up regularly as part of overall refuge operations.

Describe methods/software used in data analysis:

All fire monitoring data is entered into FFI software, a data storage, analysis and reporting software. This software specializes in the calculation of fuel loading based on published formulas using specific density of fuels. Formulas are also used to calculate fuel loading (tons per acre) from live and dead vegetation abundance data collected.

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

Summary reports, results of data analysis, summary reports of general plot data as well as other reporting options are available by the FFI software.

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. USFWS. 2007. Big Branch Marsh Fire Management Plan. Lacombe, LA
2. USFWS. 2010. Big Branch Marsh Fire Effects Monitoring Plan. April 2010. Lacombe, LA
3. USFWS. 2013. Monitoring hazardous fuels treatments. Southeast Regional Field Guide. USFWS. Atlanta, GA.

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

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Maps and Appendices:

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Survey Instructions

Marsh Monitoring via Coast-wide Reference Monitoring System (CRMS)

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

- Serve as Initial Survey Instructions (ISI) (701 FW 2), and an initial step in development of formal NWRS survey protocols;
- Capture information valuable in development of Inventory and Monitoring Plans (IMP);
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Using the Initial Survey Instructions Field Form

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Survey name:

Marsh Monitoring via Coast-wide Reference Monitoring Systems (CRMS)

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR

Background/Survey Justification:

The refuge consists of approximately 7,000 acres of coastal marsh (fresh, brackish and saltwater marshes) and an additional 6,000 acres of open water. Marshes are tidally influenced and salinities range from saline to brackish to fresh along a landward transect inland from Lake Pontchartrain. Marsh habitats are well defined on the refuge by a distinct transition to pine forest at the marsh edge along the lake shoreline. Marsh habitats are critically important to the refuge and provide areas for feeding, roosting, nesting and staging for numerous wildlife species including migratory waterfowl species as stated in the CCP (USFWS 2007). Coastal ecosystems along the northern Gulf of Mexico are among the first directly impacted by climate change. Changes in coastal ecosystems are monitored to understand the impacts of sea level rise, subsidence rates and changes in marsh vegetation over time. The refuge participates in the Coastwide Reference Monitoring Systems (CRMS) to monitor marsh health over time. The CRMS design implements a multiple reference approach by using aspects of hydro-geomorphic functional assessments and probabilistic sampling. The refuge has 5 CRMS reference sites and currently relies on this data as the only mechanism to monitor any changes in marsh habitats on the refuge.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

All species within the fresh, brackish and saltwater marshes.

Target habitat(s): *(if applicable)*

Fresh, brackish and saltwater marshes.

Survey objectives: *(Your primary survey objectives , i.e., what questions do you hope to address with this survey?).*

1. This survey includes the collection of water quality and pore water, surface elevation, marsh accretion, vegetation, and soils property data on a periodic sampling scheme at each of the designated reference sites on BBM NWR. A report is provided by the Louisiana Coastal Protection and Restoration Authority (LACPRA) and produced at the end of each calendar year to show the results of the data collected for that year. It also shows the relative changes observed in relation to the over 300 other reference sites established along the Louisiana coastline as part of a proposed coast-wide reference monitoring system for evaluating wetland restoration trajectories in Louisiana (Steyer et al 2003).

Section 2. Survey Design

For Collaborative Surveys

☒ **This survey is part of a collaborative State, Regional, or National survey:**

Coordinating organization(s) and contact information:

Although deemed extremely important and ranked as a high priority, significant reductions in refuge staff and funding have limited the level of refuge participation in this monitoring activity. The refuge relies completely on the support of LACPRA for the implementation of this monitoring effort including sampling design, plot establishment, sampling protocols, data collection, data archiving and storage, analysis and reporting.

Is there an established protocol for the survey? ☒ Yes ☐ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

A reference monitoring system protocol utilized in this monitoring effort has been published by Steyer et al 2003.

Are there refuge-specific elements of implementation? ☐ Yes ☐ No (☐ Not Sure)

If yes, also specify refuge-specific details in the section below.

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ **This survey has refuge-specific design elements:**

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

CRMS plots have been established on the refuge since 2006.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☒ Plot ☐ Point ☒ Other:

Do sampling units remain fixed (i.e., same location from year to year)?

☐ Yes ☒ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

The protocol used in this survey is well established, peer reviewed and published by Steyer et al. 2003 (see CRMS program: <http://lacoast.gov/crms2/home.aspx>).

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

The protocol used in this survey is well established, peer reviewed and published by Steyer et al. 2003 (see CRMS program: <http://lacoast.gov/crms2/home.aspx>).

Section 3. Survey Methods

Primary metrics collected:

Water quality, pore water, surface elevation, marsh accretion, vegetation, and soils property data on a periodic sampling scheme at each of the designated reference sites on BBM NWR.

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

The protocol used in this survey is well established, peer reviewed and published by Steyer et al. 2003 (see CRMS program: <http://lacoast.gov/crms2/home.aspx>).

Describe equipment used during the survey:

The protocol used in this survey is well established, peer reviewed and published by Steyer et al. 2003 (see CRMS program: <http://lacoast.gov/crms2/home.aspx>).

Describe detailed methodology (field and lab procedures):

The protocol used in this survey is well established, peer reviewed and published by Steyer et al. 2003 (see CRMS program: <http://lacoast.gov/crms2/home.aspx>).

Who conducts the surveys (Include staff, interns, contractors, etc... if primary surveyors):

The refuge staff supports this monitoring activity by issuing permits, logistics support, and guidance and advise about refuge matters.

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

Data collected is provided in summary reports and spreadsheets provided by LACPRA.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

Data provided on spreadsheets is stored on refuge server. Raw data is stored on LACPRA data storage facilities.

Describe procedure for verifying/checking/securing the data:

None.

Describe methods/software used in data analysis:

Excel – summary statistics.

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

Summary reports are provided by LACPRA annually and on request as needed.

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

None.

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

None.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. Steyer, G.D., C. E. Sasser, J. M. Visser, E. M. Swensen, J. A. Nyman, and R.C. Raynie. 2003. A proposed coast-wide reference monitoring system for evaluating wetland restoration trajectories in Louisiana. Environmental Monitoring and Assessment 81:107-117
2. USFWS. 2007. Comprehensive Conservation Plan Big Branch Marsh National Wildlife Refuge. Final. Lacombe, LA 143pp.

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

Version Tracking

You can use the table below to track updates to the Survey Methods Record.

Version	Completed by	Date	Comments/material updated
1.0	SWilder	9/23/2015	Reviewed by BBM Refuge Manager as part of IMP process

Maps and Appendices:

You can insert maps and any appendices of information (e.g., progress tables, timelines, budgets, activity logs, etc...) directly into this document (Insert in Word document version or Attach to Adobe version).



Survey Instructions

Wood Duck Nest Box Monitoring

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

- Serve as Initial Survey Instructions (ISI) (701 FW 2), and an initial step in development of formal NWRS survey protocols;
- Capture information valuable in development of Inventory and Monitoring Plans (IMP);
- Augment survey information in the Planning and Review of Inventory and Monitoring ([PRIMR](#)) database;
- Reveal multi-refuge and landscape-level data inference opportunities.

Using the Initial Survey Instructions Field Form

Staff should use this tool for all on-going surveys, particularly those high priority refuge-based surveys where protocols are not available, and followed by cooperative and/or coordinated surveys with important refuge-specific elements of implementation. The information provided in the ISI form should be as thorough and complete as possible; however it is acceptable to leave fields or sections empty if particular survey information is unknown. Provide completed forms to your I&M ecologist, who will archive the it on [Fishnet](#) and link it to the survey record in PRIMR for long-term reference. Regional I&M staff ecologists can assist refuge staff with completing the Survey Instructions. If the Survey Instructions are updated over time, we recommend saving updates as versions (e.g., version 2.0).

Survey name:

Wood Duck Nest Box Monitoring

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR

Background/Survey Justification:

Wood ducks, (*Aix sponsa*) and mottled ducks (*Anas fulvigula*) are the only year-round resident waterfowl on the refuge. Managing for wood ducks on Big Branch Marsh NWR fulfills the purpose of the refuge. Providing habitat for this species, as for other waterfowl, helps reach the goals of the North American Waterfowl Management Plan (NAWMP) (USFWS 1986). Wood ducks naturally inhabit quiet inland waters near woodlands, such as wooded swamps, flooded forests, green tree reservoirs,

ponds, marshes and streams. Goals for good natural breeding habitat is approximately one suitable cavity per 2 acres (FWS 2003) yet the amount of available suitable habitat for wood ducks on Big Branch Marsh NWR has not been quantified to date. Thus the refuge supports existing wood duck habitat with a system of nest boxes that are monitored for nesting success annually.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

Wood ducks, (*Aix sponsa*) and to potentially mottled ducks (*Anas fulvigula*)

Target habitat(s): *(if applicable)*

Breeding habitat for wood ducks, mainly wetland forested habitats on the refuge.

Survey objectives: *(Your primary survey objectives , i.e., what questions do you hope to address with this survey?).*

The objectives of monitoring wood duck nest boxes are; 1) to provide information to improve wood duck production in artificial cavities, and enhance brood habitat on Service lands; 2) to provide information that demonstrates proper use and placement of predator-proofed wood duck boxes as a supplement to compensate for shortages in natural cavities; 3) to provide information that will contribute to the reduction of excessive predator related mortality via improvement of brood habitats and strategic location of boxes; and 4) to provide information that will help serve in educating the public on wildlife habitat programs.

Section 2. Survey Design

For Collaborative Surveys

☐ This survey is part of a collaborative State, Regional, or National survey:

Coordinating organization(s) and contact information:

At this time, this monitoring effort is not coordinated amongst refuges but there is a regional (and national) effort to coordinate the protocols, data archive and analysis in the near future.

Is there an established protocol for the survey? ☐ Yes ☒ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

Are there refuge-specific elements of implementation? ☒ Yes ☐ No (☐ Not Sure)

If yes, also specify refuge-specific details in the section below.

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ **This survey has refuge-specific design elements:**

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

Wood duck boxes have been established on Big Branch Marsh NWR since 2006.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☐ Plot ☒ Point ☒ Other:

Sampling unit is the individual nest box.

Do sampling units remain fixed (i.e., same location from year to year)?

☒ Yes ☐ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

Unless severely damaged or dump nesting occurs, the Wood Duck nest box locations should remain fixed.

Nest boxes are opportunistically place in suitable Wood Duck breeding habitat.

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

Late February- September

Section 3. Survey Methods

Primary metrics collected:

Condition of nest box, presence / absence of nesting activity, Number of eggs, hatched shells, dead hatchlings, signs of dump nesting or non-target bird use, and signs of predation are recorded.

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

GPS waypoints

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

Get equipment ready for field. Get map of wood duck box locations.

Describe equipment used during the survey:

gloves, data sheets, Wood Duck nest box materials and tools for repairs, vehicle

Describe detailed methodology (field and lab procedures):

A suitable nest box design can be found at:

https://fishnet.fws.doi.net/regions/4/nwrs/IM/Shared%20Documents/Initial%20Survey%20Instructions/Birds/duck_box_plans.pdf

Wood Duck nest boxes are checked at least monthly from late February - September. During the first check, nest boxes are cleaned and fresh cedar chips are placed approximately one inch deep inside. Any damages to the box and predator guards are repaired or replaced. The openings of the boxes should be facing the water and a half mile apart from other nest boxes or at a minimum, out of view other other nest box openings to reduce dump-nesting.

During subsequent monthly checks, productivity is monitored and recorded.

Who conducts the surveys (include staff, interns, contractors, etc... if primary surveyors):

Refuge staff, interns, students and volunteers visit and check wood duck boxes.

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

Summary data and Wood Duck nest box locations are stored in refuge file cabinets and computers.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

All fire monitoring data is housed on refuge server under fire effects monitoring folder in SELA FIRE.

Describe procedure for verifying/checking/securing the data:

None.

Describe methods/software used in data analysis:

None.

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

Summary reports are included in annual narratives and RAPP.

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

Other non-target bird species may use the Wood Duck nest boxes. If species are migratory birds (Screech Owls, Great-crested Flycatchers, Hooded Mergansers) they should be left alone. If species is the non-native European Starling, the eggs and nest material can be removed.

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

None.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. USFWS. 2003. Increasing wood duck productivity guidelines for management and banding. USFWS Refuge Lands (Southeast). Updated 2003. US Fish and Wildlife Service, Division of Migratory Birds, Atlanta, GA.
2. USFWS. 1986. North American waterfowl management plan. US Department of Interior. Washington, DC.

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

Version Tracking

You can use the table below to track updates to the Survey Methods Record.

Version	Completed by	Date	Comments/material updated
1.0	SWilder	9/23/2015	Reviewed by BBM Refuge Manager as part of IMP process

Maps and Appendices:

You can insert maps and any appendices of information (e.g., progress tables, timelines, budgets, activity logs, etc...) directly into this document (Insert in Word document version or Attach to Adobe version).



Survey Instructions

Baseline Herpetofauna Inventory

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

- Serve as Initial Survey Instructions (ISI) (701 FW 2), and an initial step in development of formal NWRS survey protocols;
- Capture information valuable in development of Inventory and Monitoring Plans (IMP);
- Augment survey information in the Planning and Review of Inventory and Monitoring ([PRIMR](#)) database;
- Reveal multi-refuge and landscape-level data inference opportunities.

Using the Initial Survey Instructions Field Form

Staff should use this tool for all on-going surveys, particularly those high priority refuge-based surveys where protocols are not available, and followed by cooperative and/or coordinated surveys with important refuge-specific elements of implementation. The information provided in the ISI form should be as thorough and complete as possible; however it is acceptable to leave fields or sections empty if particular survey information is unknown. Provide completed forms to your I&M ecologist, who will archive the it on [Fishnet](#) and link it to the survey record in PRIMR for long-term reference. Regional I&M staff ecologists can assist refuge staff with completing the Survey Instructions. If the Survey Instructions are updated over time, we recommend saving updates as versions (e.g., version 2.0).

Survey name:

Baseline Herpetofauna Inventory

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR

Background/Survey Justification:

This survey establishes a baseline inventory of herpetofauna (reptiles and amphibians) throughout all habitat types on the refuge to describe species occurrence. Many herpetofauna are considered at-risk though a paucity of rigorous long-term population monitoring or species occurrence information exists at local or regional scales. This taxon is extremely vulnerable to a number of current disease issues including chytrid and ranavirus which have been implicated in local and regional scale species

decline and extirpation. In addition, the refuge has a significant wild hog population which has been suggested to have significant negative effects on salamanders due to their rooting behavior and destruction of coarse woody debris. This survey was selected because it provides important baseline information regarding a taxon that is poorly understood and reflects on the health of the aquatic system. Also, the survey furthers the CCP objective to conserve biodiversity associated with non-game and threatened and endangered species.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

Snakes, Lizards, Turtles , Frogs, Toads, Salamanders

Target habitat(s): *(if applicable)*

All habitat types

Survey objectives: *(Your primary survey objectives , i.e., what questions do you hope to address with this survey?).*

1. Determine the species composition and occurrence of herpetofauna within each habitat type on the refuge.

Section 2. Survey Design

For Collaborative Surveys

☐ This survey is part of a collaborative State, Regional, or National survey:

Coordinating organization(s) and contact information:

At this time, this monitoring effort is not coordinated amongst refuges but there is a regional (and national) effort to coordinate the protocols, data archive and analysis in the near future.

Is there an established protocol for the survey? ☐ Yes ☒ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

Are there refuge-specific elements of implementation? ☒ Yes ☐ No (☐ Not Sure)

If yes, also specify refuge-specific details in the section below.

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ **This survey has refuge-specific design elements:**

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

TBD – survey may take several years to be comprehensive.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☐ Plot ☐ Point ☒ Other:

Sampling will include a variety of techniques including fixed plots, points and transects.

Do sampling units remain fixed (i.e., same location from year to year)?

☐ Yes ☒ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

Sampling design and effort will be based on stratifying across habitat types.

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

All year round. However, special efforts will be made to sample during spring and summer when herpetofauna are most active.

Section 3. Survey Methods

Primary metrics collected:

Species occurrence.

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

Sampled sites will be GPS referenced.

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

Observers will need to be able to identify herpetofauna in the field. Ability to determine the species of anuran based on calls should be developed prior to initiation of the survey

Describe equipment used during the survey:

GPS, data sheet, dip net, minnow traps, hoop traps, cover boards, Automated Recording Devices, snake hook, five-gallon buckets, snake box traps and drift fencing, digital camera.

Describe detailed methodology (field and lab procedures):

Because of the variability of herpetofauna to be encountered and the complexity of their behavior and habitat use, multiple survey methods will be used to inventory for them.

Salamanders will be predominantly sampled with minnow traps in vernal pools and other wetlands. Cover boards may be placed to locate certain salamanders which tend to live near stream edges. Cover boards will also provide opportunities to locate snakes and skinks.

Time- and area-constrained searches of random areas and areas of debris will be done to look for snakes. In addition, drift fences and box traps will be utilized.

Frogs and toads will be inventoried based on conducting fixed call surveys at wetlands near existing roads. Each location will be evaluated 3 times for a period of 5 minutes. Surveys will coincide with precipitation within the past 4 days.

Turtles will be trapped in baited, partially submerged hoop nets.

Survey techniques will generally follow those outlined by Graeter et al. (2013).

Who conducts the surveys (Include staff, interns, contractors, etc... if primary surveyors):

Refuge Biologist, Manager, I & M Aquatic Ecologist

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

Data are recorded onto an excel data sheet and also imported into ArcMap as a point shapefile to show locations of sample plots and where individual herpetofauna were identified.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

Data will be stored on the refuge server.

Describe procedure for verifying/checking/securing the data:

None.

Describe methods/software used in data analysis:

Excel – summary statistics

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

A final report of inventory efforts will be prepared. If work is done over multiple years, annual interim reports will be developed.

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

None.

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

None.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. USFWS. 2003. Increasing wood duck productivity guidelines for management and banding. USFWS Refuge Lands (Southeast). Updated 2003. US Fish and Wildlife Service, Division of Migratory Birds, Atlanta, GA.
2. USFWS. 1986. North American waterfowl management plan. US Department of Interior. Washington, DC.

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

Version Tracking

You can use the table below to track updates to the Survey Methods Record.

Version	Completed by	Date	Comments/material updated
1.0	SWilder	9/23/2015	Reviewed by BBM Refuge Manager as part of IMP process

Maps and Appendices:

You can insert maps and any appendices of information (e.g., progress tables, timelines, budgets, activity logs, etc...) directly into this document (Insert in Word document version or Attach to Adobe version).



Survey Instructions

Weather Monitoring via RAWS

Purpose

Documenting survey design and methods maintains the scientific integrity of refuge biological programs and guards against information loss over time. The Survey Instructions field form was developed to assist refuges in recording important biological survey information and ***will enhance survey integrity by ensuring that survey procedures are clear and consistent.*** It will provide additional benefits, including:

- Serve as Initial Survey Instructions (ISI) (701 FW 2), and an initial step in development of formal NWRS survey protocols;
- Capture information valuable in development of Inventory and Monitoring Plans (IMP);
- Augment survey information in the Planning and Review of Inventory and Monitoring ([PRIMR](#)) database;
- Reveal multi-refuge and landscape-level data inference opportunities.

Using the Initial Survey Instructions Field Form

Staff should use this tool for all on-going surveys, particularly those high priority refuge-based surveys where protocols are not available, and followed by cooperative and/or coordinated surveys with important refuge-specific elements of implementation. The information provided in the ISI form should be as thorough and complete as possible; however it is acceptable to leave fields or sections empty if particular survey information is unknown. Provide completed forms to your I&M ecologist, who will archive the it on [Fishnet](#) and link it to the survey record in PRIMR for long-term reference. Regional I&M staff ecologists can assist refuge staff with completing the Survey Instructions. If the Survey Instructions are updated over time, we recommend saving updates as versions (e.g., version 2.0).

Survey name:

Weather Monitoring via RAWS

This survey occurs on: ☒ Single refuge only ☒ Multiple refuges

Refuge name(s):

Big Branch Marsh NWR;

Background/Survey Justification:

Automated weather stations are located on various refuges across the nation to provide real-time on site fire weather conditions and data used to calculate fire danger ratings. This data is shared among many partners at the local, regional and national level to understand current weather conditions for a variety of purposes. The RAWS stations are incorporated into a real-time monitoring and analysis network (ROMAN) across the nation (see <http://raws.wrh.noaa.gov>). Fire managers use this data to

predict fire behavior and monitor fuels; resource managers use the data to monitor environmental conditions. Locations of RAWs stations can be searched online courtesy of the Western Regional Climate Center (<http://www.wrcc.dri.edu/>). This survey entails automated recording of weather data by a RAWs station located on the refuge.

Section 1. Survey Targets & Objectives

Target species/taxa/community:

All species/taxa/communities.

Target habitat(s): *(if applicable)*

All refuge habitats.

Survey objectives: *(Your primary survey objectives , i.e., what questions do you hope to address with this survey?).*

1. To obtain current weather data automatically, including: temperature, relative humidity, wind speed, wind direction, max wind speed, precipitation duration, precipitation amounts, 10 hour fuel moisture, and dew point.

Section 2. Survey Design

For Collaborative Surveys

☒ **This survey is part of a collaborative State, Regional, or National survey:**

Coordinating organization(s) and contact information:

The refuge relies on partners to complete the data collection and maintenance of the remote access weather stations. Data are served on partner sites including ROMAN, and the National Weather Service. Currently all weather stations are serviced via a contract with the National Fish and Wildlife Service office in Boise, ID with some assistance at the refuge level by staff employees to complete periodic maintenance.

Is there an established protocol for the survey? ☒ Yes ☐ No ☐ In Prep (☐ Not Sure)

Protocol Name, citation and/or link to documentation:

A protocol has been developed and published by the National Wildfire Coordinating Group (NWCG 2012). Weather data are collected hourly. Data are transmitted via satellite to a data server and available via internet through WIMS supported by the Fire and Aviation Tools Support System. Data are archived on a United State Forest Service computer server and accessible via KCFast (Kansas City Fire Access Software).

Are there refuge-specific elements of implementation? ☐ Yes ☒ No (☐ Not Sure)

If yes, also specify refuge-specific details in the section below.

Section 2. Survey Design (*Continued*)

For Surveys with Refuge-specific Details
(collaborative OR unique refuge surveys)

☒ **This survey has refuge-specific design elements:**

Year of survey origin: *(Add year of survey modification after origin if applicable.)*

RAWS station was established in 2002.

Are specific sampling units identified? ☒ Yes ☐ No (☐ Not Sure)

Type of sampling unit (sampling geometry):

☐ Route/linear transect ☐ Plot ☒ Point ☐ Other:

Sampling unit is the local weather parameters at the weather station location.

Do sampling units remain fixed (i.e., same location from year to year)?

☒ Yes ☐ No (☐ Not Sure)

Describe sampling design: *(e.g. study area of interest, how sampling units were selected or modified over time, if stratified sampling area, sample size, etc.)*

Weather station is located in a specific area to alleviate any disturbance that could impact weather data recordings (i.e., forest trees, building shadows etc.).

Describe Survey Timing: *(Examples include # repeat visits each year, months, season, time of day, etc...)*

Weather data is collected hourly. Data is transmitted via satellite to a data server and available via internet through the Weather Information Management System (WIMS) supported by the Fire and Aviation Tools Support System. Data is archived on USFS data servers and accessible via KCFAST (Kansas City Fire Access Software).

Section 3. Survey Methods

Primary metrics collected:

Weather information is collected automatically via a remote weather station and includes: temperature, relative humidity, wind speed, wind direction, max wind speed, precipitation duration, precipitation amounts, 10 hour fuel moisture, and dew point. Some stations have additional sensors to report water level or other variables of interest. Refuge staff are required to initially locate, build, and establish satellite communication as well as maintain all equipment used by the weather station on a regular basis.

How are sites marked? *(Examples include GPS waypoints, flagging, etc...)*

Locations are permanently marked as weather station sites.

Describe preparatory requirements for the survey: *(Examples include permits, training, contracts, other logistics, etc...)*

Currently all weather stations are serviced via a contract with the National Fish and Wildlife Service office in Boise, ID. Refuge staff will serve as the primary contact for needed maintenance or servicing.

Describe equipment used during the survey:

The weather station includes a variety of sensors and equipment: 1) tipping bucket, 2) wind speed, 3) wind direction, 4) air temperature, 5) fuel temperature, 6) relative humidity , 7) battery, 8) fuel moisture, 9) barometric pressure, and 10) solar radiation. A Bendix king radio is needed to access the weather station locally.

Describe detailed methodology (field and lab procedures):

Data is collected automatically and sent to data depots via satellite. Data accessible on the web via WIMs or ROMAN. Archived weather data available via KCFast. Some minor maintenance of site and weather station are conducted by fire management staff.

Who conducts the surveys (Include staff, interns, contractors, etc... if primary surveyors):

Major repairs to equipment are completed via contract with National Program in Boise. Minor maintenance and inspections completed by refuge staff.

Section 4. Data Management

Specify data entry file format(s):

Examples include MS Excel, MS Access, GIS, web dbs (e.g., SQL), etc...

Data is downloaded as comma delimited text files and converted to MS Excel Spreadsheets as tabular datasets.

Specify data storage/archive location (hardcopy and electronic):

Provide file names and locations here if applicable.

Archived data is stored and accessible via KCFast and can be downloaded. Archived tabular datasets are archived in refuge files.

Describe procedure for verifying/checking/securing the data:

The National Contractor is responsible for ensuring the weather station is reporting accurate weather readings and all equipment is running correctly and data download is smooth.

Describe methods/software used in data analysis:

Software such as Fire Family Plus and Fire Weather Plus can be used to analyze the data and use to calculate indices of fire danger

Section 5. Reporting

Describe reports developed from this survey:

Include details on reporting schedule/frequency, distribution, archiving, etc... Include links and citations for previous reports if applicable.

See Methods above. Use Fire Family Plus or Fire Weather Plus to download and build data sets. A ten year historic weather data spreadsheet is built for each refuge to aid in the development of pocket cards and fire risk assessments.

Section 6. Other Survey Information

Comment on additional survey elements and issues to consider when implementing the survey:

BBM Weather Station WIMS ID is #168541. GOES ID is 83771160.

Description of attachments/supplemental documents/data sets:

Use the space below to describe supplemental documents (e.g., maps, appendices, etc) included with this form.

None.

Cite resources:

Cite the source of the information in the form below, including personal communication and citations for published and gray literature.

1. NWCG 2012. Interagency Wildland Fire Weather Station Standards and Guidelines. PMS 426-3.
2. USFWS. 2010. Big Branch Marsh Fire Effects Monitoring Plan. April 2010. Lacombe, LA

Submitted by and contact information:

Sue Wilder, Ecologist, Southeast Region I&M, sue_wilder@fws.gov, 985-882-2008

Version Tracking

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Version	Completed by	Date	Comments/material updated
1.0	SWilder	9/23/2015	Reviewed by BBM Refuge Manager as part of IMP process

Maps and Appendices:

You can insert maps and any appendices of information (e.g., progress tables, timelines, budgets, activity logs, etc...) directly into this document (Insert in Word document version or Attach to Adobe version).