WISCONSIN RED-SHOULDERED HAWK SURVEY
Instructions Booklet 2012

****Please direct all comments and questions to the survey coordinator – Ryan Brady, Wisconsin DNR, 2501 Golf Course Rd, Ashland, WI 54806, 715.685.2933, ryan.brady@wisconsin.gov.*

INTRODUCTION

The Red-shouldered Hawk (*Buteo lineatus*) is a Species of Greatest Conservation Need in Wisconsin due to its status as a state Threatened species. However, we currently have a very limited sense of this species' abundance and distribution in the state because previous work has focused largely on intensive monitoring of productivity and nest-site fidelity at more local scales. Additionally, there is some qualitative evidence that this species may be more common in Wisconsin than previously thought and/or is increasing its population statewide. The new Wisconsin Red-shouldered Hawk Survey, a project of the Wisconsin Bird Conservation Initiative (WBCI) and WDNR's Bureau of Endangered Resources, is designed to assess these issues by generating population abundance and trend estimates for breeding Red-shouldered Hawks throughout the state, which will allow for an updated status assessment and inform strategic management goals for this species and the mature forests on which it depends. The survey will be conducted annually by citizen volunteers and involve road- and river-based transect surveys using playback methodology on randomly-selected routes statewide.

WHAT VOLUNTEERS CAN EXPECT

Volunteers conduct two morning surveys of a pre-established route between late March and early May. Routes include 12 stops spaced a mile apart to cover a length of 11 miles. Most occur along roads but those in the Driftless Area of western Wisconsin are river-based and surveyed by canoe or boat. Observers use playback equipment (mp3/CD player and portable speakers) to broadcast Red-shouldered Hawk territorial calls at each 10-minute stop, and surveys generally take ~3-5 hours to complete.

METHODS

Route Selection

To meet project objectives, routes to be surveyed were selected randomly from available habitat suitable for Red-shouldered Hawks, which we defined using a variety of landscape and site-level habitat features (I'll spare you the details here!). We purposefully did not attempt to include all or "the best" sites for the species and thus recognize that your favorite place for Red-shoulders may not have been selected. In the Driftless Area of western Wisconsin, all routes are river-based to target floodplain forest and need to be surveyed by canoe or boat. Nearly all routes elsewhere are road-based, with limited survey effort in far northern Wisconsin where the species is very rare.

Seasonal Timing
Previous work has shown Red-shoulders have their highest response rates early in the breeding season. Thus surveys should be conducted generally between late March and early May, with the exact survey period defined by latitude as shown below:

- SOUTH = March 25 – April 17
- CENTRAL = April 1 – April 24
- NORTH = April 8 – May 1

***Border between SOUTH and CENTRAL is Hwy 90/94 from La Crosse to Mauston to Madison to Milwaukee.
***Border between CENTRAL and NORTH is Hwy 8 from St. Croix Falls to Ladysmith to Rhinelander to Niagara.

Daily Timing
Previous work has also shown response rates are highest early in the morning. Thus all surveys should start roughly at sunrise and be completed no later than five hours after sunrise. Given the time of year, this equates to approximately 0600/0630 h to 1100/1130 h. Each survey will take about 4-5 hours to complete. Road routes may take shorter (which is fine) but water-based routes may take longer depending on water levels, wind conditions, canoe vs. boat, paddler experience, etc. If you start at sunrise and find that you need to go later than the allotted time, this is okay provided that weather conditions are still favorable. Please give us feedback if your route is impossible to complete in the desired morning hours.

Survey Replication
Each route should be surveyed TWICE (this is important, so no exceptions please), with each replicate survey ideally separated by one to two weeks. If you can only get in two surveys by conducting them on back-to-back days, this is acceptable provided no alternative exists. Be sure to plan ahead and conduct your first survey early in the survey period to allow time for the second survey later in the season.

Suitable Weather
Weather conditions may interfere with detection of hawks. You should cancel surveys if:

- Wind speeds are greater than Beaufort scale 3 (8-12 mph; see included Beaufort Wind Scale),
- Precipitation is constant (more than a light mist or flurries), and/or
- Visibility is less than ½ mile.

Note that wind speeds are the most likely factor to affect your surveys, so be sure to watch this aspect of the weather forecast closely. If winds pick up near the end of your survey such that detectability of hawks is greatly affected, please note this on your datasheets and contact Ryan soon after to determine if you need to run the route again on another day.

Route Details
Here are some important considerations pertaining to each route:

- Each route has 12 survey points spaced 1.0 miles apart and is 11 miles in length.

- You should determine the space between each points using "travelled miles", not "as the crow flies" miles. For road routes, use your car odometer to space points a mile apart. For river routes, you must use GPS to determine travelled miles (see your GPS manual for how to do this). The only exceptions will be a small number of river routes that have many twists and turns and thus need to space points using straight-line distances. See the captions on the google map or contact Ryan to see if this applies to your route.
- Regardless of the above, if you have a GPS unit, please GPS the survey points on your route using the decimal degree format (xx.xxxxx, yy.yyyyy) and send them to me after both surveys are complete. This will help you with your second survey, help another surveyor that may take over the route in the future, and help us with analyses of bird-habitat relationships.
- As mentioned previously, some river routes may not be possible to complete in the five-hour timeframe. Don't rush – you may go somewhat over as long as you note this and the weather allows for it (e.g. the wind doesn't kick up).
- You should print your maps (and all other needed forms) from the survey website at http://wiatri.net/projects/birdroutes/hawk.htm. Be sure to print multiple maps at different scales and read the captions on the side of the google map. It is very important that you start at the correct starting point – if this is unclear, contact Ryan before heading out.
- You will be playing a loud hawk call at an early morning hour, possibly on a weekend, so keep an eye out for nearby houses or other people/places you may disturb! If necessary, you may move a point 0.1 – 0.2 miles to avoid such an issue. You may also move a point this short distance for safety (but not habitat) reasons. Please note this on your datasheet and resume the original distance at your next survey station (e.g. 2.0 mi from the start, 3.0 mi from the start, etc.).

Survey Protocol

1) Start your survey at the start location marked on your google map. This is usually at an intersection, boat landing, notable landmark, or some even distance from one of the above.
2) Before you begin the survey, fill out the top portion of the datasheet:
    - Record the route number and name as provided on your map when you signed up.
    - Record the surveyor(s). A data recorder or broadcast operator is welcome but only one person should conduct the actual survey (i.e. detect hawks).
    - Record the date.
    - Circle whether this is the first or second replicate survey of your route.
    - Describe the type of CD/mp3 player and speakers used to conduct the survey. If you received both from the survey coordinator, simply write "WBCI". If otherwise, provide the brand of each, which will allow us to assess effects of the equipment on survey results.
3) Weather and noise data should be filled out for each survey point. Weather (wind, sky, and temperature) can be done prior to surveying the point, while # of cars (or other vehicles) and noise must be done after surveying the point.

- Record Wind using the Beaufort Wind Scale below. If consistently greater than Beaufort # 3 (8 - 12 mph) you should stop the survey or wait for wind speed to decrease.

APPENDIX III: BEAUFORT SCALE TRANSLATIONS TO WIND SPEEDS

Beaufort #	Wind Speed in km/hr (mph)	Indicators of Wind Speed
0	< 2 (< 1)	Smoke rises vertically
1	2 to 5 (1 to 3)	Wind direction shown by smoke drift
2	6 to 12 (4 to 7)	Wind felt on face, leaves rustle
3	13 to 19 (8 to 12)	Leaves, small twigs in constant motion
4	20 to 29 (13 to 18)	Raises dust/loose paper, small branches move
5	30 to 38 (19 to 24)	Small trees in leaf sway

- Record Sky Condition as Sunny (0), Partly Cloudy (1), Cloudy (2), or Rain/Snow (3).
- Record Temperature (F) for Points 1, 6, and 12. Estimate if unknown. You do not need to record temperature for every survey point.
- After the survey is over, record the Number of Cars or other vehicles (boats, trains, planes, etc.)
- Also record the Noise code that best applies. Note that Noise includes wind, traffic, and any other source that may have affected your ability to detect the birds.

Noise Code	Description
1	None or trace, no effect on audio or ability to hear responses
2	Some noise, but limited to no effect on audio or hearing
3	Significant noise that likely reduced detectability of hawks
4	Constant noise that made surveying the point very difficult

4) At each survey point, record the Point Number, associated GPS coordinates, and start time of survey. Please record the Latitude and Longitude using the decimal degree format (xx.xxxxx, yy.yyyyy) on your GPS unit. Use of other formats is difficult and time-consuming to translate. If the points are in identical locations for each replicate survey (as they should be), then you do not need to write the coordinates a second time. Lastly, it is easier for the survey coordinator to handle coordinates electronically, so if you can email as a shapefile or spreadsheet, please do.

5) Conducting the survey:
   - Hold the caller away from your body angled at about head level or set the caller on top of your vehicle.
   - Set the volume to the highest level that clearly plays the provided audio file. The desired output is 100-110 db measured one meter from the speaker, which will broadcast the call to ~0.6 mi (1 km). You can test this beforehand by using a soundmeter. Some electronic stores (e.g. RadioShack) may test your equipment for you if brought into the store.
   - The caller will immediately play the pre-recorded red-shouldered hawk call for 20-seconds followed by 40-seconds of silence to listen for a response.
   - Rotate the broadcast caller 120º after every 20-sec calling period.
   - Repeat five times for a total of six calling bouts covering a total of six minutes. Note that the provided audio file has each silent period incorporated such that you do not need to start and stop the playback.
   - After all six calling bouts are complete the caller will stop playing the call.
   - Following the six minutes of broadcast calls, listen for an additional 4 minutes. This results in 10 minutes of survey time at each survey station.
6) When a response is detected from a Red-shouldered Hawk, turn off the broadcast caller and determine the distance and direction of the response. Responses from multiple birds at the same station should be recorded separately. If you have detected a Red-shoulder it is important to stop the broadcast so as to not harass the birds. You should then record your data as indicated below and move on to the next survey point.

   Filling out the form's Detection Data:
   - Record the species detected. Use "RSHA" for Red-shouldered Hawk and other shorthand codes for other species as needed. Do not hesitate to write "Unknown" – it's best to be conservative if you are unsure of the identification.
   - Record the minute in which each individual was first detected (e.g. if the bird was first observed during or just after the third calling bout, then record this as "3").
   - Record the type of response as one of three categories: "Auditory", "Visual", or "Aud+Vis".
   - Record the direction of the response - compass bearing preferred or N, NW, NE, etc.
   - Estimate the distance of the response from the station in meters. This can be difficult but do your best. If you're completely unsure, indicate as Unknown.
   - Use comment area as needed.

   Important:
   - Each individual RSHA gets its own line/row of data (see example below).
   - Providing detailed data on Minute, Type, Direction, and Distance for other species of raptors is optional. Likewise, if you see a group of other raptors (e.g. vultures, eagles), you can write them all on one line (i.e. "6 TUVU" for six Turkey Vultures).
   - If no raptors are detected at a point, simply write "NONE" on that line/row.

7) Follow your route as mapped and stop every 1.0 miles for additional surveys. Your final survey point/station will be #12.

Sample Point and Detection Data:

Point Data				*Detection Data*					
Pt.	**Latitude** (decimal degrees)	**Longitude**	**Start Time**	**Raptor Species**	**Minute** (1-10)	**Type** (Aud/Vis)	**Dir-ection**	**Dist** (m)	**Comments**
1	44.35271	-90.31274	06:24	RSHA	2	Aud + Vis	270	150	Flew in and perched 60m away
				RSHA	3	Aud	NNE	400	Called during multiple minutes
				7 TUVU					Detailed data optional
2	44.37123	-90.31485	06:45	None					
3	44.38005	-90.32218	07:10	RSHA	9	Vis	045	85	Soaring overhead
4	44.39110	-90.32903	07:37	None					
5	44.40020	-90.33101	08:00	RSHA	5	Aud+Vis	315	150	Immature, not adult
6	44.41891	-90.34612	08:28	4 BAEA					Detailed data optional

The example above shows data only for points 1-6 but the same process would apply to all other points. Here the observer detected two different Red-shouldered Hawks at Point 1, the first in minute two and the second in minute three. S/he both heard and saw the first bird but only heard the second. The direction and distance were good cues that these were different birds. Also note the detection distance is the distance at which the bird was first detected, not where the bird ended up. The observer also saw 7 Turkey Vultures at the first point and provided the minimum level of data required for other raptor species. No raptors were detected at Point 2 or Point 4. Point 3 featured one RSHA first detected to the northeast by sight only during minute 9. At Point 5, the observer heard and saw a RSHA to the northwest first during minute 5 and noted this bird was in juvenile/immature plumage. Four Bald Eagles were the only raptors found at Point 6. Overall, on these six points (again, all 12 points not shown here), the observer tallied 4 Red-shouldered Hawks, 4 Bald Eagles, and 7 Turkey Vultures.

VOLUNTEER EQUIPMENT AND OTHER NEEDS

- Playback equipment such as mp3/CD player and portable speakers (provided if needed)
- Standardized audio file of RSHA calls (available for download on WBCI website)
    - Note that equipment with provided file should produce output of 100-110 db measured at 1 meter from speaker
- Instructions and 1-2 data sheets per survey replicate (available for download on website)
- Route map (available for printing on website)
- Extra batteries for playback equipment (Important!)
- Stopwatch/clock
- Clipboard, pens/pencils, etc.
- GPS Unit (optional but encouraged for road routes, required on river routes)
- Compass (optional)
- Thermometer (optional)

SAFETY AND OTHER CONSIDERATIONS

- Use caution when conducting surveys. For road routes, pull safely off the road and pay attention to traffic and nearby houses. If necessary for safety or disturbance purposes, it is acceptable to move a point 0.1-0.2 mi from the target location. For water routes, bring safety gear, prepare for higher spring water levels, and look for floating debris. If you have time, it's definitely a good idea to scout your route beforehand.
- This is another pilot year and thus your feedback on the safety, noise, traffic, and habitat associated with each randomly-selected route is very important. If you think a route should not be conducted as is for the short or long term, please tell us.
- If at any time you feel uncomfortable or unsafe for any reason, do not hesitate to discontinue the survey.
- Make sure you have fresh batteries in all playback equipment prior to your survey. There's nothing worse than getting up before dawn, driving out to your site, and then discovering your playback equipment isn't working acceptably.
- Lastly, remember that you may not hear or see a red-shouldered hawk during the survey. Reporting the absence of hawks is extremely valuable as well, so don't be discouraged and be sure to return your datasheets as if you had detected many.

RETURNING DATA SHEETS & EQUIPMENT

Return your data sheets and volunteer effort form* to: Ryan Brady, Wisconsin Department of Natural Resources, 2501 Golf Course Road, Ashland, WI 54806. Or you can scan your forms and email them to Ryan at ryan.brady@wisconsin.gov.

Contact Ryan at 715.685.2933, or ryan.brady@wisconsin.gov, for direction on what to do with any borrowed equipment, such as mp3 player and/or portable speakers. Please do not assume that you are supposed to keep this equipment until next year.

**Each volunteer should keep track of the miles traveled and hours spent on all activities related to the Wisconsin Red-shouldered Hawk Survey. Record the type of activity (scouting, surveying, etc.) in the "Purpose of effort" column. This form, which can be downloaded on the survey website, should be returned with data sheets at the end of the season.*

THANK YOU

Many thanks for your dedicated volunteer efforts that make this survey possible. This statewide effort represents the first of its kind and we appreciate your patience as we work through the survey's early years. For a summary of results from the survey's first year, visit http://wiatri.net/projects/birdroutes/docs/RSHA2010AnnualReport.pdf.