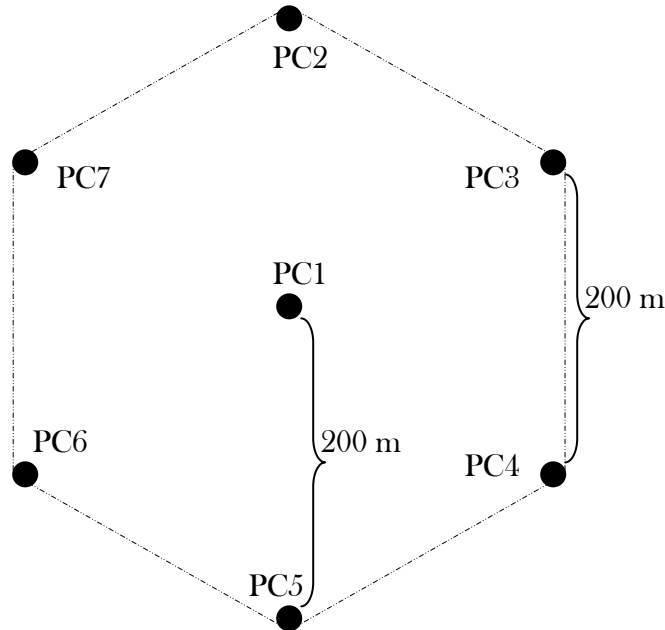


Chapter Eleven

Breeding and Migratory Bird Monitoring Protocol

IOWA BIRD MONITORING:

Two primary methods will be used to document birds in Iowa, point counts and nocturnal broadcast surveys. Both of these methods will be implemented in such a way as to be able to be compared to the USFS data, should that program become national. The nocturnal broadcast surveys will cover a larger area which encompasses the hexagonal sampling plot. In addition to the 4 point locations utilized by the USFS (one in the hexagon center and 3 of the hexagonal edge points, Manley et al. 2005), the Iowa MSIM program will use all of the hexagon points as well as the center point for a total of 7 stations per site.



SURVEY METHODS:

Point Counts

From the interior center point (point count location 1), the azimuths for the remaining 6 point count locations are 0° , 60° , 120° , 180° , 240° , and 300° , respectively. The point count stations are 200 meters apart. If the station should fall on a dangerous (e.g. cliff) or noisy place (e.g. road), then the station should be moved to the closest available spot with care being taken to keep the station spacing as close to 200 m as possible.

The timing of observations at the point counts will include 3 seasons, basically. The first (spring: April - May) and last (fall: September - October) will focus on migratory birds. The middle season (summer: June - July) will focus primarily on breeding birds. However, ALL birds seen or heard during any field visit should be recorded. Since migratory birds are not as

vocal or showy as breeding birds, the surveys conducted during these 2 seasons may not necessarily be restricted to the morning hours. All of the point count stations in a single hexagon will be visited on the same day. Once at the station, the technician will record 10 minutes of information, divided into 3 time frames: the first 3 minutes, the middle 2 minutes, and the last 5 minutes. However, upon first arriving at the point count station, the technician should wait 2 minutes, standing quietly before beginning the timed data collection. Data collection should begin 15 minutes after sunrise and be concluded for the day by 4.5 hours after sunrise. Depending on travel time both within the hexagon between stations and between permanent sampling plot locations, it may or may not be possible for 1 person to cover 2 permanent locations in one day. The order of the stations visited (e.g. 1, 2, 3, 4, 5, 6, & 7 vs. 2, 6, 7, 1, 3, 5, & 4) is left to the discretion of the observer but could be randomly mixed or mixed by choosing a different starting point each visit.

Within the spring and summer seasons, 3 visits will be made to each site, with at least 4 days in between visits. If possible, each visit should be conducted by a different technician to ensure observer un-bias. During the fall season, however, bird species composition may change quickly, therefore 4 visits per site would be preferred. It may be feasible to cover two permanent sampling locations each day as it is not as critical that data be collected only during the morning in the fall (i.e. – it does not get as hot so birds are still active). Inclement weather, following the Breeding Bird Survey rules (<http://www.mbr-pwrc.usgs.gov/bbs/instruct.html>), and including fog, steady drizzle, prolonged rain, and wind > 20 km/h (12 mph), will result in stopping the survey.

In addition to recording the species seen or heard, additional data will be collected for every observation, including the distance to the individual and the type of observation (visual or auditory). In using DISTANCE SAMPLING for the point count locations, it is critical to correctly be able to estimate the distance of the bird from the observer. On the data sheet, the distance (in meters) is divided into categories to aid in this estimation. The technician must also be careful to record birds where they are first detected and to avoid double counting the same individual. By recording the distance estimates, one may calculate the species density.

Other data to be collected at every sampling hexagonal plot include the date, cloud cover, wind speed, and start & end times. Tables for sky condition and wind speed are located on the data sheet. Species other than birds which are seen or heard during the day should also be recorded (including calling amphibians or vocal mammals, for example). Birds that fly overhead without landing in the sampling plot should be recorded as such. In addition, birds seen or heard as the technician moves through the sampling plot should be recorded. These individuals will be noted on the species list for the site, but no distance measurement will be recorded outside the point stations and these individuals may not be used in the density estimates.

During the summer season (May and June) an additional 30 minutes should be spent on each property after the BPC has been completed on 2 of the 3 visits, for a total of 1 hour of extra search time. This search time should be spent in the 'best quality' habitat (left to the discretion of the technician, with input from the project leader). All birds (and other species) seen or heard should be recorded along with information as to what area the animal was in. The areas should be delineated on the site information sheet/aerial photo maps compiled under the

protocol in Chapter 3 (Landscape Characteristics) to ensure that the same name is used for a given area between multiple people.

Nocturnal Broadcast Surveys

Since the target of the nocturnal broadcast calling surveys (i.e. owls) have home ranges much larger than the area of the hexagonal sampling site (e.g. burrowing owl: 64 - 139 ha, in Gervais et al. 2003), a larger area encompassing the sampling plot will be utilized for these surveys. Up to a 300hectare block around the center point could be used. Within this block, sampling points should be chosen ahead of time with the aid of aerial photos. During daylight areas, these sites should be located and flagged (along with necessary trails) with reflective tape. Each block should contain 3 to 10 broadcast stations. Some of the stations can be along roads, but other should be away from roads. Hilltops may work best for this technique and care should be taken to broadcast across drainage areas as opposed to along drainages. For safety reasons, at least 2 technicians should always be together to complete this survey. Sites should be surveyed at least twice per season at times that do not interfere with breeding, as this technique could result in nest abandonment if done too often. Surveys should not be conducted more often than twice in one month. An additional problem may be that birds become habituated to the survey (and fail to respond) if done too often. It is advised to time the 'season' of this survey to that which would result in the best response from the 4 species of owls of greatest conservation need.

Nocturnal broadcast surveys begin 30 minutes after sunset and end at midnight (although some species may be responsive 4 hours prior to sunrise, so need to determine best timing for owls of interest here). Surveys are not done during bad weather conditions. Published literature suggests best results occur on moonlight (bright) nights. The calling tape (or CD) should contain calls of the target species for that area beginning with the smallest species and ending with the largest species. Calls will be played on a portable tape (or CD) player and if needed, amplified with a megaphone such that calls are 100-110 dB at 1 m in front of the technician holding the speaker or megaphone.

When the technicians arrive at the survey point, 2 minutes of 'silence' are first observed where all calls are written down. Then, each call is broadcast 3 times with 30 seconds of silence between calls, with an additional 30 seconds between species calls (this can be set-up ahead of time with the recording). Observers should pause the tape when necessary for species ID. One observer moves (quietly) around (up to 50 m) in order to increase detection probability. Both observers listen and watch for birds. After all calls have been played, observers watch and listen for 5 more minutes, using a 1,000,000 candle watt spotlight to search for additional birds. In addition to the owls, this technique may work for American woodcock, Whip-poor-wills, Henslow's sparrows, rails and other marsh birds. Species to be included on the tape are expected to vary by county.

Data collected should include: survey route/site description, call station number, UTM coordinates, and directions to station (these can be recorded when stations are identified and flagged during daylight). Also collected are data concerning: site identification number, call station number, time, temperature, wind speed, precipitation, cloud cover, moon phase and visibility, bird identification, sex (if possible), time of detection, response of detection (in regards to species playing on tape), and bird location.

HABITAT & PLANT COMPOSITION DATA COLLECTION:

Environmental variables such as air temperature, wind speed, and other weather conditions should be recorded at the time of the survey on the bird monitoring data sheets. A habitat data collection plot should be established at every bird point count location. See Chapter 19 for information on terrestrial habitat and plant composition measurements, and Chapter 20 for information on aquatic measurements. As the same areas will be searched for all species of greatest conservation need, habitat data collection instructions are included in these chapters. However, all data collection technicians should coordinate with other crews to ensure that all needed habitat data is collected.

EQUIPMENT LIST:

Day point count surveys:	Binoculars
	Small tape recorder and blank tapes (to record unrecognized bird calls)
	Stopwatch
	Range finder (if observer needs assistance in determining distance)
	Standard field backpack with clipboard, datasheets, pencils, notebook, and field guides
	Bird call tapes to leave in truck for ID help
Nocturnal calling surveys:	Correct calling tape or CD for that area
	Tape or CD player
	Megaphone
	Batteries
	Headlamps
	1 million candle watt spotlight
	Compass
	Topographic maps
	Aerial photos (leave in truck)
	Flagging (reflective)
	Stopwatch
	Standard field backpack with clipboard, datasheets, pencils, notebook, and field guides

STAFF & TRAINING:

Point count survey technicians should be hired based upon their ability to already be able to ID birds by call and sight (at least most birds). They can gain experience on the job but should have at least limited prior experience. There should be one person per site per visit and technicians should rotate through sites so no site is visited by the same technician during the same 'season' unless there is no other choice. People hired with a greater amount of experience could be given the extra responsibility of helping to train and test the more inexperienced technicians.

Although technicians should be hired based upon previous experience, there should also be 2-3 weeks training at the beginning of the season, including field trials and museum visits. Each person will be provided a list of potential sightings and a notebook to record unknowns and

details. Technicians will be tested and leaders can adjust training to the needed level. Technicians need to learn when to halt surveys due to bad weather. Training should include judging distance as well. This can be done by flagging different distances and have them practice recording the distance. Most likely the bird technicians will be needed to do both the early point count surveys and the nocturnal callback surveys. Nocturnal callback survey technicians should work in teams of at least 2 for safety concerns as these surveys are conducted after dark (between sunset and midnight). Ideally, one of the 2 people would have prior nocturnal birding experience.

DATA QUALITY & MANAGEMENT:

To aid in the management of the data quality, care must be taken to ensure technician proficiency in bird identification. This can be addressed by testing technicians before the beginning of the season and also during the season. Survey times should also be limited to a given timeframe (the 4.5 hours after sunrise for point counts). Technicians should know when to halt data collection during inclement weather, to move away from noise, and to wear muted colors.

Things that the crew leader should look for when ‘testing’ technicians include:

1. Are technicians quiet and attentive?
2. Are they turning their heads and bodies to listen in all directions?
3. Are they looking at the sky?
4. Scanning up and down vegetation?
5. Looking at the ground?
6. Are they using binoculars?
7. Are they recording directions correctly?
8. Are they double counting birds?
9. Are they correctly estimating distance?
10. Is the data legible?

Similarly, the nocturnal survey crews should also be ‘tested’ by a more experienced crew leader periodically throughout the season. Data sheets should be examined daily by the recording technician to ensure all fields are filled in. Data sheets should be checked at least weekly by the crew leader or data manager to prevent time lags in case more information is needed from the recording technician.

DATA ANALYSIS:

Program PRESENCE (MacKenzie et al. 2002) will calculate probability of detection estimates and proportion of points occupied for all of the data collected during these surveys. Program MARK has the same analysis capabilities using either the “Occupancy Estimation” or the “Robust Design Occupancy” data type selection buttons depending on how many seasons are being analyzed. Since the point count station data includes distance estimates between the birds and the observer, additional analyses can be done, including density estimation. See Chapter 5 (Data Analysis) for additional information on these techniques. The point count data can be submitted to the USGS bird database (<http://www.mp2-pwrc.usgs.gov/point/Help/Index.cfm>).

The data collected from the nocturnal calling surveys should be evaluated immediately to determine if increased stations or numbers of surveys are needed. Two potential problems with

increasing the number of surveys is that the birds may (1) habituate to the calls or (2) abandon territories if surveyed more than twice per month.

SAFETY CONSIDERATIONS:

The point count technicians will be working alone and therefore should carry a reliable cell phone or radio, GPS unit, maps, and first aid kit. The crew or section leader should maintain a sign in/sign out method to ensure everyone returned from the field as well as to know exactly where each crew member is assigned to work every day.

The nocturnal calling survey technicians should work in groups of at least 2, as this work will be done late at night, after hours for most businesses. These technicians should also carry a cell phone or radio, GPS unit, maps, and first aid kit, in addition to flashlights or headlamps and possibly a hard hat if working in a forested or rocky area. These crews should also have a sign in/sign out system so that someone is aware of their locations and status. It is advisable to have a plan for emergencies established by the beginning of each field season with information as to who to contact, where to go, and directions to the areas that could be read to a 911 operator if needed. This plan could be on a laminated piece of paper attached to the clipboard.

TARGET SPECIES:

The following list of target species represents the species of greatest conservation concern as chosen by the Steering committee for the Iowa Wildlife Action Plan (Zohrer et al. 2005). Birds have been divided into 2 groups: breeding birds and migratory birds. Distribution maps for these species can be found in Birds in Iowa (Kent and Dinsmore 1996) and additional maps for some species can be found in Iowa GAP (Kane et al. 2003). Appendix 1 contains a list of additional, more common, bird species (again, these have been separated into breeding and migratory bird species) which may also be encountered during the monitoring efforts.

Target breeding bird species:

Common Name	Scientific Name	Habitat
American bittern	<i>Botaurus lentiginosus</i>	Wetland
Least bittern	<i>Ixobrychus exilis</i>	Wetland
Black-crowned night heron	<i>Nycticorax nycticorax</i>	Wetland, wet shrubland
Yellow-crowned night heron	<i>Nyctanassa violacea</i>	Wetlands, riparian forest
Trumpeter swan	<i>Cygnus buccinator</i>	Wetland
Northern pintail	<i>Anas acuta</i>	Wetland, grassland
Canvasback	<i>Aythya valisineria</i>	Wetland
Redhead	<i>Aythya americana</i>	Wetland
Osprey	<i>Pandion haliaetus</i>	Wetland, riparian forest
Bald eagle	<i>Haliaeetus leucocephalus</i>	Riparian forest, deciduous forest
Northern harrier	<i>Circus cyaneus</i>	Grassland, marsh
Red-shouldered hawk	<i>Buteo lineatus</i>	Riparian forest
Broad-winged hawk	<i>Buteo platypterus</i>	Deciduous forest
Swainson's hawk	<i>Buteo swainsoni</i>	Savanna, open woodland

Target breeding bird species continued:

Common Name	Scientific Name	Habitat
Peregrine falcon	<i>Falco peregrinus</i>	Riparian forest, deciduous forest
Ruffed grouse	<i>Bonasa umbellus</i>	Dense forest, open woodland
Greater prairie chicken	<i>Tympanuchus cupido</i>	Grassland
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	Grassland, shrubland
Northern bobwhite	<i>Colinus virginianus</i>	Grassland, shrubland
King rail	<i>Rallus elegans</i>	Wetland
Common moorhen	<i>Gallinula chloropus</i>	Wetland
Sandhill crane	<i>Grus canadensis</i>	Wetland, grassland
Piping plover	<i>Charadrius melodus</i>	Wetland
Upland sandpiper	<i>Bartramia longicauda</i>	Grassland
American woodcock	<i>Scolopax minor</i>	Deciduous forest, open woodland, riparian forest
Wilson's phalarope	<i>Phalaropus tricolor</i>	Wetland, grassland
Forster's tern	<i>Sterna forsteri</i>	Wetland
Least tern	<i>Sterna antillarum</i>	Wetland
Black tern	<i>Chlidonias niger</i>	Wetland
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	Riparian and deciduous forests, open woodland, shrubland
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Deciduous forest, shrubland, open woodland
Barn owl	<i>Tyto alba</i>	Savanna
Burrowing owl	<i>Speotyto cunicularia</i>	Grassland
Long-eared owl	<i>Asio otus</i>	Open woodland, savanna, deciduous forest
Short-eared owl	<i>Asio flammeus</i>	Grassland
Common nighthawk	<i>Chordeiles minor</i>	Grassland, savanna
Whip-poor-will	<i>Caprimulgus vociferus</i>	Deciduous forest, open woodland
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Savanna, open woodland, deciduous forest
Acadian flycatcher	<i>Empidonax virescens</i>	Deciduous forest, riparian forest
Willow flycatcher	<i>Empidonax traillii</i>	Wet shrubland
Least flycatcher	<i>Empidonax minimus</i>	Deciduous forest, open woodland
Brown creeper	<i>Certhia americana</i>	Deciduous and riparian forest
Bewick's wren	<i>Thryomanes bewickii</i>	Open woodland, shrubland
Sedge wren	<i>Cistothorus platensis</i>	Grassland, wetland
Veery	<i>Catharus fuscescens</i>	Riparian and deciduous forest
Wood thrush	<i>Hylocichla mustelina</i>	Deciduous and riparian forest
Northern mockingbird	<i>Mimus polyglottos</i>	Open woodland, savanna, shrubland

Target breeding bird species continued:

Common Name	Scientific Name	Habitat
Loggerhead shrike	<i>Lanius ludovicianus</i>	Savanna, shrubland
White-eyed vireo	<i>Vireo griseus</i>	Open woodland, shrubland
Bell's vireo	<i>Vireo bellii</i>	Shrubland, savanna
Blue-winged warbler	<i>Vermivora pinus</i>	Deciduous forest, shrubland
Cerulean warbler	<i>Dendroica cerulea</i>	Deciduous forest
Black-and-white warbler	<i>Mniotilta varia</i>	Deciduous forest
Prothonotary warbler	<i>Prothonotaria citrea</i>	Riparian forest
Worm-eating warbler	<i>Helmitheros vermivorus</i>	Deciduous forest
Louisiana waterthrush	<i>Seiurus motacilla</i>	Riparian and deciduous forest
Kentucky warbler	<i>Oporornis formosus</i>	Deciduous and riparian forest
Hooded warbler	<i>Wilsonia citrina</i>	Deciduous forest
Yellow-breasted chat	<i>Icteria virens</i>	Open woodland, shrubland
Dickcissel	<i>Spiza americana</i>	Grassland
Eastern towhee	<i>Pipilo erythrophthalmus</i>	Open woodland, shrubland
Field sparrow	<i>Spizella pusilla</i>	Shrubland, grassland
Lark sparrow	<i>Chondestes grammacus</i>	Grassland, shrubland, savanna
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Grassland
Henslow's sparrow	<i>Ammodramus henslowii</i>	Grassland
Bobolink	<i>Dolichonyx oryzivorus</i>	Grassland
Eastern meadowlark	<i>Sturnella magna</i>	Grassland, savanna

Target migratory bird species:

Common Name	Scientific Name	Habitat
American white pelican	<i>Pelecanus erythrorhynchos</i>	Wetland
Yellow rail	<i>Coturnicops noveboracensis</i>	Wetland, grassland
Whooping crane	<i>Grus americana</i>	Wetland, grassland
American golden-plover	<i>Pluvialis dominica</i>	Wetland
American avocet	<i>Recurvirostra americana</i>	Wetland
Greater yellowlegs	<i>Tringa melanoleuca</i>	Wetland
Lesser yellowlegs	<i>Tringa flavipes</i>	Wetland
Solitary sandpiper	<i>Tringa solitaria</i>	Wetland
Hudsonian godwit	<i>Limosa haemastica</i>	Wetland
Marbled godwit	<i>Limosa fedoa</i>	Wetland
Stilt sandpiper	<i>Micropalama himantopus</i>	Wetland
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	Wetland, short grassland
Short-billed dowitcher	<i>Limnodromus griseus</i>	Wetland
Golden-winged warbler	<i>Vermivora chrysoptera</i>	Deciduous forest, open woodland, shrubland

Target migratory bird species continued:

Common Name	Scientific Name	Habitat
Canada warbler	<i>Wilsonia canadensis</i>	Deciduous forest
Le Conte's sparrow	<i>Ammodramus leconteii</i>	Grassland
Nelson's sharp-tailed sparrow	<i>Ammodramus nelsonii</i>	Grassland, wetland
Rusty blackbird	<i>Euphagus carolinus</i>	Riparian forest, wetland, wet shrubland

ADDITIONAL METHODS FOR SPECIAL LOCATIONS:

The following are additional techniques which could be implemented at certain sites *in addition* to the core methods described above. These could be used in areas where there are known populations of species of concern or when supplemental funding has been acquired for a given area. However, the basic core protocol must still be followed to allow for comparison of all sites, both across the state of Iowa and also for a regional comparison, provided that other states or areas are following the same protocol.

Automated Recordings

Use frog loggers instead of technicians to record bird calls.

Visual Encounter Surveys

Bird species will be recorded while searching for other species. This is an incidental method of data collection and may not be used in analysis, although the species will be included on the species list for the site.

Nest Searching

If a nest happens to be found, please make a note and photograph the nest.

LITERATURE CITED:

- Gervais, JA, DK Rosenberg, and RG Anthony. 2003. *Space Use and Pesticide Exposure Risk of Male Burrowing Owls in an Agricultural Landscape*. Journal of Wildlife Management. 67(1): 155-164.
- Kane, KL, EE Klaas, KL Anderson, PD Brown, and RL McNeely. 2003. The Iowa Gap Analysis Project Final Report. Iowa Cooperative Fish and Wildlife Research Unit, Iowa State University, Ames, Iowa.
- Kent, TH, and JJ Dinsmore. 1996. Birds in Iowa. Thomson-Shore, Inc. Dexter, Michigan.
- MacKenzie, DI, JD Nichols, GB Lachman, S Droege, JA Royle, and CA Langtimm. 2002. *Estimating Site Occupancy Rates when Detection Probabilities are Less than One*. Ecology. 83: 2248-2255.

Manley, PN, B Van Horne, JK Roth, WJ Zielinski, MM McKenzie, TJ Weller, FW Wackerly, and C Hargis. 2004. Multiple Species Inventory and Monitoring Technical Guide. Review Draft. USDA Forest Service, Washington Office, Ecosystem Management Coordination Staff, Wildlife Fish Watershed Air Research Staff.

Zohrer et al. 2005. The Iowa Comprehensive Wildlife Conservation Plan.

Alternate bird point count data sheet

DATE: _____ OBS: _____ LOCATION: _____ POINT #: _____

COMMENTS:

Start time: _____ St temp: _____ %Clouds: _____ Rain: _____ Windsp: _____ End time: _____ E-temp: _____

π =0-3 minutes

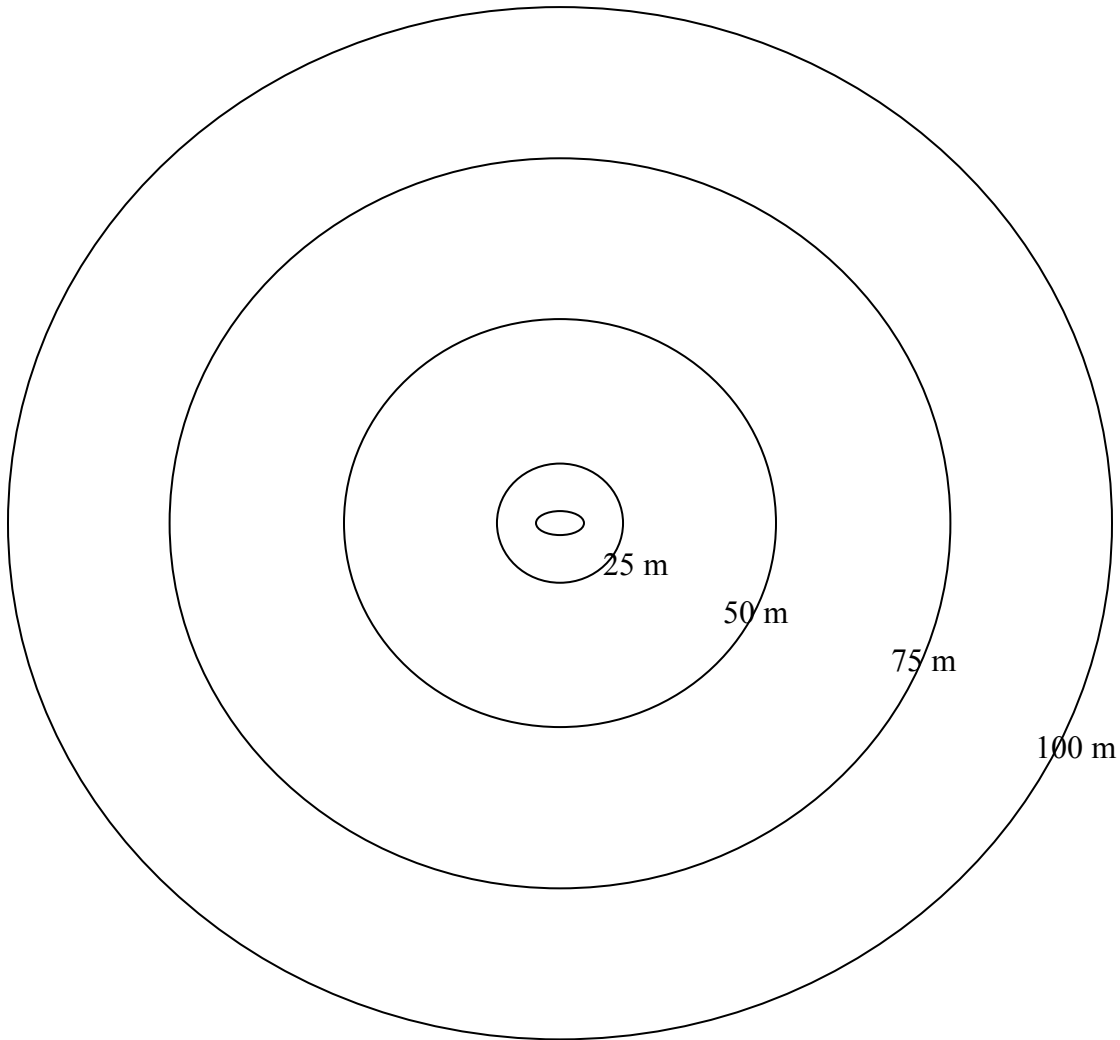
ϵ =3-5 minutes

#=5-10 minutes

Δ = Auditory

*=Visual

FO= Fly-over



Date data entered: _____ Corresponding record #: _____

Date checked: _____ Checked by: _____