Joint Oil Sands Monitoring: Environment Canada Cause and Effects Monitoring for Landbirds

Standard Operating Procedure (SOP) 2: Training Observers

This Standard Operating Procedure explains the procedures and topics to cover in training observers to collect data for the Environment Canada (EC) Cause and Effects Monitoring Program for Landbirds.

1. Field Equipment, Safety, and Communication Training

1.1 General Operations Training

Review all general procedures for all field crew staff including: recommended personal field equipment/attire (See Appendix 1); general field safety; backcountry rules and ethics; truck use (driving, ARI card use, ARI reporting, repairs, accidents, traffic violations); ATV and trailering use; Government of Canada MasterCard use; Treasury Board of Canada travel authorization and guidelines (accommodation, per dieum, incidentals).

1.2 Required Field Training

Prior to conducting field work, all field crew staff should be required to complete the following courses: Standard First Aid, Occupational Health and Safety for Employees, ATV Training, Trailering Training, Bear Safety and Awareness, H2S Awareness/Multi-gas Awareness.

1.3 Field Equipment Training

Review procedures for using GPS units, rangefinders, thermometers, and audio recording units. Refer all field crew staff to copies of equipment manuals.

1.4 Safety and Communication Training

Review procedures for using hand-held radios, cell phones, satellite phones, and SPOTs (personal satellite locator beacon). Test all communication devices. Refer all field crew staff to copies of safety and communication equipment manuals.

Review check-in and safety procedures. Refer all field crew staff to copies of the Emergency Check-In and Safety Plan.

- Review all procedures as outlined in the Emergency Check-In and Safety Plan.

- Review check-in procedures including: daily check-in procedures among members of one field crew; daily check in procedures for each field crew staff (Field Crew Leads, Field Technicians, Project Manager, Project Lead) with SafetyLine; weekly check in procedures for each Field Crew Lead with Project Manager and Project Lead.
- Review procedures to (1) avoid bear encounters and (2) respond to defensive and non-defensive bear encounters.
- Review procedures to search for field crew staff (missed check-in).
- Review procedures to respond to and report a help/emergency request for field crew staff.
- Review procedures to respond to and report an injury/accident for field crew staff.
- Project Manager/Project Lead and field crew staff should develop theoretical emergency situations and brainstorm potential responses to these situations including a clear understanding of how to respond if a field crew member should go missing, sustain any type of injury, or become seriously injured or impaired.

Following review of safety and monitoring procedures, a complete field test should be performed. The field test should examine the ability of Field Crew Leads and Field Technicians to follow check-in and check-out procedures and should assess the ability of monitors (Project Manager/Project Lead) to utilize all protocols for monitors in SafetyLine Lone Worker Monitoring Program.

2. Identifying Birds by Sight and Sound

Soon after Field Crew Leads and Field Technicians are hired, all field crew staff should be sent bird species lists and other training materials and urged to begin preparing themselves prior to their employment start date and the formal field-based training session (See Table 1 and Table 2).

Each day of the field-based training session should begin with birding at sunrise with the Project Lead and Project Manager in small groups. Field Crew Leads and Field Technicians will learn to identify new species quickly when they see and hear them in the field. The goal during training should be to visit as many habitat types and age class/structural stages as possible to (1) maximize the number of species encountered, and (2) reinforce learning of bird-habitat and bird-ecosite associations. Every day Field Crew Leads and Field Technicians should spend time studying their field guides and field notes, listening to recordings, testing themselves, and tracking down species to observe in the field. This facilitates review of plumages, field marks, vocalizations, and behaviours. The Project Lead and Project Manager should review species that are (1) difficult to identify, and (2) may not be encountered during the field training.

2.1 Estimating Distances to Observed Birds and Singing Birds

Field Crew Leads and Field Technicians should conduct a variety of exercises to practice plotting birds observed and heard in a variety of habitat types. Each crew of two observers (Field Crew Lead and Field Technician) should find a location to practice estimating distances to birds while conducting a point count. Each crew should mark the point count center with flagging and use the GPS unit or tape measure to measure 50 meters and 100 meters in four cardinal directions. Starting with one observer: (1) practice plotting the birds observed and heard in 3 distance bands (0-50 meters and 50-100 meters and >100 meters) for a 10 minute time period; (2) practice measuring and plotting the birds observed and heard in 3 distance bands using the laser rangefinder to measure the horizontal distance to birds observed and heard; (3) practice measuring and plotting the birds observed and heard in 3 distance bands using the laser rangefinder followed by a check of the actual location of singing/calling (heard) birds by the second observer. Measuring distances to unseen (heard only) birds can be quite challenging especially in habitats where thick understory vegetation (1) makes walking noisy or difficult (singing/calling birds will often retreat as the observer approaches, resulting in no measurement or a measurement that does not reflect the actual distance to the bird), and (2) distorts or muffles the song/call of the vocalizing bird, making distance estimation more challenging. This exercise should be repeated multiple times over the course of the training session to ensure that all field crew staff visit a variety of habitat types and different topographic and slope positions. All field crew staff should be able to estimate birds within the 3 distance bands and should aim to estimate most distances within 10-15% of the actual distance (with reduced accuracy for distant birds >100 meters).

2.2 Recording Additional Point Count Data: Time Intervals, Locations of Individual Birds, and Age, Sex, and Activity/Behaviour Data

Field Crew Leads and Field Technicians should conduct a variety of exercises to practice recording additional point count data including time intervals, locations of individual birds, and age, sex, and activity/behaviour data. Each crew of two observers (Field Crew Lead and Field Technician) should find a location to practice recording all additional data while conducting a point count. Each crew should mark the point count center with flagging and use the GPS unit or tape measure to measure 50 meters and 100 meters in four cardinal directions. Starting with one observer: (1) practice recording time intervals in which individual birds are first detected (time interval 1: 0-3 minutes; time interval 2: 3-5 minutes; time interval 3: 5-10 minutes) using the appropriate subscript coding (1/3/5); (2) practice tracking the location of individual birds over the

course of the point count survey period to avoid minimizing errors in double-counting birds within and among point count sites; and (3) practice recording the age, sex, and activity/behaviour information of individual birds. Remind all field crew staff that a bird heard or observed in the first time period (0-3 minutes) but not identified until the second time period (3-5 minutes) or third time period (5-10 minutes) should be recorded as being detected in the first time period. Encourage field crew staff to note the behaviour of individual birds when birding for practice and conducting all practice point counts. They should be noting the movement patterns (e.g. foraging behaviour), singing/calling patterns and behaviours (e.g. counter-singing, territory boundary encounters, contact calls, breeding vocalizations like solicitation calls, copulation calls), and approximate territory and home range sizes of individual species.

3. Conducting Point Counts

When Field Crew Leads and Field Technicians can identify most species and have begun practicing distance estimation and recording additional point count data, part of each training day should be devoted to conducting simultaneous point counts. Working in groups of 2-4, field crew staff should conduct practice point counts at the same time in the same location. At the end of each count, they should compare notes and discuss any differences in the species detected and the estimated direction and distance to each individual bird. Each crew should continue these simultaneous point counts in a variety of habitat types (forested, non-forested, upland, lowland) until there is consistency among observers in the species and distances recorded. The Project Lead and Project Manager should visit groups of field crew staff while conducting practice point counts to assess and verify all data collection and data recording procedures. While conducting these practice point counts, field crew staff should adhere to all aspects of the field protocol (see SOP 3: Conducting Point Counts) including the use of audio recording units. Field crew staff should practice recording data on all relevant data forms (see SOP 3: Conducting Point Counts). Individual field staff must be comfortable with all aspects of the point count protocol because each member of the field crew staff will be working alone to conduct point counts.

4. Identifying Vegetation and Collecting Habitat Type and Vegetation Data

Throughout the training session, the training staff (Project Lead, Project Manager) will teach the Field Crew Leads and Field Technicians all trees, shrubs, and indicator herbs/forbs, and mosses/lichens. Conducting practice point counts in different habitat types should facilitate exposure to a wide variety of plant species, plant communities, and ecosites/ecosite phases. Field crew staff will also need to study plant guides and receive some instructions to be prepared to identify plants in higher elevation areas that

may not be accessible during the training session. The Project Lead and Project Manager should review ecosite classification procedures, habitat type classification (See SOP 4: Classifying Vegetation), and bird-habitat associations in the JOSM study area. Field crew staff should also practice collecting ecosite, habitat, and vegetation data as a group in order to standardize ecosite and ecosite phase classification, observed habitat type classification, and vegetation measurements. Vegetation measurements include crown closure, canopy height, percent canopy conifer, as well as order of occurrence of the following vegetation layers: dominant trees, codominant trees, tall shrubs, short shrubs, and ground cover types (see SOP 4: Classifying Vegetation). Practice should occur in multiple habitat types and should continue until crew-wide standardization is achieved. While conducting practice point counts and collecting the associated ecosite, habitat, and vegetation data, field crew staff should adhere to all aspects of the field protocol (see SOP 4: Classifying Vegetation). Field crew staff should practice recording data on all relevant data forms (see SOP 4: Classifying Vegetation).

5. Orienteering

During the training session, all field crew staff must become proficient at off-trail orienteering, including the use of a compass, GPS unit, and the ability to read and relate to field maps. Field crew staff must become proficient at determining their own location and travelling to distant and unseen sample points using only a compass and field map. These skills should be practiced until all field crew staff are proficient. Each field crew staff must carry multiple sets of replacement batteries and a waterproof cover for their GPS unit.

6. Recording and Transcribing Data

Field crew staff must be instructed how to complete each of the relevant data forms and have an opportunity to practice completing them during training so that questions can arise and be resolved before official data collection begins.

7. Conducting Practice Surveys

The Project Lead and Project Manager should arrange 1-2 days of simulated surveys using designated training survey areas in order to practice all components of the survey procedure: survey area reconnaissance; survey area access and navigation; survey transect navigation; point count protocol; ecosite, habitat, and vegetation protocol; check-in procedures; and data recording and transcribing procedures. One field crew can be sent to each survey area to conduct a series of point counts along a survey

route planned by the Field Crew Lead. On Day 1, the Field Crew Lead and Field Technician can complete individual point counts along a shared survey route. On Day 2, the Field Crew Lead and Field Technician can complete individual point counts along independent survey routes.

8. Computer Data Entry

During the pre-season training program, all field crew staff should receive adequate instruction on data entry procedures (see SOP 5: Data Entry and Verification) so that they can complete some or all of their data entry during the field season (e.g. weather days).

Table 1. Master list of bird species observed in Bird Conservation Region 6-Boreal Taiga Plains.

Landbirds		
Alder Flycatcher	Fox Sparrow	Purple Martin
American Crow	Golden Eagle	Red Crossbill
American Goldfinch	Golden-crowned Kinglet	Red-breasted Nuthatch
American Kestrel	Golden-crowned Sparrow	Red-breasted Sapsucker
American Pipit*	Golden-winged Warbler	Red-eyed Vireo
American Redstart	Grasshopper Sparrow	Red-headed Woodpecker
American Robin	Gray Catbird	Red-shouldered Hawk
American Three-toed Woodpecker	Gray Jay	Red-tailed Hawk
American Tree Sparrow	Gray Partridge	Red-winged Blackbird
Baird's Sparrow	Gray-cheeked Thrush	Ring-necked Pheasant
Bald Eagle	Gray-headed Chickadee	Rock Pigeon
Baltimore Oriole	Great Crested Flycatcher	Rock Ptarmigan
Bank Swallow	Great Gray Owl	Rose-breasted Grosbeak
Barn Swallow	Great Horned Owl	Rough-legged Hawk
Barred Owl	Greater Prairie-Chicken	Ruby-crowned Kinglet

Bay-breasted Warbler	Hairy Woodpecker	Ruby-throated Hummingbird
Belted Kingfisher	Hammond's Flycatcher	Ruffed Grouse
Black-and-white Warbler	Harris's Sparrow	Rufous Hummingbird
Black-backed Woodpecker	Hermit Thrush	Rusty Blackbird
Black-billed Cuckoo	Hoary Redpoll	Savannah Sparrow
Black-billed Magpie	Horned Lark	Say's Phoebe
Blackburnian Warbler	House Finch	Scarlet Tanager
Black-capped Chickadee	House Sparrow	Sedge Wren
Blackpoll Warbler	House Wren	Sharp-shinned Hawk
Black-throated Blue Warbler	Indigo Bunting	Sharp-tailed Grouse
Black-throated Green Warbler	Lapland Longspur	Short-eared Owl
Blue Jay	Lark Sparrow	Smith's Longspur
Blue-headed Vireo	Le Conte's Sparrow	Snow Bunting
Bobolink	Least Flycatcher	Snowy Owl
Bohemian Waxwing	Lincoln's Sparrow	Song Sparrow
Boreal Chickadee	Loggerhead Shrike	Spotted Towhee
Boreal Owl	Long-eared Owl	Sprague's Pipit
Brewer's Blackbird	MacGillivray's Warbler	Spruce Grouse
Brewer's Sparrow	Magnolia Warbler	Steller's Jay
Broad-winged Hawk	Marsh Wren	Swainson's Hawk
Brown Creeper	Merlin	Swainson's Thrush
Brown Thrasher	Mountain Bluebird	Swamp Sparrow
Brown-headed Cowbird	Mourning Dove	Tennessee Warbler
Calliope Hummingbird	Mourning Warbler	Townsend's Solitaire
Canada Warbler	Nashville Warbler	Townsend's Warbler

Cape May Warbler	Nelson's Sparrow	Tree Swallow
Cassin's Vireo	Northern Cardinal	Turkey Vulture
Cedar Waxwing	Northern Flicker	Varied Thrush
Chestnut-sided Warbler	Northern Goshawk	Veery
Chimney Swift	Northern Harrier	Vesper Sparrow
Chipping Sparrow	Northern Hawk Owl	Violet-green Swallow
Clay-colored Sparrow	Northern Mockingbird	Warbling Vireo
Cliff Swallow	Northern Parula	Western Kingbird
Common Grackle	Northern Pygmy-Owl	Western Meadowlark
Common Nighthawk	Northern Rough-winged Swallow	Western Tanager
Common Raven	Northern Saw-whet Owl	Western Wood-Pewee
Common Redpoll	Northern Shrike	White-breasted Nuthatch
Common Yellowthroat	Northern Waterthrush	White-crowned Sparrow
Connecticut Warbler	Northern Wheatear	White-tailed Ptarmigan
Cooper's Hawk	Olive-sided Flycatcher	White-throated Sparrow
Dark-eyed Junco	Orange-crowned Warbler	White-winged Crossbill
Downy Woodpecker	Orchard Oriole	Willow Flycatcher
Dusky Flycatcher	Osprey	Willow Ptarmigan
Dusky Grouse	Ovenbird	Wilson's Warbler
Eastern Bluebird	Pacific-slope Flycatcher	Winter Wren
Eastern Kingbird	Palm Warbler	Wood Thrush
Eastern Meadowlark	Peregrine Falcon	Yellow Warbler
Eastern Phoebe	Philadelphia Vireo	Yellow-bellied Flycatcher
Eastern Towhee	Pileated Woodpecker	Yellow-bellied Sapsucker
Eastern Whip-poor-will	Pine Grosbeak	Yellow-billed Cuckoo

Eastern Wood-Pewee	Pine Siskin	Yellow-headed Blackbird
European Starling	Pine Warbler	Yellow-rumped Warbler
Evening Grosbeak	Purple Finch	Yellow-throated Vireo
Shorebirds		
American Golden-Plover	Marbled Godwit	Upland Sandpiper
Greater Yellowlegs	Red-necked Phalarope	Whimbrel
Hudsonian Godwit	Semipalmated Sandpiper	Wilson's Phalarope
Killdeer	Short-billed Dowitcher	Wilson's Snipe
Least Sandpiper	Solitary Sandpiper	
Lesser Yellowlegs	Spotted Sandpiper	
Waterbirds		
American Bittern	Double-crested Cormorant	Pied-billed Grebe
American Coot	Eared Grebe	Red-necked Grebe
American White Pelican	Forster's Tern	Red-throated Loon
Arctic Tern	Franklin's Gull	Ring-billed Gull
Black Tern	Great Blue Heron	Sandhill Crane
Black-crowned Night-Heron	Herring Gull	Sora
Bonaparte's Gull	Horned Grebe	Virginia Rail
California Gull	Long-tailed Jaeger	Western Grebe
Caspian Tern	Mew Gull	Whooping Crane
Common Loon	Pacific Loon	Yellow Rail
Common Tern	Parasitic Jaeger	Yellow-billed Loon
Waterfowl		
American Wigeon	Common Merganser	Northern Shoveler
Barrow's Goldeneye	Gadwall	Red-breasted Merganser

Black Scoter	Greater Scaup	Redhead
Blue-winged Teal	Greater White-fronted Goose	Ring-necked Duck
Bufflehead	Green-winged Teal	Ross's Goose
Cackling Goose	Hooded Merganser	Ruddy Duck
Canada Goose	Lesser Scaup	Surf Scoter
Canvasback	Lesser Snow Goose	Trumpeter Swan
Cinnamon Teal	Long-tailed Duck	Tundra Swan
Common Eider	Mallard	White-winged Scoter
Common Goldeneye	Northern Pintail	Wood Duck

* Note: Landbird species highlighted in gray have occurences in the region, but are not commonly observed in the boreal forest of Alberta during the breeding season.

Table 2. Audio recording albums and audio training tools for field crew leads and field technicians.

Albums	**Other Audio Tools**
Butler, Jim. *Songs of the Wood Warblers of the Western Forest.* 2010.	Denroica online learning tool (http:www.natureinstruct.org)
Neville, John. *Bird Songs- Western Boreal Forest.* Neville Recording. 2004.	iBird Pro App
Beck, Barb and Jim. Alberta Birding By Ear. 2003.	Audubon Birds App

Appendix 1. Required and recommended personal equipment for field crew leads and field technicians.

Item	Notes	Suggestions
Items REQUIRED:		
Footwear	You will be travelling long distances on foot (possibly >5-10 km/D) through upland and lowland (e.g. wetlands) habitats	Caulk boots (with BAMA bootie liners for comfort) OR full shank leather, waterproof hiking boots (broken in) with Gore-Tex socks and gaiters
Raingear	Raingear should be with you all the time so think about portability and compactness	High quality, medium-heavy duty (not ultra lightweight) nylon coated raingear-jacket and full-zip or partial zip pants (i.e. you want to get them off without taking off your boots)
Hand Protection	You need gloves to wear while dealing with ATV equipment and also to protect your hands from the many prickly plants that occur in the boreal.	High quality gloves with leather or synthetic to protect your hands
Bug Protection	Yes it is true insects in the boreal can be fierce (e.g. mosquitos, black flies)	Outdoor Research (OR) Bug Bucket hat
Digital Watch	You will need a digital watch for conducting point counts	
Sleeping bag, pillow, and liner	These are the only pieces of camping equipment that are not supplied	Sleeping bag- 2 season bag with temperature rating to at least 0 or -5 degrees Celsius; Hiking pillow; Sleeping bag liner- this is nice to have because you only need to wash your bag liner
Items SUGGESTED:		
Field Clothes	Gear you use for hiking	Synthetic/wool clothes that dry quickly and wick moisture

	Base layers	Long underwear, tops, bottoms. Capilene, merino, other synthetic fabrics
	Outer layers	Long pants and long-sleeve tightly woven shirts with collars and cuffs to keep the bugs out
	Warm layers; expect it to be quite cold in the early morning in May and even June	Merino/wool, fleece, synthetic insulation
	Other	Toques, warm gloves, warm hiking socks, Gore-Tex socks, buff or bandanas, swimsuit, shoes/sandals
Additional Gear	Water bottles (bring a few), water bladder, travel mug, personal thermos, headlamp, insect repellent, insect bite treatment (including Benadryl if you are allergic), sunscreen, duffle bag	

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