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# Searching and Monitoring Protocol for Kirtland's Warbler in Canada

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DND/D. Coulson – OMNR

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**Prepared by the Kirtland's Warbler Recovery Team**

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## 1. Preface

The management and recovery actions for Kirtland's Warbler in Canada are carried out under the direction of the Kirtland's Warbler Recovery Team and the Canadian Wildlife Service, with input and advice considered from various experts and authorities. Contributions from interested field personnel towards searching and monitoring are a very valuable component of recovery efforts.

The following protocol has been prepared to assist recovery-related efforts to search for and monitor occurrences of Kirtland's Warbler in Canada. The purpose is to provide some standardization and documentation of efforts while at the same time ensuring minimal to no disturbance of Kirtland's Warblers on established territories.

### Objectives of the Searching and Monitoring Protocol for Kirtland's Warbler in Canada:

- **Determine the distribution of Kirtland's Warbler in Canada;**
- **Increase the knowledge of Kirtland's Warbler breeding biology, behaviour and habitat use in Canada;**
- **Identify important habitat features;**
- **Identify potential threats to the species and habitat in Canada.**

**Approaching the nest (i.e. conducting nest searches and/or nest checks) of Kirtland's Warbler or other migratory bird species at risk requires authorization** under a Migratory Bird Regulations permit issued by the Canadian Wildlife Service and may also require Ontario Ministry of Natural Resources authorization.

## 2. Species Information

### 2.1 Description

The Kirtland's Warbler is a relatively large member of the North American wood-warbler family (Parulidae). The adult male Kirtland's Warbler has greyish-blue upperparts that are streaked with black, a yellow breast and belly, and black streaks that run up the flanks toward the breast. It has a broken white eye ring and thin white wing bars. The female is similar to the male, but with a more brownish wash to the upperparts and duller features overall. Both sexes are known to habitually pump their long tail up and down, which can be a useful criterion for identification (Mayfield 1992), although there are exceptions.

### 2.2 Habitat

Kirtland's Warblers are habitat specialists. They prefer extensive tracts of early successional, densely stocked jack pine, with frequent small open to lightly-stocked areas. Jack pine dominated

stands larger than 80 ha with 35 – 65% canopy closure are highly preferred, though they have used stands between 32 and 80 ha (Environment Canada 2006). Jack pine 1.5 to 5 m tall (or 5 to 15 years old) provides adequate branch cover for this ground-nesting species. Soils are preferably well-drained sands (Mayfield 1992, Environment Canada 2006).

Based upon the ecology of Kirtland's Warbler, potential habitats in Ontario can be described using established land classification schemes:

- Based upon the Forest Ecosystem Classification for Central Ontario (Chambers et al., 1997), the early age stages of Ecosites 15.1 Jack Pine (dry to moderately fresh). (Drier sites of Ecosite 15.2 Jack Pine [fresh] may be suitable where the site is dry and dominated by Jack Pine).
- Based upon the Ecological Land Classification for Southern Ontario (Lee et al., 1998), the early stages of Ecosite FOC1-1 (Dry Jack Pine coniferous forest) and CUP3-4 (Jack Pine Coniferous Plantation)

### **3. Field Protocols**

#### **3.1 General Field Protocols**

There are two main approaches in this program: i) to search for potential breeding populations and habitats, and ii) to monitor known occupied territories.

One should become familiar with both the primary song (which although the Kirtland's Warbler uses a different habitat, sounds somewhat like a Northern Waterthrush) and the call note - the latter being a 'chip' note similar to the alarm call of a White-throated Sparrow. The Kirtland's Warbler repertoire also includes, although heard infrequently, an unmusical chatter and a "whisper" song, the latter a quiet version of either the primary or chatter song that a male reportedly uses in response to a song broadcast (Mayfield 1992)

Searching and monitoring efforts should carefully consider weather conditions. Wind and/or rain reduces the ability to hear any singing males, while cold and wet weather significantly reduces the frequency of singing. Weather should be recorded on the datasheets at the start and finish of surveys.

The attached survey forms (Appendices E & F) should be used to document search efforts and monitoring. It is important that all fields of a survey form are filled out, even if a site does not yield any occurrences. Information on negative search results is also of value and should be documented. These data will contribute greatly towards ongoing efforts of the recovery team and others working to gain a greater understanding of the distribution and relative abundance of Kirtland's Warbler and potential Kirtland's Warbler habitat in Canada. Maps of areas surveyed should be attached to survey forms and submitted to the chair of the Recovery Team.

## **3.2 Searching for Kirtland's Warbler Occurrences**

### **3.2.1 Searching for New Occurrences**

When searching for new Kirtland's Warbler occurrences, fill out the "Searching for Kirtland's Warbler Occurrences" data sheet found in Appendix E..

For each site that is surveyed for Kirtland's Warbler assign a unique identifier using a local landmark (town, lake, etc.) and a number so that this site name can be referenced in any subsequent monitoring of the site. Be sure to note as much information as possible regarding the location of the site so as to make it easier to return to the site in future surveys.

### **3.2.2 Timing and Frequency of Searches**

Search efforts in potential breeding habitats should occur during the main period of territory establishment and breeding, May 7<sup>th</sup> to July 7<sup>th</sup> - preferably in the last week of May to June 20 - to maximize detection of singing males.

Preferably, searching should be undertaken between 30 minutes after sunrise and 1100 hr. Search efforts into early afternoon and evening can prove to be successful, but should not be relied upon as evidence of absence, as the frequency of singing is significantly reduced after the morning (Mayfield 1992). On the data sheet, note the time, wind speed, air temperature, and % cloud cover when starting and finishing the monitoring session .

High-quality sites should be searched more than once. Single and mated males may have 2 or 3 territories as much as 1000 m apart, so an area searched with unsuccessful results may have a resident male feeding on a neighbouring site at that time

### **3.2.3 Habitat**

The habitat at the site should be described using the fields on the data sheet. Evaluate the suitability of the habitat for Kirtland's Warbler, with notes explaining which characteristics (topography, soil, etc.) contribute to the habitat suitability. Describe the site composition by noting the proportion of the site that is covered by each dominant tree species, especially Jack Pine (Pj), Red Pine (Pr), and White Pine (Pw). Describe the Jack Pine community by noting the % cover and the average height in meters. Note whether blueberry or sweet fern are present in the understory and list other present understory species.

### **3.2.4 Survey Stations**

Survey stations should be used throughout the site to broadcast the Kirtland's Warbler song in an effort to elicit a response. Be sure to set up enough survey stations so that the entire site will be effectively searched for Kirtland's Warbler, keeping stations at least 200m apart to minimize overlap. For large areas of suitable habitat, it may be advantageous to establish survey transects 200m apart, and lay out survey stations appropriately to maximize coverage. Number each survey station, and provide UTM's or latitude/longitude coordinates to facilitate subsequent surveys in these areas.

### 3.2.5 Song Broadcast

The song recording used for broadcasting must originate from one male only since broadcasting a sequence of recorded songs sourced from multiple males could disturb the bird on territory. The recovery team has a song file available for use in surveying (contact information in Appendix A).

To achieve better coverage, broadcast the song from an open or high point on the landscape and in more than one direction during play.

When searching for new occurrences of Kirtland's Warbler in suitable breeding habitats where they **have not been known to occur**, the following approach should be followed:

1. Record start time and listen quietly for singing males for at least 5 minutes.
2. Broadcast recorded call sequence of singing male for 30 seconds to 1 minute.
3. Listen quietly for any Kirtland's Warbler response for at least 2 minutes.
4. Broadcast recorded call sequence of singing male for maximum of 30 seconds.
5. Listen quietly for any Kirtland's Warbler response for at least 2 minutes, and record finish time.

Record the source of the song recording, the make and model of the broadcast equipment, and any relevant comments about the playback on the form.

If Kirtland's Warblers are detected, cease any further broadcasting of recorded songs. It is important for both searching and monitoring efforts that recorded Kirtland's Warbler calls **are not** broadcast after a bird is found to be present on territory. The broadcast of the song is an attempt to elicit a response from a male from sites where birds appear to be absent due to a lack of calling activity.

### 3.2.6 Reporting Records and Observations

New occurrences should be thoroughly documented with field notes, photographs, video, and recordings of song. Field notes should include date, time, observer(s), accurate location (UTM or latitude/longitude) and description of bird and habitat. If a map, aerial photo, or satellite view is available, mark the sighting location(s). If a bird is discovered during a search then the "Monitoring Known Occurrences of Kirtland's Warbler" form (Appendix F) should also be completed.

For new occurrences, look for and record whether the bird is banded. If there are colour leg bands, it is important to determine the colour and relative position of each band on each leg. The colours should be recorded in the following order: left leg top band / left leg bottom band, right leg top band / right leg bottom band. Note that "**left leg**" refers to the leg on the **bird's left**, and ensure that band combinations refer to the appropriate leg. This is especially important since the Kirtland's Warbler colour banding program in the Bahamas uses a colour scheme otherwise identical to programs in Canada, but with the legs reversed. Confirm the band combinations at each monitoring session, if possible.

All new occurrences of Kirtland's Warbler **should be immediately reported to the Recovery Team** (contact information in Appendix A). Such occurrences should also be treated with the highest level of confidentiality until the observer, property owner, and Recovery Team agree on how to proceed with communication and monitoring (including required input from federal and provincial species at risk staff). **Do not provide locations of Kirtland's Warbler to birding hotlines or websites.**

Make note of any other bird species present at a site on the data sheet. If additional pages are required to record data for a given site, make note of page numbers in the top right corner of the data sheets.

### **3.2.7 Surveying Recent Occurrences (i.e. from previous breeding season)**

Surveying areas that supported Kirtland's Warblers during the previous breeding season should be done with great care. Methods similar to those for seeking new occurrences can be used. However, the initial listening period (Step 1) should be extended from 5 to 10 minutes.

## **3.3 Monitoring Known Kirtland's Warbler Occurrences**

When monitoring known Kirtland's Warbler territories, fill out the "Monitoring Known Kirtland's Warbler Occurrences" form (Appendix F). Be sure to describe the location with as much information as possible. On the data sheet, note the time, wind speed, air temperature, and % cloud cover when starting and finishing the monitoring session.

### **3.3.1 Timing of Monitoring**

Monitoring efforts should be undertaken from time of discovery until the birds vacate breeding territories in mid-July to late August.

### **3.3.2 Territories**

Once a territorial male has established a territory, the focus of monitoring should be to determine the presence/absence of a female. Monitoring efforts of known Kirtland's Warbler occurrences are designed to minimize potential disturbance while providing for sufficient confidence in determining the presence/absence of the territorial male and a female. Monitoring of birds should be undertaken every second or third day with as little disturbance to the warblers as possible and should not last longer than an hour. Individual Kirtland's Warblers may have different sensitivities to disturbance and these may change with the different events of a breeding season. Surveyors must be aware of each bird's sensitivity. **Do not play recorded songs in known occupied habitats.**

The following approach should be followed to determine if a territorial male has a mate:

1. Monitoring of a territorial male should begin 30 minutes after sunrise, since the male will first sing near the female.
2. Record start time and listen quietly for singing males. The male's song may be a softer more abbreviated song in the presence of a female.
3. Be observant and watch for females, especially down low, and listen for the female's chipping or signs of males attending females (i.e. carrying food), but do not actively intrude. Carefully and patiently observe from a non-intrusive distance.
4. If a female is observed, record any information about her appearance and behaviour. If the female appears banded, record the band combinations.

Look for and record whether the birds are banded. If there are colour leg bands, it is important to determine the colour and relative position of each band on each leg. The colours should be

recorded in the following order: left leg top band / left leg bottom band, right leg top band / right leg bottom band. Confirm the band combinations at each monitoring session, if possible.

If equipment is available, take photographs and record video and/or audio of both birds. Make note of any distinguishing features between the male and female. Describe any behaviour that would confirm a pairing or any evidence that would suggest breeding (carrying food, etc.).

Describe the habitat in the territory, making note of the composition and structure of the forest and understory. Make note of other bird species present in the area.

Be sure to complete the monitoring survey form before leaving the site whether or not bird(s) were observed.

### 3.3.3 Nests & Breeding Success

If a nest is inadvertently located or is suspected, immediately implement a **minimum 20 m radius** reserve around the suspected nest site with no entry permitted to prevent disturbance and establishment of any scent trails. **Do not approach a nest or suspected nest** since doing so could facilitate nest predators by inadvertently leaving a scent trail. **Approaching the nest (i.e. conducting nest searches and/or nest checks) of a Kirtland's Warbler or other migratory bird species at risk requires authorization** under a Migratory Bird Regulations permit issued by the Canadian Wildlife Service and may also require Ontario Ministry of Natural Resources authorization. When and who should visit a nest will be determined by the Canadian Wildlife Service and Ontario Ministry of Natural Resources in conjunction with the Recovery Team and the landowner.

Record any behavioural information that could help determine if nesting or fledging has occurred. The presence of a nest and/or hatchlings can be determined by the food carrying activities of the adults. Adults will bring food to hatchlings 2 to 8 times per hour (Mayfield 1992).

Adults will feed near the nest but not at the nest. The pair often splits the brood, so male and female may be feeding young in separate areas. The number of fledglings can be determined by parental behaviour. Once all of the young have fledged, the nest can be visited without permit to determine if an unhatched egg is present. Nest, egg, and eggshell collection (**requires Canadian Wildlife Service and Ontario Ministry of Natural Resources authorization**) can provide additional data on ectoparasites or provide feathers for additional studies.

## 3.4 Summary of Kirtland's Warbler Surveys

### Pre-survey procedures

- Select habitat with high potential for breeding Kirtland's Warbler: contact the Recovery Team
- Obtain landowner permission

### Searching for Kirtland's Warbler Occurrences

- Conduct field surveys May 7<sup>th</sup> to July 7<sup>th</sup>, preferably late May to late June
- Preferably, searching should be undertaken between 30 minutes after sunrise and 1100 hr.
- Ensure that site/stand and survey station locations are precisely and accurately recorded

- Survey stations should be at least 200 m apart
- Do not conduct surveys in adverse weather conditions (rain, fog, strong winds, etc.)
- Record habitat information at the site/stand level, not at each survey station
- Make note of other bird species present at the site/stand level
- Conduct surveys according to protocol at each survey station
- If a Kirtland's Warbler is detected on a survey immediately notify the Recovery Team

### **Monitoring Known Kirtland's Warbler Occurrences**

- Monitoring efforts should be undertaken from time of discovery until the birds vacate breeding territories in mid-July to late August
- Ensure that territory locations are precisely and accurately recorded
- Monitor territories to determine the presence of a female. Take photographs, video, and audio recordings of birds if possible
- Describe adult behaviour and any breeding evidence observed
- Describe habitat characteristics of territory
- Make note of other bird species present near territory
- Do not play recorded songs in known occupied habitats
- Be careful that bands, if present, are correctly reported. Ensure that colour combinations refer to the appropriate leg
- Do not approach nests or suspected nests**

### **Additional key points to remember**

- Use data sheets for all data collected
- Make copies of the original data sheets after each visit
- Reports of observations from each survey must be submitted to the Canadian Wildlife Service
- Surveyors must minimize the disturbance to Kirtland's Warblers, other birds, and the habitat
- If a nest is inadvertently located, the surveyor should carefully move away and record the location of the nest (UTMs or latitude/longitude, and directions to nest) and inform the Canadian Wildlife Service representative
- Do not provide locations of Kirtland's Warbler to birding hotlines or websites**
- No nest searches are to be conducted without appropriate permits and authorization**

## 4. References

Chambers, B.A., B.J. Naylor, J. Nieppola, B. Merchant, P. Uhlig. 1997. Field Guide to Forest Ecosystems of Central Ontario. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-01.

COSEWIC. 2008. COSEWIC Assessment and Update Status Report on the Kirtland's Warbler *Dendroica kirtlandii*, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 31 pp. ([www.sararegistry.gc.ca/status/status\\_e.cfm](http://www.sararegistry.gc.ca/status/status_e.cfm)).

Environment Canada. 2006. Recovery Strategy for the Kirtland's Warbler (*Dendroica kirtlandii*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vi + 23 pp.

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Mayfield, H.F. 1992. Kirtland's Warbler (*Dendroica kirtlandii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology (<http://bna.birds.cornell.edu/bna/species/019>)

### Additional Reading

Mayfield, H.F. 1960. The Kirtland's Warbler. Bloomfield Hills, Michigan; Cranbrook Institute of Science. 242 pp.

Walkinshaw, L..H. 1983. Kirtland's Warbler: The Natural History of an Endangered Species. Bloomfield Hills, Michigan; Cranbrook Institute of Science. 207 pp.

## Appendix A: Contacts

To obtain CD or MP3 recordings of the Kirtland's Warbler song, additional information, or for questions regarding any aspect of the survey methods, please contact:

Ken Tuininga  
Senior Species at Risk Biologist  
Canadian Wildlife Service  
Environment Canada – Ontario Region  
4905 Dufferin Street,  
Toronto, ON  
M3H 5T4  
Tel. 416-739-5895  
Fax 416-739-4560  
E-mail: Ken.Tuininga@ec.gc.ca

Daryl Coulson  
District Ecologist  
Pembroke District  
Ontario Ministry of Natural Resources  
31 Riverside Drive  
Pembroke, ON  
K8A 8R6  
Tel. 613-732-5563  
Fax 613-732-2972  
E-mail: Daryl.Coulson@ontario.ca

## **Appendix B: Field Equipment**

### **Survey Equipment**

- Song broadcast equipment (portable CD or MP3 players; sets of speakers; broadcast CDs; extra batteries). Carrying two sets of equipment is highly recommended in the event of equipment failure.
- GPS unit
- Flagging tape
- Compass
- Watch
- Road/topographic maps of survey area
- Aerial photos or photocopies

### **Maps**

- Road maps of survey area
- Landowner maps of survey area
- Habitat maps of survey area

### **Record Keeping/Identification Equipment**

- Field notebook (write-in-rain), pencils, clipboard
- Data sheets
- Copy of survey protocol
- Permits
- Binoculars
- Spotting scope
- Audio recording equipment
- Digital camera
- Field guide to birds
- Field guide to trees

### **Health and Safety Equipment**

- Cell phone
- Hat, sunscreen, sunglasses, cool but protective clothing
- Food/Water
- Mosquito repellent
- First aid kit

## Appendix C: Beaufort Scale

Wind speed should be recorded using the Beaufort Scale:

- 0 Calm. Smoke rises vertically.
- 1 Light air. Wind motion visible in leaves.
- 2 Light breeze. Wind felt on exposed skin. Leaves rustle.
- 3 Gentle breeze. Leaves and smaller twigs in constant motion.
- 4 Moderate breeze. Dust raised. Small branches begin to move.
- 5 Fresh breeze. Branches of a moderate size move. Small trees begin to sway.
- 6 Strong breeze. Large branches in motion.

## Appendix D: Other Bird Species

**Bird species likely to be observed in Kirtland's Warbler habitat in Canada:**

Scientific name	English name	French name	AOU Code
<i>Empidonax alnorum</i>	Alder Flycatcher	Moucherolle des aulnes	ALFL
<i>Setophaga ruticilla</i>	American Redstart	Paruline flamboyante	AMRE
<i>Poecile atricapillus</i>	Black-capped Chickadee	Mésange à tête noire	BCCH
<i>Toxostoma rufum</i>	Brown Thrasher	Moqueur roux	BRTH
<i>Molothrus ater</i>	Brown-headed Cowbird	Vacher à tête brune	BHCO
<i>Spizella passerina</i>	Chipping Sparrow	Bruant familial	CHSP
<i>Spizella pallida</i>	Clay-colored Sparrow	Bruant des plaines	CCSP
<i>Sialia sialis</i>	Eastern Bluebird	Merlebleu de l'Est	EABL
<i>Spizella pusilla</i>	Field Sparrow	Bruant des champs	FISP
<i>Catharus guttatus</i>	Hermit Thrush	Grive solitaire	HETH
<i>Vermivora ruficapilla</i>	Nashville Warbler	Paruline à joues grises	NAWA
<i>Vireo olivaceus</i>	Red-eyed Vireo	Viréo aux yeux rouges	REVI
<i>Poocetes gramineus</i>	Vesper Sparrow	Bruant vespéral	VESP
<i>Zonotrichia albicollis</i>	White-throated Sparrow	Bruant à gorge blanche	WTSP
<i>Dendroica coronata</i>	Yellow-rumped Warbler	Paruline à croupion jaune	YRWA

## Appendix E: Searching for Kirtland's Warbler Occurrences

<b>Unique Identifier (polygon or stand # from map):</b>				<b>Page:</b> ____ of ____	
<b>County/Municipality:</b>			<b>Geographic Township:</b>		
<b>Location Information</b> (describe precise location of site, include road names, landmarks, distances; attach map/aerial photo with scale, if possible):					
	<b>Time (24h)</b>	<b>Wind (Beaufort)</b>	<b>Air Temperature (°C)</b>	<b>% Cloud</b>	
<b>Start</b>					
<b>Finish</b>					
<b>Dominant Tree Species</b>	%Pj	%Pr	%Pw		
%Other (specify):					
<b>Pj Community</b>	%Cover:	Average Height (m):			
<b>Understory Species:</b> Blueberry: <input type="checkbox"/> Yes <input type="checkbox"/> No Sweet Fern: <input type="checkbox"/> Yes <input type="checkbox"/> No					
Other Understory Spp.:					
<b>Comments on Habitat Suitability</b> (topography, presence of sand, etc.):					
<b>Bird Species Present:</b> <input type="checkbox"/> Nashville Warbler <input type="checkbox"/> Hermit Thrush <input type="checkbox"/> Chipping Sparrow <input type="checkbox"/> White-throated Sparrow <input type="checkbox"/> Brown Thrasher <input type="checkbox"/> Black-capped Chickadee <input type="checkbox"/> Brown-headed Cowbird <input type="checkbox"/> Field Sparrow					
Other:					
<b>Source of Song Recording:</b>					
<b>Broadcasting Equipment (Make/Model):</b>					
<b>Comments on Playback:</b>					
<b>Survey Stations</b> (identify survey station locations on map/aerial photo)				<b>UTM Zone:</b>	<b>NAD:</b> <input type="checkbox"/> 27 <input type="checkbox"/> 83
<b>No.</b>	<b>Easting/Latitude</b>	<b>Northing/Longitude</b>	<b>Song Broadcast?</b>	<b>Number of Kirtland's Warblers</b>	
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					
			<input type="checkbox"/> Yes <input type="checkbox"/> No		
Notes:					

## Appendix F: Monitoring Known Kirtland's Warbler Occurrences

Unique Identifier (polygon or stand # from map):			Page: ____ of ____	
Date (DD/MM/YYYY):		Observers:		
County/Municipality:		Geographic Township:		
<b>Location Information</b> (describe precise location of site, include road names, landmarks, distances; <b>attach map/aerial photo with scale, if possible</b> ):				
Easting/Longitude :			Northing/Latitude:	
UTM Zone:			NAD: <input type="checkbox"/> 27 <input type="checkbox"/> 83	
	Time (24h)	Wind (Beaufort)	Air Temperature (°C)	% Cloud
<b>Start</b>			<b>Start</b>	
<b>Finish</b>			<b>Finish</b>	
<b>Time Bird(s) Detected:</b>				
<b>Description of Bird(s)</b>	<b>Sex (M/F/U):</b>	<b>Bands:</b>	Left Leg: /	Right Leg: /
	<b>Sex (M/F/U):</b>	<b>Bands:</b>	Left Leg: /	Right Leg: /
Video and/or song recorded?				
Distinguishing features between male and female:				
Behaviour:				
Breeding evidence:				
<b>Habitat Description:</b>				
<b>Bird Species Present:</b> <input type="checkbox"/> Nashville Warbler <input type="checkbox"/> Hermit Thrush <input type="checkbox"/> Chipping Sparrow <input type="checkbox"/> White-throated Sparrow <input type="checkbox"/> Brown Thrasher <input type="checkbox"/> Black-capped Chickadee <input type="checkbox"/> Brown-headed Cowbird <input type="checkbox"/> Field Sparrow				
Other:				
<b>Notes:</b>				

## Appendix G: Target Ecodistricts

Areas of Ontario with good potential for suitable Kirtland's Warbler breeding habitat (based on latitude, soils, physiography, and presence of Jack Pine) are indicated in yellow on the map below. Consult the Recovery Team to help determine the suitability of specific areas for Kirtland's Warbler searches.

