



## MANITOBA DRAGONFLY SURVEY

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### HOW TO ESTABLISH A DRAGONFLY SURVEY SITE

Collection of specimens from any location in Manitoba will be useful in documenting and expanding Manitoba records for our database. Specimens (and associated data forms) from a variety of locations you may visit during your travels throughout Manitoba are important for this survey. Also useful to our survey are regular visits to an **established monitoring site**. This handout contains detailed instructions on selecting and setting up a monitoring site, and should be used along with the “Manitoba Dragonfly Survey Citizen’s Monitoring Guide”.

Your monitoring site may be assigned in conjunction with an already established site (e.g., my frog and dragonfly monitoring sites are the same area), or it may be at another site of your choosing. To establish a survey site, it is best to select an area that is easily accessible. Frequent monitoring will be more easily accomplished if your monitoring site is close to your home or workplace. Some areas may be adjacent to a wetland, including a marsh, swamp, or bog, or any body of open water such as a lake, pond, river or stream. Monitoring natural habitats helps provide good baseline ecological data, but we are also interested in monitoring artificial or built habitats (such as golf course or farm ponds) as well as disturbed sites (including settling basins, or natural sites with known or suspected environmental impact problems).

At your chosen site, select a one-hundred foot length (or 30 meters) of habitat that seems most representative of the surrounding area, and mark the limits of that transect. Boundary markers could be small buoys in the water, ribbons tied to nearby shrubs or trees, prominent rocks or landmarks, or small flags planted close to the water's edge.

After measuring and marking your site's transect, make an assessment of the geographic and ecological features of the site. This information should be included on your survey data sheet. A copy of the data sheet is included with this guide, and additional sheets may be photocopied from it. Remember, having an established site doesn't preclude you from recording “that really neat dragonfly” just adjacent to your site.

## NOTING HABITAT FEATURES OF YOUR SURVEY SITE

### AQUATIC HABITAT

First, make notes about the **aquatic habitat** at your site:

- Is it natural, or is it a built environment such as a reservoir or garden pool?
- Is the water level fairly consistent or permanent throughout the growing season, or is it seasonally dry?
- If the water body is primarily standing water, is it in the form of
  - a pond (small, shallow, rooted aquatic vegetation throughout), or
  - a lake (greater than 10 feet deep, with unvegetated areas of open water).
- If the water body is primarily standing water, is it
  - **oligotrophic** (nutrient poor, usually deep rocky lakes with stratification),
  - **mesotrophic** (healthy, adequate plant and plankton productivity),
  - **eutrophic** (shallow, overly enriched with nutrients, algal blooms, low oxygen), or
  - **dystrophic** (polluted, stressed by physical and/or chemical inputs)?
- If the site has flowing water, is it
  - a stream or headwater stream with no tributaries,
  - a small river with some low order stream tributaries, or
  - a large river with many tributaries?
- If the site has flowing water, is there a current? You can measure current by casting a fishing bobber into the water alongside your transect (in this case a shoreline), then timing how long the bobber takes to float 10 feet. You can then calculate the distance travelled per minute.)
- What is the water clarity? Can you see the bottom substrate within a few feet of the shoreline?
- What is the water depth at 1 metre from shore?
- Can you obtain a reading for water pH? (a pH pen may be borrowed from the survey coordinator).
- Is the substrate, or soil surface under the water, characterized by rock, sand, silt, clay, or a mixture of some kind?

Finally, make note of whether the aquatic habitat at your site may have been disturbed, and whether it is a site monitored for some other purpose.

## SHORE LINE AND TERRESTRIAL HABITAT

It is useful to take note of the aquatic vegetation in the **littoral zone** (area between the high and low water marks) along the shoreline edge, and/or as well as the **terrestrial vegetation** (within 100 feet or 30 meters of the shoreline).

- Is your site bordered by or composed of
  - an open field (pasture or open yard),
  - a meadow (unmowed or ungrazed open area),
  - recently cleared or logged forest,
  - mature second growth forest (over 80 years since last clearing) or
  - old-growth forest (protected or undisturbed, not logged, mature trees)?
- What is the dominant tree or indicator plant?
- Is there a tree canopy, and is it continuous or broken?
- Are there layers of vegetation in the understory?
- What is the width of the buffer zone of terrestrial vegetation from shoreline to the nearest clearing or disturbance?
- The assessment of aquatic vegetation includes vegetation along the shoreline, as well as in the water. What kinds of plants are at the water's edge?
  - trees and bushes,
  - grasses, wildflowers or other herbaceous plants,
  - mosses or lichens, or
  - no vegetation?
- In the water right at the shoreline, are there
  - emergent plants such as cattails and reeds,
  - floating plants, like lily pads and duckweed,
  - submerged plants that are rooted and upright in the water column, but which do not break the surface of the water,
    - algae or prostrate plants covering the bottom or substrate, or
    - is the bottom open?
- How wide is the vegetated littoral zone as it extends from shore?
- Is the shoreline in a natural state, or has the vegetation been recently cleared or disturbed?
- Is there anything else noteworthy about the geography or ecology of your site?

You may not be able to answer all of these questions, but a good estimate will be helpful. Remember that changes in **daily weather conditions** may affect your survey observations. Different species of dragonflies not only exhibit different habitat preferences, they may behave differently even at their usual sites if the sites are disturbed or if the weather conditions are not optimal. If it is too hot or cool, too windy or cloudy, they may perch or become less active than usual. If you make careful field notes about these variables, your information will help us understand more about the biology and ecology of the different dragonfly species. When you fill out your data sheets, remember to note the general weather conditions for your site for that particular day. You can note whether there has been any recent precipitation, or an extreme event such as a thunderstorm or hail, and estimate the amount of shade or sunlight based on percent cloud cover. If you have an outdoor thermometer, try to record air temperature. You can make an estimate of wind speed using the Beaufort scale as follows:

#### **Beaufort # & Description (wind speed in Kph)**

- 0 smoke rises vertically (<2 Kph)
- 1 wind direction shown by smoke drift (2-5)
- 2 wind felt on face; leaves rustle (6-12)
- 3 leaves, small twigs in constant motion, light flag extended (13-19)
- 4 wind raises dust, loose paper, small branches move (20-29)
- 5 small trees in leaf sway, crested wavelets on inland waters (30-38)
- 6 large branches in motion, whistling heard in wires (40-50)

After your site has been established and a site evaluation has been made, you may begin regular surveys at your site. Twice a month is recommended, as new species will emerge every few weeks from mid-May through late summer. If you are monitoring adults, you should observe activity along your transect for about an hour per visit. You can catch flying adults, or observe adults emerging (called **teneral**s), or note species engaged in reproductive or egg-laying activity. You may list on your data sheet any species you are able to identify using your monitoring guide and/or previous experience. Keep any species that you are unable to identify so that they can later be identified for you. These specimens may be preserved, or they may be brought live (but refrigerated) to the Survey coordinator.

It is also helpful if you can give a relative estimate of abundance of the species that are present, as defined on your data sheet (1, 2-5, 6-20, a swarm of 21-50, a swarm greater than 50).

If you have an established transect at which you are surveying adults, you may also want to monitor emergence at your site by collecting the cast skins, or **exuviae**, left behind after the larvae have undergone transformation to flying adults. These exuvial skins may be found clinging to vegetation, rocks, stumps, docks, or other shoreline features along your transect. If you are able to collect all the exuviae along your site transect twice a month, it will help confirm the presence of species that have emerged there, as well as giving a more exact idea of which species are more dominant in number and which are less common. Exuviae may be collected in egg cartons or small partitioned tackle boxes, and later sorted by species and counted. You may not be able to identify the different species that you find, but you can sort them into groups and count them according to "Species A", "Species B", and so on. Save at least one representative specimen for each species you collect, and try to keep an accurate tally of how many of that species you were able to find in your transect during each site visit. I can assist with exuvial identification later on.

A complete survey for your site during a season would involve about seven site visits, during which time you would monitor the adults for an hour, and collect exuviae along your transect. You may not be able to do all this all the time, but any information you collect is a good contribution. And you may, in fact, find that you enjoy the fieldwork so much that you visit your site, or other locations, more often than you expected. The survey will begin to seem like a treasure hunt at times, and you may become more excited about your findings as you become increasingly familiar with species identification.

A word of warning: working in wetland and other areas can be dangerous -- you could slip and fall in the muck, get caught in a current, encounter a bear, trip on a submerged log, or sink into a hole in the bog. If you are working in a familiar place close to home, let someone know that you are off to your site so they can check on you if you don't come home in time. Whenever you are going further afield on a collecting expedition, always have a partner to help! Cell phones or 2-way radios are important too -- if you get your vehicle stuck in a swamp, tow trucks won't come after you but at least you can let someone know where you are.

Water socks or old sneakers should always be worn in areas where there are sharp rocks or the possibility of stepping on broken glass and litter. If you are working in an area where the water quality may be compromised, be sure to wear boots or hip waders. A polluted area may have chemical contamination as well as a high bacteria count, both of which could affect your health if you wade around in the midst of it all.

## DEER TICK NOTICE

Finally, beware of ticks. Always tuck your pant legs into your socks when you are in the field, especially in areas with long grass and a lot of brush. Examine yourself carefully when you return home. The deer tick is of special concern, as it sometimes carries the bacteria that cause Lyme disease. The deer tick is smaller than the wood tick and does not have white markings on the large part of the body. Should you develop a round red bulls-eye-like rash and/or joint pain, contact a physician. You can help in the study of Lyme disease in Manitoba by mailing or reporting deer ticks to:

**Dr. Terry Galloway, Department of Entomology**  
General Office, Room 214 Animal Sciences Building  
Fort Garry Campus, University of Manitoba, Winnipeg, MB R3T 2N2.

**MANITOBA  
DRAGONFLY  
SURVEY**



**DATA SHEET**

Please return to: **Jim Duncan**  
**Manitoba Wildlife Branch**  
**Box 24, 200 Saulteaux Cr.**  
**Winnipeg, MB R3J 3W3**

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
Telephone: \_\_\_\_\_  
Email: \_\_\_\_\_

Date: \_\_\_\_\_  
Time: \_\_\_\_\_  
Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Lat/Long, UTM coordinate or Legal  
Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Weather Conditions**  
General: \_\_\_\_\_  
\_\_\_\_\_  
Precipitation: \_\_\_\_\_  
Wind: \_\_\_\_\_  
% Cloud Cover: \_\_\_\_\_  
Air Temp.: \_\_\_\_\_  
Recent weather events: \_\_\_\_\_

**Aquatic Habitat** (Circle appropriate categories and fill in the blanks)

Natural	Built ( reservoir, farm pond, garden pool )					
Pond	Small lake	Large lake	Headwater stream	Small river	Large river	Bog
Marsh	Swamp	Other: _____				

  

Flowing	Standing	Temporary	Permanent	Water colour: _____		
Oligotrophic	Mesotrophic	Eutrophic	Dystrophic	Water depth: _____	pH: _____	

  

Bottom or substrate:	Rock	Sand	Silt	Clay	Mix
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Evidence of site disturbance: \_\_\_\_\_  
Other ecological notes: \_\_\_\_\_

**Terrestrial Vegetation** (Circle appropriate categories and fill in the blanks)

Open field or meadow	Recently cleared				
Grasses	Shrubs	Small Trees	Mature Trees	Old Growth Forest	
Open	Occasional trees	Open canopy	Closed canopy		
Understory layers: _____			Canopy layers: _____		

**Aquatic Vegetation**

Shoreline: open moss herbaceous grasses shrubs trees  
Water: open substrate submerged floating emergent  
Dominant plant type: \_\_\_\_\_  
Width of vegetated zone: \_\_\_\_\_  
Natural managed recently disturbed other: \_\_\_\_\_

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
Telephone: \_\_\_\_\_  
Email: \_\_\_\_\_

Date: \_\_\_\_\_  
Time: \_\_\_\_\_  
Location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Lat/Long, UTM coordinate or Legal  
Location: \_\_\_\_\_  
\_\_\_\_\_

Species	Exuviae (shed larval skins)	Newly emerged adults	Mature breeding Adults (territory, mating, oviposition)	Other	1	2-5	6-20	21-50	>50



# SPECIMENS OBSERVED BUT NOT COLLECTED

(DRAW OR SKETCH PROMINENT MARKS AND PATTERN)



