FISHERIES DATA COLLECTION FORMS MANUAL

Updated May 2006

In 2002, NB Aquatic Resources Data Warehouse, NB Department of Natural Resources and Energy, and NB Wildlife Council collaborated to create standardized data collection forms for various fisheries activities being undertaken by groups receiving Wildlife Trust Fund funding. The purpose of the forms is to ensure data is collected at the same level of detail and in the same manner. As a result, the following data collection forms have been created:

- Water Temperature Data Logger Form
- Fish Stocking Form
- Electrofishing Forms
- Individual Fish Measurements Form
- Aquatic Habitat Enhancement / Restoration Form
- Water Flow Calculation Form

These forms provide space to record many important details related to the specific activity, including particulars on the sampling site and methods used. Users should complete all applicable spaces on the forms. Accurately identifying the location of the activity is particularly important. Please record GPS coordinates if available, water body identification numbers (from NB Aquatic Resources Data Warehouse), and textual descriptions. Also note the locations on a 1:50,000 topographic map.

This manual describes the purpose of each form and provides instructions for completing complex or unfamiliar fields.

Upon completing the fisheries activity, please forward copies of all data, including paper forms, maps, and electronic files, such as digital photographs of sites, data logger output files, GPS coordinates, spreadsheets, Access files, etc., to one of the addresses below:

Wildlife Trust Fund Projects

NB Wildlife Council
1350 Regent Street, Room 206
Ancilliary Building
Box 23019
Fredericton, NB
E3B 7B3

Attention: Claire Caron

Other Projects

Department of Natural Resources and Energy
Fish and Wildlife Branch
Fisheries Management Program
PO Box 6000
Fredericton, NB
E3B 5H1

Attention: Fisheries Data Program

WATER TEMPERATURE DATA LOGGER FORM:

This form is used to record information about the site where each data logger is installed and details on the data logger and sampling regime. One form is filled out for each site and/or data logger. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Data Logger ID #: Unique number identifying the data logger (e.g., serial number or other number is permanently attached to the unit)

Data File Name: Name of the electronic file containing the information downloaded from the data logger located at this site. The downloaded file should be an ascii or text file, not a binary file (.bin extension). The file name should be unique and descriptive, referencing the site, logger ID and time period (e.g., Site T1 – Logger 4617 – 2002.asc). At the end of the project, downloaded files from all data loggers should be burned to a CD and forwarded to DNRE (address on Page 1)

Site ID #: Unique number to identify each temperature data logger site

Site Location Description / Directions: Use this area to describe the location of the site, including directions on how to get there. Try to be as clear as possible so others can locate the same site. Use feature names from topographic maps rather than local names, use mileages from landmarks, etc.

Site Coordinates: If using a GPS unit to determine coordinates of the sampling site, enter the GPS waypoint ID number to identify the site. Enter the longitude and latitude coordinates and the positional accuracy at the time the coordinate was taken. Record the coordinate system used by the GPS unit; most units have are set to WGS84 at the factory. Check system settings to be sure.

Start and End Dates: Dates and times when the data logger was installed in and removed from the water, as well as the dates of valid water temperature recordings. The latter set of dates represents the period the recorder is installed in the water and taking readings. The first and last dates represent complete 24 hrs of readings; do not enter first and last dates with partial readings. It is important to make these distinctions to determine which data are valid, as the temperature recording program may have begun/ended some time before or after the unit was placed in/removed from the water.

Sketch of Site and Data Logger Placement: Use this area to locate the exact position of the data logger in the stream. Add landmarks and measurements that will be helpful in locating the unit for removal.

Data Logger Details: Brand name, model, resolution, accuracy, standard temperature range, and recording options should be provided by the supplier.

Water ID: Contact the NB Aquatic Resources Data Warehouse for a list of stream/lake identifiers for your area

Drainage Code: Contact the NB Aquatic Resources Data Warehouse for the watershed code(s) in your area

It is important also to note other data collection forms that have been completed at this site. Check all boxes that apply at bottom right corner and specify others not listed.

FISH STOCKING FORM:

Before any moving of fish occurs, it is necessary to apply for and obtain a **New Brunswick Introductions and Transfers License**. This license may or may not be acquired by the hatchery on behalf of the individuals receiving the fish, so check with hatchery personnel before applying. To apply for a license or obtain more information, contact:

Andrée LeBlanc
Fisheries and Oceans Canada
Aquaculture Sciences Division
Gulf Fisheries Centre
343 Université Avenue
PO Box 5030
Moncton, NB E1C 9B6
Phone: (506) 851-6207
Fax: (506) 851-2079

This form is used to record information about the site where fish are stocked and details on the fish. One form is filled out for each site and each fish species and age class. If more than one fish species and/or age class are to be stocked at the same site on the same date, fill out a separate form for each; it is not necessary, however, to repeat the site information **as long as the site ID and date are completed**. Data entry codes for mark types and tag types are found on the reverse side of the form.

Use the *"Individual Fish Measurements Form"* to record information on individual fish, such as lengths, weights and tagging details. A sample of 20 fish is recommended to determine average lengths and weights, and this work should be undertaken 10 days before stocking to reduce stress on the fish. Hatchery personnel may already have this information, so check with them before repeating this work.

Keep all forms together that are used at one stocking site on the same date.

Listed below are some helpful data entry tips for certain fields on the "*Fish Stocking Form*" that may require further explanation:

NB I&T Licence #: Number of the **New Brunswick Introductions and Transfers Licence** which authorizes this stocking

Site ID #: Unique number identifying each stocking site

Site Location Description / Directions: Use this area to describe the location of the site, including directions on how to get there. Try to be as clear as possible so others can locate the same site. Use feature names from topographic maps rather than local names, use mileages from landmarks, etc.

Site Coordinates: If using a GPS unit to determine coordinates of the sampling site, enter the GPS waypoint ID number to identify the site. Enter the longitude and latitude coordinates and

the positional accuracy at the time the coordinate was taken. Record the coordinate system used by the GPS unit; most units have are set to WGS84 at the factory. Check system settings to be sure.

Species: Fish species name

Stock or Strain: Stock or strain of fish

Hatchery: Source of fish (i.e., hatchery name)

Life Stage: Check one box only. If "Adult", enter the age and check whether or not the fish were used as broodstock

Mark Type Applied: See list of mark type codes

Tag(s) Applied?: Check one box only. If "Yes", complete the *"Individual Fish Measurements Form"* to record all tag numbers and other information about each fish.

Fish ID Nos: Record the range of fish ID numbers assigned on the *"Individual Fish Measurements Form"*, if used, for fish stocked at this site

Water ID: Contact the NB Aquatic Resources Data Warehouse for a list of stream/lake identifiers for your area

Drainage Code: Contact the NB Aquatic Resources Data Warehouse for the watershed code(s) in your area

It is important also to note other data collection forms that have been completed at this site. Check all boxes that apply at bottom right corner and specify others not listed.

ELECTROFISHING FORMS:

Before any sampling of fish occurs, it is necessary to apply for and obtain a **license to fish for scientific purposes**. To apply for a permit or obtain more information, contact either the Maritimes (Scotia Fundy) Region or Gulf Region licensing officer, depending on the waters to be sampled (waters eventually draining into Bay of Fundy = Maritimes (Scotia Fundy) Region, waters eventually draining into Gulf of St. Lawrence or Northumberland Strait = Gulf Region):

Connie Farr, Licensing Officer
Fisheries and Oceans Canada
Maritimes Region (Scotia Fundy)
Resource Management
PO Box 1035
Dartmouth, NS B2Y 4T3
Phone: (902) 426-6453
Fax: (902) 426-9683
http://www.glf.dfo-mpo.gc.ca/sr-sc/index-e.html

Gaëlle Després, Licensing Officer
Fisheries and Oceans Canada
Gulf Region
Resource Management
PO Box 5030
Moncton, NB E1C 9B6
Phone: (506) 851-7776
Fax: (506) 851-6705

An electrofishing session refers to an electrofishing exercise at one site on one date. Create a unique number for each session, and enter it on all forms associated with that session. Keep all forms completed for one session together. There are four forms associated with an electrofishing session:

1. Electrofishing Site Form:

This form is used to record information about the electrofishing site and details on the methods and gear used. One form is filled out for each site. Note that water conductivity should be measured before electrofishing commences (see below). Listed below are some helpful data entry tips for certain fields that may require further explanation:

Fish Collection Permit #: Number of your license to fish for scientific purposes

Electrofishing Session ID #: Unique number to identify each session (refer to site ID and date)

Site ID #: Unique number identifying each electrofishing site

Site Location Description / Directions: Use this area to describe the location of the site, including directions on how to get there. Try to be as clear as possible so others can locate the same site. Use feature names from topographic maps rather than local names, use mileages from landmarks, etc.

Site Coordinates: If using a GPS unit to determine coordinates of the sampling site, enter the GPS waypoint ID number to identify the site. Enter the longitude and latitude coordinates and the positional accuracy at the time the coordinate was taken. Record the coordinate system used by the GPS unit; most units have are set to WGS84 at the factory. Check system settings to be sure.

Sketch of Site: Use this area to identify features of the site (e.g., different stream habitat types, substrate types, cover features such as boulders, large woody debris, overhanging vegetation) and indicate direction of flow with an arrow. Add landmarks and measurements that will be helpful in locating the site in the future.

Water Conductivity: This is the most important habitat measurement to take during electrofishing and should be measured before electrofishing commences, as it will determine the optimal settings on the electrofisher for the most efficient fish capture at that site (refer to owners manual of electrofisher). *Ambient Water Conductivity* (conductivity at existing water temperature) is the desired measure, but most conductivity meters measure *Specific Water Conductivity* (conductivity adjusted to a reference temperature, usually 25?C; refer to owners manual of electrofisher). **Either adjust conductivity meter to read Ambient Conductivity (if meter has this option), or use formula below to calculate Ambient Conductivity.**

$$C_a = \frac{C_s}{1.02^{(Ts - Ta)}}$$

where:

C_a = Ambient Water Conductivity (?S/cm)
C_s = Specific Water Conductivity (?S/cm) - from meter
T_a = Ambient Water Temperature (?C)
T_s = Specific Water Temperature (?C) - meter's reference temperature, usually 25?C

Water ID: Contact the NB Aquatic Resources Data Warehouse for a list of stream/lake identifiers for your area

Drainage Code: Contact the NB Aquatic Resources Data Warehouse for the watershed code(s) in your area

It is important also to note other data collection forms that have been completed at this site. Check all boxes that apply at bottom right corner and specify others not listed.

2. Electrofishing Field Tally Form:

This form is used to tally each fish caught into one of many length increments and one of four sweeps. More than one form may be required for each electrofishing session, if more than 2 species are tallied by length and sweep. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Electrofishing Session ID #: Unique session identification number established on the *"Electrofishing Site Form"*. It is important to carry this number over onto all electrofishing forms to keep the session information together.

Site ID #: Unique site identification number established on the *"Electrofishing Site Form"*

Individual Fish Measurements Form completed: Check this box if the *"Individual Fish Measurements Form"* was completed to record more information than just length on each fish e.g., measure weight on a sample of fish (approximately 20) from each age class to calculate biomass, if desired

More Tally Sheets Completed: Check this box if more tally forms were used to count fish of more than 2 fish species by length and sweep. List the page numbers at the top of each page

Length: Check "Fork" or "Total" for each fish species being tallied by length. Enter a dot for each fish in the appropriate length increment. Each length noted indicates the low end of the increment; for example, the "42 mm" increment will record fish measuring from 42 mm to 43.9 mm. If the fish measures less than 40 mm or greater than 160 mm, write out the length instead of placing a dot in the appropriate space.

Sweep Number (No. Shocking Seconds): Tally fish by sweep, and include the number of shocking seconds for each sweep in the parentheses. Sweep 1 is separated into the first 180 seconds and the remainder of the sweep; this is to allow the calculation of a standard catch rate.

Other Species: Use this space to tally numbers of fish for which a population estimate will not be calculated (e.g. minnows). Enter the species name, then the dot tally of fish by sweep. If entering only a total count, write "total" beside the count.

3. Electrofishing Data Summary Form – Part 1:

This form is used in the office to summarize the field tally sheet. **Each row in this summary form represents one length increment of one species.** Total counts of the dot tallies are entered for the number of fish of that length increment caught in each sweep for each species. (If no fish of a species were caught of a specific length increment, no entry is made for that length.) More than one form may be required for each electrofishing session, if more rows are needed to record all length increments of all species of fish captured. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Electrofishing Session ID #: Unique session identification number established on the *"Electrofishing Site Form"*. It is important to carry this number over onto all electrofishing forms to keep the session information together.

Site ID #: Unique site identification number established on the *"Electrofishing Site Form"*

More Tally Sheets Completed: Check this box if more tally forms were used to record counts of all fish of all length increments and species. List the page numbers at the top of each page

Age Class: Age or age class (e.g., 0+, 1+, 2+, fry, parr) of the fish of that length increment. Age is determined by observing bell-shaped groupings in the tallies for each age class. There will be a high number of fish tallied of the average size within the grouping, then the numbers of fish will gradually decrease for larger and smaller fish of that age class. The next age class will be represented by a similar bell-shaped grouping of the tallies. The gap between bell curves indicates the break between different age classes.

Once all fish of an age class have been recorded by increment, add a summary row immediately beneath with the total counts for each sweep of all fish of that species and age class. These sweep totals will be used to calculate the population estimate. If the age class for a species is unknown, enter total sweep counts of all fish of that species.

Length: Length increment value under the appropriate column, "Fork" or "Total", as measured in the field

Ave. Weight (gm): Average weight of the age class if samples were weighed.

Number of Fish Captured: Enter the dot tally total for each length increment of each fish species by sweep. If individual sweep counts were not recorded for a species, enter total counts of all fish of that species; this would only apply when a population estimate for fish species is not required.

4. Electrofishing Data Summary Form – Part 2:

This form is used in the office to record summary statistics of the populations of each fish species by age class. **Each row in this summary form represents one age class of one species.** Complete all applicable fields. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Electrofishing Session ID #: Unique session identification number established on the *"Electrofishing Site Form"*. It is important to carry this number over onto all electrofishing forms to keep the session information together.

Site ID #: Unique site identification number established on the *"Electrofishing Site Form"*

Fish Species: Refer to the species code list at the bottom of the form

Age Class: Age or age class (e.g., 0+, 1+, 2+, fry, parr) of the fish species

Length Code: Code indicating whether average length represents total length or fork length

Average Length: Average length (mm) of the species and age class

Average Weight: Needed to determine the biomass of the site. Use the *"Individual Fish Measurements Form"* to record the individual weights of the sample of fish measured.

Density (no./100m^2): Determined for each age class of each species by first calculating the probability of capture (P):

$$P = \frac{-(K? Tx - ? T? x)}{K? x^2 - (? x)^2}$$

then the population estimate (N):

$$N = \frac{? T + P? x}{KP}$$

then the density (D):

$$D = \frac{N}{(\text{area of site } /100)}$$

where K = number of sweeps completed
T = number of fish caught per sweep
x = cumulative number of fish removed in previous sweep(s)

Biomass (g/100 m^2): Determined for each age class of each species by multiplying the number of fish per age class by the average weight per age class, then dividing by the site area and multiplying by 100

Percent Habitat Saturation: Determined for each age class of each salmonid species (trout and salmon):

$$PHS = 100 \times D \times T \times 1.19$$

where D = density (no./m^2)
T = territory size ($\log_{10}T = 2.61 \log_{10}$average fork length (cm) – 2.83)
1.19 = correction factor

INDIVIDUAL FISH MEASUREMENTS FORM:

Before any sampling or handling of fish occurs, it is necessary to apply for and obtain either a **license to fish for scientific purposes** or a **New Brunswick Introductions and Transfers License,** whichever applies. See **"ELECTROFISHING FORMS"** or **"FISH STOCKING FORM"** section for contact information.

This form is used to record information on individual fish during one sampling session or activity. **Each row in this form represents one fish.** Each form can hold information on up to 20 fish. In addition to this form, forms documenting details on the site and methods for the activity used to collect the sample must also be completed; include the *"Individual Fish Measurements Form"* with the others from the activity. Data entry codes are located at the bottom of individual columns or on the reverse side of the form. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Site ID #: Unique site identification number established on the activity site form

Weighing Device: Type of device used to weigh the fish (e.g., electronic balance, spring scales)

Licence #: Number of your license and indicate whether the work is covered under a license to fish for scientific purposes (Fish Collection) or under an Introductions and Transfers License

Sampling Method Used: Check only one box to indicate the method used to obtain the sample of fish, or specify the activity if not listed. The user must also complete the corresponding forms for that activity (e.g., details on site and methods)

Fish ID Number: Unique fish identification number for each fish in the sample (begin sequentially at 1)

Length: Enter either or both fork and total length fields

Age Class: Age (e.g., 0+, 2+) if known (e.g., from subsequent scale analysis or from hatchery records) or age class (e.g., fry, parr, grilse, salmon) of the fish sampled

More Sheets Completed: Check this box if more sheets were used to record measurements of fish during the sampling session. List the page numbers at the bottom of each page

AQUATIC HABITAT ENHANCEMENT / RESTORATION FORM:

Before any enhancement or restoration work occurs in or within 30 metres of aquatic habitats, a **Watercourse Alteration Permit** may be required. To apply for a permit or obtain more information, contact:

Department of Environment and Local Government
Regional Services Branch
Watercourse Alteration Program
PO Box 6000
Fredericton, NB E3B 5H1
Phone: (506) 457-7363
Fax: (506) 453-6862

This form is used to record information about enhancement or restoration work in aquatic habitats **after it has been completed**. One form is filled out for each site where work has occurred. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Watercourse Alteration Permit #: Number of your **Watercourse Alteration Permit** authorizing this work

Site ID #: Unique number to identify each aquatic habitat enhancement or restoration site

Site Location Description / Directions: Use this area to describe the location of the site, including directions on how to get there. Try to be as clear as possible so others can locate the same site. Use feature names from topographic maps rather than local names, use mileages from landmarks, etc.

Site Coordinates: If using a GPS unit to determine coordinates of the sampling site, enter the GPS waypoint ID number to identify the site. Enter the longitude and latitude coordinates and the positional accuracy at the time the coordinate was taken. Record the coordinate system used by the GPS unit; most units have are set to WGS84 at the factory. Check system settings to be sure.

Water ID: Contact the NB Aquatic Resources Data Warehouse for a list of stream/lake identifiers for your area

Drainage Code: contact the NB Aquatic Resources Data Warehouse for the watershed code(s) in your area

It is important also to note other data collection forms that have been completed at this site. Check all boxes that apply at bottom right corner and specify others not listed.

WATER FLOW CALCULATION FORM:

This form assists the user to determine stream water flow. It contains boxes for recording the necessary measurements, provides the flow calculation formula and displays a sketch of various stream measurement definitions. If this calculation is undertaken during another sampling exercise at the same site, attach this form to the corresponding site/methodology form. Listed below are some helpful data entry tips for certain fields that may require further explanation:

Site ID #: Unique number to identify each site; if done in association with another sampling exercise at the same site, enter the unique site identification number established on the corresponding site/methodology form

Associated Data Collection Activity: Check only one box to indicate the other sampling exercise at this site, or specify the activity if not listed

Wet Width: Width (in metres) of the water from left bank to right bank (see "Wet Channel Width" on sketch)

Depths: Depth (in metres) of the water taken ¼, ½ and ¾ of the way across the wetted width of the stream. To determine average depth, divide the sum of the three depths by 4.

Coefficient: Coefficient for the roughness of the streambed. Enter 0.8 for rough (rocks, boulders) or 0.9 for smooth (mud, clay, sand, bedrock)

Float Length: Measured length (in metres) of the float (typically 3 metres)

Float Time: Time (in seconds) required for the float to travel the pre-established float length at a point ¼, ½ and ¾ of the way across the wetted width of the stream. To determine average time, divide the sum of the three measured times by 3.