THE IDENTIFICATION OF LIVING THINGS

Is it important for non-professional nature enthusiasts to know the names of organisms they encounter in the field? And if so, why or in what way(s) does it matter?

Birds (Class Aves) American Woodcock (*Scolopax minor*) in Neguac, photo by Aldo Dorio, Apr 14, 2015

MOTH (Order Lepidoptera)

White-banded Toothed Carpet (*Epirrhoe alternata*)

at Miramichi Marsh, photo by Peter on June 13, 2011

REPTILES - Smooth Green Snake (*Opheodrys vernalis*) at French Fort Cove, held by Ken , photo by Jim, Aug 22, 2015

AMPHIBIANS - Spring Peeper (*Hyla crucifer*) at Fundy National Park June, 2014, photo by Phil Riebel

ARACHNIDS - Probably Nordman's Orbweaver female spider (*Araneus nordmanni*), photo by Jim at French Fort Cove, Aug 22, 2015

PLANTS (VASCULAR) - Silverrod (*Solidago bicolor*)

along Miramichi R. near Middle Island, photo by Hazen, Sep 9, 2015

PLANTS

(NON-VASCULAR MOSS & LICHEN)

Juniper Hairy Cap Moss (Polytrichum juniperinum) and Reindeer Lichen (Cladina rangerifina) at Redmondville, photo by Jim, Jan 3, 2012

WHY DOES IDENTIFICATION MATTER?

Is it important for non-professional nature enthusiasts to know the names of organisms they encounter in the field? And if so, why or in what way(s) does it matter?

It's obviously important for list-recording birdwatchers to know the names of birds, but are there other watchers of birds who are not interested in identifying them? And what about less popular subjects such as non-vascular plants, or molluscs, or types of galls, or fossils, etc.? How about inanimate nature such as rocks, weather phenomena, or astronomical objects? Is it possible to not care about the names of things and still be considered a nature enthusiast? Might this describe any Miramichi Naturalists' Club members?

Robert Bateman has lamented that young people today can recognize more than a thousand corporate logos but would be hard-pressed to name a small number of birds or other species of wildlife.
http://cwf-fcf.org/en/discover-wildlife/resources/magazines/canadian-wildlife/so2012/robert-bateman.html
In the same article he recalls being dismayed upon hearing his students talk about a tree whose identity they didn't know and didn't care to learn.

In the Roger S. Keyes poem, "Hokusai says" it states, in part:

It doesn't matter if you draw, or write books. It doesn't matter if you saw wood, or catch fish. It doesn't matter if you sit at home and stare at the ants on your veranda or the shadows of the trees and grasses in your garden.

It matters that you care.
It matters that you feel.
It matters that you notice.
It matters that life lives through you.

… and so I thought maybe this "why" question was worth considering in connection with tonight's presentation about the identification of various species of flora and fauna.

(This is an abridged version of an article written by my brother, Robin McLeod, that appeared on page 37 of “The Cardinal, No. 240, Aug. 2015”, the quarterly magazine published by Nature London, the McIlwraith Field Naturalists of London, Ontario, Inc.)

MOTIVATION

It all begins with the curiosity about the diversity of life with which we share the world.

It then follows with a desire to share one's experience and discoveries with others.

This usually also results in a desire to leave a record for posterity of one's discoveries in the form of photos, specimens destined for a museum, and field notes or databases.

PURPOSE OF IDENTIFICATION

1. To give a unique name to something perceived to be different from similar-looking objects.

2. To communicate with others by using either a common or scientific name.

STEPS IN THE IDENTIFICATION PROCESS FOR SCIENTIFIC PURPOSES

1. Invention of a way to recognize how one organism differs from all other organisms by ranking it within a hierarchical system.
2. Invention of a standardized method of naming each unique organism.

Fortunately, both inventions have already been made. The resulting process is known as classification which involves both ranking and naming systems.

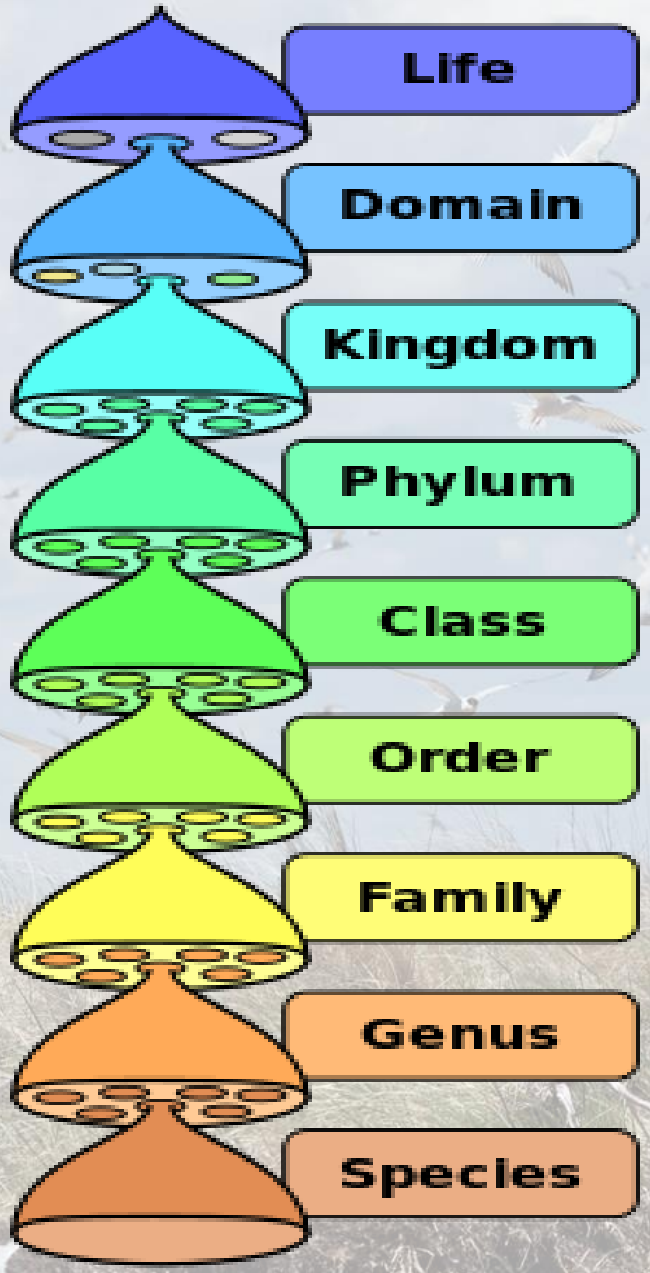
CLASSIFICATION

It's a system of giving every organism a unique status and name that involves placing it in each taxon (pl. taxa) of 8 ranks and providing it with a two-part name.

TAXONOMIC ORDER

Under the category of all living things (organisms), life has now been divided into 8 ranks or levels (taxa) as follows:

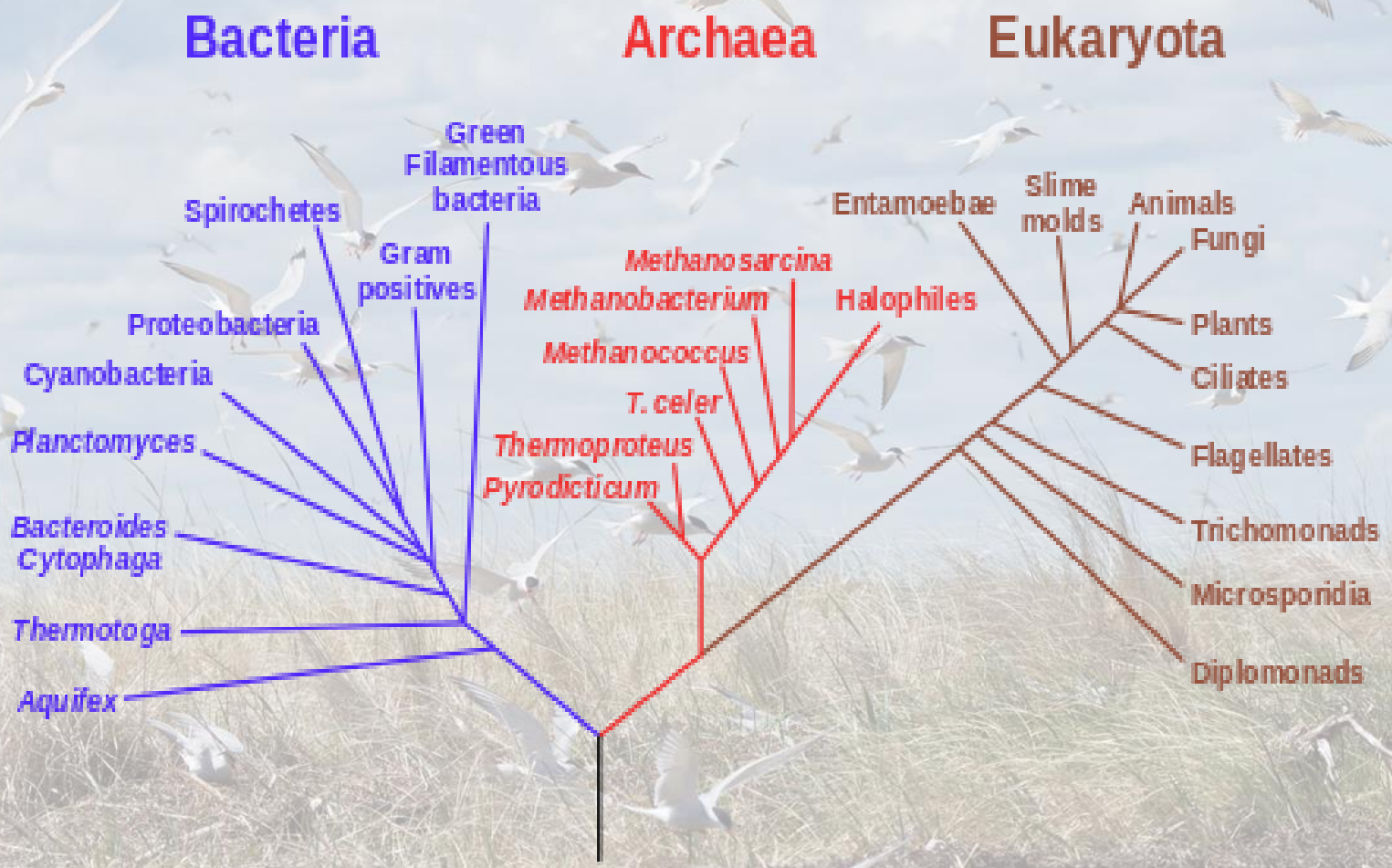
TAXONOMIC ORDER



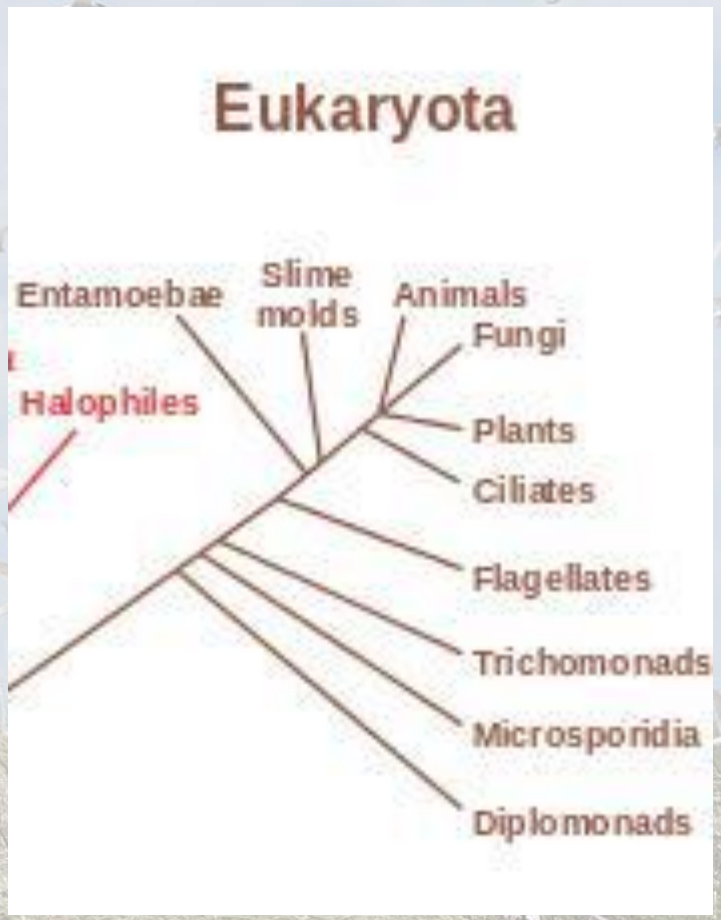
DOMAINS

The following three domains are now recognized as shown in the diagram below:

Phylogenetic Tree of Life



Note that the only domain in which the average naturalist would be interested is the Eukaryota which contains the four kingdoms: Plants, Fungi, Animals, and Slime Molds. These are the only ones that have macroscopic dimensions and can be seen by normal human vision without the aid of higher powered microscopes during the course of a field outing.



Binomial Nomenclature

The formal introduction of this system of naming species is credited to Swedish natural scientist, Carl Linnaeus, effectively beginning with his work *Species Plantarum* in 1753.

It is a formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms though they can be based on words from other languages. Such a name is called a **binomial name** (which may be shortened to just “binomial"), or a **scientific name**; more informally it is also called a **Latin name**.

Binomial Nomenclature cont'd

The first part of the name identifies the genus to which the species belongs; the second part identifies the species within the genus. For example, humans belong to the genus *Homo* and within this genus to the species *Homo sapiens*.

Binomial Nomenclature Rules

Because scientific names are unique species identifiers, they ensure that there is never any confusion as to which organism a scientist may be referring. Additionally, there are some important rules that must be followed to keep all binomial names standardized:

Binomial Nomenclature Rules cont'd

1. The entire two-part name must be written in italics (or underlined when handwritten).
2. The genus name is always written first.
3. The genus name must be capitalized.
4. The specific epithet is never capitalized.

INFORMATION SOURCES

WEBSITES

BOOKS

REGIONAL CHECKLISTS

DICHOTOMOUS KEYS

WEBSITES

- Insects and Arachnids http://bugguide.net/node/view/15740
- Moths http://mothphotographersgroup.msstate.edu/
- Birds http://birdingnewbrunswick.ca/
- Vascular Plants http://unbherbarium.ca/quicksearch
- http://plants.usda.gov/gallery.html
- Atlantic Canada Conservation Data Centre http://www.accdc.com/

BOOKS

- Field Guides for various groups for different regions
  - "Birds of Canada" (Godfrey, 1986)
  - "The Butterflies of Canada" (Layberry *et al.*, 1998)
  - "Flora of New Brunswick, Second Edition" (Hinds, 2000)
  - "The Sibley's Guide to Birds, Second Edition" (Sibley, 2014)
  - "the Insects and Arachnids of Canada" 14 + Parts, various orders by various authors
  - "Dragonflies and Damselflies of the East" (Paulson, 2011)
  - "Lichens of North America" (Brodo *et al*. 2001)
  - "Breeding Birds of the Maritime Provinces" (Erskine, 1992) (The latest atlas should be available soon.)
  - "Land Mammals of New Brunswick" (Dilworth, 1984)
  - "The Mammals of Canada" (Banfield, 1974)
  - "Introduction to Canadian Amphibians and Reptiles" (Cook, 1984)
  - "Moss Flora of the Maritime Provinces" (Ireland, 1982)

REGIONAL CHECKLISTS

- “Checklist of Beetles of Canada and Alaska” (Bousquet, 1991)
- “New Brunswick Birds” (NB Bird Records Committee, 2011)
- “The Inventory of the Flora and Fauna of the French Fort Cove Nature Park” (F. F. C. Development Commission, 2005)
- “Check List of the Lepidoptera of America North of Mexico” (Hodges *et al*., 1983)

SUGGESTION

If you have not identified a particular species before, be sure to check the normal range of occurrence and the rarity of that species in the area before settling on that determination. If it turns out to be rare or when it is beyond the known range, it would be best to check with someone else with more experience or a known expert in that group.

DICHOTOMOUS KEYS

Most of the previously-mentioned books contain dichotomous keys that provide two mutually exclusive choices at each step on the way to a final identification.

- A pictured-key "How to Know" nature series for a vast array of taxonomic groups of North America from tapeworms and trematodes, to aquatic plants, fungi, mosses and liverworts, beetles, birds, mammals, etc. by various authors are useful. The series is published by Wm. C. Brown a Google search will find many of them available from most booksellers.

Photographers' Tips to Aid Identification

1. When photographing inanimate or slow-moving objects like plants or caterpillars, try to include a scale of some kind (like a coin) that will allow an actual length calculation of the object.

Photographers' Tips to Aid Identification

2. For birds, it's helpful to show other species of known identity with the unknown one that will indicate its relative size, as is often possible at a feeder or with a mixed flock of gulls standing on ice. If not a video, it's also useful information to note the bird's behaviour (fly-catching, probe feeding, etc.), and any conspicuous body motion such as tail pumping, wagging, or flicking, hopping versus walking, neck stretching, wing motion upon landing, etc.

Photographers' Tips to Aid Identification

3. Several views of the same bird, mammal, etc., from different directions are always helpful and will reveal more clues to its identity, age, and sex in some cases, than just a single photo will. See the two Chipping Sparrow photos below of five taken in Nelson by Verica on June 20, 2015, as an example.

Photographers' Tips to Aid Identification

4. When photographing plants, in addition to taking a shot of the entire plant, try to get several shots of the different parts of the same one, including the flower from above and the side, both stem and basal leaves (if present), and the stem itself to see how the leaves are attached and the type of hairs (if any) that are present

Photographers' Tips to Aid Identification

5. Note the habitat type (deciduous, coniferous, or mixed forest, swamp, bog, open field, shrubby area, freshwater or saltwater shore, etc.) and whether the site is wet, moderate or dry. This is often critical information that will help to clinch an identification.

Photographers' Tips to Aid Identification

6. If the names of some of the associated plants are known, it's helpful to record them, because the common associates can often be clues. For example, if the photo is of a fungus such as a bolete species, some are restricted to growing only under certain species of trees.

Chipping Sparrow (*Spizella passerine*) in Nelson, photo by Verica, June 20, 2015

Chipping Sparrow in Nelson 2, photo by Verica, June 20, 2015

Dragonflies - Rusty Snaketail, (*Ophiogomphus rupinsulensis*), photo by Verica, July 15, 2015

MAMMALS – Porcupine (*Erethizon dorsatum*) at Escuminac, photo by Anne, Nov 22, 2014

Crickets - Allard's Field Cricket female (*Allonemobius allardi*), at Hay Island, photo by Aldo, Nov 2, 2015

Ragbag Lichen (*Platismatia glauca*) eaten by Gus, the Red Squirrel at Redmondville, photo by Jim, Dec. 22, 2015

Solitary Sandpiper (*Tringa solitaria*) at Miramichi Marsh, photo by Ken, May 11, 2015

INSECTS - *Crataegus* or Hawthorn Leaf Gall made by *Lestodiplosis crataegifolia*, (Order Diptera) a midge (probably predacious), photo by Jim at French Fort Cove, Aug 22, 2015

Lestodiplosis sp. of midge, photo by Steve Nanz, 2013, from internet, Jan 18, 2016

Pelecinid Wasp (*Pelecinus polyturator*) female at Hay Island, photo by Verica, Sep 12, 2015

Norway Maple (*Acer platanoides*) at Ritchie Wharf, photos by Verica, June 20, 2015

Norway Maple (*Acer platanoides*) variegated variety grafted onto standard-coloured at Ritchie Wharf, photo by Verica, June 20, 2015

American Lady (*Vanessa virginiensis*) at Strawberry Marsh, photo by Verica on Sep 23, 2015

? Gull species at Oak Point, photo by Peter, Jan. 2, 2016