The ***deeri*Nature** Almanac

What is the *i* in *deeri*Nature? Is it *information, internet?* How about *identification*. When you go out on the Deer Isle preserves, what species are you almost certain to encounter? Which ones might you wish to identify? Then how do you organize your experience so that learning about the nearly overwhelming richness of nature becomes wonderfully satisfying?

A century ago every farmer, medicine woman, and indeed any educated man or woman felt that they should have a solid knowledge of the plants around them. The Fairbanks Museum in St. Johnsbury, Vermont has maintained a Flower Table with labeled specimens since 1905. The Deer Isle-Stonington Historical Society has an antique herbarium collection made by Ada Southworth, a Dunham's point rusticator. Today there are lovely field guides galore but the equivalent of a local list can come to you now by digital download.

Here is an almanac, a list of likely plant and animal species (and something about rocks too) for our Deer Isle preserves, arranged according to season and habitat. Enjoy this free e-Book on your desktop, tablet or smartphone. Take this e-book

with you on the trails and consult the Point of Interest signs. If you have a smartphone and adequate coverage, at some preserves a QR code will tell you more at the Points of Interest.

After each category on the lists you will find suggestions for books to consult or acquire. You will have to read the on line reviews for apps as that field is developing too rapidly for any other approach. The following lists help make certain that you will succeed in your efforts at plant or animal identification. You will be rewarded and you will probably be inspired to continue exploring. Here is an enterprise, a passion, that will stay with you for the rest of your life.

These days one is supported by amazing resources on the Internet and many excellent field guides. With the lists here you now have essentially your own private guide, a teacher with years of experience who can narrow the possibilities to a reasonable number. The list of names allows you to look up any plant or animal with a Google search or whatever is your favorite search engine. You will find images and references there. Now it's up to you. On long winter nights, on rainy afternoons, on hot still noons when no creature is stirring—that is when you apply yourself to learning the field marks, habits and habitats of the species on the following "Likely Lists", first for the plants and then for the animals you will meet.

Then go out in the field and allow yourself to be surprised. Nature will delight you by presenting one new "old friend" after another. Just as foreign language students learn a few phrases to get them through ordinary conversation, familiarity with these species common to most of our larger preserves and their trails will make you feel right at home. Many of us are willing to learn enough French to enjoy being a tourist in Paris, so why not try the same technique for the green world? Parlez-vous *chlorophyll*?

An entertaining and efficient way for anyone of any age to learn to recognize plants is to make your own Flower Table, a Botany Bottle if you will. Choose one plant a day. Bring a specimen into your living space for a day or two. Identify it and write the plant's common and scientific names on a label. Repeat this from first frost to last frost –or for whatever time period you have available. The world will look different, greener, to you ever after.

Successful Self-guiding—the "Likely" Lists

You may think it is pretentious to lists the plants and animals by their scientific names. However, should you wish to look up a species on the web, you will find it very helpful to use this name to be certain you have the species you are looking for.

PLANTS

FAMILIAR FORTIES - plants grouped by form, season and habitat as appropriate.

Here you will find scientific name, common name and perhaps some pertinent facts. There are 2,100 species of plants in Maine. There are 862 species included in our favorite resource, The Plants of Acadia National Park. The plant species list for Scotts Landing alone probably totals close to three hundred plants, and if you included grasses, sedges, rushes and lichens, you would double that number. Most of our other preserves are spruce-clad forests with yet another set of characteristic plants. And yet, if you live on Deer Isle or visit frequently, you will realize that there are indeed a few "familiars" you will meet on our preserves, or for that matter, all over this Island.

We have listed here the names of the most likely plants so that you can use them to look up the specimen in the index of The Plants of Acadia National Park or on the web. Thirty to forty or even fifty somehow feels like a manageable number so we have grouped various types of plants in those numbers.

WOODY PLANTS - TREES AND SHRUBS AND VINES
TREES

Our forests have layers that give them what ecologists call "structure". Above the ground cover of mosses, lichens, and non-woody plants is the shrub layer. The next layer is small trees, and over all is the canopy layer, the tallest trees. The survival of many birds and animals depends on particular characteristics of various layers of this structure. When man simplifies this profile by over-zealous lollipopping—that is, pruning away the lower limbs of trees as high as a man with a chain saw can reach—and removing all brush, we impoverish the environment.

CANOPY TREES

If the forest is young, the canopy may be a mix of red maple, poplar species, and pine, to be replaced by spruce or some mix of oaks, sugar maple, beech and hemlock.

- red spruce *Picea rubens*
- white spruce *Picea glauca*
- balsam fir *Abies blasamea*
- American larch *Larix laricina*
- Northern white-cedar *Thuja occidentalis*
- red maple *Acer rubrum*
- red oak *Quercus rubra*
- paper (white) birch *Betula papyrifera*
- yellow birch *Betula allaghaniensis*
- big-toothed aspen (popple) *Populus grandidentata*
- trembling aspen *Populus tremuloides*

SUB-CANOPY SHRUBS

Next more or less in order of descending height, are shade-tolerant shrubs, small tree species, and saplings of shade-tolerant trees which will become the next canopy.

- striped maple *Acer pensylvanicum*

- shadbush, serviceberry *Amelanchier spp.*
- chokecherry *Prunus viginiana*
- pincherry *Prunus pensylvanicus*
- speckled alder *Alnus incana*
- staghorn sumac *Rhus hirta*
- winterberry *Ilex verticillata*
- wild-raisin *Viburnum nudumv cassioides*
- bayberry Myrica pensylvanica
- pussy willow *Salix discolor*
- stinking or red elderberry *Sambucus racemosa*
- rhodora *Rhododenron canadense*
- wild roses *Rosa virginiana* and *Rosa rugosa*
- blackberry vs raspberry *Rubus* may be hybrids, naturalized
- (The one with the really vicious prickers is blackberry)
- sweetfern *Compontia peregrine*
- (The leaves resemble fern fronds but this is a member of *Myracacea*)
- meadowsweet *Spirea alba*
- steeplebush *Spirea tomentosa*
- black huckleberry *Gaylussacia baccata*
- low-bush blueberry *Vaccinum angustifolium*
- sheep laurel *Kalmia angustifolia*

VINES

- poison ivy *Toxicodendron radicans*
- Asiatic bittersweet *Celastrus orbiculatus*

WOODLAND WILDFLOWERS

In deciduous forests these are mostly spring ephemerals, species that bloom quickly before the leaves come out overhead, when there is more light. Here on

Deer Isle the plants of this herbaceous layer must be not only shade-tolerant but able to thrive on our acidic soils.

- bunchberry *Cornus florida*
- mountain cranberry *Vaccinium vitis-idaea*
- Canada mayflower *Maianthemum canadense*
- goldthread *Coptis trifolia*
- Jack-in-the-pulpit *Arisaema triphyllum*
- partridgeberry *Mitchella repens*
- starflower *Trientalis borealis*
- twinflower *Linnaea borealis*
- wintergreen *Gaultheria procumbens*

FIELD FLOWERS

The FAMILIAR FIRST FORTY of a flowery meadow is a challenge in itself. Both Scott's landing and Mariners Park were once farms and the Tennis preserve is the site of two former farmsteads. It should not be a surprise that we find apples and hawthorn and common weeds of hay growing there. Yes, this is a whole other category to learn but since many of these are the common weeds of your lawn and your gardens, it seems worth the effort. An asterisk marks the non-native members of the list of common field flowers. (Would you like ragweed any better if you knew it was native?) :

- Queen-Ann's Lace* *Daucus carota*
- common milkweed *Asclepias syriaca*
- yarrow* *Achillea millefolium*
- ragweed *Ambrosia artemisiifolia*
- pearly everlasting *Anaphalis margaritacea*
- pussytoes *Antennaria howellii*
- burdock* *Arctium minus*
- chicory* *Cichorium intybus*
- thistles* *Cirsium arvense and vulgare*
- asters several species of white and purple aster are worth learning *Symphyotrichum spp*
- hawkweeds* orange hawkweed *Hieracium aurantiacum* and yellow species
- ox-eye daisy* *Leucanthemum vulgare*

- black eyed Susan *Rudbeckia hirtus*
- goldenrod classic and common species of goldenrod *Solidago canadensis* etc
- dandelion* *Taraxicum officinale*
- yellow rattle *Rhinantus minor*
- dames rocket* *Hesperis matronalis*
- chickweed *Cerastium arvense*
- garden valerian* *Valeriana officinalis*
- vetchling (yellow)* *Lathyrus* spp, Beach-pea, *Lathryus japonicus*
- cow vetch*,(blue) *Vicia* crown-vetch*(pink) *Securigera varia*
- clovers*, *Trifolium*, red in the field, white in the lawn
- common St. John's-wort* *Hypericum perforatum*
- blue flag *Iris versicolor*
- blue-eyed grass *Sisyrinchium montanum*, not a grass but an iris relative
- self-heal* *Prunella vulgaris*
- fireweed *Chamerion angustifoium*
- blue toadflax *Nuttallanthus canadensis*
- butter-and-eggs* *Linaria vulgaris*
- common evening primrose *Oenothera biennis*
- common speedwell* *Veronica officianalis*
- field (sheep)sorrel* *Rumex acetosella*
- curled dock* *Rumex crispus*

MOSSES

Mosses reproduce by spores and lack true roots and leaves. Although you need a hand lens to compare moss structures with photographs in field guides, you can quickly learn to recognize our six most common species just by their color and general appearance. As a challenge—not a practice—you could even do it from your car window and impress your friends.

- common haircap *Polytrichum commune* starry plants look like miniature spruce seedlings
- pincushion *Leucobryum glaucum* pale green silver-white mounds
- Shreber's or red feather or phoenix moss- *Pleurozium shreberi* – one of most common mosses here. The bright red central line gives reddish cast to patches on dry forest floor
- wind swept broom *Dicranum scoparium* looks as if it has been swept by a broom, leaflets all lined up as if brushed
- fine hair moss *Dicranella heteromalla* often kicked up in velvety tiles on well-worn paths, tiny leaflets
- sphagnum, peat *Sphagnum spp* soft fronds may be red, green or pale tan fleshy rosettes

Then when you are ready to tackle some more species, here are six more. From now on you really need the spore capsules and perhaps a microscope.

- stair-step *Hylocomnium splendens* this stepped moss has reddish stem but growth arches out of one or two previous steps, may be growing with Shreber's
- delicate fern moss *Thuridium delicatulum* very common lacy and feathery
- knight's Plume *Ptilium crista-castrensis* diamond-shaped pinnate plumes
- shingle *Neckera pennata* very flat branches on old hardwood trunks, hanging free like shaggy shingles
- brocade *Hypnum imponens* rust stems with leaflets braid-like resembling silken embroidery, glossy yellow-orange tinge
- oil spill *Platygyrium repens* green-yellow-rust nearly iridescent, very common on tree trunk bases

and then one more to think about:

- three-toothed bizzannia *Bizzania tirlobata* is a liverwort, not a moss, emerald green, almost glassy translucent, three tiny teeth on leaflet margins

FERNS

Ferns are vascular plants, but reproduce by spores rather than seeds. They are good indicators of habitat characteristics. Unfortunately for us on Deer Isle, the one truly delicious form of fiddleheads comes from ostrich ferns, *Matteuccia struthiopteris*. They are indicators of rich riverine soils and that is NOT Deer Isle. Below are the most abundant ferns of Deer Isle.

in damp conditions:

- sensitive *Onoclea sensibilis*
- royal *Osmunda regalis*
- cinnamon *Osmunda cinnamomea* spores are on separate stalks
- interrupted *Osmunda claytoniana* spores interrupt the leaflets

in moist or dry conditions:

- bracken *Pteridium aquilinum* -- a world-wide indicator of poor soils
- hay-scented *Dennstaedtia punctilobula* – dense clumps in sunny clearings
- New York *Thelypteris noveboracensis* – roadsides and edges
- wood ferns *Dryopteris spp* – several related woodland species

on rocks:

- polypody *Polypodium vulgare*

on sandy disturbed areas:

- horsetail *Equisetum arvense* not a fern but a relative of an ancient group of plants; ours looks like mini-umbrella ribs

<u>The Plants of Acadia National Park</u> by Glenn H. Mittelhauser, Linda Gregory, Sally C. Rooney, and Jill E. Weber, 530 pages. This is the one-stop shopping for vascular plants. Yes, these days it may seem like a nuisance to order and carry around a paper reference but this one has it all. Lovely color photographs for trees, shrubs, ferns, wildflowers, and even our common weeds—all narrowed down to “likely” because they have been documented on nearby Acadia National Park lands.

If you wish to try your hand at a simple botanical key, go to the helpful site of the New England Wildflower Society at https://gobotany.newenglandwild.org/.

If you are interested in using native plants to make your own yard a richer habitat for our pollinators, etc, see www.wildseedproject.net.

Forest Trees of Maine, Centennial edition
This is appealing to lovers of trees.

Common Mosses of the Northeast and Appalachian by McKnight et al, Princeton Field Guide

Flora of Maine by Arthur Haines and Thomas F. Vining, 847 pages - for the plant scholar. Definitive. No photos.

You might also enjoy www.mainenaturenews.com which walks you through how to key out tree species as well as connecting you to a wide variety of other Maine nature items.

LICHENS

First Forty for lichens? Linnaeus lumped them all in one genus but now we know that North America alone has 3,600 species. Here in our boreal coastal fog forest we might have as many as 500 species—and it takes chemical analysis to make a definite identification of some of them. A single tree trunk may support 20-30 species. Nevertheless, we can make some observations about these “fungi that learned farming”, algal/fungal symbionts, that enhance our enjoyment as we hike our trails. Like mosses, lichens lack true roots and leaves and reproduce by spores. The fungus provides structure while the alga contains chlorophyll.

It is traditional to group lichens according to growth form: are they crustose, foliose (leaf-like) or fructose? Then we ask, what is their substrate? Do they grow on soil, rocks, trees?

Once you start looking at lichens, you will realize that the lichen list of even the most common ones is quite long. Our list of TOP TWENTY begins with what is probably the most easy one:

GROUND LICHENS

- candy lichen *Icmadophila ericetorum*, crustose blueish-green with candy-pink disks on rotted wood, among mosses
- common feckled pelt *Peltigera apthosam*, foliose gray-green with brown dots. (These lumps are *Nostoc*, cyanobacteria) black underneath with white edges on rocks, tree bases, and mossy ground
- reindeer lichen (not a moss) *Cladonia spp,* fruticose , pale green multi-branched tufts on thin soil.
- staghorn and bayonet lichens (*Cladonia spp*) erect branched or pointed stalks, found with other mosses and lichens.
- pixie cups *Cladonia spp*, fruticose, pale gray-green goblets arising from ruffled mats on rocks, bark or soil
- British soldiers, fruticose, *Cladonia cristatella*, gray stalks with bright red caps; often on bark or dry ground.

ROCK LICHENS

- yellow map lichen, crustose, *Rhizocarpon geographicum* yellow tiles with black dots on the margins of the cracks on granite, may be 1,000 or more years old
- rock tripe, foliose, *Umbelicaria spp,* brown lobes connected to rock with central stalk, black underneath, on boulders in moist woods
- shingled rock shield, foliose, *Xanthoparmelia somloensis*, gray and green, radiating bulls eye pattern on bare igneous rock
- granite firedot, crustose, *Caloplaca arenaria*, gray rock crust with dark disks, on siliceous rock in full sun
- sulphur firedot, crustose, *Caloplaca flavovirescens*, yellow crust with orange disks, on siliceous rocks in full sun

- elegant sunburst lichen, foliose/crustose, *Xanthoria elegans*, yellow-orange mounded lobes in center of a circle, flat lobes at perimeter, underneath is white, all over rocks with guano
- common goldspeck, crustose, *Candelariella vitellina,* yellow crust of very small cushions on siliceous rock in full sun

TREE LICHENS

- powdery goldspeck, crustose, *Candellariella efflorescens*, powder on poplar tree trunks
- fluffy dust, mapledust, both are crustose, *Lepararia spp*,gray-green powder
- on trees and rocks
- whitewash, crustose, *Phylyctis spp* white powder on red maple and northern white cedar
- brown-eyed rim lichen, crustose, *Lecanora spp*, gray-rimmed brown disks on gray crust,
- on trees, especially poplars, 171 species in North America
- candleflame, foliose, *Candelararia concolor*, bright yellow rosettes of overlapping lobes
- grows along the rain tracks of tree bark, one of the most common tree lichen species
- common greenshield, foliose *Flavoparmelia caperata* pale yellow-green lobes in circle,
- black underneath with brown edges, extremely common on bark of all kinds, sun or shade
- lungwort, foliose, *Lobaria pulmonaria*, pale green-brown large lobes
- with upturned white undersides, especially on red maples
- beard lichens, foliose, *Usnea spp*, gray-green wisps hanging on tree branches.

Examine the color of holdfasts and elasticity of cords. These are beard you can tweak!

Lichens of the North Woods, a field guide to the 111 northern lichens, by Joe Walewski, 152 pages. This wonderful little book is relevant to our region even though written in Michigan.

Many lichens had no common names until the following book was published in 2001.

Lichens of North America, by Irwin M.Brodo, Sylvia Duncan Sharnoff, and Stephen Sarnoff. At 795 pages, this book with its glamorous photographs is beyond doubt the current authority.

ANIMALS

The FAMILIAR FIRST FORTY OF BIRDS is somewhat more complicated. Which season? And they fly, so where do you look as they go by if you hope to learn to identify them?

Since the species listed on apps usually cover the whole continent or the whole eastern half, and those long lists are arranged either reflecting family relationships or alphabetically, the beginning birder may find it difficult to locate information about the bird they see before them. To simplify, here is a list of what species are likely on Deer Isle arranged according to habitat and season. Even though the scientifically significant arrangement may be unfamiliar to the beginning birder, we have chosen it. Our list is relatively short, and after a while this arrangement will become familiar and helpful. It is the one which is followed by most bird guides.

There are a few local names for birds that are unique to this area—Lords-and-Ladies for harlequin ducks, coots for scoters, and whistlers for golden-eyes. In general there is fairly widespread agreement as to common name (unlike the situation in the plant world). The American Ornithologists Union revises the official list slightly from time to time. The follow list is based on years of observation at Acadia National Park, omitting those species for which Deer Isle

does not have appropriate habitat. Birds that are found well off-shore are not included here. Birds that are considered abundant (widespread and easily found in proper habitat in large numbers) or common (widespread and easily found in proper habitat but generally not in large numbers) are listed. The lists will help you narrow your choices when you scan the names in an app which present a long list of birds, and then you can locate them alphabetically.

Species in **bold** are those on Deer Isle that birders here feel are most likely. Of course you have to be in the right place at the right time, but if you go out to the right habitat during the appropriate season (which may be during migration!) you have a good chance of seeing the bird on the list.

<u>WOODLAND BIRDS</u>
winter and summer

- **Bald Eagle**
- **Sharp-shinned Hawk**
- **Ruffed Grouse**
- **Rock Dove**
- **Mourning Dove**
- Great Horned Owl
- Barred Owl
- **Downy Woodpecker**
- **Hairy Woodpecker**
- **Northern Flicker**
- **Pileated Woodpecker**
- Eastern Phoebe
- **Blue Jay**
- **American Crow**
- **Common Raven**
- **Black-capped chickadee**
- **Red-breasted Nuthatch**
- **Brown Creeper**
- **Golden-crowned Kinglet**
- Ruby-crowned Kinglet
- **European Starling**

- **Northern Cardinal**
- American Tree Sparrow
- **Dark-eyed Junco**
- Pine Grosbeak
- **Purple Finch**
- Red Crossbill
- White-winged Crossbill
- Common Redpoll
- Pine Siskin
- **American Goldfinch**

WOODLAND
summer only

- **Broad-winged Hawk**
- Blue-headed Vireo
- **Red-eyed Vireo**
- **Winter Wren**
- **Eastern Bluebird**
- **Swainson's thrush**
- **Hermit Thrush**
- Nashville Warbler
- **Northern Parula**
- **Yellow Warbler**
- **Chestnut-sided Warbler**
- **Magnolia Warbler**
- **Yellow-rumped Warbler**
- **Black-throated Green**
- Blackburnian Warbler
- **Black-and-White Warbler**
- American Redstart
- Ovenbird
- **Common Yellowthroat**
- **White-throated Sparrow**

FIELD AND EDGE

summer only

- Northern Harrier
- **Sharp-shinned Hawk**
- **Broad-winged Hawk**
- Red-tailed Hawk
- American Kestrel
- **Turkey Vulture**
- **American Turkey**
- **American Woodcock**
- **Ruby-throated Hummingbird**
- Yellow-bellied Sapsucker
- **Northern Flicker**
- **Tree Swallow**
- Barn Swallow
- **American Robin**
- Eastern Bluebird
- **Gray Catbird**
- Brown Thrasher
- Cedar Waxwing
- **European Starling**
- Nashville Warbler
- **Yellow Warbler**
- **Chestnut-sided Warbler**
- **Magnolia Warbler**
- **Yellow-rumped Warbler**
- **Black-throated Green**
- **Black-and-White Warbler**
- American Redstart
- Northern Waterthrush
- **Common Yellowthroat**
- **Northern Cardinal**
- Chipping Sparrow
- Savannah Sparrow
- Fox Sparrow
- **Song Sparrow**
- Swamp Sparrow

- **White-throated Sparrow**
- White-crowned Sparrow
- **Red-Winged Blackbird**
- **Common Grackle**
- Brown-headed Cowbird
- Baltimore Oriole
- **American Goldfinch**

SUMMER SHORE

- **Common Loon**
- **(by boat only) Wilson's Storm-petrel**
- **Double-crested Cormorant**
- **Great Cormorant**
- **Great Blue Heron**
- **American Black Duck**
- **Mallard**
- **Black Scoter**
- **Surf Scoter**
- **White-winged Scoter**
- **Common Eider**
- **Killdeer**
- **Greater Yellowlegs**
- **Lesser Yellowlegs**
- Ruddy Turnstone
- Sanderling
- Semi-palmated Sandpiper
- Black-bellied Plover
- Semi-palmated Plover
- **Laughing Gull**
- **Bonaparte's Gull**
- **Ring-billed Gull**
- **Herring Gull**
- **Great Black-backed Gull**
- **Common Tern**
- **(by boat only) Razorbill**

- **Black Guillemot**

WINTER SHORE

- **Bald Eagle**
- **Common Loon**
- Horned Grebe
- Red-necked Grebe
- **Canada Goose**
- **American Black Duck**
- **Common Eider**
- **Long-tailed Duck**
- Black Scoter
- **Surf Scoter**
- **White-winged Scoter**
- **Common Goldeneye**
- **Bufflehead**
- **Red-breasted Merganser**
- **Bald Eagle**
- Purple Sandpiper
- **Bonaparte's Gull**
- **Ring-billed Gull**
- **Herring Gull**
- **Great Black-backed Gull**
- **Black Guillemot**
- (by boat only) Harlequin Duck

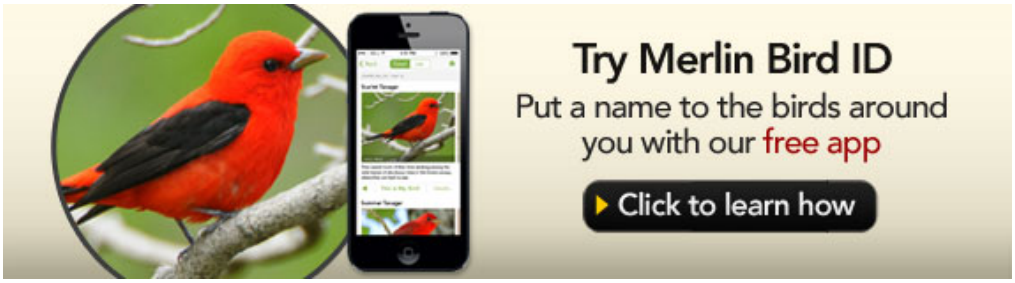
To tap into local knowledge, join Downeast Chapter of Audubon at www.downeastaudubon.org

You will find a selection of **binoculars** and good field guides at the Nature Shop at Heritage House, the office of Island Heritage Trust in Sunset.

March through November you can read **bird migration forecasts** in real time at www.birdcast.info. The Cornell Laboratory of Ornithology and National Audubon are collaborating in a number of citizen science projects: Check out

eBird where you can record —and share—your own data. Also see the many apps on the market. **Birdseye HD** offers a form optimized for tablets and another for smartphones. You will find there monthly abundance graphs, photos, behavior notes and sound files. (Did you know that birds have regional local dialects just as humans do?)

For what amounts to a free field guide with photographs of birds and audio of songs, and range maps, etc. check out the offerings of the Cornell Laboratory of Ornithology at www.birds.cornell.edu or download their free app, see below. This amazing offering is so simple that any novice can handle it. You choose from 4 silhouettes to approximate size and click on color swatches. You enter where you are seeing the bird and what it is doing, and CLICK! the answer pops up with range maps and audio. Absolutely wonderful!



Merlin Bird ID is just the thing for very young children. You really do not even have to know how to read yet and the result is so rewarding. One can click through to other information, range maps etc, but this app may not be the best tool for the next stage of learning.

Bird enthusiasts will find joining the public FaceBook Group called MAINE Birds (https://www.facebook.com/groups/MAINEBirds/) very helpful and informative. Experts are happy to identify species in photos you post.

For context cues to help reinforce learning as opposed to just identifying birds, you really cannot beat the **Crossley ID series**. The Crossley ID Guide: Eastern Birds comes in both paper and Kindle editions. What is so special about this guide? The clever use of photoshop techniques to combine images of the birds in various plumages in their appropriate habitat. As an off-season virtual trip, a browsing session is remarkably pleasant and instructive. The Crossley web site,

www.crossleybooks.com, is also worth visiting for its insightful material presented by photographs, text and videos.

Bird enthusiasts of any level might well enjoy What the Robin Knows: How Birds Reveal the Secrets of the Natural World. You will want to buy it in the Kindle Edition with Audio/Video. (Download the free Kindle app for reading it on any tablets or smart phones.) As you read the text about learning to listen more knowledgably to robins and juncos, you simply touch the icon and the sound file plays. Then the pleasantly informal text continues and you realize you are moving into the new era of digital multisensory applications.

Several interesting bird species are found only **offshore**. That presents special challenges, but here are some suggestions for getting to view offshore wildlife:

Several boat trips are scheduled for the Wings, Woods and Waves birding festival in mid-May. Contact Island Heritage Trust for information.

For private tours for groups of 2-5 people, contact Guided Island tours (see photo above) www.guidedislandtours.com. The emphasis on these boat trips is on natural history.

For the schedule and fees for the daily runs of the Isle au Haut Mail Boat, see www.isleauhaut.com but understand that reservations are not possible and the trips are not natural history tours although it is a good way to get out on the water in a wonderful habitat.

Old Quarry Ocean Adventures also offers daily runs (19 people) to Isle au Haut as well as rental kayaks and campground facilities. See www.oldquarry.com/shop/charterboat.php.

Winter offers a special suite of birds in our bay as species come south from the arctic to winter here. Island heritage Trust has been offering very successful trips to the far side of Isle au Haut to see Harlequin ducks and other waterfowl. See www.islandheritagetrust.org for further information. These trips fill up fast so you will want to make your reservations promptly. Below is a photograph of Harlequin ducks, these little daredevil ducks at the edge of the wild surf, and an excellent description of the March 2014 trip.

photograph courtesy of Aislinn Sarnaki, Bangor Daily News

http://actoutwithaislinn.bangordailynews.com/2014/04/02/recreation/birds-galore-offer-valuable-learning-experience-on-maine-duck-tour/

In recent years several live **web cameras** observing nesting birds have been installed at locations in Maine, New England or elsewhere. Cornell Laboratory of Ornithology calls web cams "virtual birdwatching at its best". Do an on-line search to see what sites are both funded and occupied by the birds for the year in question.

Cornell Laboratory of Ornithology web cams: **red-tailed hawk** and others at www.cams.allaboutbirds.org

Eagles: Biodiversity Research Institute, Education and Outreach, offers two eagle cams, a peregrine cam and information about what live web cams around the country are currently operating, all at www.briloon.org

Osprey: Try this site for the coming year:
www.wildlife.state.nh.us/Wildlife/wildlife.htm
or http://explore.org/live-cams/player/live-osprey-cam

Loons: the Minnesota loons did not use their camera platform in 2013. Try this site for 2014: www.mnbound.com/live-loon-cam

OTHER ANIMALS

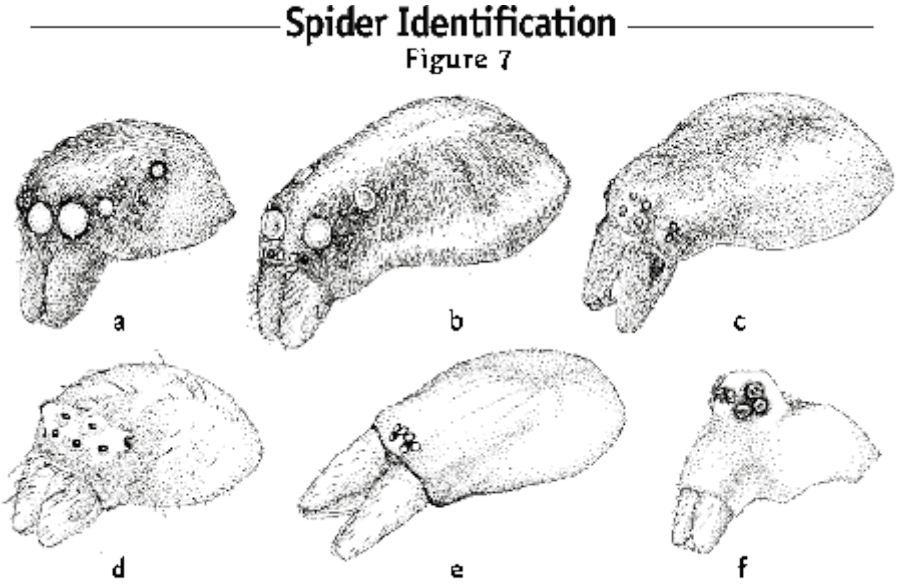
Sir David Attenborough is a patron of the British conservation charity WildScreen, promoting worldwide conservation efforts through wildlife imagery. Their site, www.arkive.org directs you to wildlife photos, videos and texts as vivid and imaginative (and accurate) as you would expect from the aforementioned Sir David. Although Arkive is worldwide in scope, most of our species are represented there.

INSECT and SPIDER POPULATIONS

These small creatures of huge importance lend themselves well to digital imaging. The Cirrus Digital Imaging site is a wonderful place for spider portraits as well as pictures of Insect orders that the butterfly enthusiast may overlook.

SPIDERS

There are more than 40,000 species of spiders around the world and at least 4,000 in North America. Spiders have a bad reputation but in fact they perform important functions in ecosystem. Because there are so many kinds of spiders and so few arachnologists, the Denver Museum of Nature &Science is enlisting citizen scientists there to conduct the Colorado Spider survey from which the following eerie chart is excerpted:



Eye patterns are distinctive for different spider families.
Drawings © 1999 Eric Parrish

a) Salticidae, or the jumping spiders;
b) Lycosidae, or the wolf spiders;
c) Araneidae, or the orb-weaving spiders;
d) Thomisidae, or the crab spiders;
e) Dysderidae; **f) Pholcidae**, or the daddy-long-legs spiders.

If the spider you are trying to key out does not fit one of these eye patterns, refer to the Dichotomous Key to Spider Families.

You can also make a good attempt to assign a family according to the type of web you see without having to look a spider in the eye, or eyes. Your digital camera and its macro setting would also be a good tool to use in taking a closer look at these interesting creatures.

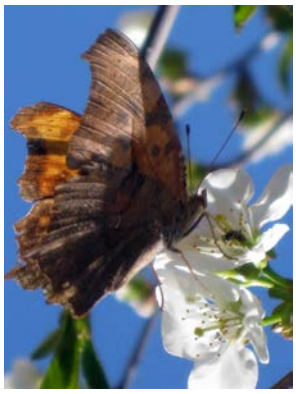
http://www.spiders.us/articles/identification/#identifying-spider-family

http://umaine.edu/home-and-garden-ipm/frequent-specimens/frequentspiders/

You will soon learn as you negotiate the world wide web (note pun was avoided, barely…) that a dissecting microscope and serious expertise is required to determine the species, and even then, the look at the spider genitalia may not be enough; DNA analysis may be called for.

It is fun to at least decide if you are looking at a **jumping spider**, *Salticidae*, small, fuzzy, with bright or iridescent mouth parts and huge eyes. True to their name, they jump and face you with those big eyes.

- **Crab spiders**, *Thomisidae*, (pictured above), wait in flowers to ambush pollinators. They are usually white or yellow (and can change color according to the flower!) and they scuttle sideways like a crab.
- **Nursery web and Fishing spiders**, *Pisauridae*, may be quite large. The common Nursery web spider is light brown with a distinctive dark brown central stripe down its back. Some species are found walking over the surface of ponds and dive under to catch aquatic insects and even small fish.
- The **Orb weavers**, *Araneidae*, make lovely large webs. The common garden spider, *Argiope aurantia*, can often be seen hanging head down in its spiral web with its distinctive white silk zig zag, the stabilimentum. Spectacularly black and yellow, they are probably sleeping after a night's hunting, ridding your garden of insects you consider to be pests.
- **Wolf spiders**, *Lycosidae*, are quite large, and dark brown. They may come indoors to overwinter. The females are often seen carrying white egg sacs, moving them to sun or shade for the best temperature for their offspring.
- The **funnel weavers**, *Agelenidae*, are inconspicuous, slender brown spiders but you have doubtless seen their webs on late summer mornings. The common grass spider, *Agelenopsis,* weaves a sheet with a tube-like funnel where it awaits the vibrations of its prey.
- Harmless and long-legged, Daddy-Longlegs, *Pholcidae,* are not true spiders, but rather a separate order of Arachnids.



BUTTERFLIES AND MOTHS- *Lepidoptera*

Like other insect populations, Lepidoptera populations are highly prone to great fluctuations in numbers. In some years we see a veritable outbreak of gypsy moths. Some years spear-marked black moths flutter along all our woodland trails for weeks. Other years we scarcely see a one. Is that because we are not there at the right time to notice, or was there a combination of factors working against them? Some species such as the showy Lunas, Cecropias and Polyphemus moths of the Giant Silkworm family seem to be less common than they once were. Others such as honey bees and the beloved Monarch butterflies seem to be struggling with a perfect storm of disasters.

The odd acronym BAMONA refers to the butterflies and moths of North America. This web site is such a good introduction to the world of on line Lepidoptera enthusiasts that it is quoted here:

"The Lepidoptera Wing Pattern Identification System (LepWing ID) uses interactive pattern recognition technology to help researchers quickly and accurately identify species of moths and butterflies. This system was developed by Jeff Miller, a professor in Oregon State University's College of Agricultural Sciences, and colleague Hans Luh, a senior research associate with the university's Integrated Plant Protection Center. This pilot project allows users to compare a digital image of a specimen against a library of more than 1,600 photos.

Butterflies of America is a comprehensive image archive, currently including all American butterfly species and subspecies from the Arctic Circle to Panama, and the Caribbean Islands (except Trinidad and Tobago). As of January, 2011, over 100,000 images are posted to the site. Butterflies of America is especially useful for identifying northern Neotropical Hesperiidae, Lycaenidae and Riodinidae.

A very useful online identification tool is the Butterflies guide of the IDnature

guides series.

BugGuide is a good resource for butterflies or moths. A few web sites that may be able to help with butterfly identification are Cirrus Digital Imaging (photographs of butterflies and moths), The Butterfly Website,TheButterflySite.com, and What's That Bug?. If you are trying to identify a skipper (family Hesperiidae) in the Northeastern United States or southeastern Canada, check out Skippers of the Northeast, a handy set of videos that will guide you through skipper identification.

Moth fanciers will find joining the public FaceBook Group called Moths of the Eastern United States (https://www.facebook.com/groups/MothsoftheeasternUS/) very helpful and informative. Experts are happy to identify species in photos you post.

For moth identification assistance, try the North American Moth Photographers Group, the Cirrus Digital Imaging site, or John Snyder's Web Images of North American Moth Species. Snyder's site is valuable specifically for moth identification and makes available a tremendous number of American moth photographs. This site is somewhat difficult for the amateur to use, because of the hundreds of species covered. However, if you can narrow your moth down to probable family by using this site, you can then visit Snyder's site, browse through all of the species within that Family, and possibly identify your moth."

Now here is the Deer Isle version, first steps into this potentially overwhelming topic.

The FIRST FOUR

- Mourning cloak – flies every month of the year, dark with yellow band at wing margin
- Azure- small, pale blue
- Cabbage white- green caterpillar is a garden pest, now our most common butterfly
- Canadian Tiger Swallowtail- on lilacs and birch trees

The SUMMER SIX and then some

- Viceroy or Monarch –check the wing vein patterns to distinguish between Viceroys and Monarchs
- Red Admiral- red stripes on dark wings
- American Lady- note number and size of blue spots on wing
- Common Ringlet- warm tan, flutters low over lawns
- White Admiral- highly territorial, white stripes on black wings

skippers – quick darting fliers, hold wings like paper airplanes

- Clouded Sulphur- clear yellow (or Pink Sulphur)
- Meadow Fritillary- medium version like Great spangled
- Question Mark- look for small silver-white question mark on lower underwing (barely visible in photo above)
- Little American Copper- small zigzag pattern on wing edges
- Common Wood Nymph- brown with eye spots

The FALL FEW
the travelers:

- Monarch
- Painted Lady
- Question Mark

the last to disappear, November before killing frosts:

- Cabbage White
- Orange (Alfalfa) and Yellow Clouded Sulphurs

MOTHS

Most of these fly by day; moths generally have feathery antennae and hold their wings flat when at rest

- Spring White – lovely small moth, pure translucent white, looks like petals flying backup to fruit tree blossoms

- Hummingbird clearwing- often mistaken for birds
- Rosy Maple moth- lovely pink and yellow
- primrose moth- another pink and yellow, spends day head down in wild yellow evening primrose
- Ctenucha moth- handsome dusky black with emerald and orange, often on our native holly (pictured above)
- Luna moth- large pale green moth often found on screens after June nights
- Spear-marked Black- small black moth fluttering like strobe lights on woodland paths
- White-marked Tussock moth- exotically tufted caterpillars on blackberries
- Rusty Tussock moth- small rust-colored swarms in late summer

Peterson Field Guide to Moths of North America by David Beadle, Seabrooke Leckie

Quick Key to Butterflies and Moths of Deer Isle by Marnie Reed Crowell

There are many lovely field guides to choose from. Choose those with photographs or paintings as you prefer.

DRAGONFLIES AND DAMSELS –*Odonata*

Dragonfies are quite fascinating to watch and new books and binoculars and web pages make it possible for the beginner to make some reasonable identifications. The order *Odonata* is divided into two sub-orders, the dragonflies with wings held out parallel with the ground, perpendicular to their bodies, and the damselflies which hold their wings above their back when perching at rest. Darners are a family within the dragonflies. In Maine 158 species of Odonata have been recorded. Perhaps thirty of these are fairly common, and of those you can learn to identify several quite easily. These insects are skilled fliers and very territorial. Look for them near ponds and overhead as you walk trails such as the road up to the Quarry at Settlement.

- common green darner *Anax junius* - large, 2-3", iridescent wings, emerald green thorax with a stripe of deep garnet red running down the middle of blue abdomen. Strong fliers zoom in a straight line, doubling back and forth.
- twelve-spotted Skimmer *Libellula pulchella* , large, 2", very common. Depending on how you count the white and dark spots on its clear wings it can also be called the Ten-spot skimmer (pictured above)
- meadowhawk *Sympetrum spp,* common in late summer*,* medium sized with clear wings and bright red abdomen

Dragonflies through Binoculars by Sidney W. Dunkle, 174 pages.

Maine Damselfly and Dragonfly Survey at
www.dds.umf.maine.edu/Species%20List.htm

AMPHIBIANS AND REPTILES = "herps" from Greek for "creeping crawling creature"
Reptiles and amphibians face additional challenges in colonizing islands. Because they hibernate, crossing ice is not an option. This limits them to swimming, the proverbial floating log, or transport by humans. Because of their thin skin, amphibians cannot tolerate immersion in salt water and they may also be limited by habitat requirements as well.

AMPHIBIANS

- **Spotted salamander *Ambystoma maculatum***
- **Eastern newt *Notopthalmus viridescens***
- **Northern redback salamander *Plethodon cinereus***
- **American toad *Bufo americanus***
- **Spring peeper *Hyla crucifer***
- **Green frog *Rana clamitans***

- **Pickerel frog *Rana palustris***
- **Wood frog *Rana sylvatica***

REPTILES

- **Common snapping turtle *Chelydra serpentina* – rarely seen unless female is laying eggs**
- **Eastern Painted Turtle *Chrysemys picta***
- **Ringneck snake *Diadopis punctatus***
- **Milk snake *L*ampropeltis triangulum**
- **Smooth green snake *Liochlorophis vernalis***
- **Red-bellied snake *Storeria occipitomaculata***
- **Common garter snake *Thamnophis sirtalis.***

Maine Amphibians and Reptiles edited by Malcolm L. Hunter Jr, Aram .J.K. Calhoun, Mark McCollough (with CD of frog and toad songs) 252 pages.

FRESHWATER FISH

- American eel *Anguilla rostrata*
- Brook trout *Salvelinus frontalis*
- Brown trout *Salmo trutta*
- Largemouth bass *Micropteris salmoides*
- Pumpkinseed *Lapomis gibbosus*
- Stickleback *Eucalia spp.*
- Rainbow smelt *Osmerus mordax*
- White sucker *Catostomus commersoni*

- Golden shiner *Notemigonus crysoleucus*
- Banded killifish *Fundulus diaphanous*

See www.dec.ny.gov/animals/52634.html for an excellent Freshwater Fish Gallery that of course includes some species that we do not have here.

MAMMALS

Since the days of Darwin, it has been recognized that islands have fewer species than the nearby mainland, and Deer Isle is no exception. One hundred years ago, downeast Maine had about 34 species of land mammals but only about 19 species were native to Deer Isle. Since then many larger fur bearers such as bobcat and fisher were extirpated while recently least seven new mammals have arrived. Along with an influx of summer people, the skunk and raccoons arrived soon after the building of the bridge in 1939. Other hibernators such as eastern chipmunk, flying squirrel and woodchuck are still absent. Among recent immigrants which may also have crossed on the bridge, the eastern coyote, gray squirrel, and white-footed mouse have been extending their ranges in the Northeast, probably in response to habitat change caused by development and climate change.

LAND MAMMALS

- Masked shrew *Sorex cinereus*
- Short-tailed shrew *Blarina brevicauda*
- Star-nosed mole *Condylura cristata*
- Grey squirrel *Sciurus carolinensis*
- Red squirrel *Tamiasciurus hudsonicus*
- Beaver *Castor canadensis*
- Deer mouse *Peromyscus maniculatus*
- White-footed mouse *Peromyscus leucopus*
- Red-backed vole *Clethrionomys gapperi*

- Meadow vole *Microtius pennsylvanicus*
- Muskrat *Odatra zibethicus*
- Porcupine *Erithrizon dorsatum*
- Snowshoe hare *Lepus americanus* (pictured above)
- Red fox *Vulpes vulpes*
- Eastern coyote *Canis latrans*
- Mink *Mustela vison*
- Striped skunk *Mephitis mephitis*
- Fisher (?) *Martes pennanti*
- River otter *Lutra canadensis*
- Black bear (transient) *Ursus americanus*
- Raccoon *Procyon lotor*
- Bobcat *Lynx rufus*
- White-tailed deer *Odocoileus virginianus*
- Moose (transient) *ALces alces*

See www.dnr.state.mn.us/mammals/index.html for comprehensive coverage of the species that we have in Maine (plus of course, a few more…) Different states have made different choices about how to spend their budgets when it comes to wildlife and natural resources. If the states are at our latitude, their species lists may overlap ours in a useful manner. At least it is likely that the material on their web pages has been vetted by biologists—and it will be user-friendly for the general public. See New Hampshire's site, www.wildlife.state.nh.us/Wildlife/wildlife.htm for excellent wildlife profiles.

TRACKS AND SIGNS

You do not have to actually see a mammal to learn quite a bit about it if you know how to read its signs and tracks. For example, in summer and winter you can find the tunnels of the meadow vole. In summer look for tunnels and nesting or food storage chambers in the thatch of heavy grass. These same tunnels in the snow are often open to the sky over the vole's preferred toileting place and can be identified by droppings and yellow stains. The tracks of these meadow mice show

a fairly alternate gait; deer mice, which are tree climbers, show paired footprints and perhaps the drag mark of their long tails.

Red squirrels' feet are only half as large as the gray squirrels'. It is the red squirrel, not the gray, that makes piles of empty spruce cone scales. These garbage heaps, called middens, are usually found up on stumps or logs where the squirrel has a good vantage point to keep watch while eating. Red squirrels are quite territorial about their middens and use them year after year so some middens are quite large.

Snowshoe hares, like red squirrels, bound and leap with their hind feet making prints that land in front of their short forefeet. The furry winter pads of the snowshoe hares are amazingly huge as is the amount ground they can cover in a single bound. Do know that as snow begins to melt, tracks appear larger in size and this can mislead you.

Mink and otter (and weasels and fisher) both bound along, body stretched out in midair. They land with one front foot slightly ahead of the other. Then they are off again and their hind feet touch down in those same prints. Both frequent our shores. In winter you may even be lucky enough to see the U-shaped trough where an otter has belly-flopped down and slid on its stomach.

You may find that skunks have made lots of golf-ball-sized divots in your lawn as they dig for grubs etc. In winter if the weather is warm enough, skunks and raccoons may wake up and go for a walk on the snow. Or should we say waddle? They move with the front and hind foot on the left side of their body and then advance both feet of the right side. That means a line of tracks has one small hand-like (five toes) forepaw paired with a longer hind paw and then another pair of tracks, only this pair has the small front paw matched with the larger hind paw on the alternate side.

Members of the cat and the dog family both have four toes but the cats are likely to keep their claws retracted. A line of fox or coyote tracks likely shows the toenails and both fox and coyote walk a pretty straight line. Fox urine has a very skunky smell while that yellow stain made by a coyote has no odor.

Rodents and hares can clip off branches sharply with their incisors; deer have to munch and tear branches, leaving a rough end. Hare droppings are round like marbles. Deer droppings are darker rather round balls. In winter deer droppings have dry compact shape but in summer when they are eating more laxative berries you can tell.

Fox and coyote droppings usually end in a tapered point. Raccoon droppings are blunt-ended cylinders; cats' droppings are usually rather segmented and they often make some attempt to bury theirs.

Bird droppings usually have some white, uric acid, at one end. A grouse may leave a pile on the trail like so many cigarette butts. Looser splotches under a tree branch reveal where a crow has spent the night. Grouse may sleep under the snow and leave wing marks where they emerge. A pair of wing marks around a patch of blood obviously tells the tale of a hawk or owl capturing its prey. Often you can read that this drama as the final act at the end of a frantically twisting line of small rodent tracks. In autumn a patch of feathers on a woods road reveals where a migrating hawk topped off its energy tank with a small bird before taking off across the bay.

Using a stick to open pellets and scats you can often find hair, bone bits and teeth which tell you what prey has been eaten. Humans are subject to some animal diseases so you should treat road kills and droppings with caution.

The Minnesota site mentioned above, www.dnr.state.mn.us/mammals/index.html , includes a sidebar of tracks with their wildlife profiles.

Mammal Tracks and Scat, Life-size Tracking Guide by Lynn Levine and Martha Mitchell is waterproof so you can take it out lay it by the tracks in the snow.

MARINE MAMMALS

Harbor seal (above) numbers are abundant since the Marine Mammal Protection Act was passed in 1972. In recent years Gray seals have been appearing. Harbor porpoises are seen, and the occasional Atlantic white-side dolphin has washed ashore. Minke whales have been seen in the bay and Humpback and Fin whales travel by offshore.

Of General Interest

The Center for Northern Woodlands Education offers a FaceBook page, a magazine, and an online e-mail subscription of wonderfully interesting and useful material appropriate to our area. See http://northernwoodlands.org/

Information on a relatively new program for improving your natural history skills is found at http://www.mainemasternaturalist.org/.

For daily e-mails including handsome photographs and an interesting paragraph about natural phenomena occurring in our area, see http://naturallycuriouswithmaryholland.wordpress.com/

GEOLOGY

Although geology is covered in the individual preserve write-ups of the **Self-Guided Nature Trails**, a few general thoughts are worth repeating.

OUR ROCKS

The bedrock map of Deer Isle shows that most of Little Deer is Castine Volcanics which erupted in the Cambrian era. Ellsworth Schists cover the western part of Deer Isle from Small's Cove up to the Causeway. There is a section of Torrey Pond serpentinite, but the remaining two thirds of the Island, east and south, and including the scattered islands of the Reach and Stonington Archipelago, are what we think of as Deer Isle-Stonington granites -- that is, light pinkish-grey

hornblende or porphyritic biotitic granite. Granite from Sedgwick across the Reach is a medium to coarse-grained biotitic granite lacking the pink color.

Geologists use a complicated mix of chemistry and microscopic structure and inferred relationships based on other regions to ascertain the identity of rocks. You might however, learn to recognize a few of our local rocks with some chance of being right.

Castine Volcanics are usually fine-grained, often grey rocks from long ago volcano vents, perhaps with bits of other colored pebbles caught in the melt and metamorphosis. Our schists are often grey-green, layered and wrinkled in most interesting ways, with lines of white quartz. Our granites show black specks of biotite, with a tweed-like mixture of greys, white, clear or pink crystals of feldspar and translucent quartz. For the layman: how to tell Stonington granite vs Ellsworth Schist—big boulder blobs vs looming contorted hulks, or the mini-version—granite softballs vs grey skipping stones. Is Stonington granite the same thing as Deer Isle granite? Yes. But your answer may depend on whether you are a geologist or shop keeper or where you live or how chauvinistic you are.

Not only do our bedrocks show scratches made by passing glaciers, the glaciers have left us with accumulations of erratics, those boulders clearly from elsewhere, and piles of unsorted small stones and sands: glacial till. The finest ground materials form a continuum of sand→silt→clay. Sticky beds of blue-grey marine clays even provide a workable pottery medium.

See http://iceagetrail.umaine.edu/content/iceageinmaine/MarineClay.php

See A Geologic History of Deer Isle, Maine, a thumb-nail sketch by Roger LeB Hooke available at the IHT Nature Store.

SHORE

Information about our marine resources is necessarily a combination of land and sea, plants and animals, factors of calendar and habitat, etc. that it deserves a section unto itself.

OUR SHORES

Every beach on Deer Isle has its own distinct characteristics based on both the physics and such things as wave action and the history of the living creatures there. We might divide roughly into two categories the rocks which ring the shore and those that supply the grist for the ocean “mill” that grains the sand for the beaches. The rough, round grains with pinkish tinge were probably made from Deer Isle granite. Beaches and shores of the southern half of Deer Isle are probably slightly pink. The grey rocks that make up most of the northern part of Deer Isle are probably Ellsworth Schist, revealing by their smooth flattened oval shapes that they were formed from layers of greenish-grey rocks that weather to pale shades.

Sand that is made of many barnacles may be quite white. Sift the bits through your fingers and you realize that they represent tiny plates of the volcano-shaped structures that once armored the living barnacles, crustaceans that lie on their backs and flicker their legs out to filter food.

Two more categories are worth commenting on: silt and clay. Geologists classify sand grains as particles coarser than silt, and silt as coarser than clay. Sand is usually comprised of quartz particles, while clay is predominately feldspar. In silt, principally quartz and feldspar, the particles have a different shape, equal in all directions. In your fingers silt feels like flour, smooth when wet, but you can detect the grains. The even smaller clay particles are plate-shaped and so stick together. Silt and clay comprise most of the mineral component of soil.

The sediments formed from these two adhere to the sticky walls of filamentous blue-green algae and accumulate to form the base for the rhizomes of salt-tolerant grasses and flowering plants. Wave action in the various coves and along the shores will determine how much of this buildup washes away and how much remains and accumulates. Therefore the habitat types along our shore grade into one another: salt marsh, mud flat, sand flat, sandy beach, cobble and boulder beach, sheltered rocky shore, and exposed rocky shore.

The extent to which these shores are exposed as tides recede and the amount of exposure to waves determine which plants and animals live in the various zones. However, patterns of population densities of various shell species, urchins, starfish, and lobsters, as well as the fish in the sea are changing. Warmer currents are sweeping up our Gulf of Maine coasts. Comb jellies, moon jellies and large red lion's mane jellyfish often appeared in the summer waters a few years ago. Moon snails, sea urchins and sea stars were common in the lower intertidal. Expect to see further changes.

The black-and- white ducks that come south from the arctic to Penobscot Bay to spend the winter seem to have firm opinions about which coves suit them. Loons, guillemots, grebes and eiders can be found all around the Island. Long-tails are most likely off Stonington and the west side of the Island. Look for buffleheads in Burnt Cove and at the Causeway. Webb Cove and sheltered waters of the Reach may have golden-eyes and mergansers.

Plant and animal species at our shores arrange themselves according to the number of hours they can tolerate being exposed to air—or being submerged under water. On rocky shore this is results in a vertical distribution. Where we have sandy shores the pattern looks horizontal. Creatures are arrayed at different depths in zones that appear to be stretching away from us as we stand on the beach and contemplate the bay waters. The energy of the waters, the force of the waves or the amount of shelter in a cove also determine where we find species. Competition between species and their role in the food chain influence the intertidal arrangement of species as well.

ROCKY SHORE PROFILE
such as Barred Island

Fringing the woods at the edge of the sea you may find salt tolerant plants such as bayberry, beach pea, and silverweed, *Potentilla anserine*. Mats of crowberry, *Empetrum nigrum*, may fringe the rocks. In the cracks of the granite, you will find seaside plantain, *Plantago maritime*. In what is called the spray zone are various yellow or pale green lichen species. A black haze of cyanobacteria stripes the rocks above a white line of barnacles and brown rockweeds.

SHORE PROFILE
above most tides:

- lichens
- cyanobacteria (formerly known as blue-green algae)

Intertidal zone – between high and low tides:

- common periwinkle *Littorina littorea*
- northern rock barnacle *Semibalanus balnoides*
- dog whelk *Nucells lapillus* are often dirty white with a tan tip; feeds on barnacles and dog whelks, their egg cases look like grains of rice hanging under rocks
- tortoiseshell limpet *Tectura testudinalis*
- common Atlantic slipper shell *Crepidula fornicate*
- blue mussel *Mytilus edulis*
- bladder wrack *Fucus vesiculosus* is Y-branching with paired bladders
- *Fucus spiralis* has swollen receptacles with a distinct ridge surrounding them, found in low energy sites
- rockweeds or knotted wrack *Ascophyllum nodulosum* is finer, more rope-like, in higher energy sites exposed to wave action
- green crab *Carcinus maenas*

below most tides or in tide pools:

- kelps, *Laminariales,* often have a tiny white "lace" of bryozoa on them
- Irish moss Chondrus crispus
- northern sea star- with yellow madreporite (the small porous plate which is the water intake)
- common sea star- bright orange madreporite
- green sea urchin *Strogylocentrotus droebchiensis*
- crumb of bread sponge *Halichondria panacacea*
- brittle star *Ophiolis aculeate*

SHELLS ON THE BAR washed up from deeper waters

- Hen/ surf/cherrystone clams *Spisula solidissima* - the various common names refer to sizes available commercially, not to different species. These are the hefty pairs that seem like soap dishes or ashtrays.

- New England nassa *Nassarius trivittatus* – tiny, less than ½ inch, tan shades, 3 horizontal zones of vertical beaded ridges
- northern moon snail *Euspira heros* - may grow to be the size of baseballs or softballs; fragments may have the attractive appearance of a cameo
- pandora *Pandora Gouldii* - pearly bi-valve the size of a pair of thumbnails; you rarely find both halves
- horse mussel *Modiolus modiolus*- large purple mussel with two shoulders rather than a single one as in blue mussels, *Mytulis edulis*, which are the ones we enjoy eating
- Stimpson's spindle whelk *Colus Stimpsoni* very occasionally
- ten-ridged whelk *Neptunea lyrata decencostata*

TIDE POOLS

At the south side of the bar, at the island end there are particularly fine tide pools. At the landward end, the high boulders show the vertical zonation very clearly. Follow that shore out to the point extending westward into the bay for more fine pools. In the other tide pools east of the bar, nearer Goose Cove Lodge, there are usually hermit crabs in the periwinkles. In past years hermit crabs were more likely to be found in moderately large moon shells. The sand collars that moon shells use to shelter their eggs could often be found on the bar itself.

- Coral weed *Corallina officinalis*, red algae that form small branching clusters, often bleached white
- several rock crusts, crustose red algae, may completely cover mussel shells and small rocks with white tan or pink crusts
- northern sea star
- blue mussels
- periwinkles
- hermit crabs
- Enteromorpha- transparent green tubules the size of spaghetti strands

FLAT BEACHES
such as Shore Acres, Scotts Landing, Causeway Beach and Grays Cove Reach Beach, Mariners Park

Fringing our shores are several salt-tolerant species of roses, bayberry bushes, and the following:

- cordgrass *Spartina alterniflora*
- salt meadow hay *Spartina patens*
- sea lavender *Limomnium nashii*
- seaside goldenrod *Solidago sepervirens*
- glasswort *Salicornia europaea*
- black rush *Juncus gerardii*
- spike grass *Distichlis spicata*

- wrack- various species of dried seaweed forming a line at high tide; home to many tiny crustaceans that may be especially important as food for migrating birds
- sand- may be pink if composed primarily of granite, grey from shistose sand, white particles of barnacles if shore actions is right

Notice the sorting by particle size based on wave action. If you dig down you will see coarse layers that are the result of winter storms. A rusty brown slimy layer is composed of diatoms. The rotten egg odor is from sulphides turning to sulphates; iron sulphates are both smelly and black.

At the Causeway between Little Deer and Deer Isle, the beach is really a miniature sand dune. Sand grains are stabilized by runners of the sea grasses. The sandy environment is dry at the upper zone, then for 2-3 feet down, the habitat retains some water. Deeper yet there is a resurgent zone, and finally a low water zone, with plants and animals sorted accordingly. Without the plants the narrow beach would entirely wash away so care must be taken to avoid damaging the vegetation.

Periwinkles at water's edge may well have hermit crabs in them. The larger periwinkles, well-crusted with a pink growth called "snail fur", are quite likely to be housing hermit crabs. This mat is usually a colony of hydroids, small colonial animals.

Shells of small green crabs are common and by no means always green. They have three rounded projections between their eyes and five triangular "teeth" on either side of the eyes. This species, *Carcinus maenam* has invaded from Europe and eats baby clams. More recently Asian shore crabs, *Hemigrapsus sanguineus*, have arrived from Japan. Their boxy dark green shells, perhaps 2" across, are more square with eyes set far apart. We hope you will not find them; but if you do, please collect them and take them to Penobscot East Resource Center.

- soft-shell or steamer clam *Mya arenaria*
- razor clam *Ensis directus*
- macoma clam, *Macoma balthica*- on beaches that are more mud than sand, hinge teeth look like a deer track, a pair of v-shaped indentations

- hen/surf/cherrystone clam- *Spisula solidissima*- can tolerate more wave actions, hinge indentation is a single wide indentation like a thumb print
- sand dollar *Echinarachinus parma*

Some coves and beaches are more suited to clam worms than to clams. Reach Beach at Grays Cove is an example.

- clam worm *Nereis virens* most common, greenish
- shimmy worm *Nepthus caecus* moves like a sidewinder, flicks out a red proboscis
- spaghetti worm *Amphitrite ornata* - in a U-shaped tube, frilly red gills and tangle of white tentacles
- blood worm *Glycera dibranchiate*- found deeper, red, will stick out its red proboscis and pinch hard!

Life Between the Tides: Marine Plants and Animals of the Northeast by Les Watling, Jill Fegley and John Moring, June 2003.

World Register of Marine Species at www.bigelow.org

SHELL FORENSICS

By examining bits of shells you can often deduce what killed the mollusk. A mussel shell dropped by a gull or crow onto a rock to break it exhibits a clean fracture.

When a gull drops a clam on the rocks it breaks in jagged fractures.

A powerful rock crab or Jonah crab will shear off the lip or turret of a snail shell, leaving edges that look as if scissors or tin snips were used.

Shallow grooves trailing over a shell that look as if they were made by some sort of mini-router might be the work of nemertean marine worms.

A single hole with beveled edges in a clam was likely made by a moon snail. The moon snail engulfs the clam in its large foot and drills in with its radula leaving that tell-tale beveled edge.

Dog whelks make small round holes in mussel shells.

They also insert their proboscis into the top plates of barnacles and pry them open. These carnivorous snails secrete acids that aid in their “safe-cracking”. Once inside the body cavity of their prey with their proboscis, the snails secrete enzymes which help them slurp up the victim’s insides. The shells of dog whelks that have been dining on mussels may exhibit a tell-tale bluish hue. Those dining principally on barnacles may have more whitish shells.

Interestingly, if the whelks have found sheltered places to live, their shells may exhibit ridges and sculpturing, whereas those in places more exposed to wave action, maintain smooth streamlined shells. These carnivorous snails have to be careful not to get caught in tide pools where it gets too hot or too toxic with snail sewage as they are not as good at surviving such conditions as are the herbivore periwinkles happily grazing on algae.

Live boring or sulfur sponges, *Cliona* spp., appear as thick yellow mounds. They make a series of almost pin-prick sized holes on shells. Where these holes are numerous you might at first mistake the lacey appearance for a coral.

BEACHCOMBERS GALLERY
Note: seashells look virtually the same throughout their adulthood although many enlarge as they age. The photos below are approximate, just to give an impression of the relative sizes.

northern rock barnacle

coral weed

crustose coralline

common periwinkle

smooth periwinkle

rough periwinkle

dog whelk

blue mussel

horse mussel

tortoiseshell limpet

New England nassa

waved whelk

littleneck or steamer clam

macoma clam – “ pleated” grooves at hinge

hen or surf clam, quahog

moon snail

two opercula- snail “doors”

pandora

razor clam

Atlantic slipper snail

white slipper snail

Stimpson’s spindle whelk

ten-ridged or Neptune whelk

Aristotle’s lantern – mouthparts of green sea urchin

FURTHER RESOURCES

When the Deer Isle Christmas Bird count was reinstituted in 1998 a number of people expressed interest but hesitated because they were not confident of their ability to identify the birds. We were fortunate to be given the early records of Margaret Hundley for birds of Deer Isle. It was a real coup when the National Park Service gave us the Bird Abundance monthly record for Acadia to be included in Quick Key for Birds of Deer Isle.

Today bird apps and the Cornell Laboratory of Ornithology web site with birdcast and eBird provide sophisticated birding data making it available instantly. Any listing of URLs rather quickly becomes out of date. Search engines deliver a wide array of resources so you cannot do better than consulting internet searches.

Old-fashioned as it may seem, a visit to the Nature Store at Heritage House in Sunset is still rewarding. Flipping through various field guides to see which style you prefer is valuable. You will probably want to build a wardrobe of guides as your interests and abilities evolve.

When Emily Muir died in 2003 it became apparent that we might lose the stories of the remarkable people who endowed Deer Isle with its ring of preserves. The book Beads and String, a Maine Island Pilgrimage thus came into being while firsthand accounts of donors, their children, and their motivations were still available. Filled the natural history of each preserve, this book is a blueprint for your own pilgrimages.

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download the full suite of PDFs for:

- **Self-Guided Nature Trails**
- **DeeriNature Species Almanac**
- **Nature Activities**

at www.deerisle.com

Text by Dr. Kenneth L. Crowell and Marnie Reed Crowell
with information from the series of **Walks and Talks**
by geologist Dr. Roger LeB. Hooke
and marine biologist Dr. Robert E. Knowlton

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