

New England Botanical Club Field Trips September 2004

On Friday afternoon, September 10, Drs. Chris Neefus and Art Mathieson of UNH led a party of approximately 10 Club members and several UNH students to explore the seaweed flora of the rocky intertidal zone of Wallis Sands in Rye, New Hampshire, and the salt marsh of Brave Boat Harbor, in Kittery, Maine. The rocky intertidal zone of Wallis Sands is a very exposed and disturbed environment, with high wave action and sand scour. The group scrambled down to the shoreline to observe the thick layer of wrack that had washed ashore. Several species were identified, with some noteworthy field characteristics. *Laminaria saccharina* (sugar kelp) is large and ribbon-like, with a very thick and strong holdfast. Somewhat smaller, *Laminaria digitata* (kelp) has “digits” along the margin. Although not a true kelp, *Agarum* sp. (shotgun kelp) could be identified by the numerous holes in the thallus. *Phycodrys rubins* (sea oak) is one cell thick except along the midrib. Green, threadlike, tangled balls of *Chaetomorpha* sp. were scattered about; *Desmarestia* sp. exudes sulfuric acid, and has minute spikelets on the margin. *Ulva* sp. (sea lettuce) could be discerned by its flat, bright green thallus.

A few low intertidal species were observed, including *Fucus spiralis*, *Chondrus crispus* (Irish moss), *Corallina*, and *Ascophyllum nodosum* (rockweed), which covered much of the rock surfaces of the intertidal zone. In the high intertidal *Porphyra umbilicalis* (nori) grew attached to rocks. This economically important seaweed is used in making sushi wraps. *Porphyra* was observed with variable pigmentation, from purple to green. The light-harvesting pigment phycoerythrin gives the thallus its purple coloration. The level of pigment depends on the light level. Plants growing in shaded areas are dark purple, while those exposed to full sunlight appear greenish. Pigmentation is also controlled by the amount of nutrient availability; a decrease in pigmentation may be associated with low nutrients.

For the second part of the field trip, Art Mathieson first described the habitat, morphology, and phenotypic variation of two seaweed species, *Ascophyllum nodosum* and *Fucus vesiculosus*. The group then journeyed through deciduous forests down to Brave Boat Harbor to search among *Spartina patens* for the seaweed. The Brave Boat Harbor salt marsh has a well drained, sandy substrate and is highly susceptible to erosion. Art taught the group how to distinguish between ecads and germlings. The former is a phenotypic variant of a species and is caused by extensive proliferation and degeneration of detached fragments. Germlings could be discerned by the presence of a distinct, discoid holdfast. Several phenotypic variants were found, including *Ascophyllum nodosum* ecad *scorpiodes*, *Fucus vesiculosus* ecad *volubilis*, and *Fucus* ecad *cottonii*.

On Saturday morning, September 11, Dr. Garrett Crow of UNH, accompanied by his phytogeography class, led several Club members to explore the vascular flora of the salt marshes and sand dunes along the New Hampshire coastline. The first stop was to a salt marsh in Rye, just south of Odiorne State Park. Here, the group trekked through pure stands of *Spartina patens*, *Distichlis spicata*, and *Juncus gerardii*. Other species encountered in the salt marsh included *Atriplex subspicata*, dense red patches of *Salicornia europaea*, *Spartina alterniflora*, *Solidago sempervirens*, *Potentilla anserina*, *Triglochin maritima*, *Limonium carolinianum*, *Suaeda maritima*, *Plantago maritima*, and *Scirpus robustus*. In some of the pools, *Ruppia maritima* was found. Garrett discussed the geographic distribution of several species, the role of environmental factors in shaping this type of plant community, and adaptations of species to such conditions.

The group then met at the Seabrook sand dunes. This area represents the largest coastal sand dune remnant in the state of New Hampshire. Prior to protection of this community, the sand dunes suffered a substantial amount of disturbance from ATV usage. Plants that colonize the dunes are adapted to strong prevailing winds, storm activity, shifting sands, salt spray, and high solar radiation. *Ammophila breviligulata* and *Lathyrus japonicus* are early colonizers of the foredune. Several species were observed among the dunes, including *Polygonella articulata*, *Lechea maritima*, *Cakile edentula*, *Artemisia stellaria*, *A. caudata*, *Hypericum gentianoides*, and *Myrica pensylvanica*. *Prunus maritima* grew intermixed with *Toxicodendron radicans*, making the collection of its sweet and succulent fruit a risky endeavor. Because the sand dunes are a rare community in New Hampshire, this area is the location of several state-listed taxa, including *Aristida tuberculosa*, *Cyperus grayi*, and *Hudsonia tomentosa*, all of which the group observed. Sunken forests, hollows among the dunes where the establishment of shrubs is followed by tree species, were scattered among the dunes. A few members of the group followed Garrett into one of them. The sunken forest was cooler, being densely shaded by a canopy of *Acer rubrum*, *Populus tremuloides*, and *Pinus rigida*. Shrub species included *Ilex verticillata*, *Amelanchier stolonifera*, *Vaccinium* sp., and *Viburnum* sp. The forest floor was colonized by species such as *Parthenocissus quinquefolia*, *Aralia nudicaulis*, *Trientalis borealis*, *Maianthemum canadense*, and *Carex pensylvanica*.

— Mare Nazaire, Recording Secretary, *pro tempore*