Figure 4.7. Soil types found on Prudence, Patience, Hope, and Dyer islands. GIS data sources courtesy of RIGIS.
Figure 4.9. Land cover in 1995 on Prudence, Patience, Hope, and Dyer islands. GIS data sources courtesy of RIGIS.
Figure 4.10. Examples of the dominant land cover classes on Prudence Island, including: (a) forest (pine-oak mixed forests are common on Prudence); (b) wetland (in this case, a salt marsh); and (c) brushland (dominated here by briar, Smilax spp.). Photos from NBNERR photo library.

Table 4.2. Acres of land cover types on Prudence, Patience, Hope, and Dyer islands based on RIGIS 1995 land-use/land cover coverage. Acres of Prudence Island land cover classes are presented for different sections of the NBNERR, for the NBNERR as a whole, and for all of Prudence Island.
and Charlton complex, characterized by a surface where stones and boulders cover between 2 and 10 percent, and where rock outcrops cover up to 10 percent (Rector, 1981). Because of these features, Hope Island resembles the rocky shorelines found in some areas along the southern coast of Rhode Island and along much of the northern New England coast. Dyer Island is also dominated by non-hydric soils (23 acres, compared to six acres of hydric soils). The six-acre hydric soil unit is Matunuck mucky peat that supports a small salt marsh on the southern end of the island.

**Land Use and Land Cover**

A diverse mosaic of land cover and habitat types exists on Prudence, Patience, Hope, and Dyer islands, in part due to over 300 years of extensive human modifications (see Chapter 3). Detailed land-use and land cover data for the islands (and all of Rhode Island) are available for the years of 1995 and 1998 in the form of GIS coverages that are coded according to the Anderson Level 3 land-use/land cover classification system (RIGIS, 2005). Based on the 1995 coverage, 23 land cover classes are found on the four NBNERR islands (Table 4.2; Fig. 4.9). All of these classes are present on Prudence, but not on Patience (seven land cover classes), Hope (three classes), or Dyer (three classes).

Prudence Island is dominated by secondary growth habitats. Deciduous forest is the largest land cover class (1,208 acres; 34 percent of the island), followed by wetlands (743 acres; 21 percent) and brushland (643 acres; 19 percent) (Fig. 4.10). In contrast, developed land cover classes (e.g., residential areas) comprise only 249 acres, or 7 percent of Prudence Island. Compared to the three other large islands in Rhode Island (Aquidneck, Conanicut, and Block), Prudence Island has by far the least amount of developed and agricultural land and the most forested and brushland, again illustrating the natural setting of Prudence (Rosenzweig et al., 2002).

When considering only the land within the NBNERR on Prudence Island, dominant land cover classes include deciduous forest (32 percent), brushland (23 percent), and wetlands (21 percent) (Table 4.2). However, only 17 land cover classes were identified in the Reserve, due to the absence of orchards and nurseries, mines and quarries, developed recreation areas, waste disposal, and vacant lands. At least 64 percent of the total acreage of each natural land cover class on Prudence Island was located inside Reserve boundaries, with the exception of evergreen forests (only 20 percent of this class was found in the Reserve). Land cover differed among the units of the NBNERR, but most were again dominated by forest, wetland, and brushland (Table 4.2).

Patience Island is almost completely composed of natural land cover classes, including mixed evergreen forest (79 acres; 38 percent of the island), mixed deciduous forest (48 acres; 23 percent), brushland (30 acres; 14 percent), and wetlands (23 acres; 11 percent). A 0.8-acre of residential development remains on Patience Island due to a lone inholding remaining after the island was purchased by the state.

Hope and Dyer islands differ from both Patience and Prudence in that they are both overwhelmingly dominated by a single land cover class. There are 64 acres of brushland on Hope Island and 25 acres on Dyer, making up 85 percent and 86 percent of the two islands, respectively. The only other land cover classes on these islands are deciduous forest and institutional (remnants from Navy use) on Hope, and water and wetland on Dyer.

Three land cover classes grew by at least 37 acres between 1988 and 1995 on Prudence Island: Ninety-nine acres of mixed deciduous forest, 72 acres of brushland, and 37 acres of deciduous forest grew during this period. Virtually all of these habitat increases occurred on the South Prudence Unit where areas that were abandoned by the Navy began to revert back to a more natural state (Fig. 4.9).

**Wetlands**

Based on the RIGIS wetlands coverage maps, 10 types of wetlands are found on Prudence, Patience, Hope, and Dyer islands (Fig. 4.11), although most of these are either deciduous forested wetlands and estuarine emergent wetlands (i.e., salt marshes) (Table 4.3). Almost 70 percent of all wetlands occurring on the four islands are protected within the boundaries of the Reserve, including 76 percent of all salt marshes. Compared to Aquidneck, Conanicut, and Block islands, Prudence has by far the greatest proportion of wetlands relative to the total island area (Rosenzweig et al., 2002).

**Surficial Hydrology**

Surface water bodies that retain water throughout the year are scarce on the four islands in the Reserve. Prudence has a few small year-round ponds, although the exact number is unknown (six were present on the RIGIS ponds coverage, and six
Figure 4.11. Wetlands on Prudence, Patience, Hope, and Dyer islands. GIS data sources courtesy of RIGIS.
Figure 4.12. Freshwater ponds and streams on Prudence, Patience, Hope and Dyer islands. All pond names are colloquial; ponds were unofficially named by island residents or Reserve staff. GIS data sources courtesy of RIGIS.
more were located based on personal observations; Fig. 4.12). Prudence also supports approximately 15.5 km (9.7 miles) of streams (based on the RIGIS streams coverage) and numerous, but unquantified vernal pools. Patience and Dyer islands do not support any standing freshwater ponds or streams (Fig. 4.12; the stream on Patience Island is actually a salt marsh tidal creek). Hope Island has two streams present on it according to the RIGIS coverage in addition to two small freshwater ponds that do not show up on the ponds coverage (personal observation). More detailed maps and information on ponds, vernal pools, and streams on the islands are needed, in part due to mapping inaccuracies on the RIGIS coverages.

### Shoreline

Based on the RIGIS Narragansett Bay estuarine habitat coverage, the NBNERR encompasses approximately 29 km (18.2 miles) of estuarine shoreline on Prudence, Patience, Hope, and Dyer islands. The Reserve’s shoreline is composed of five classes, including 15.5 km of beaches (mostly cobble, some sandy), 6.2 km of salt marsh (fringing and meadow marshes), 5.3 km of rocky shore, 1.9 km of upland, and 0.3 km of Phragmites australis (Fig. 4.13).

### Literature Cited
