600
Triassic Lowlands

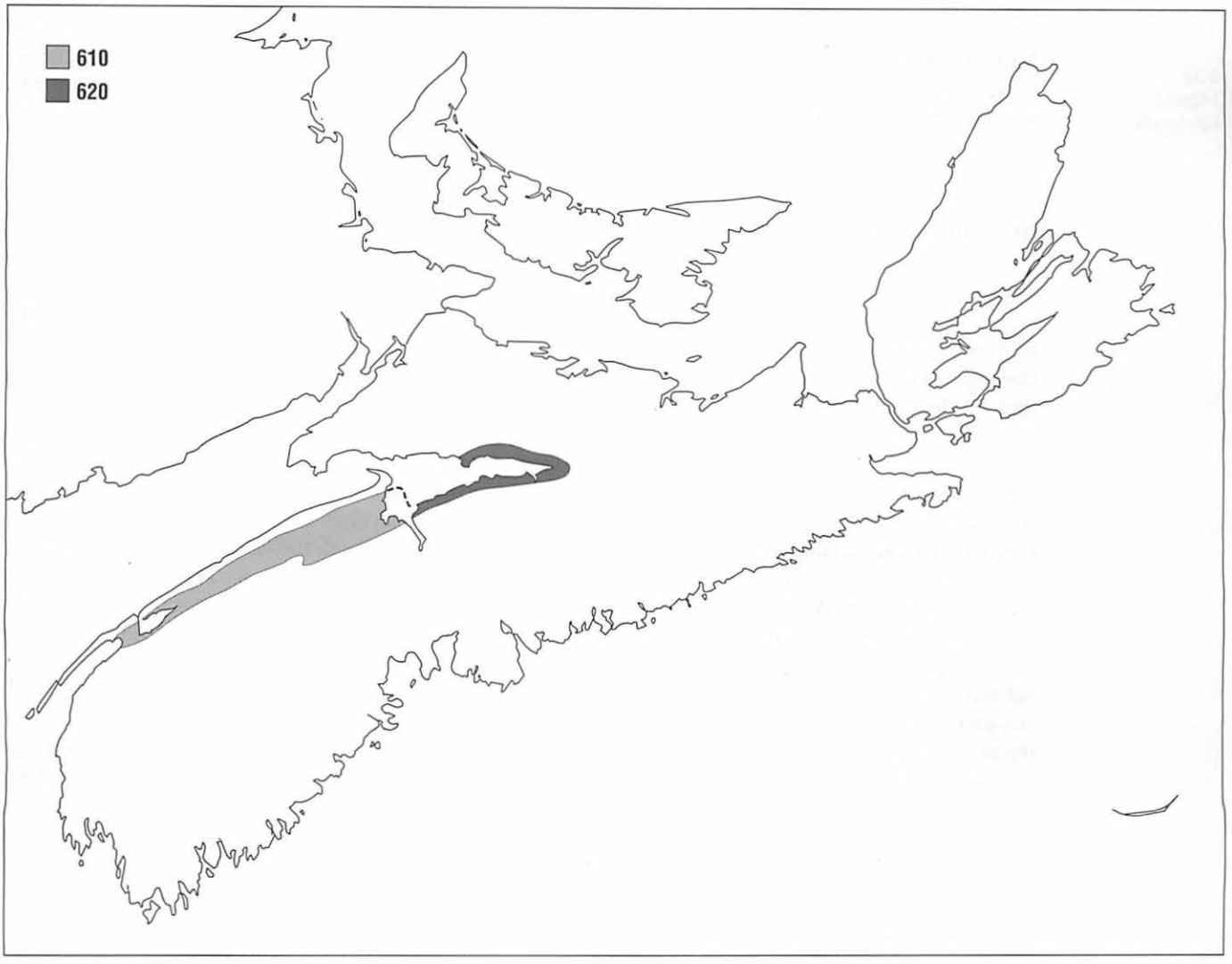

Figure 22: Region 600, Triassic Lowlands, and its component Districts.

600 TRIASSIC LOWLANDS

Two Districts are recognized within the Triassic Lowlands Region are:

610 Valley
620 Tidal Bay

REGIONAL CHARACTERISTICS

Soft Triassic sandstones have been eroded to form an open-ended valley. Material from the parent rock and glacial and post-glacial deposits provide a mixture of soil types. Shelter by North and South Mountains provides the most favoured climate in the province, with a growing season of 195 days. Where the valley is open to the sea at its east and west ends, the inland climate is moderated by marine influences. Natural vegetation includes Red Spruce, Eastern Hemlock, pine forests, oak and maple forests, bogs, and salt marshes (often turned to dykeland). Mud flats are rich in life and support large flocks of migratory shorebirds.

GEOLOGY AND LANDSCAPE DEVELOPMENT

The distinctive red beds that fringe the Minas Basin and Cobequid Bay, and extend underneath the Annapolis-Cornwallis Valley belong to the Triassic Lowlands. They are made up of weakly cemented and easily eroded sandstones and sandy shale overlain by glacial deposits of varying character.

The red beds were deposited under arid conditions in a narrow, hill-fringed basin while Nova Scotia was still part of Pangaea. The early deposits washed down from South Mountain and the Cobequids were coarse sands that were later consolidated into a crumbly sandstone (Wolfville Formation). Much of the basin was then flooded with lava as volcanoes became active in the Fundy region. Later faulting and subsidence created a spoon-shaped depression or trough in which the sandstones, shales, and basalt dip at 5–10° towards the centre line of the Minas Basin. This trough is now largely occupied by the sea.

The northern side of the trough is downfaulted. The master fault is probably the Cobequid Fault, but the present boundary of the Triassic deposits is the Portapique Mountain Fault. Along this northern margin the strata are more steeply inclined than those to the south and in places are even gently folded.

During the long period of erosion up to and including the Cretaceous, much of the basalt was removed. Some still remains as a protective cap on the sandstones, but to the north, east, and south, wide bands of soft sandstone became uncovered. Rapid erosion then ensued as a river system developed in the trough followed by glacial scouring and finally marine invasion. Much of the Triassic Lowlands Region is now covered by water. The largest area still above sea level is the eastern part of the Annapolis-Cornwallis Valley, which, though undergoing rapid erosion, is protected somewhat by its flanks of resistant rock: the North Mountain basalt and South Mountain granite (see Figure 25). The western end of the valley underlies St. Marys Bay. Elsewhere the Triassic deposits fringe the Minas Basin and Cobequid Bay, forming low, rapidly retreating sea cliffs fronted by wide, wave-cut platforms and mud flats.

CLIMATE

The climate of the Triassic Lowlands is inland in character because of the shelter provided by North and South Mountains, but is modified at the Digby and the Minas Basin ends by marine influences. The main climatic features in this region are a warm early spring, hot summers with less precipitation than elsewhere, and a higher frequency of clear skies.

Winters are cold but not severe. The January mean daily temperature is –6°C, compared to –8°C in northern Nova Scotia, and –5°C in southern Nova Scotia. Mean daily temperatures rise above freezing in late March, with the warming trend moving west to east. Spring temperatures are warm, and by July the mean daily temperature is 18°C. Mean daily temperatures fall below freezing during the first week of December. The western end of the Region, under the influence of the Bay of Fundy, is slightly milder in winter and cooler in summer.

Total annual precipitation at the eastern end and extreme western end of the Region is less than 1200 mm. Towards the centre of the valley it is somewhat higher: between 1200 and 1400 mm. Snowfall is moderate, being more than 250 cm in the centre of the Region and along the north shore of Minas Basin, and decreasing westwards. The Digby area receives less than 150 cm. The snow-cover season lasts longer

at the eastern end than at the western end by approximately thirty days.

Most of the Region is relatively protected by North Mountain from seasonal fog, mist, and low cloud of marine origin, making clear sunny days more frequent than in coastal areas.

This is the most favoured bioclimate in the province. The frost-free period and the growing season (145 and 195 days, respectively) are fairly long, with an accumulation of more than 2,400 growing-degree days. Summer precipitation at the eastern end of the Region is lower than elsewhere, and this, combined with the prevalence of coarse sandy soils, can lead to droughty conditions in some years. The warm temperatures and low elevations create a high potential for evapotranspiration and a mesothermal climate. Poor air drainage on the valley floor creates frost pockets.

FRESH WATER

Many streams and very few lakes are found in this Region. Numerous steep and shallow second- and third-order streams drain the surrounding higher elevations. Where they reach the lowlands, productivity is relatively high. Drainage in the Region is dendritic and parallel.

SOILS

The soil map reveals a complex mix of soil types in this Region. This is attributable to the variety of parent materials and to a range of glacial outwash and post-glacial marine deposition processes. The soft, red Triassic sandstones are easily eroded and have formed deep, coarse soils. Along the footslope of North Mountain the parent material often includes a mixture of basaltic rock. Along South Mountain the till is modified at the eastern end by grey and black slates and shales, and at the western end by granite. Most of the soils are well or excessively drained sands and sandy loams. Some limited areas of imperfectly drained soils have developed on finer water-deposited materials. At either end of the Annapolis Valley, and at the head of Cobequid Bay, extensive areas of salt marsh have been dyked. Small areas of organic soils are found scattered all along the valley floor and along the south shore of Minas Basin, but not along the north shore.

PLANTS

The Triassic Lowlands are part of Loucks' Red Spruce, Hemlock, Pine Zone in which Red Spruce and Eastern Hemlock, now heavily cut, once attained their greatest prominence. This zone is in turn divided into two forest ecoregions. The Annapolis Valley is part of the ecoregion covering the western interior, in which coarse soils predominate and Red Oak is a common species. To the east, slightly heavier soils occur, and Red Maple replaces Red Oak as the successional species after fire.

The main factors influencing regional vegetation are the warm summers, well-drained soils, and extensive disturbances by cutting and fire. The remaining stands are mostly coniferous, but there were probably more deciduous trees on the valley floor before lumbering. The climate suits shade-tolerant species, but the precipitation is just high enough to give spruce and hemlock the advantage. The main species are Red Spruce, Eastern Hemlock, White Pine, Balsam Fir, with Red Oak in the western portion, and Black Spruce and Red Maple to the east. Extensive areas are cleared for agriculture, and oldfields are common, usually regenerating in White Spruce. Extensive Red and White pine stands grow on the sand plains in the centre of the Annapolis Valley, often in association with heath barrens. Dykeland and salt-marsh plant communities are found along the coast.

ANIMALS

This Region provides a wide range of terrestrial and aquatic habitats, including productive intertidal habitats. Terrestrial habitats include a diverse mix of open land and forested areas. The fauna of this Region includes a number of more southerly and opportunistic species often associated with agricultural areas (e.g., fox and skunk). The mud flats, salt marshes, dykelands, and estuaries are important breeding and staging areas for waterfowl and migratory shorebirds such as Semipalmated Sandpiper. Together with wet meadows, the salt marshes and dykelands are among the largest areas of suitable habitat in Nova Scotia for Arctic Shrew. Typical freshwater fishes include Atlantic Salmon, Brook Trout, and Creek Chub.

CULTURAL LANDSCAPES

The Triassic Lowlands attracted the first European settlement in Nova Scotia as the French were lured by fur trade with the Mi'kmaq, the exploitable fisheries, and imperial territorial claims. Acadians chose to dyke tidal marshes to create fertile farmlands rather than clear the forests. Thus the coastal landscape was dramatically transformed. The largest Acadian com-

munity was located on the higher elevations near Grand Pré, and descendants of willow trees planted by the Acadians still stand. Both Mi'kmaq and Acadians weir-fished the river tributaries of Minas Basin and hunted the abundant waterfowl. After the 1755 Acadian deportation, successive waves of immigrants settled these fertile lands, continued to use the dykelands, and cleared valley forests to create prosperous farmlands.

Tidal-powered grist mills were established at Canning and Walton, but most grist mills were powered by river waterwheels. Numerous hydroelectric generating stations now harness waterways in this area. Today, the fertile soils of the Triassic Lowlands support the most productive farms in Nova Scotia. The advent of steamships in the nineteenth century facilitated the transport of produce overseas. The Annapolis valley's apple industry thrived during this period as produce was more likely to reach Britain in marketable condition. Railways and, later, truck transport increased other apple markets. Timber cut from forests of the Triassic Lowlands supplied local shipbuilding, furniture manufacturers, and export markets. In these primarily agricultural lands, forestry exploitation has always been economically important, and today, as in the past, many sawmills operate. Nova Scotia's first tourism ventures took place in the Annapolis Valley, attracting American tourists to the land of Longfellow's fictional "Evangeline" and her Grand Pré home. Today the Triassic Lowlands support many tourism and recreational activities, including bird-watching along the Fundy shores, where migrating flocks may be seen.

• • • • • • • •

Associated Topics

T2.5 The Nova Scotian Desert, T2.6 The Triassic Basalts and Continental Rifting, T3.2 Ancient Drainage Patterns, T3.3 Glaciation, Deglaciation and Sea-level Changes, T5.2 Nova Scotia's Climate, T7.3 Coastal Landforms, T8.1 Freshwater Hydrology, T8.2 Freshwater Environments, T9.3 Biological Environment, T10.4 Plant Communities in Nova Scotia, T11.1 Factors Influencing Birds, T11.3 Open-habitat Birds, T11.5 Freshwater Wetland Birds and Waterfowl, T11.6 Shorebirds, T11.13 Freshwater Fishes.

Associated Habitats

H2.4 Mud Flat, H2.5 Tidal Marsh, H3.1 Freshwater Open-Water Lotic, H3.3 Freshwater Bottom Lotic, H3.5 Freshwater Water's Edge Lotic, H5.2 Oldfield, H5.3 Cliff and Bank, H6.2 Softwood Forest (Spruce, Hemlock, Pine Association; Pine Association).

610 VALLEY

GEOLOGY

The Annapolis Valley extends from the eastern end of St. Marys Bay in the west to the mouth of the Cornwallis River in the east. It is approximately 128 km long and 3–11 km wide.

Early Fluvian Erosion

The Valley has been carved out by river action and deepened by glacial scouring. When the sandstones were first exposed as the basalt wore away, rivers flowed at right angles across the valley. These rivers rose on South Mountain and flowed north across the present valley and North Mountain before discharging into the centre of a river which flowed down the Bay of Fundy. The sandstone wore away more quickly than the basalt, and when the ends of the Valley became open to the sea, the drainage was diverted to the west and east, leaving "wind" gaps across North Mountain, for example, the gap north of Melvern Square.

Sandstone is infrequently exposed within the Valley because it breaks down so readily to form a sandy soil. However, some sandstone can be seen on the slopes of South Mountain in the beds of rivers and resting upon older rocks. Outcrops of the overlying, younger Blomidon Formation that are adjacent to the basalt on the north side of the valley are covered by glacial deposits or scree slopes. At the ends of the valley, where marine erosion has removed the overburden, red cliffs can be seen: along the face of Cape Blomidon (where the lower slope exposes the Blomidon Formation); on the north shore of the Annapolis Basin at Thorne Cove and near Port Wade; and in the bluffs at Rossway. At Kingsport on the Minas Basin, excellent exposures of Triassic Wolfville sandstone occur. These contain fossil plant roots and occasional reptile bones. Because the sandstones lie underneath the basalt and dip northwards, no outcrops are found on the north shore of North Mountain.

Glacial Deposits

As the ice retreated after the last glaciation, the sea level rose and the land surface rebounded from its depressed position. In western Nova Scotia and the Bay of Fundy area, sea levels rose faster and encroached inland. The beaches, marine deltas, elevated shorelines, sand spits, and bars which formed at that time can now be seen raised well above sea level in many places along the Annapolis-Cornwallis Valley. The average elevation is 15–30 m above present sea level, but beaches are often found at different heights in the same vicinity. These, perhaps, have different ages or represent features established along a temporary shoreline as glacial water was impounded against the coast or in a basin. Raised beaches and terraces are best seen in Digby County at the mouths of rivers and around the lower part of the Annapolis Basin.

Glacial outwash deposits are also preserved in this area and near Kentville. Windblown sand, dunes, and loess, possibly from glacial outwash deposits, are found between Kingston and Greenwood. Kentville lies on the edge of the sand area.

Rising sea levels, during the past 4,000 years or so, drowned the lower reaches of the Annapolis and Cornwallis rivers. During this period, St. Marys Bay formed and the Annapolis Basin was flooded as the sea broke through the river-cut gap at Digby Gut.

FRESHWATER AND COASTAL AQUATIC ENVIRONMENTS

The Annapolis-Cornwallis Valley is drained by two main rivers separated by a secondary watershed divide. The Annapolis flows west and the Cornwallis flows east. Many first- and second-order streams drain in parallel and dentritic patterns off North and South Mountains to feed the Annapolis and Cornwallis. In the lower reaches of both systems, drainage becomes more complex with several tertiary watershed divides. Where the tide influences the rivers, large meanders form at high tide. The water can trickle down to a mere stream at low tide when tidal flats and muddy banks prevail, but these streams can resemble rushing torrents when a tidal bore enters the channels.

Large productive freshwater wetlands occur along both the Annapolis and Cornwallis rivers in their headwater areas between Kingston and Kentville. There are many bogs, swamps, and marshes, and many small areas of wet meadow.

The Annapolis and Cornwallis rivers have developed extensive tidal marshes in their lower reaches. The wide, fertile valley north and east of Kentville

that opens onto the Minas Basin was created by five rivers: the Gaspereau, Cornwallis, Canard, Habitant, and Pereaux. The floodplains of these meandering rivers are separated by low ridges and protected from tidal incursions only by the system of dykes originally built by the Acadian farmers, for example, near Port Williams. Grand Pré was probably once a meander in the Cornwallis River, with Long Island Head and Boot Island forming part of the northern bank of the floodplain. At some time, the river swung northwards to form a new meander between Starrs Point and Long Island Head, and the old meander silted up. Rising sea levels have now drowned the lower reaches of this river, forming a wide estuary west of Grand Pré.

SOILS

The soils in this Unit have formed on parent materials from various exposed geological strata, and on water-deposited materials. The finest textured strata are uppermost, and on this soft Triassic shale, well-drained soils of the Pelton series have developed on the footslopes of North Mountain. Coarser sandstones from the middle strata exposed on the Valley floor have produced the deep Woodville and Berwick sandy loams. The lowest strata exposed are a fine-grained conglomerate from which the Somerset series (a well-drained loamy sand) has developed. In the centre of the Valley is a complex, water-deposited series of sand flats. Associated well-drained soils are Canning, Cornwallis, and Nictaux, while Debert, Kingsport, and Lawrencetown soils are imperfectly to poorly drained. Alluvial Cumberland soils have developed beside streams and rivers, and imperfectly drained Fash soils have developed on lacustrine or marine clays in the central part of the Annapolis River drainage basin. Along the south slope are numerous beach terraces of slaty gravel origin from which Torbrook and Nictaux soils have developed. On the lower slopes, well-drained Morristown soils have formed from slaty parent materials, while Bridgetown soils have developed from a mixture of Carboniferous sandy loam till brought from the north, and locally weathered granite and quartzite. Organic soils are scattered through the Valley, the most notable example being the large Caribou peat bog located on the watershed divide between the Annapolis and Cornwallis river systems at Aylesford. Some of the Valley floor is wet because of effluent water. In these areas, water-loving vegetation such as alders and larch prevail.

PLANTS

The Annapolis Valley is most obviously an agricultural region. By the late nineteenth century, extensive clearing had restricted forests to more marginal sites. Now, however, large areas are reverting to forest growth. Apple orchards were originally located on the richer tills of the Valley slopes. Sugar Maple, American Beech, Red Spruce, and Eastern Hemlock are typical in later successional stands (H6.3); White Spruce, fir, and pine, with the shade-intolerant hardwoods maple and birch, are found on more recently disturbed sites. On the dry, sandy soils of the Valley floor, which are more prone to drought and frost, the maple, oak, birch association is common. Red Pine, White Pine, and Red Oak are found on the valley-bottom sand plain. Wire Birch, Red Maple, Red Oak, White Birch, and poplar are common post-fire species. Oldfields usually regenerate in White Spruce, except where wetter conditions favour alder and Black Spruce. Black Spruce and larch are the species found in depressional areas or on poorly drained soils.

Non-forest plant communities are very conspicuous in this Unit and include those found in dykelands, oldfields, tidal marshes, and floodplains. Scattered Alleghanian floral habitat is found throughout the Valley.

ANIMALS

Wildlife habitats in this Unit are diverse and include agricultural lands, orchards, oldfields, woodlands, and heathlands. Freshwater habitats include only a few lakes but many slow, meandering streams and rivers. Because of the high Fundy tides, coastal habitats consist mainly of extensive intertidal areas—salt marshes and mud flats—and associated dykelands.

Mammals often associated with agricultural areas include a large raccoon population, Red Fox, woodchuck, and increasing numbers of skunk. Muskrat and mink are common. The avifauna also reflects the agricultural character, which provides good habitat for pheasant, snipe, woodcock, and hawks. The crow population is high, and the Valley provides wintering habitat for the Bald Eagle. The dykelands provide good habitat for Gray Partridge (declining) and Short-eared Owl.

The west end of the Minas Basin and the Avon River estuary are nationally important because they support high numbers of shorebirds and waterfowl. Shorebird numbers peak in late summer and early fall, and important sites include Kingsport, Pereaux, and Evangeline beaches. Waterfowl include Black

Duck, Canada Goose, Brant, and teal. Boot Island provides nesting areas for gulls, herons, and cormorants and is a crow roost in winter.

At the other end of the Valley, the Annapolis Basin and the Annapolis River are important because they provide migration habitat for concentrations of waterfowl in spring and fall, and because a moderate number of duck remain through the winter. At the head of St. Marys Bay, high numbers of shorebirds occur, primarily in August. Anadromous fish such as American Shad and Atlantic Salmon pass through the Annapolis River estuary to spawn in fresh water further upstream. Striped Bass are also present but do not manage to spawn upstream.

SCENIC QUALITY

Inland portions of the Annapolis-Cornwallis Valley have moderately high scenic value. The most striking scenic feature is the prominent North Mountain escarpment, which provides a uniform and die-straight edge to the Valley. The South Mountain, though rising to a similar elevation, is much less dramatic and often not visible from the Valley floor. The District rates well in terms of landcover, since most sections have an aesthetically favourable mix of farmland and woodland. At the extremities of the Valley, the Annapolis and Minas basins add interest and even splendour to the visual scene. The Annapolis Basin fills the Valley's trough and is connected to the Bay of Fundy by the faultline cleft of Digby Gut. The Minas Basin has distinctive expanses of red mud at low tide,

Plate 6: Region 600. View from Blomidon Look-off at the east end of the Annapolis Valley (District 610) showing an agricultural landscape of cleared forest land and reclaimed tidal marsh. Photo: A. Wilson.

set against the red cliffs of Cape Blomidon, and its shores have been fashioned into rich dykelands by both Acadians and Planters. Panoramic views of the area are provided from the adjacent hills (see Plate 6).

CULTURAL LANDSCAPES

The resource potential of the Valley's land and wildlife have long shaped human settlement patterns here. In 1604 the French established a post at Port Royal, laying territorial claims to the New World, with the fur trade and fishery serving as economic catalysts for their interest in Acadia. Good relations between the Mi'kmaq and the French secured trade relations and political alliances. Acadians soon migrated to other areas outside the vicinity of Port Royal and began dyking tidal marshlands along the Minas Basin, with the largest Acadian settlement at Grand Pré. Thus the coastline underwent radical change as dyke building transformed these estuarine saltmarshes into fertile agricultural lands. With their own food needs met, Acadians traded surplus grain to the Boston States before their own deportation by the British in 1755—an act which a century later would serve as subject matter for one of America's most celebrated poets. Longfellow's poem "Evangeline," published in 1847, was immensely popular for a hundred years. Many Americans travelled here in search of Evangeline's mythical Acadian paradise, attracted in part by the promotion of the Dominion Atlantic Railway, which transported tourists from the Yarmouth Steamship to Grand Pré on its "Land of Evangeline" route, one of the first tourism ventures in the province. Today the Grand Pré National Historic Site commemorates Acadian history. As well, the Annapolis Royal Historical Gardens features a replica of an eighteenth-century Acadian house and garden, and a stand of Elephant Grass, a circumboreal plant species that the Acadians grew in Nova Scotia for use as roof-thatching material.

The first apple trees in Nova Scotia were planted by the French at the beginning of the seventeenth century. By 1698 a French census showed 1,584 apple trees distributed among 54 Acadian families at Port Royal alone. The fertile Acadian farmlands and orchards vacated by the deportation were inherited by successive waves of settlers. First came the New England Planters, then the Loyalists, and others followed. Tidal mills to grind grain or saw lumber were established at various points around the Minas Basin; an 1845 record indicates a tidal mill around Canning. Today, the Annapolis Tidal Power Station on the Annapolis River is one of the first such plants in the world and generates 20 MW of electricity for 12,500 homes. However, it has also changed river currents, caused river erosion upstream, and detrimentally affected some fish populations. Hydroelectric generating stations have harnessed the power of waterways at Lequille, Paradise, Nictaux, Hells Gate, Lumsden Lake, Hollow Bridge, and Methals. Mixed farming characterizes much of Valley land use, including the highest production of hay, tree fruits, vegetables, beef cattle, hogs, and chickens in the province. As a consequence, many secondary industries related to agriculture, such as processing and packing, are established here. In Aylesford, a peat-harvesting operation marks the first commercial exploitation of peat in the province. Several sand and gravel deposits in the valley are exploited by large commercial producers. In some areas, such as Del haven, fishing takes place. Bay of Fundy stopovers during annual bird migrations attract bird-watchers to many areas, particularly Evangeline Beach, Wolfville Sewage Ponds and Canard Pond.

610
Valley

●●●●●●●●

Sites of Special Interest

- North of Melvern Square—wind gap
- Cape Blomidon—red sandstone underneath basalt
- Thorne Cove, Port Wade, Rossway—red cliffs and bluffs
- Annapolis Basin—gravel terraces at river mouths; for example, east of the mouth of Bear River are sands (Torbrook soils) 30 m above sea level
- Smiths Cove—point covered with fine sand, 30 m above sea level
- North of Digby—obscure beach deposit 27–30 m above sea level
- Deep Cove—gravel deposits 42 m above sea level
- Upper Granville—U-shaped sand bar
- North of Wolfville—raised beaches
- Woodside—series of sandy mounds extend for 4 km near Pereau River, 25 m above sea level; the easterly ones are curved like a spit
- West end of Kentville—small lake amongst sand hills is a kettle hole surrounded by kames
- Kingston to Greenwood—kames and esker-like ridges
- Avonport Mountain—view from highway across valley
- Kingsport—excellent exposures of Triassic sandstone with fossil plant roots and rare dinosaur bones and tracks

- Kentville Ravine (IBP Proposed Ecological Site 64)—old-growth hemlock stand, and river floodplain with rich herbaceous flora
- National Wildlife Area—Boot Island
- Provincial Wildlife Management Areas—Dewey Creek, Minas Basin
- Kentville Migratory Bird Sanctuary
- Aylesford Bog (Caribou Bog)
- Near Kingston—sand barrens

Provincial Parks and Park Reserves
- Upper Clements
- Upper Clements West
- Clairmont
- Coldbrook
- Joggins Bridge

Scenic Viewpoints
- The Lookoff (panoramic view looking south over District 610)
- Grand Pré National Historic Park (views over dykeland towards Cape Blomidon)
- Kentville Agricultural Research Station (Elderkin Brook trail)
- Fort Anne National Historic Park, Annapolis Royal
- Digby (views of Annapolis Basin)
- Smiths Cove (views of Annapolis Basin)

Associated Offshore Units
912 Outer Fundy, 913a Minas Basin.

Associated Topics
T2.6 The Triassic Basalts and Continental Rifting, T3.4 Terrestrial Glacial Deposits and Landscape Features, T4.2 Post-glacial Colonization by Plants, T6.4 Estuaries, T8.1 Freshwater Hydrology, T9.2 Soil Classification, T10.2 Successional Trends in Vegetation, T11.2 Forest and Edge-habitat Birds, T11.3 Open-habitat Birds, T11.4 Birds of Prey, T11.13 Freshwater Fishes.

Associated Habitats
H2.3 Sandy Shore, H2.4 Mud Flat, H2.5 Tidal Marsh, H3.1 Open-Water Lotic, H3.3 Bottom Lotic, H3.5 Water's Edge Lotic, H4.1 Bog, H4.3 Swamp, H4.4 Freshwater Marsh, H5.2 Oldfield, H6.1 Hardwood Forest (Maple, Oak, Birch Association), H6.2 Softwood Forest (White Spruce Association).

620 TIDAL BAY

GEOLOGY AND LANDSCAPE DEVELOPMENT

Minas Basin and Cobequid Bay were carved out by rivers which eroded eastwards from the Bay of Fundy, cutting a channel along the Minas Passage Fault between Cape Split and Cape Sharp. The shape and profile of the entire Bay of Fundy was greatly affected by repeated glaciations during the Pleistocene. The floor is smooth and striated like a glacial pavement and covered by a mantle of loose material up to 10 m thick, some of which is glacial till. At the entrance to Cobequid Bay is a glacially scoured trough.

Around Cobequid Bay the Triassic red beds are nearly horizontal and form a low area with gentle undulations (see Figure 23). On the north side of Cobequid Bay, they attain their greatest width but then end abruptly at the Portapique Mountain Fault. The Triassic block has dropped down on the south side of this fault and now lies against older Carboniferous strata. West and east of Truro, Triassic deposits lie unconformably against Carboniferous Horton strata. In both areas the Carboniferous strata are harder and form low rolling hills. The boundary with the flat red beds is generally very distinct.

The Shubenacadie and Salmon rivers, which flow into Cobequid Bay, have drowned estuaries and buried river channels beneath the riverbed deposits. In the Truro area the incised channels of North River

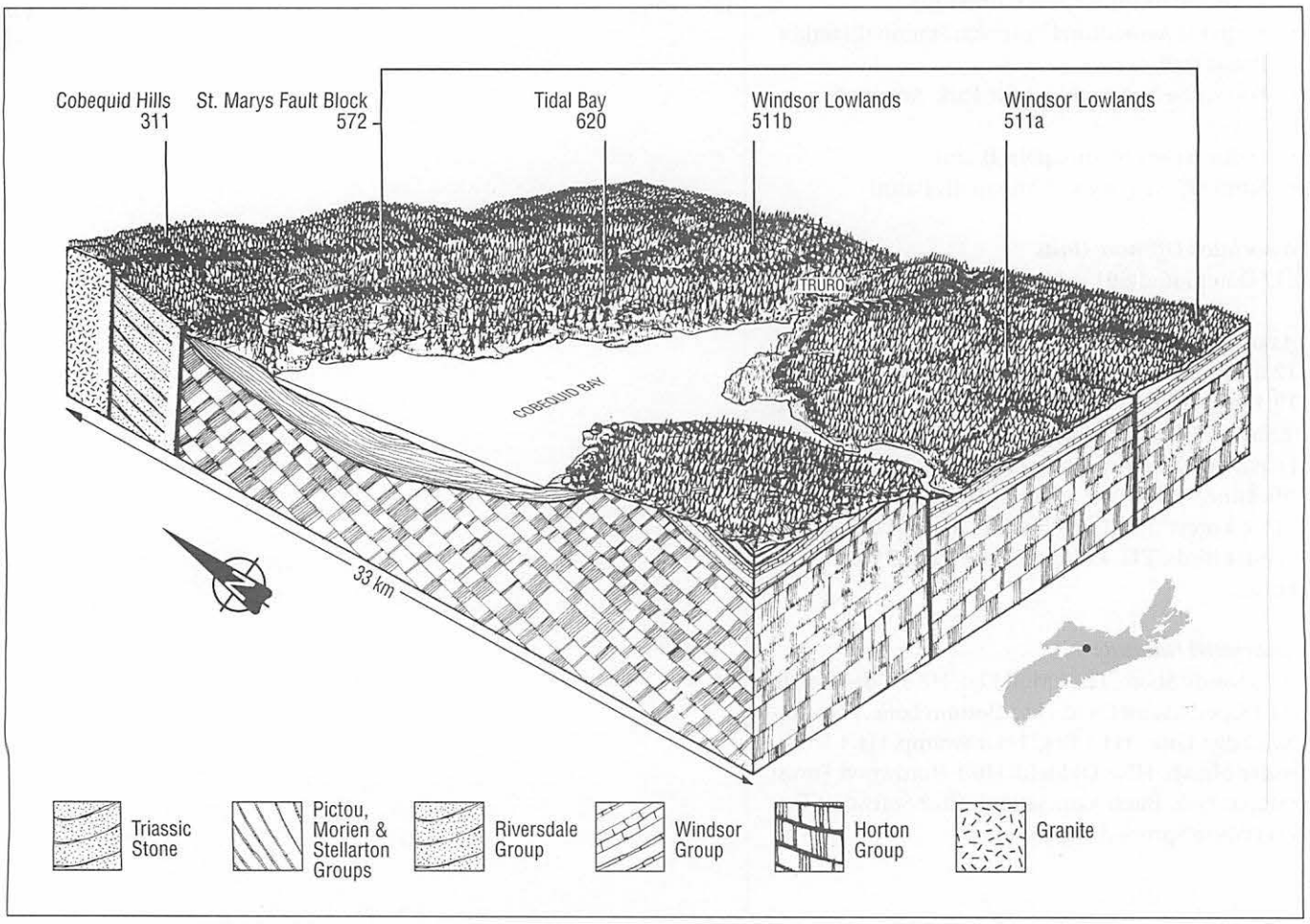

Figure 23: Cobequid Bay area. Very soft, red Triassic sandstones fringing Cobequid Bay (District 620) are surrounded by the somewhat more elevated and resistant Carboniferous rocks of the Windsor Lowlands (Unit 511). A westerly extension of the St. Marys Fault Block (Unit 572) forms a dissected shoulder to the Cobequid Hills (Unit 311), from which short, steep rivers drain into the bay.

and Salmon River can be traced for 6 km and 8 km, respectively. They merge under the town and continue out to the Cobequid Bay, deepening to 40 m and narrowing to one kilometre, following the same course as the present river. These channels, cut in the sandstone bedrock, are filled with fluvioglacial outwash sands and gravels from the end of the last glacial period, about 10,000 years ago.

Much of the Triassic Lowlands from Truro to the north side of Cobequid Bay are covered by glacial deposits. The Truro sub-basin is filled with outwash sands and gravels carried from the north and east that form a plain elevated to 18 m above sea level; this plain is now dissected by streams. On the north side of Cobequid Bay, outwash deposits can be seen in the terraces of rivers. At Glenholme the underlying Triassic sandstone is exposed where the gravels have been washed away.

As sea levels continue to rise, the soft coastal red beds are being eroded rapidly, adding enormous volumes of sediment to the waters of the bay. This sediment is washed up and down the rivers with the tide, and some is deposited in the estuaries as sand bars; for example, in the Avon and Shubenacadie river estuaries.

As the coastline retreats, coastal marshes are also being eroded. In some cases the remains of fossil forests of beech, pine, Black Spruce, and larch are exposed. These trees were buried by bluish marine clay when the combined effects of rising sea levels and increasing tidal ranges brought salt water further up low-lying river valleys and over coastal lowlands. Once exposed to tidal action, the fossil stumps are quickly destroyed; however, new ones are continuously being exhumed. The rapid coastal erosion has created a wave-cut platform 100–300 m wide that borders the shore. This platform is commonly backed by low cliffs.

FRESH WATER

The drainage pattern across the Triassic Lowlands in the Cobequid Bay area is broadly dendritic, with the rivers reaching the bay through drowned estuaries. The District is dissected by four secondary drainage divides. Along the north shore the streams flow steeply down off the Cobequids (Unit 311), forming numerous parallel tertiary watersheds, and are second- or third-order streams by the time they reach the lower elevation of District 620. Short, isolated first-order streams flow directly into Cobequid Bay along the south shore. Major rivers (such as the Shubenacadie, Salmon, Chiganois, and North) and several smaller streams influence seawater chemistry in the estuary at the head of Cobequid Bay.

There are many tidal marshes in the estuary and scattered along the coastline, concentrated in inlets and the mouths of rivers.

SOILS

Hantsport clay loams occur along the narrow strip on the south shore of the Minas Basin. On the western side they are well drained but have imperfectly to poorly drained associates to the east. Around the town of Truro, well-drained Truro soils have developed from the red sandstone, with poorly drained associates covering approximately one-third of the area. Gravelly sandy loams of the Harmony series have also formed in this area over gravelly, sandy clay loams. Coarse Hebert soils on outwash sands, and finer-textured Cumberland and Stewiacke soils on alluvial materials, are found along streams and rivers. Large areas of Acadia soils have formed on dykelands at the head of Cobequid Bay.

PLANTS

This Unit is extensively farmed but differs from District 610 mainly in the presence of heavier soils. Pine is therefore not as dominant a feature of the vegetation. Scattered Sugar Maple, American Beech, and Yellow Birch occur locally on low ridges, but spruce, fir, White Birch, Red Maple, Eastern Hemlock, and White Pine form relatively stable forests on other sites. Red Maple and Wire Birch replace Red Oak as post-fire species. White Spruce, Red Spruce, and Balsam Fir are the usual invaders of oldfields. Heathlands with Jack Pine are found in the Debert area, and the Minas Basin is fringed with areas of salt marsh. Rich intervale sites in the Truro area support Alleghanian floral species.

ANIMALS

This District provides a mix of forested and open land and intertidal habitats occupied by a fauna similar to that described in District 610. The south coast of Minas Basin and Cobequid Bay is regionally important because of the significant concentrations of shorebirds in late summer and early fall, and the moderate numbers of waterfowl. The north shore of Cobequid Bay is also visited by several thousand shorebirds in August and September, and by waterfowl in spring and fall—mostly Black Duck with some Canada Geese. The provincial waterfowl sanctuary near Debert has a unique population of American Wigeon and several hundred geese use this wetland in the fall. A small population of Gray

Partridge occurs in open dykeland and coastal farmland. Freshwater fishes include Creek Chub and Brook Trout. Anadromous species, such as Atlantic Salmon, Atlantic Sturgeon, American Shad, Striped Bass, and Rainbow Smelt, occur in Cobequid Bay. In order to spawn, many thousands of shad enter the Shubenacadie River, and Atlantic Salmon enter most Cobequid Bay rivers.

SCENIC QUALITY

This area shares many of the Valley's scenic characteristics: it is a narrow and elongated farming region based originally on dyking of tidal marshlands. The water element, however, is more visually prominent (as the District forms a narrow fringe around Cobequid Bay) and relief is more muted. With the exception of the stretch west of Economy, there is no dramatic escarpment to mark the northern edge of the District; rather the land rises gently to the slightly more elevated Carboniferous Lowlands. From the southern side of Cobequid Bay, however, the Cobequid Hills provide a distant backdrop to a northward view.

CULTURAL LANDSCAPES

An excavation at Debert uncovered an important Paleo-Indian campsite estimated to be 11,000 years old. Artifacts indicated that these early peoples hunted Woodland Caribou that had migrated northward after the retreat of the glaciers. In the seventeenth century, Acadians first settled in tidal-bay marshland areas that could be dyked to create fertile farmlands. After their 1755 deportation, Planters, Loyalists, and others settled much of this land, with an important farming area established around Truro. Today, farmlands here support the highest concentration of dairy cows in Nova Scotia. Timber supplied a thriving shipbuilding industry in the late 1800s, aspects of which are documented at Maitland's Lawrence House Museum, the home of shipbuilder and designer W.D. Lawrence. Hardwoods from the Cobequid Hills supply lumber to the Bass River Furniture Company. A large barite deposit near Walton was mined for 30 years, closing in 1971. Walton was also the site of an early tidal mill, where water power was used to grind grain or saw lumber. In the 1970s the tidal bay was seen as a candidate site for a large tidal power project. Peat is now exploited in the tidal bay area for the horticulture market.

• • • • • • • •

Sites of Special Interest

- Walton (Whale Cove)—Triassic sandstones (Wolfville Formation) unconformably overlie the vertical Horton red siltstones exposed at low tide
- Route 215 between Maitland and Cambridge—road follows the boundary between the low Triassic coastal fringe and the adjacent rolling Carboniferous hills
- Inner Minas Basin shoreline—coastal sections of Triassic sandstone with plant fossils and bones of early dinosaurs
- Salter Head, Maitland—low sandstone cliffs fronted by a wave-cut platform and large sand bars in the estuary of the Shubenacadie River
- Selma—large sand bar
- Victoria Park, Truro—a river gorge carved during Triassic times in the Carboniferous Horton Group and now being exhumed by Lepper Brook; under the bridge in the park is an angular unconformity between the Horton Group and the younger Wolfville Formation
- Glenholme—glacial gravel overlying Triassic sandstone in the river terrace
- Debert Wildlife Management Area

Provincial Parks and Park Reserves

- McElmons Pond
- Anthony

Scenic Viewpoints

- Highway 215, east of Selma (view over Cobequid Bay)
- Burntcoat loop
- Highway 2, Economy to Lower Economy

Associated Offshore Unit

913a Minas Basin.

Associated Topics

T2.6 The Triassic Basalts and Continental Rifting, T3.3 Glaciation, Deglaciation and Sea-level Changes, T6.4 Estuaries, T7.1 Modifying Forces, T11.5 Freshwater Wetland Birds and Waterfowl, T11.6 Shorebirds, T11.13 Freshwater Fishes.

Associated Habitats

H2.4 Mud Flat, H2.5 Tidal Marsh, H6.1 Hardwood Forest (Sugar Maple, Yellow Birch, Beech Association), H6.3 Mixedwood Forest (Spruce, Fir, Pine–Maple, Birch Association).