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IDENTIFICATION, DOCUMENTATION AND MAPPING OF PRIME TIDAL WETLANDS IN THE TOWN OF HAMPTON, NEW HAMPSHIRE

Submitted to: The Hampton Conservation Commission
Hampton, New Hampshire

and

The Office of State Planning
State of New Hampshire

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INTRODUCTION:

Tidal wetlands in the town of Hampton, N.H. total approximately 1,720 acres comprising intertidal marsh inundated by daily high tides, high marsh or salt meadow flooded during bi-monthly spring tides, tidal flats, rivers and creeks. This represents about one-half the total acreage of the Hampton - Hampton Falls - Seabrook tidal wetlands system. Land above the normal range of high tide such as outcroppings in the tidal wetlands referred to as marsh islands and upland borders of the tidal marsh are also considered respectively as features of the marsh topography and areas of major importance to maintaining the integrity of the tidal wetlands ecosystem. Consistent with the criteria set forth by the Wetlands Board, State of New Hampshire, documentation is provided for each category specifically related to tidal wetlands.

The status of a tidal wetland as prime means that this land is worth more to the natural resource inventory of the town and state when left in it's natural, unaltered condition. This status precludes any alternative land use except as a wetland - wildlife habitat and for the aesthetic and recreational enjoyment of the people. The prime status specifically prohibits filling or other alteration of the wetlands for development, commercial enterprise or any other purpose which would cause degradation of the present condition of the land. Maintenance of navigable waterways and established marina basins through limited, closely supervised dredging is acceptable provided the dredge spoils are not dumped

on the marsh surface or placed in non-navigable waterways. Areas of tidal wetlands previously impacted and/or degraded by any means so as not to achieve the prime status may be considered as to their feasibility for reclamation or development potential, provided engineering requirements for construction within a flood hazard zone are met with and approved by state and local officials.

A tidal wetland may be assessed relative to the prime status by a qualitative evaluation of how it conforms to the criteria. Designation of the prime tidal wetlands status for a specific area can be effectively quantified by rating it in terms of how many and to what level the criteria categories are represented. A strictly quantitative procedure for determining prime tidal wetlands status for all criteria categories is not possible. Some technical expertise is necessary to assure the precise delineation of prime tidal wetlands, border zones and impacted areas. This adds to the credibility of the study and may be required for legally defensible prime wetlands designation.

In Hampton, the prime tidal wetlands status is realized for all but a few small areas designated on the accompanying tax maps. Although some areas may rank higher than others within the prime status because of their pristine condition, exceptional wildlife habitat or especially high aesthetic or historical importance, areas in proximity to development or otherwise impacted may also fall within the prime status and are, for the most part, contiguous with those ranked higher as well as with those tidal wetlands outside town boundaries. This study is concerned only with tidal wetlands within the town of Hampton. However, the major salt marsh system of Hampton - Hampton Falls - Seabrook must, from an ecological perspective, be considered a whole.

A brief description of the tidal wetlands for each of the thirty-six maps is provided herein. An index map is provided herein with a numerical designation corresponding to each area represented by a tax map bearing the same number.

METHODOLOGY:

The establishment of criteria used to designate prime tidal wetlands was developed for each category as listed by the Wetlands Board (Chap. Wt 700, Prime Wetlands; N. H. Code of Administrative Rules Source #1825, eff 10-5-81. Appendix I). Within each category, specific criteria are set forth and references for more detailed information embodied in scientific literature are given. These criteria are intended to be guidelines which can be supplemented by more technical information, but are sufficient to allow an individual not having an extensive scientific background to make an accurate assessment on the status of a particular wetland. A tidal wetland can be ranked according to how well it is described, either positively or negatively, by the criteria categories. In the case of actual land use planning or in contest of permit applications, especially those regarding potentially non-prime (determined not feasible for reclamation) and border zone areas, technical expertise is desirable. Non-prime wetlands frequently border prime tidal wetlands and may therefore be of considerable importance to the conservation of the prime areas and require careful study if filling or development is to take place.

A survey of the tidal wetlands in Hampton was conducted by walking nearly the entire perimeter and surface of these areas while recording information pertinent to the criteria categories. Special attention was paid to those areas most susceptible to development pressure which are primarily located west of Hampton Beach and Ocean Boulevard to Winnacunnet Road. Repeat visits were

made to many areas during periods of spring tides to note the extent of tidal flooding.

Soundings for depth were made with a sectional steel rod pushed down into the peat to the marsh basement - the interface between the organic peat deposits and the underlying mineral soil. A rough estimate of the age of the peat deposit and other features such as submerged tree stumps contribute to an understanding of the development of the marsh. For more detailed information on soil profiles a McCauley peat sampler was used to collect a core from deeper peat deposits. This device was used extensively in the Soil Survey of New Hampshire Tidal Marshes (Breeding, Richardson and Pilgrim, 1974) and might well be utilized for on site evaluations of the marsh substrata at locations for which a highly technical assessment is required. Soil types noted in these descriptions are in accordance with data presented in the aforementioned soil survey.

An inventory of plant and animal species encountered was made at the various sites with attention to density, cover and species diversity, the latter being particularly significant in the border zones.

Drainage patterns for tidal waters through rivers, creeks and ditches were noted, particularly with respect to areas which do not receive adequate flushing and exchange due to impoundments or other interruption of tidal ebb and flood. Wetlands which are being degraded because of improper drainage are, for the most part, small areas with the exception of five acres north of Huckleberry Lane and

west of Ocean Boulevard in the Little River drainage. Other water bodies on the marsh which may be permanently or seasonally wet-pond-holes and pannes respectively - were examined and their importance to the salt marsh ecosystem is discussed.

Field studies usually had to be planned according to the tide schedule, otherwise areas would become inacessible or if it was necessary to cross an expanse of marsh on a rising tide, the return trip might be rather hazardous. When walking on salt marshes in New Hampshire one must keep a watchful eye for the many drainage ditches, some of which are quite narrow and overgrown with marsh grasses; they are true pitfalls.

Personal communications with residents and transients, both long term and newcomers, gave some interesting perspectives on attitudes concerning conservation and development as well as the cultural and natural history of the marshes such as their historical importance to food gathering and farming.

Thirty-six tax maps on which tidal wetlands appear were used to indicate the prime tidal wetlands, border zones and impacted (non-prime) areas. These maps were obtained at the Rockingham County Registry of Deeds and correspond to number designations on an index map. Because the individual maps are drawn to different scales, an index map with each area corresponding to a tax map could not be accurately delineated.

The problem of precise delineation of prime tidal wetlands on tax maps is further compounded by the fact that the planimetric maps show only general marsh boundaries and water courses without topographic features. Another feature of the Hampton tax maps is that subdivisions and roadways are shown which were planned but never developed. Consequently, it is necessary to delineate wetland boundaries over subdivision lines on the maps as accurately as possible.

DEFINITIONS:

1. PRIME TIDAL WETLANDS: Any areas falling within the jurisdictional definitions of RSA 483-A:1 and 1-a, and that possess one or more of the values set forth in RSA 483-A:1-b, and that, because of their size, unspoiled character, fragile conditions or other relevant factors, make them of substantial significance. Criteria have been established to designate wetlands so defined (see Appendix I).

2. BORDER ZONES: The border zone or ecotone is a transition zone between two adjacent communities; the tidal marsh and the upland or fresh water marsh in the upper reaches of estuaries. The border zone contains species characteristic of both communities as well as other species occuring only within the zone. It is for this reason that the border zone has a high species diversity not only in vegetation but of animal populations as well.

   It is imperative that these areas be as vigorously conserved or protected as the tidal wetlands proper and should be considered an integral part of the whole ecosystem. The border zone, aside from its biological richness, provides a buffer zone to maintain the integrity of the tidal marsh. A minimum of fifty feet along the perimeter of tidal wetlands should be maintained with a one hundred foot border most desirable especially at previously undisturbed sites.

3. IMPACTED AREAS: Some areas of tidal wetlands (salt marsh) and border zones have experienced biological degradation to the extent that there has been a loss in viability. This condition may be the result of a principle factor or the combined effect of a number of

influences among which are: 1) improper drainage due to road-building without adequate culverts to allow sufficient ebb and flow of sea water; 2) areas isolated or impounded by adjacent fill, dikes or other structures; 3) die-back of natural vegetation due to either of the above or because of waste, waste water or other material being placed on the marsh.

Impacted areas may be assessed in terms of feasibility for reclamation or development. If proper drainage is restored and surface contamination removed, a tidal wetland has the capacity to gradually recover to a viable, productive state. In very severly impacted areas such as those surrounded by past development, the remaining marsh may still serve as flood water storage areas. Development of severely impacted areas should proceed only after careful consideration of other alternatives and a detailed site evaluation. One criteria for consideration of placing fill in a severely impacted area would be depth of organic material. It is suggested that only in areas where shallow peat deposits (less than 16 inches) overlie sand or coarser materials should development by filling be considered a feasible option.

CRITERIA:

1. SOILS: Tidal wetlands soils are organic peat deposits consisting of plant remains in various states of decomposition and sand, silt and clay mineral fractions. The intertidal marsh soil contains mostly rhizomes of the smooth cordgrass (Spartina alterniflora) and coarse mineral particles. The percent of organic matter in the intertidal marsh soil is not as high as the high marsh or salt meadow due to the scouring action of ice flows in the intertidal zone which carry away the aerial plant parts. On the high marsh, another species of Spartina with much finer stems, 'salt hay' (S. patens) grows in dense mats often having a 'cow-licked' appearance. The high marsh does not receive the extent and duration of tidal flooding the intertidal marsh does and much less if any scouring action of ice flows. The high marsh peat then has a considerably higher organic matter content and contains the finer mineral fractions (silts and clays) which are held in suspension longer as the flood tides cover the marshes. The presence of sulfidic materials is perhaps the most important property of tidal wetland soils. These materials accumulate in both organic and mineral soil materials under permanently saturated conditions. They can easily be detected by the presence of hydrogen sulfide (H_2S). When a clod of soil is dug up, a characteristic 'rotten egg' smell is often quite noticeable. If these soils are drained or excavated and exposed to the air, the sulfides oxidize and form sulfuric acid and the soil will no longer support plant growth.

Three additional properties are useful in the classification of tidal marsh soils. These include:

1. Kinds and thickness of organic soil materials.
2. Texture of underlying mineral soil materials (the marsh basement).
3. Total salts of surface soil materials.

Please consult the Soil Survey of New Hampshire Tidal Marshes (Breeding et al., 1974) for detailed information regarding appropriate soil classifications, interpretations of physical and chemical properties for engineering and suitability or degree of limitation as a resource material, for engineering uses, for town and country planning, recreation development and farm use.

Although the deeper soils indicate earlier development and well established tidal wetlands, depth alone cannot be a criterion for prime status. Shallow more recently formed marsh may be in a superb state of preservation in an important wetland - wildlife habitat while an older deeper marsh may have had its' drainage pattern disrupted by natural or artificial causes and become impounded, hold fresh water runoff and literally start to rot and become invaded with freshwater marsh plants as happened off Huckleberry Lane.

In some areas, sounding the marsh will reveal peat development over bedrock or the presence of tree stumps indicating the encroachment of the tidal marsh over the upland. This occurs with the vertical accretion of peat resulting from a gradual increase in sea level relative to the land over the past 3,500 years in New England. A very rough estimate of this rate is 3.5 - 4 inches per 100 years.

2. FLORA: Tidal wetlands vegetation is distributed in relation to the range of the tides, elevational differences in the marsh surfaces, soil salinity and to some extent soil types. Vegetational zonation is especially apparent in tidal wetlands, the most obvious distinction being between the intertidal (Spartina alterniflora) marsh and the high (S. patens) marsh. In some areas monospecific stands of one of these perennial grasses will occur. With a gradual rise in elevation from intertidal to high marsh, a mixed association may be present. In other areas the marsh vegetation may be quite heterogeneous with scattered broad leaved annuals, some having showy flowers, appearing in among the grasses or colonizing areas where grasses do not grow or have not been successful due to an increase in soil salinity or damage to rootstocks and meristems such as by trampling. Prime tidal wetlands are characterized by healthy, vigorous vegetation whether it be monospecific or in mixed stands.

There are no registered rare or endangered plant species found on the Hampton tidal marshes although the Dwarf Glasswort (Salicornia bigelovii) was seldom encountered. The Marsh Elder or Highwater Shrub (Iva frutescens var. oraria) which is only known from sites around Great Bay and in Portsmouth, was not found although much suitable habitat on strands along the edge of the marsh exist.

The border zones or ecotones of vegetation surrounding the marsh have the highest species diversity. It is in these areas that one would most likely find rare native plants, but none were located during this study. The high species diversity is in itself a criteria

for prime status. This can be determined by making a species list and determining percent cover, frequency and abundance by standard methods (see Odum, 1971; Whittaker, 1971). The border zone or ecotone is a transition zone between two adjacent communities; the tidal marsh and the upland or fresh water marsh in the upper reaches of estuaries. The border zone contains species characteristic of both communities as well as other species occuring only within the zone. It is for this reason that the border zone has a high species diversity not only in vegetation but of animal populations as well. Many birds and mammals which feed on the marsh seek refuge in the border zone. The abundance of seed and fruit bearing plants is high, thereby offering a valuable food supply. Larger predators, both bird and mammal, find this an ideal hunting ground. The Harrier or Marsh Hawk is a frequent visitor to these areas in search of small mammals. White-tailed deer brouse and may find cover in the border zone. Deer sign was encountered along the Drakes River Marsh and Taylor River Marsh off Drakeside Road. The border zone also provides nesting habitat for many bird species, both migratory and permanent inhabitants.

It is imperative that these areas be as vigorously conserved or protected as the tidal wetlands proper and should be considered an integral part of the whole ecosystem. The border zone aside from it's biological richness, provides a buffer zone to maintain the integrity of the tidal marsh. A minimum of fifty feet along the perimeter of tidal wetlands should be maintained with a one hundred foot border most desirable especially at previously undisturbed sites.

Brackish - fresh water wetlands such as cattail swamps or sedge meadows should be considered part of the wetland/marsh system with a border zone being the first fifty to one hundred feet inland on upland mineral soil.

The areas of highest impact to the border zone are found west of Hampton Beach and Ocean Blvd. north to High St. In many of these areas the natural border zone community has been impacted to the point of complete destruction with fill being placed on or adjacent to the organic tidal marsh soil. With the exception of very limited areas of tidal wetland on the northern side of Island Path in which the shallow peat deposits have been severely impacted, no further encroachment should occur. The areas on the north side of Island Path between Brown Ave. and the old town incinerator site (see maps 98, 99 & 115) owing to their present degraded condition, brought about by improper drainage due to previous filling in the immediate area, warrent further study to determine feasibility for reclamation or development potential.

Vascular plant species which are indicative of tidal wetlands are listed here along with some characteristic border zone flora. This list compares with those included in RSA 483-A: 1a, and the annotated plant species list in the Soil Survey of New Hampshire Tidal Marshes (appendix A).

Indicator Vascular Plant Species for Tidal Wetlands and Border Zones:

Scientific Name	Common Name	Habitat
Aster subulatus Michx.	Annual Salt Marsh Aster	Upland border of high marsh.
Aster tenuifolius L.	Perennial Salt Marsh Aster	Same as A. subulatus, uncommon.
Atriplex glabriuscula Edmond.	Orach	Common along creeks and drainage ditches.
Atriplex patula L. (vars.)	Orach	Very common on high marsh, along creeks, ditches & in strand line.
Distichlis spicata (L.) Greene	Spike-grass	Abundant on high marsh, often in association with Spartina patens.
Eleocharis halophila Fern. & Brack.	Salt Marsh Spike-Rush	Occasional in wet depressions on high marsh.
Gerardia maritima Raf.	Salt Marsh Gerardia	Edges of pannes and scattered on Spartina patens marsh.
Glaux maritima L. var. obtusifolia Fern.	Sea Milkwort	Border of high marsh growing in Spartina patens.

Juncus gerardii Loisel.	Black Grass	Very abundant along the upland border of high marsh either associated with Spartina patens or forming pure stands.
Limonium nashii Small	Sea Lavender or Marsh Rosemary	Scattered on high marsh, forb pannes and along edges of high marsh.
Myrica pensylvanica Loisel.	Bayberry	Shrub of the border zone.
Panicum virgatum L. var. spissum Linder	Switchgrass	Common grass in tufts along border zone.
Phragmites australis	Tall Reed	Very tall grass forming dense stands along marsh border and in disturbed or filled areas.
Plantago oliganthos R. & S.	Seaside Plantain	Scattered on high marsh and in forb pannes.
Potentilla anserina L.	Silverweed	Common especially along edges of high marsh.
Puccinellia maritima (Huds.) Parl.	Alkali Grass	Scattered in clumps along ditches and on the high marsh.
Rosa rugosa Thunb.	Salt Spray Rose	Clumps or thickets in the border zone.
Rosa virginiana Mill.	Virginia Rose	Border zone and upland.

Ruppia maritima L. (vars.)	Ditch Grass	Submersed aquatic of pond holes and ditches in the high marsh.
Sanguisorba canadensis L.	Canadian Burnet	Occasional in the border zone.
Salicornia bigelovii Torr.	Dwarf Glasswort	Occasional in highly saline pannes on high marsh.
Salicornia europaea L.	Glasswort or Samphire	Common in pannes and scattered on high marsh especially where soil salinity is high.
Salicornia virginica L.	Perennial or Woody Glasswort	Forms mats in some areas of high marsh.
Scirpus americanus Pers.	Three-square sedge	Wet borders of high marsh.
Scirpus maritimus L. var. fernaldii (Bickn.) Beetle	Salt Marsh Bulrush	Extensive stands along wet borders of high marsh.
Scirpus paludosus Nels.	Bayonet-Grass	Sedge of very wet pannes and "rotten spots" on high marsh.
Smilax rotundifolia L.	Greenbriar	Thorny, trailing vine of the border zone and on 'marsh islands'.
Solidago sempervirens L.	Seaside Goldenrod	Common in the border zone.

Spartina alterniflora Loisel.	Salt Water Cord Grass	Dominant species of the intertidal marsh. Dwarfed form in low lying poorly drained areas.
Spartina patens (Ait.) Muhl.	Salt Meadow Grass	Dominant species of high marsh.
Spartina pectinata Link	Fresh Water Cord Grass	Border zones and near fresh water.
Spergularia canadensis (Pers.) Don	Sand Spurrey	Sandy strands along edge of marsh.
Spergularia marina (L.) Griseb.	Spurrey	Common on edges of high marsh and rim of creek and ditch banks.
Suaeda (Spp.)	Sea blite	Common along strand line, borders of high and intertidal marsh and around pannes.
Triglochin maritima L.	Seaside Arrow Grass	Scattered on high marsh and forb pannes.
Typha angustifolia L.	Narrow-Leaved Cattail	Extensive colonies in brackish areas along border of marsh.

3. FAUNA: Prime tidal wetlands and adjacent border zone communities provide critical wetland - wildlife habitat for a number of indigenous birds, mammals, reptiles, amphibians, finfish, shellfish and invertebrates as well as feeding and resting areas for a variety of migratory waterfowl and shorebirds. Of special concern is the latter capacity of providing suitable feeding and resting habitat for the migratory birds of the atlantic flyway which are dependent on these areas for survival during their long seasonal journeys. A number of species of waterfowl and shorebirds regularly spend a period of time on the marshes, some for considerable periods, while others are transitory and a few rare occurances are usually sighted each year.

The prime status is appropriate for all areas of tidal wetlands containing pond-holes and pannes. The former being small, vertically-sided, permanent water bodies ranging from 30-100 cm. in depth; the latter are shallow (10-30 cm. depth), but often more extensive water bodies which may dry up due to evaporation in late summer or periodically dry and then refill on flood tides or with sufficient rain fall. These features of the marsh topography form in a variety of ways (see Redfield, 1972; Richardson, 1980), and provide abundant food for waterfowl and shore birds. Ruppia maritima, a submersed aquatic plant, grows in these areas and is a source of leaves, shoots and seeds to foraging waterfowl. This plant also serves as an attachment substrate and shelter for invertebrates and small fish which are preyed upon by wading and diving birds such as egrets, herons and terns. As the

shallow pannes begin to evaporate in mid-late summer, which coincides with the arrival of many shorebirds, the worms, crustacea and other invertebrates are voraciously fed upon by these seasonal visitors.

Among the most commonly encountered waterfowl are Black Ducks, Mallards, American Goldeneyes, Mergansers, Buffle-head, Blue-winged Teal and Canada Geese. Shorebirds include Semipalmated Plover, Killdeer, Black-bellied Plover, Golden Plover, Ruddy Turnstone, Dowitcher, Knot, Lesser Yellowlegs, Greater Yellowlegs, Sanderling, Semipalmated Sandpiper and other sandpipers. The Common Tern is present and there is some evidence of a small nesting population but no nest sites or fledglings were observed. Marsh Hawks or Harriers frequent the border zone. Red-winged black birds and other song birds are found in the border zone. The Red-winged black birds, highly visible in their territorial behavior, are easily observed in cattail swamps such as along Drakes River,the Taylor River and Meadow Pond.

Most of the mammals which live and/or feed along the border of the marsh and in the border zones are quite secretive and nocturnal, but evidence was found indicating the presence of cotton-tail rabbits, muskrats, raccoon, fox and white-tailed deer.

In the larger creeks and rivers winding through the marsh, a variety of finfish including flounder and mackerel provide food and recreation. Crabs and eels may be trapped and soft-shelled clams collected on the tidal flats. The tidal mud flats south of Island Path and west of Ashworth Ave. contain good populations of softshelled

clams. Blue mussels and the somewhat less desirable Blue-ribbed mussel may also be collected here. A few American Oysters were seen along the Taylor River near Hampton Landing. Small fish such as Tom-cod and Killifish inhabit small creeks and ditches where they provide food for wading and diving birds and are also collected for bait. Seaworms and bloodworms may also be collected for bait on the tidal flats.

4. FOOD CHAIN PRODUCTION: The primary production of tidal wetlands equals or exceeds nearly every other type of natural ecosystem or agricultural crop on earth. The value of tidal wetlands and estuarine systems as nursery grounds for finfish and shell fish cannot be over-estimated. Maintaining the integrity of the natural tidal wetlands ecosystem is essential to the perpetuation of the delicate balance of myriad interrelationships at all levels of the food chain. Sophisticated data collection and experimental work are often necessary to obtain an accurate determination of energy flow and production in terrestrial and aquatic food chains and are beyond the scope of this study. However, information from the literature such as Odum (1971), contributes substantially to our understanding of the dynamics of the tidal wetlands/estuarine ecosystem and provides further references for in-depth analysis (see also Nixon and Oviatt, 1973; Nixon, 1982).

5. HYDROLOGY: Tidal wetlands are extremely important as buffer areas to absorb energy and flood waters during coastal storms. Extensive flood damage and situations perilous to the well-being of people in the coastal area are mitigated by the flood control capacity of tidal wetlands. Filling marsh land or impeding the flow of waters over and through the marsh, such as by installing culverts of insufficient diameter under roadbeds, greatly increases the flood hazard potential in a given area.

The tidal wetlands of Hampton function in this capacity in their present condition. There are, however, areas where natural drainage has been impeded thereby increasing the flood hazard potential while lessening the long term viability of the tidal wetland. The five acres of marsh off Huckleberry Lane is an area where near total blockage of tidal ebb and flood has caused degradation of the system to the extent that over the past few years it has increasingly taken on characteristics of a brackish - fresh water swamp. This five acre salt marsh, which was given to the Society for the Protection of New Hampshire Forests in memory of Thomas Ira Batchelder, now has very low salinity and fresh water plants like the aggressive colonizer Lythrum salicaria (Spiked or Purple Loosestrife), which threaten to choke out the native salt marsh vegetation. Local flooding occurs in the environs of this marsh due to lack of drainage for upland runoff.

At another site,Drakes River at Drakeside Road, there has recently (1976-77) been a tide dam (tide gates) installed. This system of flap-

covers on the culvert allows for fresh water drainage from Batchelder Pond and Drakes River but impedes or effectively stops the flow of tidal waters upstream into the tidal wetlands between Drakeside Road and the Hampton Expressway. This will no doubt result in an eventual change in the vegetation in this area as is already apparent with the encroachment of cattails on marsh peat on either side of the expressway. The tide dam was installed at the request of the landowner (Woodman) who apparently thought tidal waters were flooding his "freshwater marsh", adversely affecting his property and that the town of Hampton was responsible to alter this situation. The tide dam was installed by the Hampton Department of Public Works by order of the Board of Selectmen.

6. HISTORICAL, ARCHEOLOGICAL, AND/OR SCIENTIFIC IMPORTANCE:

The tidal wetlands were formerly utilized extensively for a number of enterprises directly connected with the livelihoods of our ancestors. Such activities include salt haying, finfish and shellfish collecting, and market gunning for wild fowl and shore birds. The circular arrangements of wooden stakes known as 'staddles' which can be seen scattered on the high marsh were used to stack the salt hay (primarily composed of Spartina patens and Juncus gerardii) before it was taken off the marsh by the shallow draft barges known as 'gundalows'. Areas of salt marsh containing staddles should be designated prime tidal wetlands for their historic and aesthetic importance in addition to other criteria they may satisfy.

There has been evidence of Indian settlements near local marshes (e.g. Seabrook) and their use of the marsh for food gathering.

Tidal wetlands are of exceptional value as resources for scientific inquiry. Research in both the natural and physical sciences is carried out in tidal wetlands. Extensive literature exists on various subjects of tidal marsh/estuarine dynamics and yet many aspects still warrent investigation. The tidal wetlands, estuaries and border zones offer ideal teaching/learning opportunities at all levels of education. The appreciation gained in learning about the natural history, cultural history, geography, and other aspects of tidal wetlands provides people of all ages and backgrounds with a voice in local and state decision making regarding conservation policies and land use planning and management.

7. OUTSTANDING OR UNCOMMON GEOMORPHOLOGICAL FEATURES:

The total acreage of tidal wetlands in New Hampshire (ca. 7,500 acres including coastal and estuarine marshes) represents only a small fraction of the wetlands in the state. This is attributed to our very limited coastline especially when compared to acreage of Maine and Massachusetts tidal wetlands. This aspect alone - limited overall size - makes the tidal wetlands of New Hampshire a limited and valuable part of our natural resource inventory. Tidal wetlands in New Hampshire are prime examples of geological processes at work on a glaciated coast line. The ontogeny or development of our tidal wetlands represents 3000 - 3500 years of coastal processes. The tidal wetlands of Hampton are mostly in

excellent condition and with proper conservation practices should continue their unadulterated productive existence.

Redfield (1972), in a twelve year study of the development of the Barnstable, Mass.salt marsh, has contributed substantially to our understanding of geomorphological and biological phenomena regarding New England salt marshes. Many of the concepts discussed in Dr. Redfield's paper elucidate processes apparent in the Hampton tidal marshes. Hampton's tidal marshes are worthy of preservation as limited regional examples of geological history.

8. AESTHETICS: To evaluate and designate tidal wetlands as prime on aesthetic values is highly subjective and difficult if not impractical to quantify. Personal interests and incentives may play a large part in one's assessment of a landscape. The artist, the scientist, the developer and real estate agent will most likely have different levels of appreciation for unaltered natural wetlands, creative land use management, or exploitation of resources for monetary gain. The approach concerning "positive" and "negative" aspects of the landscape features and their aesthetic implications when alternative functions and values are evaluated as set forth under this criteria category by the Wetlands Board seems a workable solution.

9. SIZE: The coastal tidal wetlands of the Hampton - Hampton Falls - Seabrook marsh system are for the most part contiguous although isolated areas do exist. Size does not correlate with quality. A small

estuarine marsh may satisfy the criteria for prime status as well as an expansive salt meadow or intertidal marsh. Tidal wetlands of limited acreage (i.e. five acres or less) may still qualify for prime status. There is no reason to believe that these smaller marshes such as the borders of Meadow Pond, the marsh between Drakeside Road and the Hampton Expressway and the 'Little River Swamp' off Huckleberry Lane, need be any less viable, short lived or of limited capacity to support significant flora and fauna provided natural drainage is allowed and other impacts are minimized or prevented. However, all three of these areas are presently subject to environmental impacts which could ultimately cause severe biological degradation of otherwise viable prime tidal wetlands.

10. OTHER CONSIDERATIONS:

a. It is suggested that to foster recreational use of the Taylor River estuary by and for the people, that limited, closely supervised dredging of navigable waterways and extant marinas is feasible provided dredge spoils are not placed on the marsh, border zone or in non-navigable waterways. It is further recommended that when any such activity takes place that the water quality is monitored over a period of time and any adverse effects on the environment noted. The feasibility for future dredging can be assessed through these studies.

b. There are areas west of Ashworth Ave. where considerable trampling has occured on the marsh surface by people going to and

from the tidal flats for clamming. It seems feasible that wooden catwalks and foot bridges could be constructed to allow access to these areas provided they do not interfere with navigable waterways, are "so constructed as to permit the unobstructed flow of the tide and preserve the natural contour of the marshes and vegetation" (draft, proposed wetlands conservation district for the town of Hampton, N.H.). These structures would preserve the surface of the marsh and vegetation from trampling while providing easier and safer access for people to the tidal flats.

c. The small pockets of tidal wetlands with creeks or drainage ditches in the area west of Hampton Beach, where extensive filling of the wetlands has occurred, should be conserved as areas needed to buffer the impact of tidal flooding. For example, the area south of the Island Path parking lot.

LITERATURE CITED:

Breeding, C.H.J., F.D. Richardson and S.A.L. Pilgrim. 1974. Soil survey of New Hampshire tidal marshes. N.H. Agr. Exp. Sta. Res. Rept. No. 40. 94 p. and maps.

Nixon, S.W. 1982. The ecology of New England high salt marshes: a community profile. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C. FWS/OBS - 81/55. 70 pp.

Nixon, S.W. and C.A. Oviatt. 1973. Ecology of a New England salt marsh. Ecol. Monogr. 43: 463-498.

Odum, E.P. 1971. Fundamentals of Ecology, third ed. W.B. Saunders Comp., Phila. 574 pp.

Redfield, A.C. 1972. Development of a New England salt marsh. Ecol. Monogr. 42: 201-237.

Richardson, F.D. 1980. Ecology of Ruppia maritima L. in New Hampshire (U.S.A.) tidal marshes. Rhodora. 82: 403-439.

Whittaker, R.H. 1971. Communities and Ecosystems. The Macmillan Comp. New York. 158 pp.

Proposed wetlands conservation district for the town of Hampton, N.H. - Draft document. 6 pp.

Prime wetlands. (criteria etc.) Draft document. Wetlands Board, State of New Hampshire. 7 pp.

New Hampshire Code of Administrative Rules. Chapter Wt 700 Prime Wetlands; Part Wt 701 - Wt 704. Source #1825, eff 10-5-81.

INDEX MAP TO TAX MAPS WITH PRIME TIDAL WETLANDS DELINEATIONS. HAMPTON, N. H. (U.S.G.S. 1967; photo revised 1973)

PRIME TIDAL WETLANDS MAPS:

Refer to index map for location of individual tax maps.

Note: Symbols for soil type designations correspond to those used in the Soil Survey of New Hampshire Tidal marshes. Consult that publication for detailed descriptions of soil types and soils maps on aerial photographs.

SOIL LEGEND:

Symbol	Name
397	Typic Sulfihemists, organic materials thicker than 50 inches.
497	Terric Sulfihemists over sand, organic materials 16 to 50 inches thick overlying sandy materials.
597	Terric Sulfihemists over silt, organic materials 16 to 50 inches thick overlying silty materials.
997	Sulfihemists, surface soil materials with low salt, organic materials thicker than 50 inches, or 16 to 50 inches thick overlying sandy or silty material.

Map No.	Soil Type(s)	Description
37	397, 497	Prime tidal wetland east of where Landing Road dead ends at H-E Expressway. Large shallow pannes are excellent shorebird feeding areas easily visible from road.
66	397, 497	Prime tidal wetland and border zone, Tide Mill Creek, pond holes and pannes. Well developed marsh with vigorous growth of Spartina. Large pannes of pond holes contain Ruppia. Canadian Burnet (Sanguisorba canadensis) in border zone.
67	397, 497	Prime tidal wetland and border zone, Hampton River, pond holes and pannes. Boardwalk across marsh to Nudd's Landing affords excellent views of the marsh and an opportunity to closely examine pannes, ditches, etc. Good spot for salt marsh field trip. Oysters near mouth of creek just west of marina on Hampton River. Old staddles scattered on marsh.

Map No.	Soil Type(s)	Description
113	397	Highly impacted marsh south of parking lot provides buffer in flood hazard area.
115	397	See #98. Old staddles.
116	397	Prime tidal wetland, highly impacted border zone along Eel Creek. Tidal wetlands on map #s 116, 117, 118, 119, 120 are under very high development pressure.
117	397	Same as #116.
118	397	Same as above. Undeveloped subdivision adjacent to Ocean Blvd. provides the only unobstructed view of the marsh.
119	397	Same as #116. Extremely high development pressure in this area.
120	397	Same as above.
121	997	Prime tidal wetland, impacted border zone Eel Creek to Meadow Pond.
122	997	Same as #121. Map #s 122-127 represent borders of Meadow Pond. Viable salt marsh with border zones impacted and/or under development pressure.
123	997	Same as above.
124	997	Same as above.
125	997	Same as above
126	997	Same as above. Cranberry bushes in very wet areas.
127	997	Same as above. Phragmites stand borders High Street.
135	997	Prime tidal wetland being degraded due to blockage of channel so there is no tidal ebb and flood. Invasion by freshwater vegetation (eg. Lythrum salicaria).
400	397, 997	A tide dam has been installed where Drakes River flows under Drakeside Road (1976-77). This prime tidal wetland is gradually being degraded due to lack of tidal waters to a brackish - fresh water marsh.

Map No.	Soil Type(s)	Description
68	397, 497	Prime tidal wetland and border zone. Pond holes and pannes. Fuller's Creek (Landing Brook) and tributaries. Old staddles. Little Green Herons frequently seen along waterways.
89	397	Prime tidal wetland impacted border zone, Eel Creek. Common Terns sighted in this area. Vigorous S.alterniflora growth along creek. Numerous pannes and pond holes out on open marsh.
92	397, 497	Prime tidal wetland, impacted border zone. Large, tidal ponds. Eel Ditch flows under Winnacunnet Road to Meadow Pond.
94	397	Prime tidal wetland, impacted border zone, Tide Mill Creek. Elkins Street subdivisions not developed. Scattered old staddles between here and Brown Ave. (Map #115)
95	397	Prime tidal wetland, impacted border zone, Tide Mill Creek.
96	397	Prime tidal wetland, impacted border zone, Tide Mill Creek, Brown's River. Boat landing at end of Glade Path good access for exploring marsh creeks.
98	397 and shallow peat along both sides of Island Path.	Garland Street and Ridge Park sub-divisions are not developed, but shallow marsh along north side of Island Path is highly impacted. Other areas Prime.
99	397	Same as #98.
106	397, 497	Prime Tidal wetland, impacted border zone, Hampton River. The areas shown on this map and #s 107, 109 and 111 are subject to considerable trampling by persons going to and from clam flats.
107	397, 497	Same as #106
109	397, 497	Same as above
111	397, 497	Same as above. Especially good clam flats west of here along Hampton River to end of Island Path. (Not shown on map)

Map No.	Soil Type(s)	Description
420	397, 497	Prime tidal wetland, border, zone, Taylor River, Drakes River. Many large pannes - excellent shorebird feeding habitat. Numerous old staddles.
430	397	Prime tidal wetland, cattail swamp, border zone. Upper limit of tide.
441	397	Prime tidal wetlands and border zone. Pristine remote areas of marsh - with very large salt ponds and extensive pannes. Excellent bird habitat.
442	397	Same as #441; Drakes River excellent border zone. Very wet marsh. Slough marsh with lush growth of Spartina. Old staddles.
443	397	Prime tidal wetland, Taylor River, Drakes River, border zone. Numerous pannes, excellent shore bird feeding areas. Many old staddles easily seen from Lafayette Road.

APPENDIX I - PRIME WETLANDS

INTRODUCTION

Prime wetlands shall be of substantial significance because of their size, unspoiled character, fragile condition, or other factors, as well as providing one or more of the values listed below. After adoption by a municipality under local option described in RSA 483-A:7; special consideration will be taken by the board as described in RSA 483-A:4a IV and RSA 483-A:4 IV and procedures contained in this chapter.

Submerged Lands and Wetlands Provide:

1. Sources of nutrients for finfish, crustacea, shellfish, and wildlife;
2. Habitat and reproduction areas for plants, fish, and wildlife;
3. Commerce, recreation, aesthetic enjoyment, and other interests to the general public;
4. Help maintain adequate ground water levels;
5. Capability to handle runoff of water and absorb flood waters and silt thereby decreasing general flood damage and silting of open water channels.

Of particular concern are saltmarshes and those wetlands associated with streams or open water such as setbacks, oxbows, and channels. These wetlands are usually adjoining flood plains and generally rate highly in every evaluation.

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

CHAPTER Wt 700 PRIME WETLANDS

PART Wt 701 CRITERIA

Wt 701.01 Purpose. The purpose of these regulations is to provide criteria to municipalities for use in designating wetlands of significant value that are worthy of extra protection because of their uniqueness, fragility and/or unspoiled character. (RSA 483-A:7)

Source. #1825, eff 10-5-81

WT 701.02 Evaluation. The following criteria shall be utilized in a thoughtful evaluation process to determine in each municipality those wetlands that deserve special consideration, review, protection, and designation as "prime".

Source. #1825, eff 10-5-81

(a) SOILS

All wetlands to be designated as prime shall have the wettest soils as identified under the National Cooperative Soil Survey performed by the U. S. Soil Conservation Service. These soils in New Hampshire which generally have a slope of 3% or less, are currently categorized as the very poorly drained mineral soils, the very poorly drained organic soils, and fresh or saltwater marsh, namely:

(1) Very poorly drained mineral soils: Example of soil series are: Biddeford, Saco, Scarboro, Whately and Whitman.

(2) Very poorly drained organic soils: Example soil series are: Ossipee, Chocorua, and other muck and peat soils.

(3) Marsh:

a. Borohemists (fresh water marsh)

b. Sulfihemists (salt water marsh)

(b) FLORA

High value may be ascribed to a wetland that presents one or more of the following characteristics:

(1) High diversity of species ranging from water dwelling species to emergent species.

(2) Containing a native species at the extremity of its range.

(3) Containing rare and/or endangered native plants.

(c) FAUNA

Prime wetlands may be wetlands that are used by a great variety or large numbers of animals and/or birds for feeding, shelter, and/or reproduction. Prime wetlands may also be frequented by rare native species, species at the limit of their ranges, or endangered species.

(d) FOOD CHAIN PRODUCTION

Consideration of food chain values is complex and involves a large number of intricate biological and physical processes. Some factors to be evaluated are:

(1) The relative productivity of different types of wetlands.

(2) The amount of primary production available to terrestrial and aquatic food chains.

(3) The amount of that food chain production which supports specific animal species or groups, such groups may contain species that are endangered or those that have commercial value such as oysters, lobsters and other shellfish.

(4) Other factors controlling wetland productivity.

(e) HYDROLOGY

To be classified as prime under this criteria, a wetland must significantly benefit the watershed by at least one of the following capacities:

(1) Store water and regulate flow in flashy watershed. The wetland size shall be at least one percent of the watershed.

(2) Filter out sediments and regulate flow of nutrients to maintain water quality in adjacent lakes and streams. The wetland size shall be at least one percent of the watershed.

(3) May be indicative of a significant aquifer.

(f) HISTORICAL, ARCHEOLOGICAL and/or SCIENTIFIC IMPORTANCE

Significant areas of wetlands which have historical or archeological importance may be considered for designation as prime wetlands. Wetlands which have an on-going research value may also be designated.

(g) OUTSTANDING OR UNCOMMON GEOMORPHOLOGICAL FEATURES

Unique or unusual physical forms of wetlands which reflect geologic processes are worthy of preservation such as unique or regional examples or geological history. Such forms may occur in either estuarine or fresh water environments.

(h) AESTHETICS

Prime wetlands, in addition to supporting diverse flora and fauna, may also contain distinctive landscape features which can gratify the aesthetic senses through intrinsic appreciation of natural beauty.

(1) Evaluation, however, of aesthetic values is difficult to quantify and, at best, is entirely subjective. Although several scenarios can be developed to "positively" evaluate aesthetic values of wetland landscapes, a basic approach requiring much less knowledge in landscape principles is to analyze the "negative" aspect of the landscape. This approach is more appropriate since the positive features and their aesthetic implications are taken into account when the other functions and values of wetlands are evaluated. The approach, therefore, is to assign penalties to the negative elements or influences that already affect the overall appreciation of the wetlands such as adverse air quality, water quality, noise, non-conforming use, etc. However, a wetland can be extensively used by man and retain its aesthetic appeal. For example, there are many recreational activities, such as hunting, fishing, developing nature trails, etc., which would not conflict with the basic natural setting of an aesthetically prime wetland.

(i) SIZE

Although the size of a wetland is important in terms of its capacity to support significant and diverse types of flora and fauna, it is difficult to categorically define the importance of wetland relative to size alone. Wide diversity of wetland types requires that the importance of size be related to the individual characteristics and/or functions of the wetland in question. In general a wetland less than 5 acres, except when bordering open water, is expected to be short lived and of limited capacity to support significant flora and fauna, however, smaller areas may be considered prime with other values.

(j) OTHER CONSIDERATIONS

Other selected and identified issues that are unique and important to the municipality may be evaluated.

Source. #1825, eff 10-5-81

PART Wt 702 SUBMISSION

Wt 702.01 Report. A report shall be submitted with maps. This report shall identify each prime wetland by name or number correlated to map or maps. The rationale presented shall clearly set forth the applicable and significant criteria along with specific data that support the designation of each prime wetland.

Source. #1825, eff 10-5-81

Wt 702.02 Map Format. The designation shall carefully describe each prime wetland with an exterior outline defined to nearest 50 feet in location and shall be related to property boundaries. Scale shall be the same as the municipal tax map. Map sheets submitted to the wetlands board shall not exceed a size of 28 inches by 40 inches and shall have a one-inch border and title block with scale and legend. Such maps shall contain adequate identification of the prime wetlands. Colors shall not be used to identify prime wetlands perimeters.

Source. #1825, eff 10-5-81

Wt 702.03 Acceptance. A review of the submission from each municipality shall be conducted by the board for compliance to the requirements of report and format. The board reserves the right to reject a submission for reasons of lack of completeness or nonconformance to format.

Source. #1825, eff 10-5-81

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

PART Wt 703 PERMIT PROCESS

Wt 703.01 Determination. Applications filed for proposed projects will be reviewed by the municipal conservation commission, if any, or the municipal planning board, if any, or the municipal executive body to determine if the proposed project is located in or contiguous to prime wetlands. It shall be the responsibility of the municipal board(s) to notify the wetlands board in writing that the proposed project involves prime wetlands. If this notification is not received within 10 days from filing date with the town/city clerk the board will process the application under its regular procedures.

Source. #1825, eff 10-5-81

Wt 703.02 Verification. Upon receipt of notification that a proposed project involves work in or adjacent to prime wetland, the application will be presented to the board for verification and a public hearing ordered.

Source. #1825, eff 10-5-81

Wt 703.03 Incorrect Delineation. In the event that it is alleged that the prime wetlands incorrectly defines the limits of the prime wetland and evidence to that effect is presented to the wetlands board, the wetlands board may determine the designation of the disputed area.

Source. #1825, eff 10-5-81

Wt 703.04 Public Hearings. Procedures are to be the same as under section entitled "Conduct of Hearings" with the addition that board members, staff, and state agencies will submit oral testimony during the hearing and/or submit written reports as part of the record.

Source. #1825, eff 10-5-81

PART Wt 704 NOTIFICATION OF DECISION

Wt 704.01 Notification of Approval.

(a) Announcement. A decision to approve any of the proposed projects involving prime wetlands shall have an effective date 28 calendar days after the date of decision. The municipal conservation commission, planning board, executive body, the applicant, and interested parties shall be notified forthwith of the decision.

(b) Issuing permits. The permit shall be issued to the applicant on the effective date unless a motion for rehearing has been filed by either the municipal conservation commission or municipal executive body. No rehearing shall be granted unless new and substantive information is filed with the motion.

Source. #1825, eff 10-5-81

WT 704.02 Notification of Denial. Interested parties will be informed in writing of a decision to deny the proposed project involving prime wetlands.

Source. #1825, eff 10-5-81

APPENDIX I-a

EVALUATION

Recognizing that many communities may not have available expertise in research design and social measurement, there are basic approaches that can be utilized by the "lay-person" to develop basic, quantitative, measurable data to be used in the evaluation of wetlands.

It is generally recognized that the use of scales and indices in the measurement of "social" attitudes are significant since they provide relatively quantitative measures that are amenable to greater precision, statistical manipulation, and explicit interpretation of the values under study. However, scaling techniques for collecting standardized, measurable data are relatively complex and require the services of a person knowledgeable in research design and social measurement. It is, recommended that, if such expertise is not available among the members of the conservation commission itself, a survey of the community's resource talent be undertaken to determine whether this type of talent might be available and utilized. Such resource expertise is extremely valuable to the conservation commission in the ascertainment and delineation of prime wetlands and in the subsequent presentation of its findings to the community.

One approach can be in the development of indices and scales which are often used interchangeably to refer to all sorts of measures; absolute or relative, single, or composite. The indices developed can be very simple and need not be complex. For example, one way to measure aesthetics is to ask the direct questions; How would you rate the aesthetic value of this wetland? Very good, good, fair, poor, very poor. This, in addition, could be refined so that the responses are placed on a numerical scale as shown below.

AESTHETIC VALUE

Very Good		Good		Fair		Poor		Very Poor
9	8	7	6	5	4	3	2	1

The use of this scale is based on logical inference and requires the assumption that the respondents can realistically act in subjective evaluation. Upon evaluation of all the designated criteria by each member of the commission individually, a composite score can then be calculated for each wetland studied. Subsequent ranking of the evaluated wetlands provides a basis for determining which ones should be designated as prime.

The above scale does not, however, truly take into account the negative aspects of a particular wetland in relationship to a given criteria. Should one wish to do so, a more appropriate index hence might be in the

use of an attitude scale. In this instance, one simply makes the positive statement that a given wetland is aesthetically valuable and the respondents either strongly agree, agree, neither agree or disagree, disagree, or strongly disagree. A new scale can be developed when negative values are assigned to the last two categories and would be reflected in the composite score.

If a conservation commission wishes to assign a different weight to a given criteria because of the unique value of that criteria to the municipality one needs simply to subdivide the criteria into several categories. For example, the hydrological aspects of a wetland could be considered in terms of its water retention capability, ground water recharge, siltation protection value, etc. The weighted criteria would then be reflected in the composite score.

BUFFER ZONE

Adjacent means situated near or next to, adjoining, abutting, or juxtaposed. This means that any activity proposed in an undeveloped area in direct contact with a designated prime wetland will be considered to be adjacent to that delineated area. Therefore, in the delineation of a prime wetland, adequate buffer zones should be included to protect the environmentally sensitive habitat. This is to assure that any development activity will not significantly degrade the designated prime wetlands. Hence, careful and thoughtful analysis would have to be made of the surrounding terrain in order to determine the extent of the buffer zone. In dealing with already developed areas, additional factors that should be considered would be the nature, location, and extent of existing development.

In event that the buffer zone required to protect the prime wetland is in itself a wetland, then the Wetlands Board will exert its jurisdiction and consider the project as adjacent to prime wetlands. If the buffer zone is uplands and dry ground, the Wetlands Board will have no jurisdiction over the project, except that small portion touching wetlands. In this case, municipalities would have to assert jurisdiction under its own authority for the regulation of projects located within the buffer zone.

However, it must be recognized that in delineating a protective buffer zone to a prime wetland, consideration must be given to the private landowner that his rights are not unduly compromised and/or infringed upon.

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