Town of Barnstable
Conservation Commission
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PREFACE TO REGULATION GOVERNING ACTIVITY IN THE 100 FT. BUFFER ZONE

Introduction

The Massachusetts Wetlands Protection Act (MGL Ch. 131, Sec. 40), its attendant regulations (310 CMR 10), and Article 27 of the Town of Barnstable By-laws were promulgated to protect wetland resource areas and the values or interests they serve. Moreover, the Town of Barnstable Zoning By-law (soon Ordinance) embraces several construction setbacks from wetlands (35') and MHW in coastal areas and inland great ponds (50'). By extending potential regulatory jurisdiction over proposed activity within the resource areas themselves and also within a 100' buffer zone landward of such areas (when activity may elicit a deleterious resource area impact), the foregoing statute, regulations and by—laws provide the Conservation Commission with a meaningful set of tools for protecting the long-term integrity of areas under its jurisdiction.

Prevention of Pollution

The role that a protective buffer zone plays in the maintenance of viable wetland resource areas has been frequently discussed in the scientific literature. Omernik (1977) thoroughly documented the dramatic increase in nitrogen and phosphorous loading to wetlands and waterbodies as their adjacent watersheds are cleared. Water quality, it was demonstrated, can be better maintained if protective buffer strips are preserved along stream edges.

As surface runoff from developed sites flows toward a wetland resource area, the buffer zone can provide a site where eroded sediments settle, where nutrients from fertilizers are adsorbed onto soil elements, and where transition zone vegetation can uptake unbound nutrients preventing nuisance algal blooms in adjacent waters (Harris and Gosselink, 1989).

Nutrients are by no means the only pollutant which may degrade wetland resource areas. Surface runoff from developed sites carries a diverse and potent pollution load: hydrocarbons, lawn chemicals, metals, bacteria, and viruses are common constituents (Diamond and Nilson, 1988). While it has been demonstrated that wetlands can play an effective role, in "cleansing" pollutant loads (Nickerson, 1978), little is known of the assimilative capacity of wetland systems in accommodating the broad spectrum of nonpoint pollutants in a given watershed. Indeed, evidence of our swamping of the natural threshholds for wetland resiliency abound.

Wildlife

The transitional assemblage of trees, shrubs and groundcover (containing both wetland and upland elements) frequently found in buffer zones has been found significant to the support of a greater number of native and specialist wildlife species in the interior of resource areas which they border. Put another way, similar habitats provide, a gradual transition zone that is not as inhospitable as an abrupt habitat "edge" (Harris, 1984b). It seems that the relationship between the width of the transitional buffer zone along a bordering marsh, for example, and the provision of Optimum wildlife habitat for its native marsh fauna is a proportional one. On the other hand, more common edge species, including many opportunistic exotics and generalists may find their habitat proportionately diminished. '

Cumulative Effects

Cumulative effects are defined and discussed in the Town of Barnstable Wetland Protection By-law (Article 27). Cumulative effects result from individually minor but collectively significant actions taking place over a period of time (Council on Environmental Quality, 1978). While Article 27 provides that the Commission may deny any project which will have a significant cumulative effect on a wetland or its values, our permit—level activities (i.e. site disturbance) are difficult to measure on the scale of cumulative impacts (i.e. watersheds) (Gosselink & Lee, 1989). Thus, techniques employed for individual permit review are not robust enough to resolve potential significant cumulative impacts, even though it may be clear that the collective impact of many such proposals could adversely affect or imperile a wetland resource area. A reasonable hedge against the cumulative impact is the ascription of a flanking undisturbed buffer of suitable width.

Storm Damage Prevention/Flood Control

The Town of Barnstable's 100 miles of coastline have long provided an active interface for the power of the sea and the buffering capacity of its coastal land forms (marshes, beaches, dunes and banks).

The concern for continued efficacy of the foregoing resource areas in buffering, storing, or containing floodwaters has recently been elevated in the face of predictions for sea level rise in the next century. Due to an increasingly warm atmosphere, a rise in mean sea level of 20-40 cm has been predicted by the year 2100 (Oerlemans, 1989). However, other projections find mean sea level will increase by 66 cm in the same period (Steward, 1989). However, it is important to note that only the relative rate of increase in sea level is being debated, not the tendency to sustained increase in the centuries ahead. The effect of an accelerated rise in sea level will be an appreciable acceleration in coastal erosion processes and their notable manifestations: land erosion, storm damage, flooding, and loss of coastal wetlands.

Additionally, impacts to coastal resource areas may be incurred as a result of site development. Rill erosion of coastal banks and sedimentation of salt marshes may result from lack of appropriate drainage conveyance systems or erosion control practices for surface flows.

In the face of the scientific concern over the acceleration of the rate of sea level rise, and so that upland—induced impacts to coastal resource areas may be minimized, the imposition of a flanking undisturbed buffer zone of suitable width is found both advisable and necessary, respectively.

How Wide a Buffer?

The Massachusetts Audubon Society has recommended the imposition of 300 foot wide natural undisturbed buffers in those areas that directly abut critical resource areas. Projects proposed for prohibition within the buffer zone include both non-water-dependent activities (building construction, sewage disposal systems) and water-dependent activities (bulkheads, revetments) (Brady and Buchsbaum, 1989). Minimum buffer zone widths as mandated by other Northeast states for areas of critical environmental concern range from 200 ft. in Rhode Island to up to 300 ft. in Maine, Maryland and New Jersey.

Conclusion

The Conservation Commission finds that the uniform provision of an undisturbed buffer zone width of 50’ will serve to insulate wetland resource areas from adverse impacts stemming from development elsewhere in the buffer zone. In cases where the slope of an undisturbed buffer exceeds 18%, or in any instance where the scope or nature of the project is likely to require a greater spatial offset to wetland resource areas, the Commission reserves the right to increase buffer zone width to a more suitable dimension.

LITERATURE CITED

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Regulation Governing Activity in the 100 ft. Buffer Zone

Pursuant to the regulation of activity under Article 27 of the Town of Barnstable By-laws in the 100 ft. buffer zone of resource areas given in 310 CMF 10.02 (I)(a) and given in Article 27, Section 2 (exclusive of any land under said waters, any land subject to flooding or inundation by groundwater, surface water, tidal action or coastal storm flowage), the following performance standard shall be satisfied:

* An undisturbed buffer zone 50 ft. in width shall be provided between wetland resource areas and the limit of site disturbance. It is recommended that proposed structures within the buffer zone be located no closer than 20' from the landward limit of the buffer, so that attendant construction, landscaping, and maintenance activities may ensue without buffer zone insult.

This regulation shall not be construed to preclude access paths, vista pruning or construction of water-dependent structures within the buffer zone, any of which may be permitted at the Commission's discretion.

These regulations notwithstanding, the Conservation Commission will consider any and all proposals for activity within the buffer zone on a site specific basis, disposing of each according to its merit and the degree to which wetland interests have been protected and preserved at the locus.

Approved by the Conservation Commission on: June 5, 1990