D. Ecology

The following chapter reviews the existing ecological conditions (including vegetation types, terrestrial wildlife, wetland communities, marine fish and invertebrates, and essential fish habitat) within the project area and the potential beneficial and adverse impacts to these ecological resources associated with the proposed action. The potential adverse impacts to the ecological resources of Garvies Point Preserve are also analyzed. This chapter also reviews the proposed mitigation measures incorporated into the project design aimed at providing ecological benefits and minimizing the magnitude of potential adverse impacts to the site's ecological resources and those of the adjacent Garvies Point Preserve and Glen Cove Creek.

1. Existing Conditions

   a) Vegetation and Habitat

   The majority of the project area, as well as a significant portion of Glen Cove Creek, exhibits characteristics typical of intense commercial and industrial use occurring over extended historical time periods. The past and present uses of the project site, along with site contamination and remediation activities, have been described in detail in **Section III.B** of this Draft Environmental Impact Statement ("DEIS").

   Since the completion of environmental remediation activities on Blocks A-C of the project site, this area has been re-colonized by native and invasive pioneer plants. As shown in **Exhibit III.D-1,** Blocks B, C, E and F now contain 12.6 acres of open fields and upland herbaceous vegetation, 3.9 acres of open, standing water and surrounding hydrophytic vegetation, and 6.0 acres of upland woodlands. The open fields are dominated by various native pioneer plants and invasive plants, including mugwort (*Artemesia vulgaris),* goldenrods (*Solidago sp.*), and white heath aster (*Aster pilobus*). In Block B, there are two large areas of standing water found in shallow depressions resulting from the extensive grading and excavation associated with the environmental remediation of the site. These shallow ponds are bordered by native and invasive hydrophytic plants including broad-leaved cattail (*Typha latifolia*) and common reed (*Phragmites australis*). In addition, two smaller areas of standing water are located at the northern edge of Block B bordering Garvies Point Road. These areas feature various hardwood trees, shrubs, and woody vines including various willows (*Salix sp.*), European alder (*Alnus glutinosa*), box elder (*Acer negundo*), and Norway maple (*Acer platanoides*). A complete inventory of the plants present on the project site based on field investigations conducted in June 2004 and June 2008 is provided in **Table III.D-1**.

   The majority of Glen Cove Creek is lined by bulkheaded shoreline and has no intertidal marsh, high marsh or transition zone habitats. Additionally, Glen Cove Creek consists of a federally maintained navigation channel that extends from

Hempstead Harbor eastward to the existing fuel depot located at the eastern terminus of the creek. Historical dredging and shoreline hardening structures have resulted in the elimination of all natural shoreline areas with the exception of a tidal wetland resource located at Captain's Cove and at the Garvies Point beach. These areas contain remnants of the natural shoreline assemblages formerly common within the Hempstead Harbor estuary.

Captain's Cove (Blocks A and B)

The area known locally as the Captain's Cove site has intertidal/high marsh vegetation dominated by Smooth cord grass (*Spartina alterniflora*) and Marsh elder (*Iva frutescens*) dominating the zone. Open areas of shoals/mudflats are heavily utilized by avian species as a foraging/resting site. Transition zone habitat is located between the intertidal/high marsh fringe and the developed parkland esplanade and contains a mixture of invasive pioneer species such as common reed (*Phragmites australis*), tree of heaven (*Ailanthus altissima*), mugwort (*Artemisia vulgaris*), and honey locust (*Gleditsia triacanthas*). Much of the slope area exhibits evidence of past deposition of concrete/debris utilized to stabilize the slope. Aggressive plant species have colonized the disturbed side slope with some vegetative cover.

The Captain's Cove portion of the site is classified as: (1) Intertidal Marsh (IM) and (2) Coastal Shoals, Bars and Flats (SM) by the NYSDEC. Intertidal marsh areas are considered to be the highest quality, while coastal shoal areas vary extensively in quality from site to site.

Intertidal marshes are considered the most biologically productive tidal wetlands. This is due in part to the twice daily flushing of photosynthetic products and decomposition materials to adjacent waters, where they are incorporated into the food web. In addition to productivity, intertidal marshes are very effective in the protection of upland areas from storms and flooding. For these reasons, intertidal marshes are considered most effective at cleansing ecosystems and absorbing silt and organic materials.

Coastal shoals, bars, and flats (SM), on the other hand, are highly variable in their productivity and protection. In Captain's Cove, wetlands are classified as SM seaward of the existing intertidal marsh. Due to the high variability associated with this classification, it's important to assess this site individually. At this site, the biological productivity in the SM area is high. In addition, the SM area acts to not only protect the upland area, but also the valuable intertidal marsh area behind it. As such, the SM designated wetlands of Captain's Cove wetlands are also of high quality.

INSERT EXHIBIT
III.D-1 Existing Habitat

Garvies Point Beach Area

The terminus of Garvies Point Road provides an excellent view of the existing beach area. The vegetative assemblage found within the site is located seaward of the beach area and is primarily dominated by tidal wetland species such as Smooth cord grass (*Spartina alterniflora*) interspersed by open shoal/mudflat areas. Upland adjacent areas located above apparent high water contain a narrow band of pioneer species within the sandy substrate.

A complete list of the vegetation observed in the open fields and shallow ponds of Blocks B and C, Garvies Point Beach and Captain's Cove areas is found below in **Table III.D-1**.

Table III.D-1
Existing Vegetation (Observed Species)

Common Name	Scientific Name
Box elder	*Acer negundo*
Norway maple	*Acer platanoides*
Garlic mustard	*Alliaria petiolata*
European alder	*Alnus glutinosa*
Tree of heaven	*Ailanthus altissima*
Common ragweed	*Ambrosia artemisiifolia*
Blue stem	*Andropogon* sp.
Mugwort	*Artemisia vulgaris*
White heath aster	*Symphotrichum pilosus*
Groundsel bush	*Baccharis halimifolia*
Birch	*Betula* sp.
Lambsquarters	*Chenopodium album*
Queen Anne's lace	*Daucus carota*
Autumn olive	*Elaeagnus umbellata*
Honey locust	*Gleditsia tricanthos*
English ivy	*Hedera helix*
Marsh elder	*Iva frutescens*
Purple deadnettle	*Lamium purpuream*
European honeysuckle	*Lonicera periclymenum*
Witchgrass	*Panicum capillare*
Common reed	*Phragmites australis*
Pokeweed	*Phytolacca americana*
Japanese knotweed	*Polygonum cuspidatum*
Quaking aspen	*Populus tremuloides*
Fire cherry	*Prunus pennsylvanica*
Black cherry	*Prunus serotina*
Black locust	*Robinia pseudoacacia*
Red sorrel	*Rumex acetosella*

Common Name	Scientific Name
Multiflora rose	*Rosa multiflora*
Pussy willow	*Salix discolor*
Black willow	*Salix nigra*
Weeping willow	*Salix* x *sepulcralis*
Goldenrod	*Solidago* sp.
Canada (tall) goldenrod	*Solidago altissima*
Smooth cordgrass	*Spartina alterniflora*
Salt hay	*Spartina patens*
Chickweed	*Stellaria media*
Dandelion	*Taraxacum officinale*
Poison ivy	*Toxicodendron radicans*
Red clover	*Trifolium pratense*
White clover	*Trifolium repens*
Broadleaf cattail	*Typha latifolia*
Common mullein	*Verbascum thapsus*
Wild grape	*Vitis sp.*
Common cocklebur	*Xanthium strumarium*

Source: Land Use Ecological Services

The Garvies Point beach area is classified solely as coastal shoals, bars and flats (SM) on the New York State Department of Environmental Conservation ("NYSDEC") Tidal Wetlands Map. Again, due to the high variability associated with the SM classification, it was important to assess this site individually.

Field inspections of the site revealed that the majority of this area falls within the SM classification. However, Article 25 of the NYS DEC Environmental Conservation Law provides that the SM designation is applicable only if the area is not vegetated by *Spartina alterniflora* (Smooth cord grass). A portion of the Garvies Point beach area is vegetated by *Spartina alterniflora*, and therefore the area should be considered both coastal shoals (SM) and intertidal marsh (IM). As such, the quality as measured by productivity and protection of upland areas is high.

In conclusion, both the Captain's Cove and Garvies Point Beach areas are considered high quality wetlands, as defined by the NYS DEC (Article 25, Environmental Conservation Law), supporting an assorted amount of related vegetation.

b) Wildlife

(1) Terrestrial Wildlife

Due to the historical industrial use of the subject property, the upland portions of the property largely consist of early successional habitats such as open fields, areas of upland herbaceous vegetation and bare soils. In addition, there are small stands of small hardwood trees and shrubs located along the southern margin of Garvies Point Road and on the steep slope between the esplanade and Glen Cove Creek. These early successional habitats have been observed to provide foraging, resting, and nesting for over 140 bird species as indicated by field inspections of the project site performed by Land Use Ecological Services and records provided by the North Shore Audubon Society for Garvies Point Preserve. The records for Garvies Point Preserve have been compiled by the North Shore Audubon Society for over 50 years (M. Normandia and R. Cioffi, pers. comm.) A complete list of the bird species observed on the property, from Garvies Point Road, and in Garvies Point Preserve is found in **Table III.D.2**

These birds consist of commonplace suburban songbirds which may nest on the subject property and neo-tropical migrants which use the property and the adjacent Garvies Point Preserve as foraging and resting habitat. The most abundant birds on the subject property are commonplace songbirds typical of suburban habitats such as house sparrow (*Passer domesticus*), European starling (*Sternus vulgaris*), song sparrow (*Melospiza melodia*), gray catbird (*Dumetella carolinensis*), mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceus*). However, more unusual, transient visitors have also been observed in the project site's open fields such as Eastern meadowlark (*Sturnella magna*) and bobolink (*Dolichonx oryzivorus*). Waterfowl and wading birds, such as mallard (*Anas platyrynchos*), Canada goose (*Branta canadensis*), and great blue heron (*Ardea herodias*), have been observed in the shallow pools of standing water located on the project site.

The marshes, shoals, and mudflats along Glen Cove Creek and Hempstead Harbor provide foraging and resting habitat for shorebirds and waterfowl. Species expected to inhabit the area include various gulls (*Larus sp.*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), lesser yellowlegs (*Tringa flavipes*), semipalmated plover (*Calidris pusilla*), and sanderling (*Calidris alba*). Hempstead Harbor may also be used seasonally by overwintering waterfowl such as Northern pintail (*Anas acuta*), long-tailed duck (*Clangula hyemalis*), red-breasted merganser (*Mergus serrator*), and bufflehead (*Bucephala clangula*). The mammal species expected to utilize this site consist only of species which are highly tolerant of human activity such as white-footed mouse, raccoon, opossum, and gray squirrel (see **Table III.D-2**).

Table III.D-2
Observed Bird Species for Project Site and Garvies Point Preserve

Common Name	Scientific Name	Habitat Type	Comments
Common Loon	*Gavia immer*	Open waters of bays and estuaries	
Red-throated Loon	*Gavia stellata*	Open waters of bays and estuaries	
Horned Grebe	*Podiceps auritus*	Open waters of bays and estuaries	
Double-crested Cormorant	*Phalacrocorax auritus*	Open waters of bays and estuaries	
American Bittern	*Botaurus lentiginosus*	Dense marshes and wetlands	
Great Blue Heron	*Ardea herodias*	Quiet waters of lakes, ponds, and marshes	
Great Egret	*Ardea alba*	Still, open waters or grassy marshes	
Snowy Egret	*Egretta thula*	Shallow, open waters or grassy marshes	
Green Heron	*Butoridas virescens*	Edges of marshes, wooded streams, and ponds	
Black-crowned Night Heron	*Nycticorax nycticorax*	Shallow ponds and marshes	
Mute Swan	*Cygnus olor*	Ponds and bays	Breeding Activity
Canada Goose	*Branta canadensis*	Common near water and in fields	Breeding Activity
Brant	*Branta bernicla*	Coastal bays and marshes	
Snow Goose	*Chen caerulescens*	Winters in marshes and open fields	
American Black Duck	*Anas rubripes*	Shallow water habitats, especially salt marshes	
Mallard	*Anas platyrynchos*	Frequent in any wet habitat	Breeding Activity
Northern pintail	*Anas acuta*	Shallow ponds and marshes.	
Long-tailed Duck	*Clangula hyemalis*	Common shallow ocean with sandy bottom	
American Widgeon	*Anas american*	Shallow ponds and marshes	
Blue-winged Teal	*Anas discors*	Shallow water with emergent vegetation	
Green-winged Teal	*Anas creca*	Shallow marshy and muddy ponds	
Canvasback	*Aythya valisineria*	Sheltered bays and lakes	
Greater Scaup	*Aythya marila*	Open water habitats (prefers salt water)	
Lesser Scaup	*Aythya affinis*	Open water habitats (prefers freshwater)	
Common Goldeneye	*Bucephala clangula*	Bays, lakes, rivers	
Bufflehead	*Bucephala clangula*	Common on lakes, bays, harbors; nests in trees near ponds/rivers	
Red-breasted Merganser	*Mergus serratora*	Common in salt water in lagoons and bays on sheltered coasts	
Hooded Merganser	*Lophodytes cucullatus*	Common in salt water in lagoons and bays on sheltered coasts	

Common Name	Scientific Name	Habitat Type	Comments
Turkey Vulture	*Cathartes aura*	Often seen soaring in thermal currents	
Osprey	*Pandion haliaetus*	Open water habitats; perches on trees/poles near water	
Bald Eagle	*Haliaeetus leucocephalus*	Near water	
Northern Harrier	*Circus cyaneus*	Open fields and salt marshes	
Sharp-shinned Hawk	*Accipiter striatus*	Woodlands, shrublands, and open fields	
Cooper's Hawk	*Accipiter cooperii*	Woodlands, shrublands, and open fields	
Broad-winged Hawk	*Buteo platypterus*	Wooded habitats	
Red-tailed Hawk	*Buteo jamaicensis*	Various habitats	Breeding Activity
American Kestrel	*Falco sparverius*	Open habitats, usually perched on wires hunting	
Merlin	*Falco columbarius*	Wide-open space and open woods	
Peregrine Falcon	*Falco peregrines*	Open habitats	
Ring-necked Pheasant	*Phasianus colchicus*	Open fields, brushy/weedy hedgerows and forest edges	
Clapper Rail	*Rallus longirostris*	Grassy marshes	
Black-bellied Plover	*Pluvialis squatarola*	Open ground (tundra, mudflats, pastures)	
Semipalmated Plover	*Charadrius semipalmatus*	Open mudflats and beaches	
Killdeer	*Charadrius vociferous*	Upland habitats often far from water	Breeding Activity
American Woodcock	*Scolopax minor*	Damp, brushy woods	
Greater Yellowlegs	*Tringa melanoleuca*	Shallow water or mudflat habitat	
Lesser Yellowlegs	*Tringa flavipes*	Shallow water or mudflat habitat	
Solitary Sandpiper	*Tringa solitaria*	Muddy, vegetation-enclosed ponds and creeks	
Spotted Sandpiper	*Actitus macularia*	Ponds and streams	
Short-billed Dowitcher	*Limnodromus griseus*	Mudflats and beaches	
Sanderling	*Calidris alba*	Sandy beaches	
Semipalmated Sandpiper	*Calidris pusilla*	Mudflats and beaches	
Least Sandpiper	*Calidris minutilla*	Mudflats in or near grassy/weedy vegetation	
White-rumped Sandpiper	*Calidris fuscicollis*	Grassy marshes, mudflats, beaches	
Common Snipe	*Gallinago gallinago*	Damp, muddy habitats with some vegetation for cover	
Ring-billed Gull	*Larus delawarensis*	Common and widespread	
Herring Gull	*Larus argentatus*	Common and widespread	
Great Black-backed Gull	*Larus marinus*	Common along coast	
Laughing Gull*	*Larus atricilla*	Open shoreline habitats	
Common Tern	*Sterna hirundo*	Open water habitats	
Forster's Tern	*Sterna forsteri*	Sheltered water habitats (bays, ponds, marshes)	
Roseate Tern	*Sterna dougallii*	Pelagic	
Least Tern	*Sterna antillarum*	Open beaches, bays, estuaries	

Common Name	Scientific Name	Habitat Type	Comments
Eastern Screech Owl	*Otus asio*	Open woods at forest edges	Breeding Activity
Common Nighthawk	*Chordeiles minor*	Woods, fields, etc.	
Chimney Swift	*Chaetura pelagic*	Hollow trees or chimneys	Breeding Activity
Rock Dove	*Columba livia*	Common and widespread	Breeding Activity
Mourning Dove	*Zenaida macroura*	Common and widespread in habitats with mix of open ground and brush	Breeding Activity
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Dense foliage of trees and bushes	
Yellow-billed Cuckoo	*Coccyzus americanus*	Dense foliage of trees and bushes	
Ruby-throated Hummingbird	*Archilochus colubris*	Mixed woodlands	Breeding Activity
Belted Kingfisher	*Ceryle alcyon*	Sheltered water habitats	Breeding Activity
Red-bellied Woodpecker	*Melanerpes carolinus*	Common mature deciduous woods	
Downy Woodpecker	*Picoides pubescens*	Common any wooded habitat	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Deciduous woodlands, attracted to recent clearing and burns	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Forest habitats	
Hairy Woodpecker	*Picoides villosus*	Mature woods	
Northern Flicker	*Colaptes auratus*	Common and widespread wooded areas with openings	
Eastern Kingbird	*Tyrannus tyrannus*	Open habitats w/scattered trees, bushes	
Western Kingbird	*Tyrannus verticalis*	Open habitats	
Eastern Phoebe	*Sayornis phoebe*	Open habitats near water	
Willow Flycatcher	*Empidonax traillii*	Low, brushy habitats, often near water	Breeding Activity
Great-crested Flycatcher	*Myiarchus crinitus*	Hardwood forests	Breeding Activity
Red-eyed Vireo	*Vireo olivaceus*	Common and widespread; nests in forests	Breeding Activity
Blue-headed Vireo	*Vireo solitaries*	Forest habitats	
Warbling Vireo	*Vireo gilus*	Broadleaf trees	Breeding Activity
Blue Jay	*Cyanocitta cristata*	Common and widespread in woods	
Fish Crow	*Corvus ossifragus*	Open habitats	Breeding Activity
American Crow	*Corvus brachyrynchos*	Common and widespread	Breeding Activity
Horned Lark	*Eremophila alpestris*	Barren ground with short grass or scattered bushes	
Barn Swallow	*Hirundo rustica*	Common; nests in man-made structures; forages over fields, ponds	
Tree Swallow	*Tachycineta bicolor*	Nests in birdhouses or tree cavities in open field or over water; forages over fields or water	
Rough-winged Swallow	*Stelgidopteryx serripennis*	Sandbanks	Breeding Activity
Bank Swallow	*Riparia riparia*	Sandbanks	Breeding Activity
Black-capped Chickadee	*Poecile atricapillus*	Common any wooded habitat	
Brown Creeper	*Certhia americana*	Mature woods	

Common Name	Scientific Name	Habitat Type	Comments
Tufted Titmouse	*Baeolophus bicolor*	Mature deciduous woods	
White-breasted Nuthatch	*Sitta carolinensis*	Mature deciduous and mixed woods	Breeding Activity
Red-breasted Nuthatch	*Sitta canadensis*	Mature forests, suburban habitats with conifers	
Carolina Wren	*Thryothorus ludovicianus*	Common dense brush within woods	
House Wren	*Troglodytes aedon*	Brushy tangles at edge of woods, overgrown gardens, hedgerows	
Winter Wren	*Troglodytes troglodytes*	Wet, shady woods and dense brush	
Marsh Wren	*Cistothorus palustris*	Tall reeds or marsh vegetation	
Swainson's Thrush	*Catharus ustulatus*	Dense, shady woods	
Veery	*Catharus fuscescens*	Shady woods w/leafy understory	
Gray-cheeked Thrush	*Catharus minimus*	Low spruce woods	
Hermit Thrush	*Catharus guttatus*	Open, brushy habitat	
Wood Thrush	*Hylochichla mustelina*	Understory mature deciduous forests	
Ruby-crowned Kinglet	*Regulus calendula*	Mixed woods	
Golden-crowned Kinglet	*Regulus satrapa*	Mixed woods	
Brown Trasher	*Toxostoma rufum*	Dense, tangled thickets	Breeding Activity
Gray Catbird	*Dumetella carolinensis*	Common brushy understory of woods	Breeding Activity
Northern Mockingbird	*Mimus polyglottos*	Open habitats near dense bushes, often suburban neighborhoods	Breeding Activity
American Robin	*Turdus migratorius*	Common and widespread	Breeding Activity
European Starling	*Sturnus vulgaris*	Common and widespread	Breeding Activity
Cedar Waxwing	*Bombycilla cedrorum*	Open woods, orchards, residential areas	Breeding Activity
Black-throated Warbler	*Dendroica virens*	Coniferous woods	
Blackpoll Warbler	*Dendroica striata*	Wooded habitats	
Black-throated Blue Warbler	*Dendroica caerulescens*	Dark, shaded understory within forests	
American Redstart	*Setophaga ruticilla*	Broadleaf or mixed forest habitats	Breeding Activity
Palm Warbler	*Dendroica palmarum*	Grassy/weedy open ground	
Yellow Warbler	*Dendroica petechia*	Common wet, brushy habitat	
Yellow-rumped Warbler	*Dendroica coronata*	Nests coniferous forests/edges; winters in open brushy habitats	
Black & White Warbler	*Mniotilta varia*	Common; nests in mature deciduous/mixed forests	
Tennessee Warbler	*Vermivora peregrina*	Found in trees/woods	
Orange-crowned Warbler	*Vermivora celata*	Edges of low trees and weedy habitats	
Nashville Warbler	*Vermivora ruficapilla*	Brushy habitats and low woods	
Blue-winged Warbler	*Vermivora pinus*	Brushy, second growth and open woods	
Golden-winged Warbler	*Vermivora chrysoptera*	Brushy, second growth and open woods	
Chestnut-sided Warbler	*Dendroica pensylvanica*	Second-growth deciduous woods	
Magnolia Warbler	*Dendroica magnolia*	Mixed coniferous woods	
Cape May Warbler	*Dendroica tigrina*	Conifers or flowering trees	
Blackburnian Warbler	*Dendroica fusca*	Mature mixed coniferous woods	

Common Name	Scientific Name	Habitat Type	Comments
Cerulean Warbler	*Dendroica cerulea*	Tall trees near water	
Pine Warbler	*Dendroica pinus*	Pine forests	
Prairie Warbler	*Dendroica discolor*	Low, brushy habitats and second-growth woods	
Bay-breasted Warbler	*Dendroica castanea*	Wooded habitats	
Worm-eating Warbler	*Helmitheros vermivora*	Woods in dense, low to mid-level vegetation	Breeding Activity
Connecticut Warbler	*Oporornis agilis*	On or near the ground in dense, brushy vegetation	
Kentucky Warbler	*Oporornis formosus*	On or near the ground in dense, brushy vegetation	
Northern Waterthrush	*Seiurus noveboracensis*	Found along wooded streams and pond edges	
Louisiana Waterthrush	*Seiurus motacilla*	Found along wooded streams and pond edges	
Ovenbird	*Seiurus aurocapillus*	Shaded, wooded habitats	
Canada Warbler	*Wilsonia Canadensis*	Found low in dense, shady understory, often near water	
Hooded Warbler	*Wilsonia citrina*	Found low in dense, shady understory, often near water	
Wilson's Warbler	*Wilsonia pusilla*	Dense, brushy vegetation near water	
Common Yellowthroat	*Geothlypis trichas*	Marshy, brushy vegetation near water	Breeding Activity
Scarlet Tanager	*Piranga olivacea*	Wooded habitats	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Hardwood forests	
Blue Grosbeak	*Guiraca caerulea*	Brushy or weedy areas with scattered trees	
Indigo Bunting	*Passerina cyanea*	Grassy, weedy open areas near brush or trees	
Northern Cardinal	*Cardinalis cardinalis*	Brushy habitat within or at edge of woods, and suburban settings	
Eastern Towhee	*Pipilo erythrophtalmus*	Brushy habitat, sunny clearings, shrublands, or brushy growth within open forests	
White-throated Sparrow	*Zonotrichia albicollis*	Dense brush	
White-crowned Sparrow	*Zonotrichia leucophrys*	Brushy, weedy habitats (not woods)	
Chipping Sparrow	*Spizella passerine*	Open woods	Breeding Activity
Field Sparrow	*Spizella pusilla*	Brushy, weedy habitats	
Swamp Sparrow	*Melospiza georgiana*	Grassy, weedy, brushy habitats, often near water	
Lark Sparrow	*Chondestes grammacus*	Open ground (lawns, fields, open woods)	
Vesper Sparrow	*Pooecetes gramineus*	Open fields and pastures, near trees	
Lincoln's Sparrow	*Melospiza lincolnii*	Grassy, weedy, brushy habitats, often near water	
Grasshopper Sparrow	*Ammodramus savannarum*	Tall, dense grass	
Sharp-tailed Sparrow	*Ammadramus caudacutus*	Coastal salt marsh	

Common Name	Scientific Name	Habitat Type	Comments
Savannah Sparrow	*Passerculus sandwichensis*	Open grassy or weedy habitats	Breeding Activity
Song Sparrow	*Melospiza melodia*	Common and widespread; open brushy areas and hedgerows	Breeding Activity
Eastern Junco	*Junco hyemalis*	Nests open coniferous/mixed woods with patches of open ground; forages open ground	
Red-winged Blackbird	*Agelaius phoeniceus*	Wet marsh or brush	Breeding Activity
Brown-headed Cowbird	*Molothrus ater*	Woods, edges, and open fields	Breeding Area
Rusty Blackbird	*Euphagus carolinus*	Wooded swamps	
Common Grackle	*Quiscalus quiscula*	Common and widespread	Breeding Activity
Eastern Meadowlark	*Sturnella magna*	Open, grassy habitats	
House Sparrow	*Passer demesticus*	Common and widespread	Breeding Activity
Dicksissel	*Spiza americana*	Grassy, weedy fields or nearby brush	
Lapland Longspur	*Calcarius lapponicus*	Open ground (fields, beaches, pastures)	
Dark-eyed Junco	*Junco hyemalis*	Coniferous woods, winter in open woods, brushy habitats	
Snow Bunting	*Plectrophenax nivalis*	Barren, open ground (beaches, fields, tundra)	
Bobolink	*Dolichonyx oryzivorus*	Grassy, weedy meadows	
Orchard Oriole	*Icterus spurius*	Scrubby or open woods	Breeding Activity
Baltimore Oriole	*Icterus galbula*	Open broadleaf woods	Breeding Activity
House Finch	*Carpodacus mexicanus*	Common suburbs and brushy, wooded areas	Breeding Activity
Purple Finch	*Carpodacus pupureus*	Open woods and shrubs	
Pine Siskin	*Carduelis pinus*	Open coniferous forest	
American Goldfinch	*Carduelis tristis*	Woodland edges, thickets	Breeding Activity

*Known breeding activity on the project site or Garvies Point Preserve is noted in the Comments
Source: Land Use Ecological Services

Mammal species expected to utilize this site consist only of animals which are adaptable to intense human activity such as raccoon, opossum, and gray squirrel (see **Table III.D-3**).

Table III.D-3
Mammals (Observed or Expected) on Project Site

Common Name	Scientific Name
White-footed Mouse	*Peromyscus leucopus*
House Mouse	*Mus musculus*
Norway Rat	*Rattus norvegicus*
Gray Squirrel	*Sciurus carolinensis*
Eastern Cottontail	*Sylvilagus floridanus*
Raccoon	*Procryon lotor*
Opossum	*Didelphis marsupialis*

Source: Land Use Ecological Services

(2) Finfish and Invertebrates

The intertidal wetlands, shoals, and mudflats located in Glen Cove Creek and Hempstead Harbor provide habitat for a diverse assemblage of invertebrates and finfish. A complete list of the invertebrates and finfish observed and expected to be found in the wetlands and shallow waters adjacent to the project site is presented in **Table III.D-4**. These finfish and invertebrates are abundant in estuaries and shallow coastal areas on Long Island. While a diversity of invertebrate and finfish species have been observed in the site's wetlands, the densities of these species are not expected to be commercially exploitable within the project limits.

The biological productivity of these intertidal and adjoining sub-tidal areas is high and contributes significantly to the large variety of wildlife species utilizing these areas. The project wetlands are also heavily utilized by a variety of finfish species. Juveniles enter these areas and use these sites as developmental habitat. This use will then attract larger predator species that will enter the project area to forage on the abundant baitfish.

Table III.D-4
Aquatic Species (Observed or Expected Within Project Wetlands or Adjoining Sub-tidal Areas)

Common Name	Scientific Name	Observed/Expected
Atlantic Ribbed Mussel	*Geukenisa demissa*	Observed
Blue Mussel	*Mytilus edulis*	Observed
Northern Quahog	*Mercenaria mercenaria*	Observed
Softshell Clam	*Mya arenaria*	Observed
Common Periwinkle	*Littorina littorea*	Observed
Three-lined Mudsnail (New England dog whelk)	*Nassarius trivittatus*	Observed
Mud dog whelk	*Nassarius obsoletus*	Observed
Bay barnacle	*Balanus improvisus*	Observed
Long-clawed Hermit Crab	*Pagurus longicarpus*	Expected
Marsh Crab	*Sesarma reticulatum*	Expected
Fiddler Crab	*Uca pugnax*	Observed
Lady Crab	*Ovalipes ocellatus*	Observed
Blue Crab	*Callinectes sapidus*	Expected
Spider Crab	*Libinia emarginata*	Expected
Green Crab	*Carcinus maenas*	Expected
Razor Clam	*Ensis directus*	Expected
Eastern Oyster	*Crassostrea virginica*	Expected
Horseshoe Crab	*Limulus polyphemus*	Observed
Comb jelly	*Beroe spp.*	Expected

Common Name	Scientific Name	Observed/Expected
Moon jellyfish	*Aurelia aurita*	Expected
Lion's mane jellyfish	*Cyanea capillata*	Expected
American Eel	*Anguilla rostrata*	Expected
Atlantic Menhaden	*Brevoorita tyrannus*	Expected
Atlantic Needlefish	*Strongylura marina*	Expected
Sheepshead Minnow	*Cyprinodon variegatus*	Expected
Mummichug	*Fundulus heteroclitus*	Expected
Striped Killifish	*Fundulus majalis*	Expected
Atlantic Silversides	*Menidia menidia*	Expected
Tidewater Silversides	*Menidia beryllina*	Expected
Fourspine Stickleback	*Apeltes quadracus*	Expected
Northern Pipefish	*Syngnathus fuscus*	Expected
American sandlance	*Ammodytes americanus*	Expected
Bay Anchovy	*Anchos mitchelli*	Expected
Blackfish (Tautog)	*Tautoga onitis*	Expected
Bluefish	*Pomatomus saltatrix*	Expected
Scup	*Stenotomus chrysops*	Expected
Silver Perch	*Bairidiella chrysoura*	Expected
Striped Mullet	*Mugil cephalus*	Expected
White Mullet	*Mugil curema*	Expected
Summer Flounder	*Paralichthys dentatus*	Expected
Striped Bass	*Morone americanus*	Expected
Weakfish	*Cynoscion regalis*	Expected
Windowpane flounder	*Scophthalmus aquosus*	Expected
Winter Flounder	*Pleuronectes americanus*	Expected

Source: Land Use Ecological Services

(3) Benthic Invertebrate Survey

August 9, 2004

An invertebrate survey of the shoreline and mudflats was conducted to determine the composition of the benthic invertebrate community at the project site. The survey was conducted on August 9, 2004 between the hours of 13:30 and 14:30; low tide occurred at approximately 13:58.

Observations extended along the north shore of Glen Cove Creek, from the mouth of the creek eastward (roughly half the length of the creek). All invertebrates observed on the mud and surfaces were recorded. In addition, sediment pits were dug at three locations to assess the mollusk species present within the site's sediments. These locations included: (1) Garvies Point Beach at the mouth of the creek adjacent to the boat ramp, (2) Captain's Cove wetland area approximately halfway between the

mouth of the creek and the proposed marina site, and (3) at the proposed large vessel marina site. A shovel was used to dig down about one foot into the sediment at the low water line and also in water roughly one foot deep. Species found within the sediment were identified to the lowest practical taxonomic level.

There were three types of green algae on the north shore of the creek, rockweed (*Fucus gardneri*), sea lettuce (*Ulva sp.*) and *Enteromorpha sp*. One type of red algae, *Polyides rotundus*, was observed. Algae were more abundant at the western end, or mouth of the creek, than they were in the area of the proposed marina.

The three most abundant invertebrates present were soft-shelled clams (*Mya arenaria*), the mud dog whelk (*Nassarius obsoletus*) and Atlantic ribbed mussels (*Geukensia demissa*). Soft-shelled clams were observed at every sediment survey site (10+ individuals per site), and there was evidence of their abundance throughout the mudflats. Mud dog whelks were observed in patches of 100+ individuals at or below the low water line. Ribbed mussels were observed in patches of 20 to 100+ individuals above the low water mark, at or near the low water mark, and below the low water mark.

In addition to the above, fiddler crabs (*Uca sp.*) were observed in low numbers in the Captain's Cove mudflat. Approximately 20 to 25 fiddler crabs were observed 1 to 5 feet above the low water mark in each of the following locations: (1) west of the proposed large vessel marina, and (2) south of the proposed observation deck. Bay barnacles (*Balanus improvisus*), a single lady crab (*Ovalipes ocellatus*), and 5 dead horseshoe crabs (*Limulus polyphemus*) were also observed. The bay barnacles occurred near the low water line along the entire length of the creek in low densities (<5 per m^2).

May 12, 2009

Benthic invertebrates were also sampled on May 12, 2009 to determine the densities of invertebrate species found in the intertidal zone. Sampling was conducted from 18:45 (6:45 pm) through 20:15 (8:15 pm), with low tide at 19:43 (7:43 pm).

To quantitatively assess the species found at the site, ½ m^2 quadrats were surveyed at three locations at Garvies Point Beach, three locations within Captain's Cove, and one location at the proposed large vessel marina area. A clam rake was used to dig down approximately one foot (1') below the surface. Observed organisms were counted and identified to the lowest practical taxa.

In all quadrats, the following species were present: soft-shelled clams (*Mya arenaria*), mud dog whelk (*Nassarius obsoletus*), and bay barnacle (*Balanus improvisus*). Bay barnacles were observed on rocks and shells, and were too numerous to count. Mud dog whelks were also too numerous to count, with an estimated 80-100/m^2 in Garvies Point Beach quadrats and 50-70/m^2 in Captain's Cove and large vessel marina quadrats.

At Garvies Point Beach, 8-28 clams/m^2 were observed. In Captain's Cove, soft-shelled clams were more abundant, with 30-86 clams/m^2 observed. There were no soft-shelled clams observed at the large vessel marina quadrat.

In addition to the species found in all quadrats, there were two additional species observed in Captain's Cove. A single Northern quahog (*Mercenaria mercenaria*) and a single clam worm (*Nereis* sp.) were found in one quadrat sampled in Captain's Cove.

In addition, blue mussels (*Mytilus edulis*) were observed in large clumps attached to bulkheading and *Spartina alterniflora* at Garvies Point Beach. Common periwinkles (*Littorina littorea*) were also observed attached to the bulkheading. At Captain's Cove, Atlantic ribbed mussels (*Geukenisa demissa)* were observed in large clumps attached to *Spartina alterniflora*.

At the Garvies Point Beach quadrats, sediments were generally characterized as sand with abundant gravel and shells. Anaerobic sediment conditions were observed within 1-2" of the surface in all quadrats at Garvies Point Beach. At Captains' Cove, sediments were silty sand with anaerobic conditions within 1-2" of the surface. Sediments in the large vessel marina quadrat were sandy with anaerobic conditions within 5" of the surface.

(4) Essential Fish Habitat Designations

A review of National Marine Fisheries Service ("NMFS") designated Essential Fish Habitats ("EFH") was conducted by Land Use Ecological Services, Inc. to ascertain existing conditions and probable impacts associated with the proposed action and the No Action, Public Access, East Side Configuration, Reduced Height, and Maximum Build-Out alternatives.

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, an expanded EFH consultation is required for the proposed projects within Glen Cove Creek. Hempstead Harbor has been identified as an EFH for one or more life cycles of 15 species of finfish by NMFS, as shown in **Table III.D-5**.

Table III.D-5
Species for which an EFH has been Designated in the Project Area by NMFS

Species – Common Name (Scientific Name)	Eggs	Larvae	Juveniles	Adults
Atlantic salmon (*Salmo salar*)			X	X
Pollock (*Pollachius virens*)			X	X
Red hake (*Urophycis chuss*)	X	X	X	X
Winter flounder (*Pleuronectes americanus*)	X	X	X	X
Windowpane flounder (*Scopthalmus aquosus*)	X	X	X	X
Atlantic sea herring (*Clupea harengus*)			X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Atlantic mackerel (*Scomber scombrus*)	X	X	X	X
Summer flounder (*Paralichtys dentatus*)			X	
Scup (*Stenotomus chrysops*)	X	X	X	X
Black sea bass (*Centropristus striata*)	n/a		X	
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculates*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X

Atlantic Salmon (Salmo salar)

The project area is designated an EFH for juvenile and adult Atlantic salmon. Essential fish habitat for Atlantic salmon is described as all water currently or historically accessible to Atlantic salmon within the streams, rivers, lakes, ponds, wetlands, and other water bodies that meet the necessary conditions. Atlantic salmon is a highly commercial species that lives in ocean waters and migrates into freshwater rivers and streams to spawn. In its *Report to Congress: Status of the Fisheries of the United States* (September 1997), NMFS determined Atlantic salmon is considered overfished, based on an assessment of stock level.

Atlantic salmon spawn in the fall, when adults migrate into freshwater rivers and streams to spawn. Adults may not die after spawning as other salmon species do, but instead undergo a migration back out to sea, where they head for cold north Atlantic waters off of northern Canada and Greenland. Atlantic salmon used to range as far south as Long Island Sound, but over-fishing and other factors now limit their southern range to Maine.

Pollack (Pollachius virens)

The project area is designated an EFH for juvenile and adult Pollack, a commercially important groundfish. Spawning for this species occurs between September and April, outside of Hempstead Harbor, in the western Gulf of Maine and Nova Scotian shelf (Mayo et al., 1989). Juvenile Pollack prefer salinities of roughly 31.5 ppt (Hardy, 1978); adults are found at salinities ranging from 31-34 ppt (Cargnelli *et al*., 1999). Both juveniles and adults inhabit a wide range of bottom types, showing

little preference for any one. Juveniles age 2+ and adults inhabit deeper waters offshore, ranging from 100m-150m (Hardy, 1978). Juveniles 0+ and 1+ inhabit inshore subtidal and intertidal zones (Cargnelli *et al*., 1999).

Surveys of the Long Island Sound region from 1984-1990 captured only 24 juveniles; adults are not typically found in Long Island Sound, but farther offshore (Cargnelli *et al*., 1999). While the habitat type is suitable for the presence of Pollack, they are rarely recorded in the area.

Red hake (Urophycis chuss)

Red hake eggs, larvae and juveniles are listed as EFH in the project area. Little is known of red hake eggs, as they co-occur with several species of hake. However, there is a major spawning area off of eastern Long Island. Spawning occurs at temperatures of 5 to 10 degrees Celsius, usually during May-June off eastern Long Island (Steimle *et al*., 1999).

Red hake larvae dominate the summer ichthyoplankton in the Mid-Atlantic Bight, mostly on the mid and outer continental shelf (Comyns & Grant, 1993). Larvae prey mainly on copepods and other invertebrates.

Juvenile red hake are distributed offshore (>100m) during the winter, and in Long Island Sound and waters adjacent to the project area (<100m) during summer months. They remain pelagic until reaching a total length of 25 to 30 millimeters (Methven, 1985). They then settle to the bottom, where they prefer sheltered habitats such as depressions in the sandy seabed or scallop beds.

Adult red hake are also common in Long Island Sound during spring through fall, mainly at depths of > 25 meters (Steimle *et al*., 1999). In Long Island Sound, they are found at salinities ranging from 20 to 33 ppt. They, like juveniles, migrate offshore and along the southern end of Georges Bank during winter months (Steimle *et al*., 1999).

Winter flounder (Pleuronectes americanus)

Winter flounder are a very important species commercially and recreationally, and occur in the designated EFH in all life stages. Typically, winter flounder are found in shallow waters during fall, winter and spring, and migrate to cooler deeper waters during summer months. They spawn during winter months in shallow habitats.

Winter flounder eggs are typically found in shallow bays and estuaries during winter months. They are demersal, and concentrated at depths of less than 5 meters, with temperatures less than 10 degrees Celsius and

salinities of 10 to 30ppt (Pereira *et al*., 1999). Typically, eggs are found in sandy bottom areas, although they have been reported in muddy sand and sand/ gravel. Eggs are found clustered together and hatch after 2 to 3 weeks, depending on temperature.

Larvae are found in spawning areas, as they are non-dispersive (Pearcy, 1962). Larvae feed in these areas on invertebrate eggs, nauplii, harpacticoids, calanoids, polychaetes and phytoplankton (Pearcy, 1962).

Young winter flounder are found in very shallow inshore waters. Pearcy (1962) found that, while young of the year remain in estuaries during spring, summer and fall, they might migrate out to inshore areas during winter months. They are driven out of the shallow estuarine habitats by temperature and photoresponse preferences (Pereira *et al*., 1999). These conditions are thought to keep older juveniles in deeper, cooler waters throughout much of the year. Young of the year and juveniles feed on copepods, harpaticoids, amphipods and polychaetes (Pearcy, 1962).

Winter flounder adults undergo an annual migration between inshore and offshore waters. In the fall and early winter, they migrate inshore to spawn in bays and estuaries in winter and early spring. Once water temperatures reach 15 degrees Celsius, adults migrate back out to deeper offshore waters to spend summer months (Pereira *et al*., 1999). Migration of winter flounder may also be affected by food availability. Feeding migrations have been documented by several studies (Kennedy & Steele, 1971; Tyler, 1971; Van Guelpen & Davis, 1979). Winter flounder are sight feeders. They position themselves on the bottom with eyes extended, and then lunge at moving prey as it approaches (Olla *et al*., 1969). This feeding method has been shown to be disrupted by turbulence. Val Guelpen & Davis (1979) found that winter flounder moved out of shallow water during storm events to avoid turbulence.

There exists a very important commercial and recreational fishery for winter flounder. The southern New England-Middle Atlantic stock is currently considered overexploited. This is a result of decreased landings since a peak of 39,000mt in the 1980's. In 1996, winter flounder landings were 18,000mt, which is an increase over the low of 8,500mt in 1992. Although increasing, the stock remains below former levels, and is therefore overexploited (Brown & Gabriel, 1998).

Windowpane flounder (Scopthalmus aquosus)

Windowpane flounder are not a commercially important species. However, they are often caught as bycatch for other benthic fisheries. Windowpane flounder spawn throughout the year. There is evidence for

split spawning season off New York and New Jersey, with peaks in May and September (Wilk *et al*. 1990).

Eggs of windowpane flounder are found in the water column from February through November, with peaks in May and October. Larvae settle to the bottom at 10mm TL (Bigelow & Schroeder, 1953). Settlement location depends on spawning time; spring spawned individuals settle in estuaries and on the continental shelf, while fall spawned individuals settle on the continental shelf. Juvenile windowpanes are found inshore throughout the year. Adults are found on sandy substrates in the project area, but generally do not spawn in estuaries.

Atlantic sea herring (Clupea harengus)

Atlantic sea herring are a commercially important species that have been fished extensively in the past. The stock collapsed in the early 1970's and landings remained low for about 10 years (Atlantic States Marine Fisheries Commission, 1998). However, stock biomass is now high and appears to be increasing (Northeast Fisheries Science Center, 1996).

Juvenile herring prefer water with temperatures 8 to 12◦C, 26 to 32ppt, and depths of 30 to 90 meters. Adults prefer waters with temperatures 9 to 21◦C, 25 to 28ppt, and depths of 10 to 30 meters. Juveniles and adults also migrate vertically in the water column, moving up to the surface at night and away from the surface during daylight (Brown, 1960; Blaxter, 1985).

Bluefish (Pomatomus saltatrix)

Bluefish juveniles and adults are seasonal inhabitants of estuarine areas of the Mid-Atlantic Bight, but leave these waters when temperatures decrease to 14 to 16◦C (Bigelow & Schroeder, 1953). Spawning occurs in the Southern Atlantic Bight; larvae and juveniles then migrate through a combination of active and passive transport to arrive at estuaries between late May and early June (Cowen et al., 1993). All age classes depart these waters for southern waters around October. Recreational fishing reports indicate that bluefish are abundant in Hempstead Harbor and Glen Cove Creek throughout the spring, summer, and early fall[1] .

Atlantic mackerel (Scomber scombrus)

Atlantic mackerel spend the winter months in the deep waters of the continental shelf from Nova Scotia to Chesapeake Bay; in the spring they move inshore and northeast. This migration trend is then reversed in the fall (Berrien, 1982). However, surveys have shown that Long Island

[1] Coalition to Save Hempstead Harbor, 2004; HHPC, 2007a; HHPC, 2007c; HHPC, 2008

Sound and its bays are not an important habitat for any life stage of this species (Studholme *et al*., 1999). Only a few juveniles and adults were caught during surveys; juveniles were caught during fall months while adults were caught during spring and summer months. Recreational fishing reports indicate that mackerel were present in Hempstead Harbor in June 2002[2].

Summer flounder (Paralicthys dentatus)

Summer flounder are a bottom dwelling species that use a variety of substrates. Various surveys have shown that larvae and juveniles inhabit sand, mud, silt, and vegetated substrates (Packer *et al*., 1999). Adults, however, prefer sandy substrates.

Adult and juvenile Summer flounder inhabit shallow coastal and estuarine waters during warmer months, migrating to offshore water where they spend the fall and winter (Bigelow & Schroeder, 1953). In Long Island Sound, the flounder migrate to inshore waters in late April and remain until November, although they occur in limited numbers throughout the winter (Packer *et al*., 1999). Recreational fishing reports indicate that summer flounder are abundant in Hempstead Harbor and near the mouth of Glen Cove Creek between the late spring and early fall[3].

Scup (Stenotomus chrysops)

Scup is a temperate species, restricted to water temperatures above 6◦C (Steimle *et al*., 1999b). This species is similar to the Black sea bass (below), migrating to and inhabiting coastal waters from spring through fall. The project area has been classified an EFH for all life stages of the scup.

Eggs of this species are found in larger bodies of coastal waters, such as bays and sounds. Larval scup are pelagic and occur in coastal waters during warmer months as well. However, since 1974 no surveys within the project area have observed scup eggs or larvae (Steimle *et al*., 1999b).

Juvenile and adult scup usually dominate larger estuarine areas during warmer months. Juveniles inhabit intertidal and subtidal habitats over sand, silty-sand, shell, mud, mussel beds and eelgrass. They were not common, however, in shoreline surveys in vegetated and unvegetated areas of Long Island Sound (Steimle, *et al.*, 1999b). During winter months, juveniles and adults migrate offshore. Recreational fishing

[2] Coalition to Save Hempstead Harbor, 2004
[3] Coalition to Save Hempstead Harbor, 2004; HHPC, 2007a; HHPC, 2007c; HHPC, 2008

reports indicate that scup are abundant in Hempstead Harbor and Glen Cove Creek between the late spring and early fall[4].

Black sea bass (Centropristus striata)

Black sea bass, like scup (above), undergo seasonal migration inshore when water temperatures climb above 7◦C. Spawning occurs on the continental shelf, and gravid females are not generally found in estuarine habitats (Allen *et al*., 1978).

The estuarine habitat of juvenile Black sea bass is shallow, hard bottom with structures as refuge (Steimle *et al*., 1999c). They are not common in open, unvegetated sandy bottoms. Adults, like juveniles, orient to structures, especially during their inshore residency (Steimle *et al*., 1999c).

Surveys of this species showed that during spring months, adults are most common in the central Sound. During fall months, both juveniles and adults are widespread throughout all of the Sound (Steimle *et al*., 1999c). Recreational fishing reports indicate that black sea bass are present in Hempstead Harbor and Glen Cove Creek between the late spring and early fall.[5]

South Atlantic Coastal Migratory Pelagic Fishes: King mackerel (Scomberomorus cavalla), Spanish Mackerel (Scomberomorus maculates), and Cobia (Rachycentron canadum)

Both mackerel species are surface dwelling, nearshore finfish known to form large schools and undertake long distance migrations. These schools may venture as far north as Cape Cod during summer months (June to October) and will frequent sandy shoals of offshore bards, barrier island oceanside waters, and barrier island inlets. Their diets consist largely of small fishes, shrimps and squid.

Cobias utilize habitats similar to the King and Spanish mackerel species, and are also found in Long Island estuarine waters in summer months. Cobia tend to utilize more of the water column, as their diet consists of crabs and shrimp as well as fishes and squid. Cobias are also more likely to frequent eelgrass beds and high salinity bays and estuaries than the pelagic mackerel species above.

All three species have pelagic larvae that are dispersed by the Gulf Stream. However, these species occur on Long Island only during summer months and are more commonly found in warm temperate and tropical

[4] Ibid.
[5] Ibid.

waters. These species have been observed in small numbers in offshore and nearshore waters of the Mid-Atlantic Bight. They are known to use estuarine habitats as nurseries, but not in the project area.

2. Potential Impacts

A discussion of the potential beneficial and adverse impacts of these proposed activities to the ecological resources of the subject property, Glen Cove Creek and Hempstead Harbor, and the adjacent Garvies Point Preserve is provided below along with a description of the mitigation measures and best management practices that have been incorporated into the site design and construction plans.

a) Potential Impacts to Upland Habitats in Blocks B and C and Proposed Mitigation Measures

Subsequent to the environmental remediation undertaken on the western portion of the project site, pioneer vegetation has colonized the bare, disturbed soils. Currently, Blocks B, C, E and F include 12.6 acres of open fields and upland herbaceous vegetation, 3.9 acres of open, standing water and surrounding hydrophytic vegetation, and 6.0 acres of upland woodlands. The open fields, early successional habitats, and areas of standing water have regenerated subsequent to the recent environmental remediation of the site undertaken to remove contaminants resulting from the previous industrial uses of the site. As described in Section **III.D.1.b**, a diverse variety of songbirds has been observed utilizing this site for foraging during the breeding season and as a stop-over location during spring and fall migrations. The open fields have been observed to provide habitat for a number of commonplace songbirds as well as more unusual visitors such as the Eastern meadowlark (*Sturnella magna*) and bobolink (*Dolichonyx oryzivorus*), both listed as threatened in New York State due to declining grassland habitat throughout New York State and the eastern United States. Various waterfowl, including Canada goose (*Branta canadensis*) and mallard (*Anas platyrynchos*), have been observed in the areas of shallow standing water.

Under the Proposed Action, the ecological benefits provided to songbirds and waterfowl provided by these 12.6 acres of open fields and 3.9 acres of standing water will be lost. However, these early successional habitats have only developed in the past few years following the extensive remedial activity.

The Proposed Action includes the preservation of 5.8 acres of open space located to the west of Dickson Avenue and to the south of Janet Lane within Blocks E and F. A portion of this property is currently disturbed and the remainder is an upland deciduous woodland dominated by Norway maple (*Acer platanoides*). This will result in the permanent preservation of woodland habitat for resident and migratory songbirds.

b) Potential Impacts to Resident and Migratory Songbirds and Shorebirds

Collisions with windows of large commercial and residential buildings in suburban and urban areas are a major cause of mortality among residential and migratory birds (Hager et al. 2008). Avian mortality at windows generally results from either: 1) the failure of birds to perceive transparent or reflective surfaces as a barrier; or 2) the tendency of birds to become disorientated in illuminated areas at night, particularly during nights with low visibility due to fog or inclement weather (New York City Audubon Society 2007). Glass surfaces are more likely to cause bird mortality when they are located proximal to coastal areas, woodlands, and wetland habitats (New York City Audubon Society 2007).

The proposed Glen Cove Creek Mixed Use Waterfront Development is located proximal to two areas of high-quality bird habitat. The 62-acre Garvies Point Preserve features a mosaic of freshwater wetland, mature hardwood forests, and early successional meadows which are known to provide habitat for more than 140 species of resident and migratory bird species. Hempstead Harbor is listed as a New York State Significant Coastal Fish & Wildlife Habitat, supports a diversity of waterbirds and provides valuable wintering habitat for waterfowl (New York State Department of State 2005). The proximity of the proposed development to the woodlands of Garvies Point Preserve and wetlands of Glen Cove Creek and Hempstead Harbor, which are used as stop-over locations for migratory songbirds and waterfowl, indicates the potential for window-related mortality.

Windows and significant contiguous areas of glazed surfaces in all buildings less than 250' in height have the potential to result in avian mortality as birds are likely to collide with surfaces that reflect surrounding vegetation, the sky, or water. Bird mortality may also occur when interior greenery or vegetation is located behind large windows or when natural habitat located beyond a glass surface is visible through that surface (i.e. as occurs in glass-enclosed walkway/linkways or at the corners of buildings).

In addition, buildings between 50' and 500' in height may be hazardous to migratory birds which descend from high altitudes in the early morning hours to correct their migration path and to visit woodland and wetland habitats to forage and rest. In addition, large illuminated areas may be hazardous to migratory birds, particularly during inclement weather, as birds become disorientated and entrapped in the illuminated areas around buildings, leading to an increased risk of predation, window-collision, or exhaustion.

Bird mortality due to window collisions is most frequent between 0 and 40' above the ground surface (City of Toronto Green Development Standards 2007). The 11- to 12-story buildings associated with the proposed development are up to 125' in height, and accordingly, pose a collision-risk to resident birds and migratory birds during stop-over and descent from migratory altitudes. The proposed

buildings are not expected to interfere with the normal migratory flight for songbirds and waterbirds, which typically occurs at altitudes of 150' to 1400' (Shamoun-Baranes et al. 2006).

Collision-related mortality is expected to be most frequent during the spring and fall migrations and during the winter months (Klem et al. 2004; Hager et al. 2007). Migratory songbirds and songbirds which frequent suburban habitats are expected to be most prone to collision-related mortality. Susceptible species include golden-crowned kinglet (*Regulus satrapa*), ruby-crowned kinglet (*Regulus calendula*), red-eyed vireo (*Vireo olivaceous*), American robin (*Turdus migratorius*), ruby-throated hummingbird (*Archilochus colubris*), white-throated sparrow (*Zonotrichia albicollis*), ovenbird (*Seirus aurocapilla*), black-capped chickadee (*Poecile atricapillus*), blue jay (*Cynaocitta cristata*), and tufted titmouse (*Baleophus bicolor*) (Klem et al. 2004; Hager et al. 2007; New York City Audubon Society 2007).

The proximity of the proposed development to the woodlands of Garvies Point Preserve and wetlands of Hempstead Harbor, which are used as stop-over location for migratory songbirds and waterfowl, indicates the potential for window-related mortality. Due to this potential for collision-related bird mortality resulting from the installation of glass surfaces and external lighting associated with the proposed development, mitigation measures are being incorporated into the architectural and landscaping design plans in order to reduce adverse impacts to resident and migratory bird populations. These mitigation measures are discussed in Section III.D.3 and are based upon the *Bird-Safe Building Guidelines* promulgated by the New York City Audubon Society (2007) and *Bird-Friendly Development Guidelines* developed by the City of Toronto (City of Toronto Green Development Standard 2007). The New York City Audubon Society (2007) *Bird-Safe Building Guidelines* have been included in the Appendix.

c) Potential Impacts to Threatened and Endangered Species

Correspondence from the New York State Natural Heritage Program dated January 6, 2009 indicated that there are no known occurrences of rare or state-listed animals or plants on the project site or in its immediate vicinity (see Appendix). However, a review of the New York State Natural Heritage Program Database Environmental Resource Mapper (http://www.dec.ny.gov/animals/38801.html) indicated the presence of two rare plant species with the potential to occur in the project area: bent sedge (*Carex styloflexa*) and woodland agrimony (*Agrimonia rostellata*). *C. styloflexa* and *A. rostellata* are listed as endangered and threatened, respectively, in New York State. Neither plant species is listed federally.

C. styloflexa occurs in wetland habitats, typically along the edges of streams, and has been documented in wet pine barrens, damp thickets, red maple hardwood swamps, floodplain forests, rich forests, and sphagnum bogs. It is typically found in association with tussock sedge (*Carex stricta*) and sweet pepperbush (*Clethra*

alnifolia). The project site does not feature the high quality, undisturbed wetland habitats that are suitable for *Carex stricta.* Furthermore, its associated plant species were not observed during field investigations nor were any specimens of *Carex styloflexa* observed. Accordingly, the proposed action is not expected to have any adverse impact on *Carex styloflexa* or potential habitat for this New York State endangered species.

A. rostellata largely occurs in forested habitats including oak hickory forests, hemlock-northern hardwood forests, limestone woodlands, and rich mesic forests. The project site does not feature the high quality, undisturbed woodland habitats that are suitable for *A. rostellata.* Furthermore, its associated plant species such as sugar maple (*Acer saccharum*) and white snakeroot (*Ageratina altissima*) were not observed during field investigations nor were any specimens of *A. rostellata*. Accordingly, the proposed action is not expected to have any adverse impact on *A. rostellata* or potential habitat for this New York State threatened species.

d) Potential Impacts to Woodlands in Garvies Point Preserve and Proposed Mitigation Measures

The proposed action has the potential to impact the habitat-quality of the deciduous woodlands of Garvies Point Preserve located adjacent to Garvies Point Road. The mature woodlands of Garvies Point Preserve are dominated by red oak (*Quercus rubra*), white oak (*Quercus alba*), black cherry (*Prunus serotina*), sassafras (*Sassafras albidum*), American beech (*Fagus grandifolia*), and tulip poplar (*Liriodendron tulipifera*). It should be noted that, due to the existing suburban character of the project area, the woodlands of Garvies Point Preserve are already subject to the effects of invasive plants and birds and predators; however, it is anticipated that the proposed action will result in a moderate increase in the level of these impacts in the southernmost portion of the preserve.

This section discusses the magnitude of potential impacts associated with increased shading from proposed buildings, increased noise associated with traffic and human activity, increased abundance of invasive plants, and increased abundance of invasive competitors and predators.

Shading

Prolonged shading by the proposed 11- to 12-story buildings during the growing season could potentially adversely affect woodlands in the Garvies Point Preserve through reduced photosynthetic rates by woody and herbaceous plants, reduced plant growth rates and biomass production, and shifts in plant species composition to more shade tolerant species. An analysis of the predicted shadows produced by the proposed buildings was conducted and the results of this analysis are described in detail in **Section III.M**. This analysis simulated building shadow dimensions and intensity on March 21, June 21, and December 21 at 10AM and 4PM. On June 21, no encroachment of building shadows is expected in Garvies Point Preserve at either 10 AM or 4 PM (Exhibit III.M-23 and 24). Accordingly, during the peak growing season, no adverse impacts on plant growth or vegetation

communities are expected to result from the proposed action. On March 21, shadows from the proposed buildings in Blocks A and B are expected to extend approximately 60' to the north of Garvies Point Road into the Preserve during the morning hours (Exhibit III.M-21 and 22). Therefore, during the early spring and late fall, a minimal area of the Preserve located immediately adjacent to Garvies Point Preserve will be influenced by building shadows. On December 21, shadows are expected to extend approximately 250' to the north of Garvies Point Preserve during the morning hours (Exhibit III.M-25). These more extensive shadows will not adversely impact plant growth as they will only be present during the dormant season. In conclusion, minor shadows are expected to encroach upon Garvies Point Preserve during the very beginning and end of the growing season. However, these shadows are not expected to have any significant effects on plant growth or community composition, as the large majority of plant photosynthesis and growth occurs during the months of June through August.

Noise

The potential for the proposed action to generate noise from vehicular traffic and construction activities is analyzed in detail in **Section III.H**. This analysis indicates that a significant increase in noise levels of 13.2 dBA (from 48.5 to 61.7 dBA) is expected to occur at the parking lot at the western end of Garvies Point Road (Site 7). This noise level increase is expected to occur during the weekday PM peak hour and is due to the anticipated increase in project-generated vehicles using Garvies Point Road to access/egress the western half of the project site. At other time periods, such as weekday AM and Saturday mid-day hours, a significant impact would not be expected to occur. A 13.2 dBA change in noise level would be readily perceptible and would exceed the NYS DEC threshold of 6 dBA for a significant impact. The noise levels at this location and the adjacent Garvies Point Preserve would remain within the NYSDEC's acceptable range for residential uses (i.e. below $L_{eq(1)}$ 65 dBA).

Section III.H also examined the potential increase in noise level associated with the operation of construction equipment and from construction vehicles and delivery vehicles traveling to and from the site. This screening level analysis of the spatial extent of the increased noise levels associated with construction activity of the project-generated vehicles indicates that significant increases in noise (88.7 dBA) are expected to occur within Garvies Point Preserve up to 215 feet from Garvies Point Road during construction.

The increase in noise level associated with construction equipment and weekday PM traffic on Garvies Point Road may have potential adverse impacts to Garvies Point Preserve.

Noise pollution associated with industrial activities and major highways has been found to result in lower bird breeding densities. For example, chronic industrial noise levels of 75-90 dbA generated by compressor stations on natural gas

pipelines in Alberta, Canada resulted in a 15% decrease in the observed breeding ovenbirds pairs (*Seiurus aurocapilla*) in forests adjacent to the compressor stations (Habib et al. 2007) and 15-66% decrease in other species including red-breasted nuthatch (*Sitta canadensis*), red-eyed vireo (*Vireo olivaceous*), and yellow-rumped warbler (*Dendroica coronata*) (Bayne et al. 2008). In addition, the observed numbers of breeding pairs for a variety of European bird species decreased adjacent to major roadways (30,000-45,000 cars per day) in the Netherlands (Reijnen et al. 1995). The reduced pairing success and breeding bird densities adjacent to these industrial facilities and roadways was attributed to increasing stress levels and noise interference with bird songs used to attract mates and defend breeding territories (Reijnen et al. 1995; Habib et al. 2007).

Over the long-term, the maximum projected noise levels within Garvies Point Preserve associated with increased traffic on Garvies Point Road would remain below 65 dBA (the NYSDEC acceptable range for residential uses) under the Proposed Action and are certainly much less intense than the industrial noise sources that have been documented in the scientific literature to adversely impact breeding birds. The increased noise levels associated with the increased traffic volume on Garvies Point Road during weekday PM hours are expected to attenuate to baseline levels at a distance of 200 feet into the Preserve. Accordingly, it is expected that some reduction in the habitat quality provided by the adjacent woodlands of Garvies Point Preserve for bird reproduction due to noise disturbance may occur within 200 feet of Garvies Point Road.

More significant, short-term impacts could occur within Garvies Point Preserve during construction as the expected noise level associated with construction equipment (88.7 dBA) is within the range of the chronic industrial levels (75-90 dbA) that have been found to impact breeding bird productivity (Habib et al. 2007). However, the impacts to breeding birds expected from construction under the proposed actions is likely to be less than those documented in the studies described previously, as these studies examined chronic and continuous noise sources. In contrast, construction-related noise impacts associated with the proposed action are expected to occur for 18-24 months and would not be continuous throughout the day. Mitigation measures to lessen the magnitude of short-term, noise-related impacts during construction are discussed in Section **III.D.3**.

Invasive Plants

Invasive plants have significant adverse impacts on ecosystems by displacing native species, altering available wildlife food supplies, and altering patterns of nutrient cycling. Many invasive species were originally planted for horticultural or agricultural uses, but have escaped into native habitats. The ecological habitats within the Garvies Point Preserve are currently adversely impacted by invasive plant species, particularly along the forest edge at Garvies Point Preserve, due to suburban and industrial land uses surrounding the Preserve. Invasive plant species currently found within the Preserve include Norway maple (*Acer platanoides*), tree-of-heaven (*Ailanthis altissima*), Hercules club (*Aralia spinosa*),

garlic mustard (*Alliaria petiolata*), Japanese barberry (*Berberis thunbergii*), multiflora rose (*Rosa multiflora*), Asiatic bittersweet (*Celastrus orbiculatus*), and mile-a-minute weed (*Persicaria perfoliata*). In order to minimize further exposure of Garvies Point Preserve to invasive plant species under the Proposed Action, plants selected for installation in proposed landscaped areas will consist of native, naturalized, and non-invasive trees and shrubs.

Edge Effects

The edges of woodlands typically exhibit differences in microclimate, plant composition, plant density, and habitat quality from the woodland interiors. For example, woodland edges will typically have higher ambient light levels, air and soil temperatures, wind speed, and lower relative humidity and soil moisture (Chen et al. 1995; Gehlhausen et al. 2000) than adjacent interior areas. These microclimate edge effects may occur up to 240' or more from the woodland edge (Gehlhausen et al. 2000). A pronounced woodland edge and its associated adverse environmental impacts are currently present within the Preserve along Garvies Point Road. Accordingly, the Proposed Action is not expected to create any new woodland edges; however, it is possible that the increased human activity resulting from the Proposed Action could result in an intensification of the edge effects already present along Garvies Point Road.

Invasive Competitors and Predators

Nesting habitat for songbirds in suburban forests is often degraded by the abundance of predators and invasive competitors. For example, increased numbers of feral and pet cats and native predators (such as red fox, raccoons, skunks, and opossums) resulting from increased food supplies from garbage dumpsters may adversely effect resident songbirds due to increased predation of eggs, chicks, and adults (Terborgh 1989). In addition, invasive birds, such as European starling (*Sternus vulgaris*), house sparrow (*Parus domesticus*), brown-headed cowbird (*Molothrus ater*), thrive in habitats created by humans and often nest on or in buildings. Starlings compete with native birds for nest sites in the cavities of trees, often resulting in a decline in abundance of native cavity nesters such as woodpeckers and flycatchers (Koenig 2000). Cowbirds are nest parasites and may have similar adverse impacts on native birds. Due to the highly suburban nature of the areas surrounding Garvies Point Preserve, the Preserve is currently adversely impacted by the presence of invasive competitors and predators. However, it is expected that the Proposed Action will likely result in an intensification of this existing impact.

e) Potential Impacts to Shoreline, Tidal Wetlands, and Essential Fish Habitat and Proposed Mitigation Measures

Garvies Point Beach Area

No construction activities are proposed for the existing intertidal and supratidal beaches located at Garvies Point. Construction of a paved turnaround, pedestrian walkways, parking spaces, and landscaping are proposed for the upland areas located adjacent to Garvies Point Beach. These construction activities will be located landward of the 10' elevation contour, and therefore, not located within the NYSDEC-regulated adjacent area of the tidal wetlands associated with Garvies Point Beach. The Garvies Point Beach and associated tidal wetlands will be protected from adverse impacts associated with stormwater pollution, erosion, and sediment transport through the implementation of the Stormwater Pollution Prevention Plan described in **Section III.C2.d.1**. The beach and intertidal habitats of Garvies Point Beach are used by many shorebird species as a resting and foraging area and these habitats have an abundance of intertidal invertebrates. Increased noise and activity due to the operation of heavy equipment during construction may result in a temporary displacement of migratory shorebird species that are intolerant of human activity from the Garvies Point Beach. In addition, increased human activity associated with the proposed action and increased recreational use of the beach may adversely affect the habitat quality afforded by Garvies Point Beach. It is anticipated that the adverse impacts due to increased activity would be experienced by shorebirds which utilize the upper portions of the beach above the high water line. The valuable mudflats that are primary invertebrate habitat and the vegetated areas are not expected to be significantly impacted due to the proposed erosion, sediment transport, and stormwater control measures.

The proposed action includes the removal of 550 linear feet of an existing bulkhead located at the southwest corner of Block A, placement of sand landward of the delineated tidal wetlands, and installation of native beach vegetation on the re-graded slopes between Hempstead Harbor and the proposed roadway. The existing unvegetated tidal wetland habitats in this area will be protected from stormwater runoff and the transport of sediments and pollutants during the proposed construction by the implementation of erosion and sediment control measures specified under the project's Stormwater Pollution Prevention Plan. The proposed removal of the existing bulkhead, re-grading efforts, and re-planting will result in a more natural shoreline, will provide improved habitat for songbirds and shorebirds.

Captain's Cove

Shoreline improvements associated with the proposed action will result in the removal of concrete debris and invasive plants, creation of new wetland habitats, increased public access to wetlands, and environmental education opportunities. The location of the proposed shoreline improvements are indicated in **Exhibit II-9**. The proposed activities at Captain's Cove will be conducted in three stages: (1) removal of existing asphalt and concrete debris from the slope between the

landward limit of tidal wetlands and the existing public esplanade, (2) establishment of the Captains Cove Wetland education Area, (3) re-grading of the slope and planting with native species. Debris removal and plantings are designed to restore and enhance the productivity of the tidal wetlands of Captain's Cove.

Construction of the walkways and observation deck will provide educational opportunities for the Captains Cove area. Interpretive signs placed on the walkways and observation deck will follow the signage design guidelines and educational themes developed by the New York State Coastal Resources Interpretive Signage Program (NYSCRIP).

Construction of the walkways and observation deck will impact the wetlands temporarily through physical disturbance and increased turbidity. Siltation will be minimized by installation of haybales and silt fence landward of mean high water and a turbidity curtain seaward of mean low water. Following completion of construction, the wetlands and slope area will be planted with native species, according to the specifications below. This will serve as a long-term environmental benefit associated with the proposed action.

Captain's Cove Slope Restoration

Prior to any activities, a row of silt fence and haybales will be placed at the toe of excavation areas and staked in place to prevent siltation of adjoining wetlands. Approximately 510 linear feet (23,474 square feet or 0.54 acres) of slope areas extending from the existing esplanade seaward to the toe of slope will then be excavated to remove asphalt/concrete debris, re-graded, and re-planted with native plants to provide increased wildlife habitat and aesthetic improvements. Restoration activities, initial monitoring of plant survivorship, and maintenance of the restored slope will be the responsibility of the redeveloper.

Excavation will be accomplished via hydraulic excavator located on the top of slope. Debris and existing vegetation (primarily non-native and invasive species) will be removed for off-site disposal. The slope will be re-established utilizing clean fill and 4" of topsoil graded in place. Once re-grading is completed, the slope will be planted with native grasses and shrubs listed in **Table III.D-6**.

Table III.D-6
Captains Cove Slope Restoration Planting Specifications

Type	Common Name	Scientific Name	Specifications	Estimated # of Plants
Grasses	Saltmeadow cordgrass	*Spartina patens*	Plugs; 18" centers	Approx. 1,300 plants
	American beach grass	*Ammophila breviligulata*	Plugs; 18" centers	Approx. 9,500 plants
	Switchgrass	*Panicum virgatum*	Seeded; 20lbs/acre	Not Applicable
	Big blue stem	*Andropogon gerardi*	Seeded; 20lbs/acre	Not Applicable
	Little blue stem	*Andropogon scoparius*	Seeded; 20lbs/acre	Not Applicable
	Wildflower mix	Various[1]	Seeded; 20lbs/acre[1]	Not Applicable
Trees/Shrubs	Marsh Elder	*Iva frutescens*	6' center; minimum 2 gal container	Approx. 85 plants
	Groundsel-tree	*Baccharis halimifolia*	6' center; minimum 2 gal container	Approx. 170 plants
	Bayberry	*Myrica pensylvanica*	6' center; minimum 2 gal container	Approx. 85 plants
	Beach plum	*Prunus maritime*	6' center; minimum 2 gal container	Approx. 85 plants
	Red cedar	*Juniperus virginiana*	10' center; minimum 5 gal container	Approx. 135 plants
	Virginia rose	*Rosa virginiana*	6' center; minimum 2 gal container	Approx. 35 plants
	Evening primrose	*Oenothera biennis*	6' center; minimum 2 gal container	Approx. 35 plants
	Red chokeberry	*Aronia arbutifolia*	6' center; minimum 2 gal container	Approx. 70 plants
	Shadbush	*Amelanchier canadensis*	6' center; minimum 2 gal container	Approx. 70 plants

[1]Proposed wildflower mix from New England Wildflower Mix (New England Wetland Plant, Amherst MA) or equivalent. Proposed mix contains the following species: Common Milkweed (Asclepias syriaca), New England Aster (Aster novae angliae), Partridge Pea (Chamaecrista fasciculate), Canada Wild Rye (Elymus canadensis), Virginia Wild Rye (Elymus virginicus), Ox Eye Sunflower (Heliopsis helianthoides), Big Leaf Lupine (Lupinus polyphyllus), Black Eyed Susan (Rudbeckia hirta), Wild Senna (Senna hebecarpa), Early Goldenrod (Solidago juncea), and Indian Grass (Sorghastrum nutans)

Note: All trees/shrubs to be nursery-grown container material.

Source: Land Use Ecological Services

Captain's Cove Intertidal Marsh Establishment

The 170,000 sq. ft. intertidal zone, shoals, and mudflats within Captain's Cove will be assessed for potential installation and survivorship of Smooth cordgrass (*Spartina alterniflora*). *S. alterniflora* will only grow in a narrow range of elevations in intertidal areas. The elevation range of existing healthy stands of this species in the project vicinity will be documented and open mudflat areas within the identified elevation range will be staked in the field for planting of *S. alterniflora*. It is estimated that approximately 17,500 sq. ft. (10%) of this intertidal area contains elevation and substrate suitable for establishment of *S. alterniflora.* Planting of additional *S. alterniflora* in Captain's Cove, monitoring of plant survivorship, and re-planting of plants lost to mortality will be the responsibility of the redeveloper. Plant survivorship will be monitored annually for two years subsequent to the establishment of wetland plants. After annual monitoring, planting will occur as necessary to replace plants lost through mortality. Monitoring will be stopped after two years if 85% or greater survivorship is achieved. If 85% survivorship is not attained, annual monitoring will continue until survivorship requirements are met.

Planting of designated areas will occur during spring planting season, April 1st to May 15th. *Spartina alterniflora* (2" peat-potted nursery grown plants) will be established on 12" centers within planting areas. Once planted, waterfowl exclusion fencing (2" x 2" wooden posts on 15' centers connected by 4 rows of twine and flagging) will be installed around planting areas.

Salvage and Relocation of Existing Wetland Vegetation and Soils

Dredging and construction of the large vessel marina will impact approximately 25,922 square feet (0.60 acres) of intertidal wetlands. Approximately 8,520 square feet (0.20 acres) of the intertidal zone wetlands are vegetated with *Spartina alterniflora*. The remaining intertidal zone wetlands are vegetated with invasive *Phragmites australis* or are non-vegetated mudflats.

Prior to the dredging associated with the construction of the large vessel marina, the existing *Spartina alterniflora* and associated wetland soils will be salvaged and relocated and the wetlands to the west of the marina will be stabilized. It is anticipated that 8,520 square feet of existing intertidal marsh will be salvaged from area of the proposed large vessel marina and relocated to the proposed "low sill" bulkhead construction area to the east. Only wetlands dominated by native wetland plants including *Spartina alterniflora, Spartins patens, and Iva frutescens* will be salvaged. Wetlands dominated by invasive plants, *e.g. Phragmites australis,* will not be salvaged.

The proposed salvage of wetland vegetation and soils will result in a more successful and biologically diverse wetland community within the proposed low sill bulkhead/wetland restoration area. The salvage of wetland vegetation, soils, and benthic biota has been found to be an effective method in increasing the success of mitigation wetlands in freshwater ecosystems (Stauffer and Brooks, 1997; McKinstry and Anderson, 2005). In addition, the whole sod salvage method proposed for wetland relocation has been previously approved by NYSDEC's Region III office for past projects in freshwater wetland habitats (Arlington School District, Arlington, NY).

Wetland salvage and relocation will be accomplished by using the "whole sod salvage" protocol described below. Salvage and relocation of existing wetland plants and soils provides additional benefits relative to planting of native vegetation from nursery stocks (Bowman & Bowman, 1999). Salvage and relocation of wetland vegetation and soils will introduce native plant genotypes and native invertebrates, such as ribbed mussels (*Geukensia demissa*) to the proposed low sill bulkhead area.

The whole sod salvage method for wetland relocation has been successful in past projects. However, if salvage of the wetlands is not feasible, the wetlands removed from the large vessel marina area during dredging and dock construction would be offset by the creation of wetlands in the low sill bulkhead area (see below) and restoration of the Captain's Cove wetlands (see above) using only wetland vegetation supplied from nursery stock. In the applicant's opinion, the exclusive use of nursery stock without salvaged organic matter and benthic invertebrates would delay the development of natural soil conditions within the restoration area and delay the colonization of the restoration area by benthic invertebrates.

The whole sod salvage method would also preserve soils and invertebrates, specifically ribbed mussels (*Geukensia demissa*). Although the mussels are expected to survive relocation, there is no alternative for replacement if they do not. However, mussels are expected to recolonize the created and restored wetlands over time, so the absence of mussels within the low sill bulkhead restoration area would not be long-term.

The western edge of the marina area will be stabilized to protect the wetland education area marsh/mudflat from impacts associated with the dock facility operations and construction. Stabilization will incorporate construction of a 175' x 8' steel breakwater to prevent sloughing of the mudflat/wetland on the west side of the docking facility. The steel breakwater will include a 25' diameter observation deck located at its seaward terminus.

Low Sill Bulkhead Area

A low sill bulkhead and wetland restoration area will be located east of the relocated Angler's Club. The location of the proposed wetland restoration area is indicated in **Exhibits II-9, III.C-7 and III.C-8**. A low sill vinyl bulkhead will be constructed along the bulkhead line to an elevation of mean low water (MLW). Landward of the low sill bulkhead, the intertidal marsh area will be established using the relocated marsh from the large vessel marina and supplemented with plantings of *Spartina alterniflora*. Approximately 20,500 sf of intertidal wetlands will be established in this restoration area. Approximately 42% (8,520 sq.ft.) of these established intertidal wetlands will consist of the wetland vegetation and soils salvaged from the area of the proposed large vessel marina.

Once the bulkheads have been installed in accordance with approved plans, the low sill bulkhead restoration area will be backfilled with clean to the top of sill and relocated wetland soils placed in the restoration area. Geotextile will be installed 2' below top of sill to assist in maintaining backfilled planting bed.

Once installed and graded, the restoration area will be planted with Smooth cordgrass (*Spartina alterniflora*) established on 12" centers during spring planting season (Note: relocated wetlands will not be planted). Plant material will be 2" peat-potted nursery grown stock. Waterfowl protection fence will be installed around planting beds for first growing season.

Intertidal Wetland Relocation Specifications

The portion of the 8,520 square foot intertidal marsh located at the site of the large vessel marina dominated by *Spartina alterniflora* contains significant populations of Atlantic ribbed mussels (*Geukensia demissa*). The project sponsors intend to relocate this intertidal marsh habitat utilizing the "whole sod" salvage system. This successful technique allows transfer of the marsh vegetation as well as wetland soils incorporating invertebrates and organic matter. Specifications are as follows:

During periods of low tide, relocation of the wetland will utilize a Caterpillar 330 hydraulic excavator fitted with a wetland relocation attachment developed by Land Use Ecological Services, Inc. Said attachment is fabricated from high strength steel alloys and includes four cutting edges to allow clean sectioning of marsh sods. Depth for organic soil/root mass removal is established at 18" minimum. Marsh section removal is initiated by the excavator with a vertical cut placed between existing vegetation. Once the vertical cut is completed to a 3' depth, the attachment is rotated to its horizontal axis. Vertical/horizontal cutting edges allow smooth horizontal penetration of the marsh sod and will result in removal of a marsh

section containing 18"- 24" of organic soils, mature vegetation and root systems. The marsh sod is then lifted from the substrate by the excavator and transferred to a 4' x 10' steel plate located on a transport vehicle or barge.

Salvaged material is transported to the receiving area, which will be excavated and graded per specifications for the "Low-sill Bulkhead". A hydraulic excavator (standard configuration) is stationed within the receiving area to unload and then lift off. Once final location is verified, two chains are removed as excavator pulls the plate from under the sod.

Relocation of the wetlands will be determined to be successful with an 85% survival rate of wetland vegetation. Wetland plant survivorship will be monitored annually for two years subsequent to the relocation of salvaged wetland plants and installation of new plant material. After annual monitoring, planting will occur as necessary to replace plants lost through mortality. Any mortality of salvaged/relocated plants will be compensated for by planting of nursery plants on 12" centers within gaps or bare spots within the salvaged soils. Monitoring will be stopped after two years if 85% of greater survivorship is achieved. If 85% survivorship is not attained, annual monitoring will continue until survivorship requirements are met. In addition, all monitoring requirements and permit conditions imposed by the NYSDEC or USACE will be followed. The salvage of wetland vegetation and soils, construction of the low-sill bulkhead area, planting of nursery-stock *S. alterniflora*, monitoring of plant survivorship, and re-planting of plants lost to mortality will be the responsibility of the redeveloper.

Marinas and Dredging Areas

Construction of the large vessel marina, the relocated Angler's Club slips, construction of the smaller vessel marina in the east, and dredging associated with each of these facilities has the potential to result in adverse impacts to the marine habitat of Glen Cove Creek. These impacts include permanent degradation of the benthic habitats due to dredging and boat activity, potential disturbance of contaminated sediments during dredging and marina construction, temporary increases in turbidity during dredging and marina construction, potential discharge of pollutants and resulting decreases in water quality both during construction and marina operation. Section **III.D.3** discusses mitigation measures to minimize potential adverse environmental impacts to essential fish habitat and water quality from dredging; grading, excavation, and construction associated with installation of upland structures; and marina operation.

Glen Cove Creek Ferry

Environmental impacts associated with the construction of the separately planned but geographically related Glen Cove Creek Ferry terminal are expected to be similar to those described above for the marinas and dredging activities (subject to separate Environmental Assessment).

Essential Fish Habitat

The potential adverse effects on essential fish habitat resulting from the construction associated with the proposed shoreline and wetland restoration, bulkhead removal, and marina installation and dredging are species-specific and highly dependent on the time of year. Although several studies have been done to assess the abundance and diversity of finfish species present in Hempstead Harbor, there have been no studies specific to Glen Cove Creek. It is expected that finfish may inhabit the mouth of the creek to Captain's Cove, but in lower numbers than found in Hempstead Harbor proper. It is expected that the abundance of finfish in Glen Cove Creek decreases with increasing distance to the mouth of the creek, due to the intense use (current and historical) of the creek. Therefore, the potential for impacts of this project on essential fish habitat within Glen Cove Creek is low.

The majority of finfish which inhabit Hempstead Harbor are present during the months of April through October, as described in **Table III.D-7**. Winter flounder, *Pleuronectes americanus*, migrate inshore to spawn in bays and estuaries in the months of February through May. All proposed dredging and shoreline construction will be conducted within dredging windows approved by the US Army Corps of Engineers, NYS Department of State, and NYS Department of Environmental Conservation to avoid adverse impacts to finfish populations, including winter flounder. Analysis of potential impacts to finfish indicates that the approved dredging window will likely be November 1st through January 31st.

Table III.D-7
Effects of Development Scenarios on EFH Species
(for which an EFH has been Designated by NMFS)

Species Common Name (Scientific Name)	Effect of Development Scenarios on EFH
Atlantic salmon (*Salmo salar*)	No Effect—species not observed in the project area
Pollock (*Pollachius virens*)	No Effect—species rarely recorded in area
Red hake (*Urophycis chuss*)	No Effect—species offshore during construction timeframe; habitat expected to be suitable for spring inshore migration
Winter flounder (*Pleuronectes americanus*)	Short-term Negative Effect—dredging and construction may cause mortality of eggs, larvae and juveniles; adults may see decrease foraging success
Windowpane flounder (*Scopthalmus aquosus*)	Short-term Negligible Effect—habitat may be disturbed during dredging and construction activities, but impact to species negligible
Atlantic sea herring (*Clupea harengus*)	No Effect—this species prefers depths >10m, and will not likely be in project area
Bluefish (*Pomatomus saltatrix*)	No Effect—this species is not observed in the project area during construction months, and habitat expected to be restored prior to spring migration
Atlantic mackerel (*Scomber scombrus*)	No Effect—only occasionally observed in Long Island Sound and project area
Summer flounder (*Paralichtys dentatus*)	No Effect—species offshore during construction, more abundant in central LI Sound, habitat expected to be restored prior to spring migration
Scup (*Stenotomus chrysops*)	No Effect—species offshore during construction, habitat expected to be restored prior to spring inshore migration
Black sea bass (*Centropristus striata*)	No Effect—species offshore during construction, habitat expected to be restored prior to spring inshore migration
King mackerel (*Scomberomorus cavalla*)	No Effect—species not observed in the project area
Spanish mackerel (*Scomberomorus maculates*)	No Effect—species not observed in the project area
Cobia (*Rachycentron canadum*)	No Effect—species not observed in the project area
Sand tiger shark (*Odontaspis Taurus*)	No Effect—species not observed in the project area

Source: Land Use Ecological Services

f) Potential Impacts to Water Quality of Glen Cove Creek and Hempstead Harbor

Adverse impacts to the finfish, benthic invertebrates, and shorebirds which utilize Glen Cove Creek and Hempstead Harbor, such as reduced spawning, breeding fecundity and growth rates, could occur if the proposed action were to result in a decrease in the water quality of these bodies of water. Due to the implementation of environmental mitigation measures and compliance with federal and State regulations, the proposed action is not expected to result in a decrease in water quality and, accordingly, no adverse impacts to resident wildlife is expected.

For example, landscaping vegetation will consist of native plants and naturalized plants that are well-adapted to climatic and edaphic conditions on Long Island. A conceptual landscape plan with a list of the potential woody trees and shrubs to be used is included in the Master Site Plan Drawings. Proper plant selection will serve to minimize fertilizer applications and irrigation demands. Fertilization is only anticipated to be necessary during the establishment of site landscaping. Fertilization of landscaping in the proposed action will restrict the use of inorganic, fast-acting fertilizers in favor of slow-releasing fertilizers that will not be leached into soils or runoff during precipitation events.

In addition, the proposed action will employ a Stormwater Pollution Prevention Plan (SWPPP) during project construction and post-development phases of the project in compliance with the New York State Pollutant Discharge Elimination System (SPDES). This SWPPP will dictate the best management practices that will be employed during construction to minimize the exposure of the construction site's disturbed sediments to precipitation and to control the construction site's stormwater runoff in order to minimize the transport of sediments and pollutants off the project site to adjacent upland properties and waterways. The SWPPP will also describe the site's permanent stormwater collection and containment system which will manage the stormwater runoff from various precipitation events. As described in detail in Section **III.C.2**, the first two inches of stormwater runoff from the site's impervious surfaces will be either be stored in irrigation chambers and recycled for use in irrigation of the site's landscaping or infiltrated into the ground utilizing various best management practices including drainage swales, interceptor/infiltration trenches, dry wells, infiltration basins, and structural water quality treatment devices. These devices will serve to collect stormwater, retain sediments and organic debris, and filter pollutants and nutrients by facilitating the infiltration of stormwater into the ground. This will minimize the the transport of automotive fluids, heavy metals, sediments and organic debris, pet waste, and fertilizers to the waters of Glen Cove Creek and Hempstead Harbor. It is estimated that these best management practices will remove 80% of total suspended solids, 45-70% of total nitrogen, and 40-75% of total phosphorus from stormwater before it enters Glen Cove Creek, as per NYSDEC water quality design standards

Under the existing site conditions, stormwater runoff from Garvies Point Road and the industrial/commercial developments on the north sides of Garvies Point and Herb Hill Roads discharges directly to Glen Cove Creek and Hempstead Harbor.

Incorporation of infiltration swales and trenches along the northern side of Garvies Point Road and the proposed storm sewer collection and conveyance system proposed within Garvies Point Road improves the existing drainage along Garvies Point Road. Incorporation of roof gardens, landscaped areas, irrigation collection chambers and infiltration basins and the proposed stormwater

collection and conveyance systems proposed on site provide adequate mitigation for the proposed roof area and impervious surfaces associated with the development. Therefore, the proposed action is not expected to result in any significant decrease in the water quality of Glen Cove Creek and Hempstead Harbor.

3. Mitigation Measures

The proposed action has the potential to result in positive and adverse impacts to the ecological resources of the project site and adjacent portions of Glen Cove Creek, Hempstead Harbor, and Garvies Point Preserve. Mitigation measures to minimize these potential adverse impacts and provide environmental benefits include the following:

Mitigation of Potential Impacts to Upland and Wetland Habitats

- The preservation of 5.8 acres of open space located to the west of Dickson Street and to the south of Janet Lane within Blocks E and F. A portion of this property is currently disturbed and the remainder is an upland deciduous woodland dominated by Norway maple (*Acer platanoides*). This will result in the permanent preservation of woodland habitat for resident and migratory songbirds.
- The creation of new tidal wetland habitats including the creation of approximately 20,500 sq.ft. of tidal wetlands located landward of the proposed low-sill bulkhead, creation of 49,600 sq.ft. of open water habitat at the proposed turning basin (discussed in detail in Section **III.C**), and planting of 17,500 sq. ft. of native intertidal wetland vegetation in the Captain's Cove area.
- The restoration of 23,474 sq.ft. (510 linear feet) of degraded shoreline and wetland area in Captains' Cove through the excavation of concrete and asphalt debris, removal of invasive *Phragmites australis*, and re-planting of native plants.
- The removal of an existing bulkhead and proposed grading and planting activities (22,500 sq.ft.) will result in increased beach area thereby creating areas for passive beach recreation and additional habitat for shorebirds and songbirds.
- The installation of walkways and an observation deck with educational signage guided by the New York State Coastal Resource Interpretive Signage Program will serve to educate the public about the ecology and history of the site's waterfront.
- The establishment of 12.4 acres of landscaping associated with the proposed publicly-accessible parks, playground, and open spaces and surrounding the proposed pedestrian walkways and bike paths. These landscaped spaces will be planted with trees and shrubs. The majority of which will serve to shade impervious surfaces and buildings, thereby decreasing energy costs, increasing natural evaporative cooling, and increasing comfort in outdoor public spaces. Planted trees and shrubs will consist of native, naturalized, and non-invasive species. The use of these native and naturalized species will result in minimal use of fertilizers and irrigation for the project site and, therefore, will minimize potential nutrient loading impacts to Glen Cove Creek and groundwater. In

addition, the use of native and non-invasive plant species will serve to minimize the proliferation of invasive plants in Garvies Point Preserve. Lastly, the proposed landscaped areas and open spaces will also provide habitat for some species of resident and migratory songbirds.

- The creation of 6.0 acres of roof gardens on the larger residential buildings. These roof gardens will be interspersed among terraces and walkways located on the roofs of these buildings. Irrigation for these roof gardens will be provided by collecting runoff from these roof surfaces. The first one-inch (1") of roof runoff will be collected in irrigation chambers and then re-used to irrigate the roof gardens. These roof gardens will utilize native plant species to the maximum extent practicable; however, selection of plant species will depend ultimately on the ability of the plants to grow in unique soil and climatic conditions present in roof gardens. Environmental benefits gained from these roof gardens include reducing the production of stormwater due to evapotranspiration and water retention, reducing urban heat island effects by decreasing absorption of heat by roof surfaces, increasing energy efficiency, removing air pollutants, and improving pollutant concentrations in stormwater.

Mitigation of Potential Impacts to Resident and Migratory Birds

Due to the potential for collision-related bird mortality resulting from the installation of glass surfaces and external lighting associated with the proposed development, the following mitigation measures will be incorporated into the architectural and landscaping design plans in order to reduce adverse impacts to resident and migratory bird populations. These mitigation measures are based upon the *Bird-Safe Building Guidelines* promulgated by the New York City Audubon Society (2007) and *Bird-Friendly Development Guidelines* developed by the City of Toronto (City of Toronto Green Development Standard 2007). The New York City Audubon Society (2007) *Bird-Safe Building Guidelines* have been included in the Appendix.

- The minimal use of mirrored glass and large expanses of glazing from the proposed residential and commercial spaces within the proposed development.
- The fragmentation of proposed glass surfaces using material changes, railings, multiple setbacks, and structural embellishments to break up glass surfaces and prevent the appearance of large expanses of glass and unobstructed flight passage for birds.
- The use of awnings, overhangs, and other architectural embellishments to reduce reflections of nearby vegetation, waterways, and the sky in glazed surfaces.
- Placement of new landscaping sufficiently away from glazed building surfaces to prevent the reflection of landscaping in the surfaces.
- Minimization of the external visibility of interior landscaping and greenery to reduce its attractiveness to birds.
- The use of efficient external lighting fixtures that will minimize direct upward light and minimize light pollution that may adversely affect resident and migratory birds.

Mitigation of Potential Impacts to Garvies Point Preserve

- Noise impacts during construction will be mitigated by locating all noisy equipment, such as generators, cranes, trailers, concrete pumps, concrete trucks, and dump trucks, away from the Preserve to the maximum extent feasible. In addition, either vibratory pile drivers or a shroud/noise bellows system will be used in conjunction with impact pile drivers to reduce noise levels from pile driving activity at the Preserve. Lastly, all contractors and subcontractors will be required to properly maintain their equipment and have the appropriate manufacturer's noise reduction devices including, but not limited to, a quality muffler that is free of rust, holes, and exhaust leaks installed. A permanent noise-control structure (i.e. a barrier wall or row of evergreen trees) will not installed adjacent Garvies Point Road, as this would pose a collision hazard to vehicles on the roadway.
- Native, naturalized, and non-invasive plant species will be used in the site landscaping to avoid proliferation of invasive plants within Garvies Point Preserve. No mitigation measures for the potential increased abundance of invasive competitors (i.e. European starling and house sparrow) or predators (i.e. raccoons, feral cats, etc.) in the Preserve are possible and, accordingly, are not proposed.

Mitigation of Potential Impacts to Essential Fish Habitat and Water Quality

- The proposed action and other related infrastructure improvements would be expected to result in a significant improvement to the existing stormwater drainage along Garvies Point Road through the installation of a proposed sewer collection and conveyance system and infiltration swales and trenches along the northern side of the road Garvies Point Road. In addition, the proposed green roofs, vegetated swales, landscaped open spaces, dry wells, infiltration trenches, infiltration basins, and structural water quality treatment devices will be used to remove 80% of total suspended solids, 45-70% of total nitrogen, and 45-70% of total phosphorus from stormwater before it enters Glen Cove Creek. Lastly, the implementation of a Stormwater Pollution Prevention Plan, described in detail in Section III.C, during construction would serve to eliminate the potential transport of sediments, nutrients, and pollutants into the wetlands and open waters of Glen Cove Creek and Hempstead Harbor thereby maintaining the water and habitat quality of these aquatic ecosystems.
- The construction of the large vessel marina, the relocated Angler's Club slips, construction of the smaller vessel marina in the east, and dredging associated with each of these facilities has the potential to result in adverse impacts to the marine habitat of Glen Cove Creek. These impacts include permanent degradation of the benthic habitats due to dredging and boat activity, potential disturbance of contaminated sediments during dredging and marina construction, temporary increases in turbidity during dredging and marina construction, potential discharge of pollutants and resulting decreases in water quality both during construction and marina operation.

The following best management practices and guidelines will be employed (*from* In-Water and Riparian Management of Sediment and Dredged Material, NYSDEC Technical & Operational Guidance Series, November 2004) to mitigate the potential environmental impacts of dredging. As described in Section **III.B** (Surface and Subsurface Environmental Conditions), the project site has a history of contamination resulting from historical industrial activities. Elevated levels of heavy metals (including, but not limited to, arsenic, lead, copper, and zinc), radionuclides, solvents, petroleum products, VOCs, SVOCS, PCBs, and asbestos have been previously identified and remediated to various historic clean-up standards. Accordingly, the contaminant testing described below is particularly important to avoid potential adverse ecological impacts that may result from the resuspension of contaminated sediments during dredging.

- Prior to any dredging activities, dredge sites will be tested for contaminants in accordance with the following protocols:
  - Core samples will be taken to obtain a representative characterization of the sediments in each proposed dredge area (large vessel marina, Angler's Club, and transient marina).
  - Samples will be analyzed using the whole sediment chemistry analysis method.
  - The number of core samples required and chemical analytes to be tested will be determined through consultation with NYSDEC and USACOE. Sampling plans will be developed by a qualified hydrogeologist for approval by both agencies prior to implementation.
- Dredge spoil will be dewatered and disposed of at an approved upland location. Method and location of dewatering and disposal will be determined following completion of sediment testing described above. If contaminated sediments are found during sampling, they will be disposed of according to NYSDEC, USACOE, and USEPA protocols.
- Dredging, piling and dock installation, and other aspects of marina construction, will be conducted during a dredging window approved by the US Army Corps of Engineers, NYS Department of State, and NYS Department of Environmental Conservation to avoid impacts to spawning shellfish and spawning finfish. It is likely that the dredging window will be November 1st through January 31st, based on past projects and literature review.
- To minimize the amount of material disturbed or returned to the water body, a closed, watertight bucket (closed clamshell bucket) will be used for all dredging operations, and barge overflow will be prohibited.
- To minimize resuspension of silt, oil, grease, and other fine particles or materials, careful equipment operation, floating booms, and silt curtains or screens will be used.
- Proposed bathymetric contours in the proposed boat basins will be sufficiently deep (i.e. six to eight feet deep at mean low water) to prevent scouring and propeller dredging from the operation of vessels.

In addition to the above, the following additional best management practices and mitigation measures will be employed to minimize the magnitude of adverse environmental impacts:

- A Stormwater Pollution Prevention Plan (SWPPP) will be implemented to comply with NYSDEC regulations related to SPEDES Multi-Sector General Permit for Stormwater Discharges Associated with Construction Activities to prevent stormwater discharge, erosion, sediment transport, and pollutant discharge during grading, excavation, and construction associated with installation of structures associated with upland portions of the proposed marinas (office buildings, equipment storage facilities, parking areas, etc.).
- A Stormwater Pollution Prevention Plan will be implemented for all proposed marinas to comply with NYSDEC regulations related to the SPEDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities.
- The proposed marinas will adopt the best management practices prescribed by the Hempstead Harbor Protection Committee's Clean Marinas Program pertaining to:
  - Containment of oil, gas, hydro-carbon contaminants, boat sewage and pet waste, trash and litter, heavy metals and toxic chemicals, solvents and cleaning products, anti-freeze, detergent, suspended sediments, and fertilizers,
  - Procedures for boat cleaning, painting, fiberglass repair, maintenance, and pressure washing,
  - Hauling and storage of boats,
  - Procedures for garbage storage, management, and disposal,
  - Operation and maintenance of marina support buildings,
  - Storage, handling and recycling protocols for waste oils and fuels, batteries, maintenance liquids, and restaurant liquids,
  - Procedures for emergency response, spill prevention, clean-up, and waste disposal.