Hackensack River Migratory Bird Report

With Recommendations for Conservation





1897 1997

NEW JERSEY AUDUBON SOCIETY

Newark Bay Study Area
NBSA-00014

New Jersey Audubon Society Statement of Purpose

New Jersey Audubon Society is a privately supported, not-for-profit, statewide membership organization. Founded in 1897, and one of the oldest independent Audubon societies, NJAS has no formal connection with the National Audubon Society.

NJAS fosters environmental awareness and a conservation ethic among New Jersey's citizens, protects New Jersey's birds, mammals, other animals, and plants, especially endangered and threatened species, and promotes preservation of New Jersey's valuable natural habitats.

In order to achieve its purpose NJAS, through its board of Directors, professional staff, members and volunteers endeavors to:

- Develop, encourage, and support sound conservation practices, programs, and legislation
- Disseminate information on the natural environment through education programs, information services and publications
- Advance knowledge, through field research, of New Jersey's flora and fauna and their relationship to the habitats on which they depend
- Acquire, establish, and maintain wildlife sanctuaries and educational centers.

The objectives of the Society are implemented by its professional staff under the leadership of its Executive Director and supervision of an elected, voluntary Board of Directors.

This report was funded by a grant from the Environmental Endowment for New Jersey.

Acknowledgements

Special thanks are owed to the Environmental Endowment for New Jersey for funding this report; Barbara Lowell and Sgt. Jim LaGrosa of Hackensack Water Company for access to Water Company property; to Bill Sheehan, Hackensack Riverkeeper, for monthly boat rides to sites inaccessible on foot; to Andy Willner and Steve Barnes of Baykeeper for their support; to Dave Kane for preparation of the site map; and to Chip Krilowicz, Kevin Karlson, Rhonda Rolf, Jim Bangma, and Claude Kleckner for photos used in this report.

Design and Layout by Middle Mountain Designs.

Cover Photo Information:

Short-eared Owl, an endangered species in New Jersey, occurs in the Hackensack meadowlands in winter. This day-flying owl hunts small rodents on landfills and marshes. *Photo by Chip Krilowicz.*

Section of the forest at Old Tappan. *Photo by Richard Kane.*

Publications

New Jersey Audubon, quarterly magazine with NJAS' activities, conservation and natural history; *Records of New Jersey Birds*, quarterly research journal; *Peregrine Observer*, semiannual magazine of CMBO activities; *Green Gram*, conservation newsletter; *Bridges to the Natural World*, teaching guide; *Hawk Watch*, introduction to raptor identification and migration; *Linking our Treasures: Newark to the New Jersey Highlands*, English/Spanish family guides to New Jersey's habitats; *New Jersey at the Crossroads of Migration*, avian habitat needs; *The Birds of Cape May*, guide to Cape May's bird populations; *Backyard Habitat for Birds*, guide to planting native vegetation to benefit birds and animals; *Raritan Bay Wildlife Habitat Report*, wildlife and habitat inventory with conservation recommendations; and *Save Our Highlands*, brochure with map describing the Highlands' unique resources.

NJAS Nature Centers

Cape May Bird Observatory: Center for Research and Education
600 Route 47 North
Cape May Court House, NJ 08210
(609) 861-0700

Cape May Bird Observatory: Northwood Center
707 East Lake Drive
Post Office Box 3
Cape May Point, NJ 08212
(609) 884-2736

Lorrimer Sanctuary
790 Ewing Avenue
Post Office Box 125
Franklin Lakes, NJ 07417
(201) 891-2185

Nature Center of Cape May
1600 Delaware Avenue
Cape May, NJ 08204
(609) 884-9590

Owl Haven Nature Center
250 Route 522
Post Office Box 26
Tennent, NJ 07763
(908) 780-7007

Rancocas Nature Center
794 Rancocas Road
Mount Holly, NJ 08060
(609) 261-2495

Scherman-Hoffman Sanctuaries
11 Hardscrabble Road
Post Office Box 693
Bernardsville, NJ 07924
(908) 766-5787

Weis Ecology Center
150 Snake Den Road
Ringwood, NJ 07456
(201) 835-2160

Introduction

As a result of a consent decree in 1991, Pfister Chemical, Inc. provided the New Jersey Audubon Society funding for a three year study of the Hackensack River area to inventory wildlife use, define critical migratory bird habitat and recommend conservation measures in the region. Members of the project team were Richard Kane, Director of Conservation for New Jersey Audubon, and Joan Walsh and David Githens of the Cape May Bird Observatory. An extensive document entitled Hackensack River Migratory Bird Habitats with Recommendations for Conservation, detailing all the field work and information gathered on 32 sites from 1994 to 1995, was prepared in 1996 and submitted to the various agencies having land use jurisdiction along the Hackensack River from the New York State line to the mouth of the river. The present publication derives from that study and reports on 21 selected sites especially important for migratory birds.

Methods

Most of the field work on the selected sites was conducted from January 1994 to December 1995. Attention focussed on sites in 6 USGS Quads: Jersey City, Weehawken, Hackensack, Yonkers, Park Ridge, and Nyack. In 1994 visits were made to the sites once monthly *(circa)* in breeding season (Apr.-July) and in fall migration, and less often on some sites in winter months. Sites were defined according to obvious boundaries like Conrail or the New Jersey Turnpike. The sites were named usually from recognizable topographic features like creeks appearing on the USGS maps, and delineated on those maps in pencil. Information was recorded on birds, mammals, butterflies and moths, herptiles and vegetation types. Each site account contains a site description, a record of what was seen on the visits, and a summary of its value and conservation recommendations. Visits varied in length, depending on size, from 2 hours at larger sites to perhaps 20 minutes at small sites. Duration of boat visits also was variable with the seasons. Boats were used for the sites in the Hackensack Meadowlands where foot access to the creeks was impossible. The boat was graciously provided by Bill Sheehan, the auxiliary Bay-keeper of the Hackensack River for the American Littoral Society.



Captain Bill Sheehan can be seen plying his Eco-Tour trade on the Hackensack River. He and his boat were most helpful in gathering information and photos for the publication.

PHOTO–Rhonda Rolf

Many of the sites were familiar to Kane from past visits and NJAS has published a number of articles on the Meadowlands region. However the area is changing, and some of the published information is out of date. We tried to amend the information wherever it seemed necessary. In the breeding season, roughly April through July, the birds breeding on each site were recorded by standard codes used in the concurrent New Jersey Breeding Bird Atlas conducted from 1993 to 1996 by the Cape May Bird Observatory, the NJAS research arm. During the breeding season, non-breeding birds on site are described as loafers, or feeding or dispersal birds (e.g., herons). From March 1994 to April 1995, field work was done monthly on most of the survey sites from the Newark Bay to the state line. After April 1995, field work was concentrated on 9 selected priority sites visited once a week in spring and fall migration. State endangered (E) and threatened (T) species are so noted throughout.

This report covers 21 selected sites visited from March 1994 to April



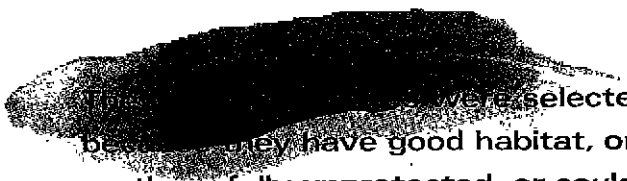
ERRATA

The caption under the photo of the Peregrine Falcon on page 1 should read: "Migrant Peregrine, a state-endangered species, at Overpeck in fall migration." The bird is not a Northern Harrier. Our apologies for this mix-up. The authors

Northern Harrier, a state-endangered species, still breeds at Berry's Creek

PHOTO–Jim Bangma

1995, and also indicates which priority sites (9) were monitored weekly in 1995 migrations. The nine priority sites were selected because they have good habitat, or are partly or fully unprotected, or could be affected by development, zoning, or other changes in status such as ownership. They include forest, fill and wetlands habitats. The nine sites monitored weekly in 1995 during migration were Losen Slote, Oradell and Old Tappan (forest sites in spring); and Berry's Creek, Moonachie Creek, Overpeck, Bellman's Creek, Cromakill Creek and Mill Creek (fill and marsh sites monitored both spring and fall). The results of the weekly counts at the nine priority sites appear in Appendix 1.



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Description of the Area

The Hackensack River flows from New York state south into New Jersey through Old Tappan and Oradell Reservoir and through the Hackensack Meadowlands to Newark Bay. Important forested watershed lands lie around the Oradell Reservoir and Lake Tappan and along the Hackensack River in Old Tappan and Rivervale. The reservoir watershed lands are habitat for neotropical songbirds, wintering raptors and migratory waterfowl and waterbirds. Much of the middle portion of the Hackensack River shows developed banks and in populous Bergen County there is not much open space or habitat along the river until it reaches the Hackensack Meadowlands. Here some 7000 acres are still in wetland (much of it common reed) and 1600 acres are in landfill. About two thirds of the Meadowlands District has been developed (about 13,000 acres). The Meadowlands has undergone extensive changes in habitat and vegetation (Sipple 1991), as a result of its glacial history, and also because of human interaction with the land.

The retreat of the Wisconsin glacier 12,000 years ago left a large lake of melt water known as glacial Lake Hackensack. There was a 3,000 year accumulation of clay. The lake drained after glacial retreat and sea level rose, sending tidewater into the meadowlands producing wetlands. The early habitats were black ash swamp, then birch and black spruce bog, then white cedar. Cedar was present from 500 years ago to as recently as 1896. During this period as much as 1,500 acres of it were present in Kearny. Then the Meadowlands became brackish and saline wetlands (Sipple, 1991).

Common reed was abundant in the Meadowlands by 1919 and outcompeted the cattails for occupation of the marshland. Diking and ditching in the late 19th century aided the decline of the cedar swamps. The diking prevented tidal influx and at the same time drained the diked area. This eliminated cedar swamp in the Sawmill Creek area. Further decline of cedars was caused by cutting for planking in road building. Ditching and diking also were conducive to the spread of reed (Sipple, 1991).

Rise in sea level played a key role in meadowlands vegetation. Influx of salt water in the 20th century aided by construction of Oradell Dam in 1922, brought salt marsh cord grass further upstream as far as Little Ferry in 1968-1970 (Sipple, 1991). The saltwater penetration has been occurring at least since the Oradell Dam.

Since the dikes on the river broke in a 1950 storm (Black 1970), the trend has been toward a more saline wetland system. The Meadowlands are important for wintering raptors, migrant shorebirds and waterfowl, breeding wetlands species including herons, ducks, rails, marsh wrens, swamp sparrow and blackbirds. Diamond-backed terrapins occur, and there is a very large muskrat population.

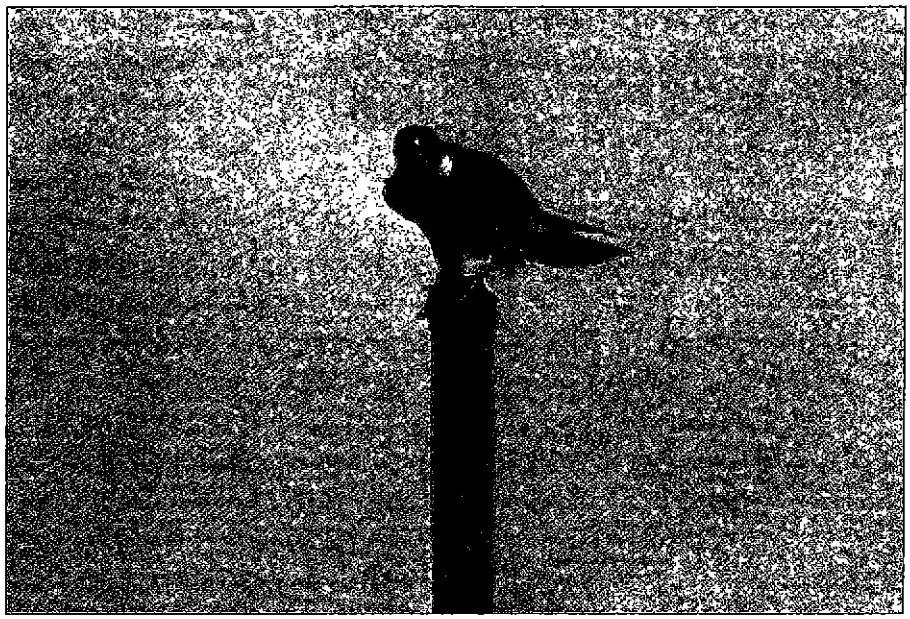


Exposed cedar stumps in the lower river marshes are all that remain of the cedar swamps where river pirates hid 200 years ago.
PHOTO–Richard Kane

There is heavy recreational use of the Meadowlands, boating on the river, fishing, hunting, trapping, Sports Complex activities (such as racing), birding, canoeing and other activities all competing for space in a very crowded metropolitan area. Only

about one third of the district's wetlands remain, following intense development prior to the 1990's. There is some room left on upland parcels for development, but the large acreage in landfills is not suitable for many kinds of development. Currently a Special Area Management Plan for the Meadowlands is being developed by HMDC, USEPA, ACOE and the State of New Jersey. NJAS sat on the SAMP Citizen's Advisory Committee. At the end of this process there is to be a blueprint for what lands can be developed and what lands will be conserved in open space and habitat. HMDC is the zoning authority for the portions of the 14 Meadowlands towns in the Meadowlands District.

The lower portion of the Hackensack River from Kearny to Newark Bay is heavily developed on both sides of the river. As with the middle portion of the river (from Hackensack to Oradell), there is not much vacant open space for habitat conservation, except for Lincoln Park in Jersey City. The river is heavily channelized and bulkheaded.



Peregrine Falcon, a state endangered species, nests on an abandoned building on the Hackensack River.
PHOTO–Jim Bangma

Important Sites

Kearny Marsh West is a well known, well reported site (Kane 1978) valuable for its egret roosts; its endangered species (formerly Pied-billed Grebe, Yellow-crowned Night-Heron); for its Black-crowned Night-Heron Rookery; its population of Least Bittern (June counts in 70's and 80's ran to 35); its use by waterfowl and endangered Peregrine Falcon; its formerly large breeding population of American Coot (HM was the only breeding site in New Jersey prior to other Atlas discoveries in 1996) and its current large population of Common Moorhen; its muskrat population; and its numbers of redwings, Marsh Wrens and Swamp sparrows. Recently the marsh has had salt water intrusion with changes in vegetation, fish size and bird use. The coots and grebes are elsewhere (see Kearny East and Kingsland), but the marsh still is heavily used by cormorants, feeding and roosting herons, moorhens and other marsh species, as well as hunting raptors, especially redtails, harriers and roughlegs, in winter.

Kearny Marsh East is a more recently flooded marsh with water control structures on the river. It is heavily used by cormorants, herons, gulls, feeding Least Terns (E), coots, moorhens and Pied-billed Grebe (E). The coots, moorhens and grebes nest in this marsh, along with mallard, gadwall, Marsh Wren and redwings. This marsh too has a large muskrat population. The shallow water is favored by all those species. The site is important year round including winter.

Kingsland impoundment (where HMDC is located) is a breeding locale for Pied-billed Grebe (E); Am. Coot and Ruddy Duck (rare breeders in NJ); Com. Moorhen in numbers; and waterfowl including Mallard, Am. Black Duck, Blue-winged Teal and in recent decades Gadwall. When water levels are drawn down, this impoundment attracts shorebirds of 30 species requiring resting and feeding places at high tide. It and Kearny East are two sites where shorebird management can and should be undertaken (Kane 1975; Kane 1983). The portable boardwalk established by the HMDC Environment Center affords close observation of wildlife for the public and access to aquatic environments by school classes.

Sawmill Wildlife Management Area operated by the Division of Fish, Game and Wildlife is a large 900 acre wetland changing from reed to spartina and hosting large numbers of waterfowl

pin oak. The beech forest is homogenous and should get to climax.

A hardwood swamp toward the southern end has a lot of dead wood. The oaks on the upland portion are mixed. In the shrub layer are ironwood, silky and alternate-leaved dogwood, spicebush, arrowwood, honey suckle (sp), and others. Extensive stands of Solomon's seal, Canada Mayflower, spring beauty, bellwort, trout lily, jewel weed, violets, Jack-in-the-pulpit, skunk cabbage and various ferns carpet the floor. There are patches of marsh. An historic site "The Stone Point", a former gristmill, has a marker on Westwood Ave. The site has good populations of Wood Ducks, woodpeckers, forest neotropicals and migrants. It is the best remaining forest in the study area with its mature trees and varied forest type.



...most important site on the upper river in New Jersey. ...The forest deficit is regionally severe. As one of the biggest and best piece of forest on the river, it should remain in the Water Company hands without alteration to protect the river. Loss or reduction in acreage of the tract would leave forest species with no alternative.

Resident birds were Green Heron, Canada Goose, Wood Duck, (all in holes in trees), Mallard, Red-bellied Woodpecker, Downy Woodpecker, Hairy Woodpecker, N. Flicker, Pileated Woodpecker, Great-crested Flycatcher, E. Kingbird, Blue Jay, Am. Crow, Black-capped Chickadee, Tufted Titmouse, White-breasted Nuthatch, House Wren, Wood Thrush, Am. Robin, Gray Catbird, Starling, Red-eyed Vireo, Yellow Warbler, Am. Redstart, Ovenbird, Com. Yellowthroat, Scarlet Tanager, N. Cardinal, Rose-breasted Grosbeak, Brown-headed Cowbird (?), House Finch and Am. Goldfinch. Many migrant birds were observed on this site over the two years, including warblers, flycatchers, Rusty Blackbird, Lincoln's and White-throated sparrow, and Pine Siskin. (See chart, Appendix 1.)

Conservation: This is probably the single most important site on the upper river in New Jersey. Its clean air and clean water contribution is irreplaceable in Bergen County. The forest deficit is regionally severe. As one of the biggest and best piece of forest on the river, it should remain in the Water Company hands without alteration to protect the river. Loss or reduction in acreage of the tract would leave forest species with no alternative. The site is protected under an arrangement by the water company, Environmental Defense Fund and Bergen Swan. The fact that this arrangement had to be negotiated shows how important it is to get a mechanism for protecting watershed lands.

Pascack Brook Mouth

This site extends along the Hackensack south from Harriot Ave. to Old Hook Road and west along Pascack Brook to a pipeline and includes the mouth of Pascack Brook. Much of this is Hackensack Water Company land. All their lands are posted "No Trespassing". Some is BCUA land.

There is some forest along the Hackensack River and along Pascack Brook. There is a forested island in the mouth of Pascack Brook. Much of the site is open water, extending eastward to Schrallenburg Road. On the Harrington Park side, the site is bordered by homes and a small park. The site is principally valuable as a waterbird stopover by migrant herons, ducks and gulls, all fish eating species, and as a wintering site for Bald Eagle (E). Three eagles wintered here in 1994-95.

Breeding birds here were Canada Goose, Mallard, Am. Crow, Black-capped Chickadee, Tufted Titmouse, House Wren, Am. Robin, N. Mockingbird, Am. Redstart, E. Kingbird, Least Flycatcher, N. Cardinal and Baltimore Oriole. Yellow Warbler and redwing were other residents, along with Warbling Vireo. Migrants here include cormorants, Common and Hooded mergansers, Bufflehead, teal, gulls and swallows.

Conservation: As the site is fenced to protect the water supply, it needs no further protection. The forested portions along the brook are wetlands which protect the stream.

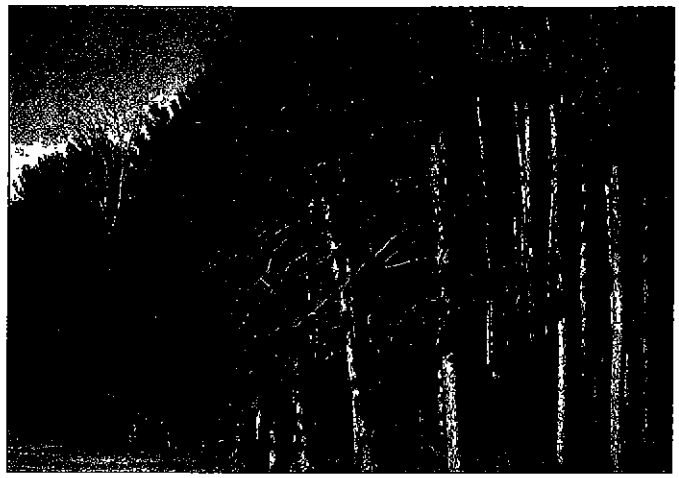
Oradell Reservoir

Located between Old Hook Road on the north, Conrail on the east and Lake Shore Drive on the south, this site lies in Closter, Haworth and Emerson. The western border is the railroad and the developments in Emerson. Owner-

ship is Hackensack Water Company. The water company office property is planted in conifers (pine spp.) on Old Hook Road. The reservoir is surrounded by golf course and developments. Most of the site is inaccessible. Because of its size, this site required 2 visits per month.

Oradell is a well known site to Bergen County birders. It gets Bald Eagle occasionally in migration and winter, along with Iceland and Glaucous Gulls, Long-eared Owl (T), winter finches, and even has records of Black-backed Woodpecker. Large numbers (1000's) of Common Mergansers use this site, as do many other common waterfowl species. The diminishing forest around the reservoir hosts many migrant warblers and other neotropicals on flight days. A breeding census of Oradell Reservoir was conducted by Bergen County Audubon in 1990. The forest around the reservoir has been reduced by the golf courses/ country clubs.

Visits to the Shore Rd. on the east side of the reservoir in 1994 revealed some nice forest with very large, mature pin oak, red oak, tulip, maple, ash, poplar with some sycamore, white pines and Norway spruce. Jewel weed was common on the forest floor. Spicebush, hazelnut, arrow wood, honeysuckles (spp), maple-leaved viburnum, and wild rose (in the openings) dominated the shrub layer. Mountain laurel was on the reservoir shoreline, along with sweet pepperbush, willows, elderberry, and some witchhazel. Ferns were abundant, also poison ivy and bittersweet. Some beech is also in the forest. There are also scattered planted red and scotch pines, and one large mixed pine planting bordered by Norway spruce.



Extensive conifer plantings at Oradell are frequented by owls, kinglets, Pine Warbler and Red-breasted Nuthatch.

PHOTO–Richard Kane

Visits to the west (Emerson) side of the Reservoir through Gate #6 in 1994 revealed a forest of tall sycamores interspersed with maples, tulip, ash, oak, poplar; a shrub layer of ironwood, cherry, elderberry, spicebush, silky dogwoods, arrow wood, multi-flora rose, maple-leaved viburnum; and large stands of equisetum (scouring rush), and jewel weed. Ferns included sensitive, lady and hay-scented. Partridge berry, Canada mayflower, solomon's plume, poison ivy and Virginia creeper were also common. At the upper end (northern end), are extensive plantings of Norway spruce, with some presumably native hemlock along the shore. A gas pipeline traverses the site and affords access through both the extensive plantings and the deciduous forest. The western edge is low and swampy with intermittent streams. This portion of the Oradell site was monitored weekly for migratory bird use in spring 1995 (see chart detailing forest migrants in Appendix 1).

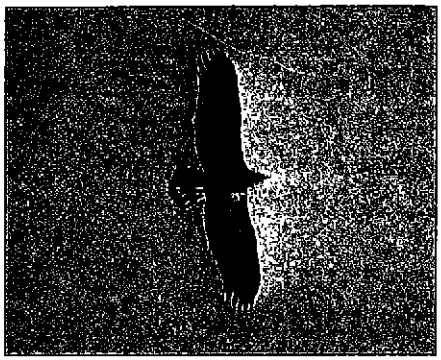


Common Merganser winters in the thousands on Oradell Reservoir as long as the water is not frozen, feeding on the abundant fish there

PHOTO–NJAS Collection

In the forest on the Gate 5 side (Closter-Haworth) were resident Mourning Dove, Fish and American Crow, E. Kingbird, E. Wood-Pewee, Cedar Waxwing, Am. Robin, Gray Catbird, Red-bellied Woodpecker, Brown Thrasher, N. Flicker, Great Crested Flycatcher, Brown Creeper, Black-capped Chickadee, Tufted Titmouse, Wood Thrush, Veery, Red-eyed Vireo, Warbling Vireo, House Wren, Yellow Warbler, Am. Redstart, Com. Yellowthroat, Song Sparrow, Chipping Sparrow, Rose-breasted Grosbeak, N. Cardinal, Scarlet Tanager, E. Towhee, Baltimore Oriole, Com. Grackles and Redwings. Insects included promethea moth, darner (sp), skipper (sp), spice-bush swallowtail.

On the Emerson side (Gate 6), common resident birds were Gray



Bald Eagle is a regular winter visitor at Oradell Reservoir. Both adult and immature eagles can be observed on the reservoir feeding on fish, crippled waterfowl or mammal carcasses.
PHOTO–NJAS Collection

Catbird, Veery and Common Yellowthroat, and there are five species of resident woodpecker. Black-crowned Night-Herons were observed in the conifers: the area appears to be a roost for non-breeding sub-adults with its ample supply of easily available fish. Likewise, non-breeding Double-crested Cormorants were observed fishing in the reservoir and loafing Ring-billed Gulls were also seen on the dam. Resident birds included Red-bellied, Downy, Hairy, and Pileated woodpeckers and N. Flicker; Great Crested Flycatcher, Blue Jay, Am. Crow and Fish Crow; Black-capped Chickadee, Tufted Titmouse and White-breasted Nuthatch; Brown Creeper; Veery, Wood Thrush and Am. Robin; Gray Catbird and Brown Thrasher; Cedar Waxwing; Red-eyed Vireo; Blue-winged and Pine warblers, Ovenbird and Com. Yellowthroat; Scarlet Tanager; N. Cardinal, E. Towhee; redwing and Com. Grackle; and House Finch. Starling was also resident.

Migrant waterbirds on Oradell Reservoir included as many as 4200 Common Mergansers (Jan. 25, 1995), smallet flocks of Bufflehead, Hooded Merganser and Ruddy Duck, and Herring and Ring-billed gulls. In winter 1994-95, three Bald Eagles (E) alternated between the main Reservoir and the Pascak Brook Mouth site, feeding mostly on fish and carcasses. The weekly spring counts were conducted in April-May, 1995 (see Appendix 1).

Conservation: The site is one of the most important on the river, as a waterfowl and waterbird stopover, as a sizeable forested tract rare in Bergen County, as a significant land bird trap and breeding bird oasis, and as a recreational resource under a permit system administered by the Hackensack Water Company. For all of those reasons, and for protection of the reservoir, a formula has to be found to stop the transfer of such watershed lands to uses other than conservation, because many of the reasons for buffer lands still obtain: clean air, cheaper clean water, wildlife habitat in an area without other alternatives, and a social amenity. Some portions of these lands can at present be sold for development.

...e would ...affect forest neotropicals like Scarlet Tanager and Eastern Wood-Pewees, warblers and vireos, as well as raptors.

But a reduction in forest size would negatively affect forest neotropicals like Scarlet Tanager and Eastern Wood-Pewees, warblers and vireos, as well as raptors. The mix of trees at Oradell provides good diversity of forest birds. Cutting should be confined only to roadways that have to be pruned to allow Water Company vehicles to pass. The best outcome for both conservation and recreation would be for these lands to continue under Water Company management.

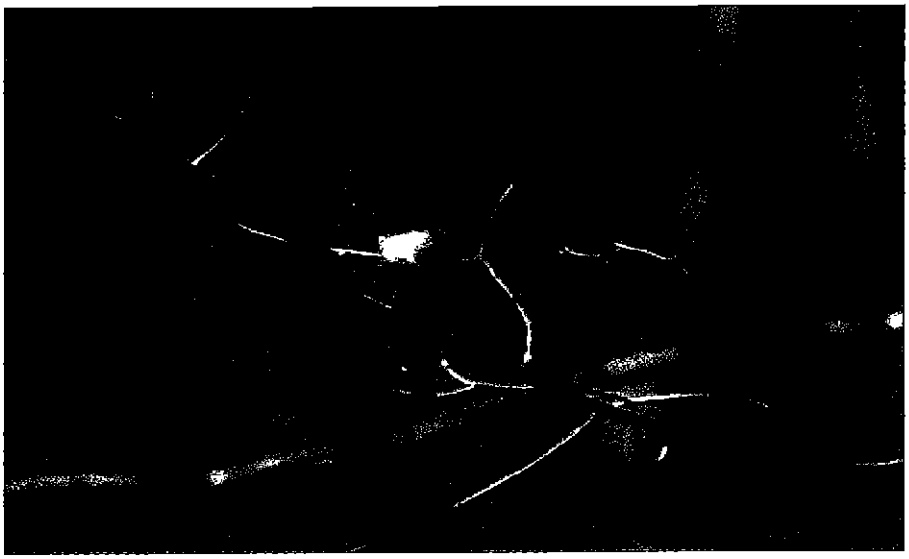
An agreement reached with the Environmental Defense Fund and Bergen SWAN by the Hackensack Water Company stipulates that much of the land will not be sold off for development. The maintenance of cheap clean water by conserving forest lands does the double duty of protecting public health and the economy, while at the same time maintaining much needed wildlife habitat.



Hooded Merganser is found in migration on both upper and lower portions of the river. It favors sites with wooded shorelines
PHOTO–Deva and Jim Burns, Natural Impacts

Oradell Gaging Station

This site extends south from Oradell Ave. to New Milford Ave. and is bounded by Grove and Elm St. on the east and the railroad on the west. The land is owned by Hackensack Water Company and lies in Oradell and New Milford. Immediately adjacent to the site is Van Buskirk Island, which was acquired by Bergen County from the Hackensack Water Company for parkland. A task force appointed by



Eastern Phoebe is a common resident and migrant along the river, feeding on insects and nesting on bridges or other structures.

PHOTO–Richard Kane

County Executive Pat Schuber was charged in 1997 with developing a recommendation for converting part or all of the island to a passive nature park. Access for observation from the west can only be had from the railroad.

The forest lining the river is narrow, but with tall white pine, Norway spruce (planted), sycamore, oaks, tulips, maple, elm, basswood, ash and other species; shrubs such as dogwoods (spp), small cherries and others especially on the east bank. Plants here included butter and eggs, tall meadow rue, daisy fleabane, spider wort, wild carrot, bouncing bet, pokeweed, spotted knapweed, dogbane and wood sorrel. Butterflies recorded were cabbage white, black swallowtail, tiger swallowtail and monarch.

Despite the small size, the site had numbers of birds resident birds, including resident Mallard and Canada Goose; Mourning Dove, N. Flicker, Am. Robin, E. Kingbird, House Wren, Tufted Titmouse, Warbling Vireo, Am. Redstart, Yellow Warbler, Com. Yellowthroat, Com. Grackle, Baltimore Oriole, Orchard Oriole and Song Sparrow. Migrant birds found here were Great Blue Heron, Black-crowned Night-Heron, Wood Duck and Hooded Merganser, Belted Kingfisher, Hermit Thrush, both kinglets; a variety of warblers, including Magnolia, Canada, Yellow-rumped, Palm, Blackpoll, and N. Waterthrush; sapsucker, various sparrows, and juncos.

Conservation: Although this is a small, narrow site, it is a good migratory stopover in the river corridor for warblers, thrushes, kinglets, creepers and others; a good breeding site for river corridor species such as warblers, vireos and orioles; and a secluded feeding area for Great Blue Heron (T), Wood Duck and other waterfowl. It is protected by a fence and by homes on both sides so it is unlikely to change, and should require no particular management. The addition of a passive nature park at Van Buskirk Island would improve the site as a migratory bird stopover by replacing development with precious habitat.

New Milford

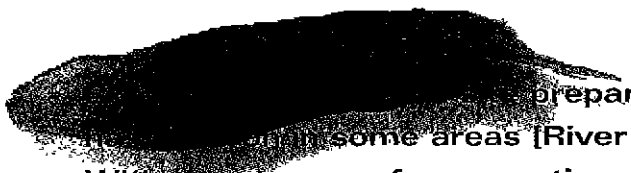
This site extends along the river from New Milford Ave. south to Riveredge Rd. On the west it is bounded by the railroad and on the east by a school and developed streets. The land is in New Milford. Access for observation is from Madison Ave., and from Park Drive. An access road from the railroad station is open during hours to a municipal leaf dump. The river corridor is lined with sycamore, silver and other maples, oaks and other large trees. The shrub layer is spicebush, and arrowwood, with some exotics. Box elder, ash and elm are other trees present. Jewel weed is common on the floor, and spatterdock grows in the river.

Resident birds included Canada Goose and Mallard, Am. Crow, E. Kingbird, Scarlet Tanager, Warbling Vireo, Am. Robin and N. Cardinal. Other resident species were Red-bellied Woodpecker, N. Mockingbird, Song Sparrow and Am. Goldfinch. Migrant birds found on the site included Great Blue Heron, Great Egret, Belted Kingfisher, Cooper's Hawk, Hooded Merganser, Wood Duck, phoebe, kinglets and various warblers like Blackburnian and Wilson's. The weedy compost area is a good migratory sparrow place in fall when abundant seeds are available.

Conservation: The New Milford Site is also a good migratory stopover for vireos, warblers, kinglets, wrens, Wood Ducks and kingfishers. The land is not likely to change much in the floodway. Wood cutting should be minimized to prevent the forest from getting any smaller.

River Edge

This long site extends from River Edge Road (on the north) south to New Bridge Road. It is bounded on the west roughly by the railroad and on the east by River Road and developments in Bergenfield. The site contains historic places, the French Burial Ground and the Zabriskie-von Steuben House. The land is owned partly by the count;, some is private. The State owns the land at the south end around the historic buildings. Access is from dead ends off of Kinderkamack Rd. on the west and River Rd. on the east, especially the sub-station and the burial ground. There are active recreation sites and a sewerage disposal plant.



preparation in some areas [River Edge]. With the pressure for recreation areas, the trick is to hang onto the remaining riparian forest.

The narrow corridor forest again comprises sycamores, silver and other maples, oaks, elms and vegetation similar to the other upriver sites. But in places this site is wider than the upriver sites and has more extensive areas pin oak, gum, red maple, ash and shrubs such as alternate-leaved dogwood, blueberry, arrowwood, spicebush and others, and some areas of marsh with pickerel weed and reed. There are extensive carpets of Canada mayflower, Solomon's seal, Solomon's plume, bellwort and other flowers, with some wetland species in the wetter areas. Extensive clearing and site preparation has gone on in some areas. With the pressure for recreation areas, the trick is to hang onto the remaining riparian forest.

Resident birds included Canada Goose, Wood Duck, Mourning Dove, Red-bellied Woodpecker, Downy Woodpecker, Blue Jay, Am. Crow, Black-capped Chickadee, Am. Robin, Gray Catbird, N. Mockingbird, Eur. Starling, Warbling Vireo, Com. Yellowthroat, N. Cardinal, Song Sparrow, redwing and Com. Grackle, and Baltimore and Orchard orioles. Migrant birds seen here were Brown Creeper; Ruby and Golden-crowned kinglets; E. Phoebe; Blackpoll, Canada, Magnolia, Yellow-rumped, Wilson's and Palm warblers; Northern and Louisiana waterthrushes; Rose-breasted Grosbeak and White-throated Sparrow.

Conservation: The Riveredge site, because it is larger and wider than the two sites up river from it, has more breeding birds associated with a river corridor such as Wood Duck, both orioles, and Warbling Vireo. It is a good migratory stopover for warblers, wrens, creepers, kinglets and other insectivores. Disturbances from adjacent properties should be minimized and wood cutting should not be permitted to narrow the forest. The area around the substation is the best habitat.

Teaneck

This stretch of the river extends from New Bridge Rd. and the State Green Acres Park at the von-Steuben house south to Route 4; on the west to developments and on the east nearby to River Rd. in Teaneck. This site contains several river front parks on the east bank, Clarence Brett Park and Andreas Park. This park contains an impoundment used by waterbirds and waterfowl for feeding and resting.

The vegetation changes here where the river widens. There are more willows, walnuts and poplars in the openings. There are still tall trees upstream, but the riparian forest narrows as the river widens and development increases. There are several reed marshes here. Common trees were maple, oak, box elder, mulberry, ash and shadbush. Plants included purple loosestrife, wild carrot, bouncing bet, daisy fleabane, white and yellow sweet clover, common St. Johnswort, whorled loosestrife and jewel weed.

Resident birds were Great Egret (feeding); Canada Goose and Mallard; Am. Crow; Killdeer; N. Mockingbird; Warbling Vireo; Yellow Warbler; Song Sparrow; redwing; Com. Grackle; Baltimore Oriole; N. Cardinal and House Finch. Migrant birds included Great Egret, Black-crowned Night-Heron, Am. Black Duck, Mallard, Hooded Merganser, Spotted Sandpiper, Killdeer; Herring and Ring-billed gulls; Fish Crow, Belted Kingfisher, E. Kingbird, E. Phoebe; Yellow-rumped and Palm warblers; White-throated Sparrow and Evening Grosbeak. Common butterflies here were cabbage white, orange sulfur, American lady, tiger swallowtail, spicebush swallowtail and monarch.

Conservation: Land use on this site can not change very much. The west side of the river is wetland and the 2 parks will remain open space.

The impoundment will continue to function as a watetbird stopover site. The path around it on the berm should be maintained for access. A portion of Clarence Brett Park near the New Bridge should be allowed to revert to wetland. It is too low to maintain as lawn.

Hackensack

This large site extends from Rt. 4 south to Fort Lee Rd. in Bogota; on the west to Hackensack, and on the east, to River Road in Bogota. Land owners include Bergen Co. (Vo-tech), Fairleigh Dickinson University, Hackensack City Parks and various developments. There is a narrow band of forest mostly on the east bank. There is one large vacant lot with no signage off Pomander Walk at the bend in river next to River Road on the east bank. There is a dirt road on the east bank of the river at Cedar Avenue. The site lacks habitat for many species.

Resident birds included Canada Goose and Mallards; Am. Crow; Yellow Warbler; N. Mockingbird; Baltimore Oriole; redwing; Com. Grackle and House Finch. Migrant birds found here were Double-crested Cormorant, Great Egret, Com. Merganser, Am. Kestrel, Ring-billed Gull, E. Kingbird, Palm and Yellow-rumped warblers and Com. Yellowthroat.

Conservation: The site has potential for a riverfront walkway. The vacant lot to the right at the end of Pomander Walk behind the fence would have greater value for migratory birds if it were allowed to revegetate, or if it were planted with native trees which grow well near water. This lot appears to be a maintenance area.

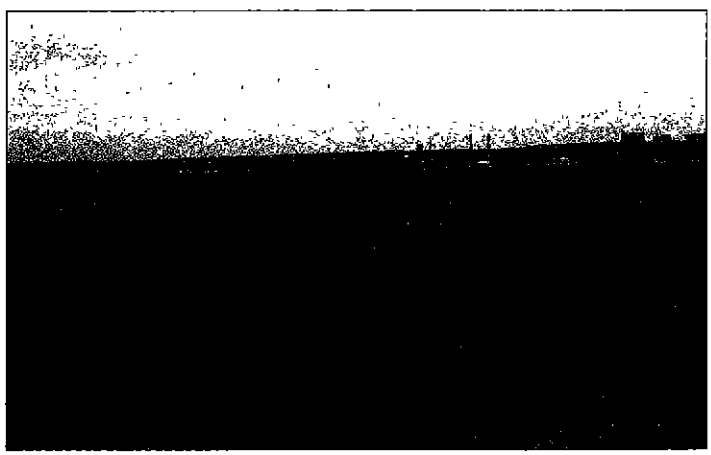
Moonachie Creek

Bounded by Route 120 (Washington Avenue) on the west, the site extends from Route 3 on the south to Moonachie Ave. and Empire Blvd. on the north, and east to the Hackensack River. Access is from Route 120 and the river. This large site includes Bashes, Moonachie, and Doctor's creeks, and the marshes surrounding them, now mostly common reed. Extensive portions of the reed burned on April 23, 1994. There are stands of poplar (sp), ailanthus, and princess tree on filled portions. Observations were made from the Barge Club at Paterson Plank Road, from Veterans Boulevard and from Empire Boulevard as well as from the river by boat.

Resident species here included Yellow-crowned Night-Heron (T), Green Heron, Mallard, Gadwall, N. Harrier (E), Virginia Rail, Com. Moorhen, Spotted Sandpiper, Killdeer, Willow Flycatcher, Marsh Wren, Yellow Warbler, Com. Yellowthroat, Swamp Sparrow and Red-winged Blackbird. An adult Yellow-crowned Night-Heron was observed feeding in Moonachie Creek June 7, 1994 (clearly not a migrant); and two Northern Harriers (a pair) were observed on several dates in April and May of 1995 acting like territorial birds, always in the same spot.

Non-breeding residents frequenting the sight in summer were Great Blue Heron (T), Great Egret, Snowy Egret, Least Tern (E) and Double-crested Cormorant. Migrants here included herons, egrets, Virginia and Sora rails, Com. Moorhen, Am. Black Duck, yellowlegs, snipe, Least and Semipalmated sandpipers, Short-billed Dowitcher, Forster's and Least (E) terns, N. Flicker, E. Kingbird, Purple Martin and Tree, Barn and Bank swallows, Yellow-rumped Warbler, Savannah (T), Song and Lincoln's sparrows, and Bobolink (T). Weekly counts of migratory bird species were conducted in April-May 1995, and Sept.-Oct.-Nov., 1995. See the chart in Appendix 1 for results.

Conservation: Obviously the Moonachie Creek site is important for its feeding herons and waterfowl, its use by listed species (harrier and yellow-crowned), and for its size. As one of the large remaining expanses of wet-



Extensive wetlands on the Moonachie site stretch through the towns of Moonachie and Carlstadt These are feeding grounds for the endangered Northern Harrier and for herons and other waterbirds using the several creeks that flow through the site

PHOTO–Richard Kane



The remnant forest at Losen Slote, with dense shrub layer and canopy, is an excellent stopover habitat for Neotropical forest migrants like warblers, vireos, tanagers and flycatchers.

PHOTO–Richard Kane

lands in the Meadowlands, it links the upper and lower river marshes on the west side of the river. Inroads into the marsh have been made by earlier development. Any more development pressure will fragment the marsh and make the wetland smaller. Spartina is growing along the riverfront on this site, and as the water level rises in the estuary, the salt marsh can be expected in the long term to increase on this and other sites that front the river. As this report is being prepared, the proposed development called Meadowlands Mills threatens to fill more than 200 acres of wetlands within this site. Such a development will, if approved, represent the largest wetland fill in the east since the passage of the Clean Water Act.

Losen Slote

This site is bounded by Losen Slote on the west, the Hackensack River on the east, and the town of Little Ferry on the north. It includes the Bergen County Utility Authority (hereafter BCUA), a large pond and some good quality forest of pin oak with some white and red oak, black gum, sweet gum, and red maple. Access is from Mehrhof Road in Little Ferry. Part of this land is a park, called Losen Slote Creek Park, developed by HMDC and managed by the borough of Little Ferry. It includes a small active recreation area with play ground and ball fields, but most of the park is forested and includes meadow, marsh, and a portion of Losen Slote Creek.

In the forest portion, shrubs include dogwood, blueberry, spicebush, arrowwood, and others and vegetation on the floor includes netted chain fern, cinnamon fern, Canada mayflower, trout lily, violets (spp.), bellwort, turk's cap lily and others. Seedlings of canopy species and the diverse vegetation below the canopy indicate a healthy forest. Portions of the meadow are overgrown by gray birch. Part of the forest extends onto the BCUA property.

Breeding birds at Losen Slote included Mallard and Gadwall, Spotted Sandpiper, Am. Crow, Barn Swallow; Blue Jay, Downy Woodpecker and Tufted Titmouse (permanent residents); Marsh Wren, Yellow Warbler, Com. Yellowthroat, Song Sparrow and redwing. Forest migrants included 5 species of flycatcher, Ruby-crowned Kinglet, Blue-gray Gnatcatcher, 3 species of vireo, 18 varieties of warblers, 5 thrush species, Cedar Waxwing, Rose-breasted Grosbeak, Bobolink (T), four sparrow species, Orchard and Baltimore orioles, blackbirds and Am. Goldfinch. Migrant waterfowl using the BCUA pool were Am. Black Duck, Green-winged Teal, N. Shoveler, Hooded and Common merganser, and Ruddy Duck. Weekly counts of



Ruddy Duck occurs commonly in migration and winter along the river. It is a rare breeder in the lower river marshes in Kingsland and Kearny. Ruddies are often found in the BCUA pool near Losen Slote in Little Ferry.

PHOTO–Deva and Jim Burns, Natural Impacts

forest migrants were made in April-May, 1995. Results appear in the chart in Appendix 1.

Conservation: The Losen Slote site is important for several reasons. The forest, in good condition with an intact floor, shrub layer and canopy, is an oasis for migrant neotropicals. Even though it is only 14 acres it is one of the few forest remnants in the Meadowlands, along with Schmitt's Woods

in Secaucus and Teterboro Airport forest. The imperative here is to maintain the current size of the forest. The park is operated by the borough of Little Ferry. The current balance of woods and active recreation sites should be kept as it is so that the woods is not made smaller. An agreement should be worked out by Little Ferry, the BCUA and the Meadowlands Commission to keep the forest at its present size. Some of the forest is on BCUA land, not on park land, but it is contiguous to the park. The BCUA, by maintaining the forest on their land, would make a contribution to a now regionally rare habitat.

As for the rest of the site, some wetland restoration might be possible, with the manipulation of the tide gate. Both the creek and the BCUA pool are well used by waterbirds, including ducks, sandpipers and herons. Since habitat shrinkage in the estuary has been so severe, every piece is important.

Power Plant Peninsula

Located at the confluence of the Hackensack River and Overpeck Creek, this site includes the west edge of the river on the west and extends east along Overpeck Creek to the New Jersey Turnpike. It extends south to the Losen site. CSX and PSE&G are property owners on the peninsula.

Since much of the peninsula is developed, there are not many breeding species here. But the mudflats and the mouth of Overpeck Creek are well used by feeding migrants and residents from other sites. Among the migratory birds here are Least Tern (E), Double-crested Cormorant, Snowy Egret, Forster's Tern, Ring-billed Gull, Greater Yellowlegs, Semipalmated Sandpiper (in the hundreds on the flats in late July-early August), Spotted Sandpiper, and various waterfowl, including Common and Hooded merganser, Am. Black Duck and Green-winged Teal.

Conservation: Much of the peninsula land is developed and permanently altered. The importance of the site is primarily for the extensive mudflat at the northern end along the Hackensack River, and the waters and flats along Overpeck Creek on the north end of the peninsula. The flats along the Hackensack are used by large numbers of sandpipers, dabbling ducks and loafing gulls. It would be helpful to remove the rocks and other rubble from this flat so that the shorebird habitat could be improved. The Overpeck Creek side is well used by feeding migratory waterfowl and is frequently open in winter when other sites are frozen.



Northern Shrike at Overpeck Creek with Tree Sparrow prey Shrikes are attracted to sites with abundant small birds and mammals in winter.

PHOTO–Kevin Karlson

Overpeck Park

On either side of Overpeck Creek, extensive park land reaches nearly from Route 46 on the south to Route 95 on the north. Fort Lee Road crosses the creek in the upper third of the park. This park land is owned by the county. Much of it is in an undeveloped state. East of the creek, there are some forested portions, extensive stretches of common reed, ball fields, and stables. On the west there are fewer trees, some ball fields, large weedy fields with wet pockets, and a large tidal bar extending into the creek. A conceptual development plan divides the park into areas. Area 2 and Area 3 west of the creek are valuable wildlife sites.

In the nineties, Overpeck West was rediscovered for birding. Many vireos, warblers, and sparrows were reported here in fall migration. Most of the eastern sparrows were seen, including large numbers of Savannah (T), Field, Song, White-crowned, White-throated, Am. Tree, and Swamp sparrows, sometimes in the hundreds. Occurring in small numbers were Lincoln's, Clay-colored, Lark, Grasshopper (T), and Henslow's sparrows (E), and LeConte's Sparrow, a very rare species

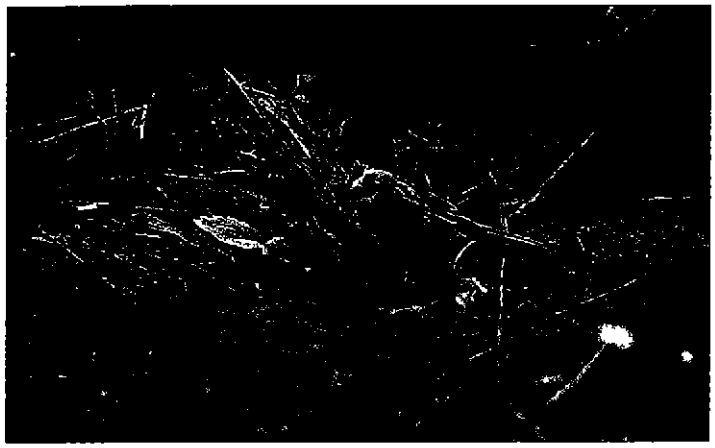
in New Jersey until this decade. The park also was frequented by snipe and other shorebirds such as Pectoral Sandpiper and both yellowlegs; many ducks (especially Com. Merganser); hard to find warblers such as Orange-crowned and Connecticut; and in late fall and winter, American Pipit, Lapland Longspur, and Snow Bunting.

Overpeck East was known primarily as a winter bird site; N. Shrike has been recorded here more than once (photo, *Records of NJ Birds*); Iceland and Glaucous gulls were regularly found in the creek with the Ridgefield Park landfill was operating (1960's, early 1970's, Kane pers. obs.). Scaup, merganser, and other ducks are found in the creek.

Most of the Audubon field work covered Overpeck West, especially the large open meadow which the county plan is calling Area 3. Much of this site is covered with daisy fleabane, mugwort, thistle, white sweet clover, goldenrods, sunflower, evening primrose, white snake root, spotted knapweed, and wild carrot. Butterflies observed here were cabbage white, orange sulphur, clouded sulphur, black swallowtail, question mark and monarch.

Migratory birds using the park are herons, waterfowl, shorebirds, raptors, warblers and vireos, flycatchers, and all the eastern sparrows (25 species).

Weekly counts of migratory species were made in April-May, 1995 and Sept-Oct.-Nov., 1995. Results appear in the chart in Appendix 1.



Clay-colored Sparrow and other rarer sparrows are found at Overpeck Park in fall migration.

PHOTO–Jim Bangma

Conservation: Clearly Overpeck Park continues to be a very important migratory bird habitat. The regionally rare open meadow in Area 3 is especially attractive to migrant passerines in the fall, with its dense cover of fruit and seed bearing plants. The numbers of sparrows and other species using the site in the fall make it a very popular birding spot. The park planning should take this into account. Unfortunately, the county will be tempted to put all the active recreation facilities in Area 3 because there are few constraints such as wetlands and streams. From an ecological point of view and perhaps from a budget point of view, that would be a mistake. The greater chunk of Area 3, from the existing ball fields on the south to the rock pile on the north, should be managed as a wild meadow. Periodically the poplars and ailanthus trees should be removed so the area does not succeed to a mono-culture woodland. The dense undergrowth of mugwort, fleabane, and pokeweed should be maintained, perhaps by bulldozing parts of the fill every 4th or 5th year. The ground cover could be supplemented by scattering native wildflower seeds, thus making an aesthetically pleasing complement to the other park uses. A screen of trees could be left next to Routes 80/95.

The [illegible] crowded area like Bergen County is to cram the maximum facilities into the available land to serve various interests. That defeats the overriding public interest which is the preservation of county-rare open space.

Area 2 at the end of Old Fort Lee Road should be left as is. It already has a trail system, somewhat crude, which could be supplemented by a few boardwalks or small wooden bridges in low wet spots. It is a good migratory bird trap; it contains a freshwater wetland with breeding habitat for Wood Ducks. Area 1 is so disturbed and altered that it may be a logical place to put ball fields. The ball fields would be within walking distance of many residents' homes. Areas 4 & 5 on the east side of the creek already have active uses with stables and ball fields there. Some wetland restoration could be done in the reed areas, as a penalty for violations in the Meadowlands District.

The conservation of Area 2 and much of the meadow in Area 3 is both

a habitat imperative and a people-use imperative. The reason for conserving habitat anywhere in the Meadowlands is obvious. The estuary is only about one third habitat and two thirds permanently altered by landfills and development.

The people-use side of the equation may be less obvious to county parks people and planners. The temptation in a crowded area like Bergen County is to cram the maximum facilities into the available land to serve various interests. That defeats the overriding public interest which is the preservation of county-rare open space. A meadow would be aesthetically pleasing to many folks who can't participate in active recreation. It would be well used by birders, photographers, walkers and painters.

The birding use of the area is very heavy in fall. The park is easily accessible to North Jersey and New York City birders, who respond quickly to bird reports on the phone alerts and the Internet. The economic multiplier effect of birders spending money around and in parks and refuges is well documented (Kerlinger and Wiedener and others) and may be as high as 3 to 1 in an area like this. With numerous bird clubs in the county (and in N.Y. and north N.J.), this is a factor that should not be ignored in planning. The park plan should have a birding component and should advertise it. The county might want to consider enlisting local volunteers to lead bird walks as Great Swamp and Sandy Hook do. The season of prime interest is September to December.



Bellman's Creek has extensive habitat for migratory waterfowl and shorebirds.

PHOTO–Richard Kane

Bellman's Creek

Located east of the Hackensack River opposite Losen Slote, this site extends from the Hackensack River and the New Jersey Turnpike on the west to the Conrail tracks and developments in Ridgefield and Fairview on the east. It is marshland with intrusive development. The southern end of the site is at a narrow point at the creek mouth. The north end of the site is at a cemetery and a substation. Access is from the end of 83rd Street in Gutenberg (North Bergen Twp.). The creek is best viewed from a boat. One side of the creek is vegetated with bushes, including elderberry and groundsel. Bull rush, swamp rose mallow and spike rush were noted in the wetlands.

Breeding birds on site were Gadwall and Mallard, Spotted Sandpiper, Killdeer, Barn Swallow, Marsh Wren, Am. Robin, Willow Flycatcher, Yellow Warbler, and Common Yellowthroat, Song Sparrow, Red-winged Blackbird and Baltimore Oriole. Migrants included Great and Snowy egrets, Black-crowned Night-Heron, Greater and



Snowy Egret feeding in Bellman's Creek. Hundreds of these birds feed in the Hackensack drainage each summer following the breeding season.

PHOTO–Richard Kane

Lesser yellowlegs, Semipalmated Plover, Green-winged Teal and Wood Duck. Northern Harrier (E), a nearby resident, was seen hunting on the site. Weekly counts of migratory bird species were made in Apr.-May, 1995 and also in Sept.-Oct.-Nov., 1995. Results appear in the chart in Appendix 1.

Conservation: This site is notable for its nesting marsh species (Moorhen, Gadwall, Marsh Wren, Yellow Warbler, Willow Flycatcher) as well as for its use by migratory herons, waterfowl (especially teal) and shorebirds, and the endangered Northern Harrier. Because of these viable breeding and migratory populations, the site should be constrained from further development. Although some development has encroached on the site, the remaining portion is still very valuable as its species diversity here attests.

Mill Creek

Located east of the Hackensack River in Secaucus, this site is bounded by the river on the west and north, by the New Jersey Turnpike eastern spur on the east, and Route 3 and the Sewage Disposal and Meadow Lane on the south. It is the site of Hartz Mountain's mitigation project for wetlands development for housing. Access is from Paterson Plank Road, Secaucus. The creek and a portion of the mitigation site can be viewed from the end of Mill Ridge Road at the boat basin. Except for the mitigation project, the marshes are mostly common reed. Dominant vegetation on the mitigation site included water hemp, spartina alterniflora, salt marsh fleabane, and pilewort among others. The upland mitigation islands are vegetated with plantings and have open, sandy patches. Some of the vegetation appears to be dying. The waterfowl are using the islands for nesting.

Breeding species on this site included Mallard, Gadwall, Canada Goose, Tree and Barn swallows, Com. Moorhen, Clapper Rail, Marsh Wren, Spotted Sandpiper, Yellow Warbler, Red-winged Blackbird, Common Grackle and Swamp Sparrow. Migrants recorded here were Double-crested Cormorant, Great and Snowy egrets, Forster's and Least (E) terns, Green-winged Teal, Greater Yellowlegs, Semipalmated Sandpiper, Savannah Sparrow (T) and Am. Pipit. Weekly counts of migratory bird species were made in Apr.-May, 1995 and also in Sept.-Oct.-Nov., 1995. Results appear in the chart in Appendix 1.



Common reed is the dominant wetland vegetation in the lower Hackensack River marshes.

PHOTO–Rhonda Rolf

Conservation: As an improved mitigation project for wetlands losses incurred by a housing development, the site is partially protected. The jury is out long term on whether the project adequately compensates for permitting housing in wetlands. The main problem with projects like this is that they shrink the size of the remaining marshes, too high a price to pay for development. No more wetlands loss should be allowed in this area. The site is important, along with the other creek sites, for migrant Green-winged Teal.

Cromakill Creek

Located east of the river in Secaucus, this site is bounded on the west by the eastern spur of the New Jersey Turnpike, on the north by development in North Bergen, and on the east by the North Bergen Yards. The southern boundary is development north of Paterson Plank Road. Access is poor unless by boat.

Access is prevented by gates on truck terminals. The fills are overgrown with poplars, ailanthus and pawlonia. Common Reed has been scraped away by the Hartz Mountain mirigation project, and bushes planted on elevated islands of upland in the marsh. Vegetation in the mitigation area included salt marsh fleabane, mullein, elderberry, water hemp, pilewort and groundsel-tree. Terrapins and fiddler crabs were common.

Breeding birds included Mallard and Gadwall, Spotted Sandpiper, Com. Moorhen, Barn Swallow, Marsh Wren and Com. Yellowthroat. Among the migrants observed were Great and Snowy egrets, Yellow-crowned Night-Heron (T), Green-winged Teal, Am. Black Duck, N. Shoveler, N. Harrier (E); various shorebirds including Least and Semipalmated sandpipers, Short-billed Dowitcher, Greater Yellowlegs, Ring-billed Gull, Least Tern (E), Am. Pipit and Yellow-rumped Warbler. Weekly counts of migratory birds were made in 1995. See chart in Appendix 1.

Conservation: The site is valuable for marsh birds, herons, some waterfowl, especially Green-winged Teal, shorebirds, and as hunting grounds for the endangered Northern

Harrier. The site was altered during work on the Turnpike and by the Hartz Mountain mitigation project. There are (raised) upland areas in the marsh and there is some salt marsh. There is little access to the site other than by boat. Development has encroached on portions of the site. The rest should be protected so that the marsh corridor along the river remains intact. That is important for Bellman's and Mill Creek as well. The jury is out longterm on these mitigation projects. They have reduced the size of the marsh both by development and by the placement of upland in wetlands. The number one priority in the Meadowlands now has to be the conservation of the existing wetlands.

Berry's Creek

On the west side of the river, this site extends from the Lyndhurst Corporate Park on the west to the river on the east, and from Route 3 on the north to Conrail on the south, just below the Jersey City aqueduct. It contains Berry's Creek and Berry's Creek canal, and marshlands are interspersed with fill, some now reverting to forest. The site is heavily used by wintering raptors, including Rough-legged and Red-tailed hawk, N. Harrier (E), Long-eared (T) and Short-eared (E) owls, Peregrine Falcon (T), Am. Kestrel, and in 1993-1994, N. Goshawk (E) (Dale Rosselet *et al.* pers. comm.) and Cooper's Hawk (E) (Kane pers. obs.).

Berry's Creek also harbors the last remaining N. Harrier (E) nest site in the Meadowlands. Formerly there were at least 4 pairs in the Meadowlands (Kane, *Am. Birds* 1975). The birds were still nesting in 1986 (New Jersey Turnpike Study, Tech. Vol. # II) and in fact, the nest site was partly responsible for stopping proposed new exit 16W of the New Jersey Turnpike. Adult birds still occupied their territory in the 1990's (Kane pers. obs.). The site also contains a N. Harrier winter roost (Bosakowski 1984). The Berry's Creek harriers successfully fledged young in 1995 and 1996 (Kane, pers. obs.).

The upland portions of the site have become overgrown with sunflower, mugwort, wormwood, occasional shrubs such as elderberry, and stands of pawlonia, ailanthus, poplar, wild cherry, and mulberry. The marshes are mostly common reed with some Spartina in the creeks and ditches. The corporate center at the edge of the site has some wetlands and planted conifers. Creeks are lined with elderberry, nightshade, swamp rose mallows, wormwood and dense common reed. East of the Turnpike, there is a large spartina alterniflora section along a small ditch and Mary Ann's Creek, with groundsel, glasswort and orache on the edges.



Nesting and feeding territory of the endangered Northern Harrier at Berry's Creek. This is the only remaining nest site for this species in the Meadowlands, and one of only three or four in Northern New Jersey.
PHOTO–Richard Kane

Still breeding on the site in addition to the harrier were Am. Bittern (T), Gadwall, Com. Moorhen, Ring-necked Pheasant, Killdeer, Spotted Sandpiper; numbers of Willow Flycatcher, Yellow Warbler, and Com. Yellowthroat; Barn Swallow, Am. Robin, E. Kingbird, Marsh Wren, Swamp and Song sparrows, and redwing.

An extraordinary number of migrant species utilized the Berry's Creek site, from cormorants, egrets, herons and teal to Sharp-shinned and Cooper's (E) hawks, Rough-legged Hawk and Am. Kestrel. Large numbers of landbirds were found in the shrubs and trees along the dikes, especially in fall. These included sapsuckers and flickers; phoebes; abundant Palm, Yellow-rumped and Blackpoll warblers; several vireos, Hermit Thrushes, Winter Wren, both kinglets and catbirds. A remarkable assortment of sparrows occurred in fall migration: Song, Swamp, White-throated, White-crowned, Fox, Lincoln's, Field, and Savannah sparrows, often in large flocks, and occasional rarities like Lapland Longspur.

Weekly counts of migratory birds were done in Apr.-May, 1995, and Sept., Oct., Nov., 1995. See the chart in Appendix 1 for results.

Conservation: As the last remaining nesting area for Northern Harrier in the Meadowlands, and the site of a winter harrier roost, this area is deserving of protection for that alone. It also has many other important features: wintering raptors, marsh birds, some neotropicals (Willow Flycatcher, Yellow Warbler, Yellowthroat, etc.), waterfowl, and extensive use by migratory land birds. The site is also important (like the Moonachie site) because it links the lower river marshes with the upper at Route 3, and provides continuous habitat through the middle of the district.

There has been encroachment into the wetlands by development. Further reduction in size will reduce raptor use and lower current breeding populations. The value of the site to wildlife lies both in its size and its location on the river. Bird counts on this site (as on Bellman's Creek) are probably conservative, owing to limitations on access. It is to be expected that this site and the other remaining marsh areas will be important to the endangered Peregrine Falcon. The falcon population is recovering in this part of New Jersey with pairs occurring at PSE&G in Kearny, at the Driscoll and Goethals bridges, and at the Verrazano Bridge.



Long-eared Owl, a state-threatened species, winters in the Hackensack Meadowlands, roosting in pines and spruces, and feeding on voles and mice on the landfills and marshes.

PHOTO–Claude Kleckner

Kingsland

This large site extends from the Conrail line and the Berry's Creek site on the north to Belleville Pike on the south, the New Jersey Turnpike western spur on the east, and railroad and development in North Arlington on the west. It includes the HMDC buildings, the Kingsland Impoundment (100 acres), a large tidal flat (700+ acres), and a portion of Sawmill Creek, as well as a very large landfill. Access is from Valley Brook Ave. in Lyndhurst.

It is the best reported and best birded site in the Meadowlands. Kane has written extensively on this site (Kane 1973, 1975, 1982). Others have described the fauna at this site and the Berry's Creek site to the north as well (Black 1970, Bosakowski 1984). The annual fall shorebird migration is spectacular when the Kingsland impoundment is drawn down (Kane 1975, 1982). Pied-billed Grebe (E), Ruddy Duck, Am. Coot, Com. Moorhen, Gadwall, and Least Bittern, among other birds, have bred in the impoundment. The tidal flat is heavily used by dabblers, gulls, and shorebirds on low tide, and terns, herons, diving ducks, cormorants, and grebes on other tides. Diamond-backed terrapin, muskrat, and raccoons are also found here.

In addition to the tidal flat and the 99 acre impoundment, Kingsland also harbors several landfills which are currently overgrowing and undergoing closure. The sides of one of them have been planted with flowers, shrubs, and pines. Maples and sycamores have been planted on the road to the environment center. There are trails on the site, on the landfill and through the impoundment (boardwalk).

Breeding species during the study period were Com. Moorhen, Mallard, Gadwall, Am. Black Duck, Blue-winged Teal, Killdeer, Barn and Tree swallows, Marsh Wren, grackles and redwings.

Migrants ranged from herons, waterfowl and raptors to gulls, shorebirds and small landbirds. Egrets are common here. Gadwall, Ruddy Duck, N. Shoveler and Canvasback are common migrants and wintering birds. Shorebird use can be spectacular, with the right draw-down conditions. Some 8,000 Semipalmated Sandpipers were recorded in the impoundment July 23, 1994. Both yellowlegs occur in the hundreds, and over 20 species of shorebirds use the impoundment annually, as do numbers of feeding Least (E) and Forster's terns. Great Black-backed and Herring gulls can be in the thousands here, and the uncommon Lesser Black-backed, Glaucous and Iceland gulls also occur here in winter.

Conservation: As the centerpiece of the Meadowlands District, this area has received a great deal of attention. A landfill has been landscaped,

trails and boardwalk installed, boxes put up for Tree Swallows, and an excellent exhibit on the Meadowlands installed in the Environment Center. Although much of the site is protected, there are some management imperatives. One is to draw down the impoundment at Kingsland Creek, at least during July through October, for shorebird use. Counts in the 1970's, when the pool was drawn down by the Mosquito Commission (Kane, 1975, 1981), indicate how valuable the pool is to migrant shorebirds, especially on high tide.



Landfill above marsh and tidal flat is a familiar scene in the Hackensack Meadowlands.

PHOTO–Rhonda Rolf

Another imperative is the use of cover on the landfills to be closed. Native species are best. Sculpting freshwater wetlands on the slope of closed landfills should also be looked at as a way of replacing lost wetlands. Seeding in some native grassland habitat would restore some of the threatened grassland bird community to the Meadowlands, where they nested only sporadically in the past (e.g. Bobolink, Savannah Sparrow (both T) and perhaps Dickcissel—see Kane, *RNJB* 1975). Since the end uses of landfills are limited, the opportunity for restored habitat will be available on much of the 1,600 landfill acres in the district.

Sawmill Creek Wildlife Management Area

Located between the New Jersey Turnpike western spur and the Hackensack River, this site extends from the Erie Lackawanna Railroad tracks on the north to the Conrail tracks near Laurel Hill on the south. It is mostly New Jersey State Wildlife Management Area and is a prime site for waterfowl with flyway significance, wintering hundreds of N. Pintails and Canvasbacks, and good numbers of other species as well. Access is by boat, and on the north and south by rail-road track. This area is also a feeding ground for breeding and wintering harriers.

Breeding birds at Sawmill included Gadwall, Mallard, Com. Moorhen, Am. Black Duck, Marsh Wren and Swamp Sparrow. The many migrants here included egrets, Black-crowned and Yellow-crowned night-herons, Glossy Ibis, cormorants, Gadwall, teal, mergansers, many shorebirds on low tide and hundreds of Herring, Great Black-backed and Ring-billed gulls.

Conservation: Sawmill is already protected by its designation as a state Wildlife Management Area. Over the long term, the marsh should continue to see an increase in spartina as the harbor estuary sustains the rise in sea level of about 11 inches per century (McKenzie, 1992).

Kearny Marsh East

West of the S-curve in the Hackensack River in Kearny lies the Kearny Marsh East. It stretches from the river on the east to the triangle formed by New Jersey Turnpike western spur and Belleville Pike on the west. It is bounded on the north by Conrail, below the Sawmill site. Access is via the Amtrak road from Belleville Pike. The southeastern boundary is the Amtrak line. This site is valuable for feeding Least Terns (E), roosting Black-crowned Night-Herons, and wintering Pied-billed Grebe (E), as well as breeding Pied-billed Grebe (E) and Am. Coot. The marsh consists of shallow pools with reed fringes. This site is flooded from the river at the S-curve through a culvert. It includes 2 radio stations, one with a catwalk that makes a convenient perch for gulls, cormorants and terns.

Other breeders here included Least Bittern, Com. Moorhen, Gadwall, Spotted Sandpiper, Marsh Wren, Com. Yellowthroat and redwing. In summer, cormorants, egrets, other herons, and Least (E) and Forster's terns use the site for feeding. Waterfowl are especially abundant in migrations. Gadwall, Mallard, N. Shoveler, Green-winged Teal, N. Pintail, all three mergansers and lesser numbers of scaup, wigeon, goldeneye and canvasback are found here as are migrant Horned and Red-necked grebes.

Conservation: Kearny Marsh East has now become as good as Kearny Marsh West was in the 1970's. The marshes here are flooded by intake pipes at the river. The shallow reed marsh is ideal for its populations

of breeding coots, grebes, moorhens and waterfowl, and its feeding and roosting populations of egrets, night-herons, gulls, terns and cormorants. The island where the sub-adult night herons have their winter roost might be the site of a future Black-crowned Night-Heron rookery. In 1995 the site was the premier migrant waterfowl site in the spring migration. Because of the flow from the river, there is always at least a small patch of open water in winter. This is critical for wintering coots, grebes, and herons as well as wintering waterfowl.



Great Egret in Kearny Marsh East.

PHOTO–Richard Kane

The WMCA radio towers may well become the site of a cormorant colony when the current sub-adult population matures. Kearny East is probably now the best unprotected wetland site in the Meadowlands. It may require management of the water levels at some future time. Periodic surveys of wildlife on the site will dictate what the management should be. No development should be permitted to intrude on this flooded site. It needs a permanent open space designation under HMDC zoning or a permanent conservation ownership. The site is also important as a flood control area.

Kearny Marsh West

This site lies west of the New Jersey Turnpike western spur and Belleville Pike, west of the previous site, and extends off the Weehawken map to the west. Access is from Belleville Pike, Conrail tracks, and Schuyler Ave. in Kearny. Access by canoe can be had from Gunnell Oval, a park off Schuyler Ave. in Kearny.

This famous reed marsh was home to a large Black-crowned Night-Heron rookery, a Least Bittern population (historically 35+ pairs), a large summer egret roost, occasionally to Glossy Ibis, and Yellow-crowned Night-Heron (T), breeding Am. Coot, Com. Moorhen, Pied-billed Grebe (E), and many ducks (Kane 1979). It now has a large feeding population of cormorants and has changed to more brackish water. The herons still nest there as do the ducks and moorhens, but the grebes and coots are mostly gone since the fish and vegetation changed. Other breeders include Green Heron, Spotted Sandpiper, Marsh Wren, Brown Thrasher, Yellow Warbler, Com. Yellowthroat, Swamp Sparrow, Indigo Bunting and redwing.

The 350 acre triangular marsh is surrounded on all 3 sides by railroad embankments which seal it off from the surrounding area. There is salt water intrusion through a broken tide gate. Several old landfills adjacent to the railroad embankments and the marsh have succeeded from mugwort, pokeweed, Japanese knotweed, elderberry and other shrubs to poplar, mulberries, pawlonia, ailanthus and wild cherry. The Belleville Pike (Rt. 7) divides Kearny Marsh West from Kearny Marsh East.

Conservation: This marsh was protected by an open space zoning requirement under the HMDC. Together with Kearny East, it is important to the Meadowlands populations of waterbirds, muskrats, and in short, of all wetland species. Even if the night-heron rookery disappears, the site is very important for feeding and roosting birds in post-breeding dispersal and migration. The Meadowlands District wetlands, taken as a whole, are the feeding grounds for hundreds of egrets, ibis, night herons, Green Herons and Great Blue Herons (T) from July to October. Conservation of migratory waterbirds can not be accomplished simply or solely by protecting the breeding sites. Feeding and roosting areas are also important. The open space designation both of this site and Kearny East should be permanent.

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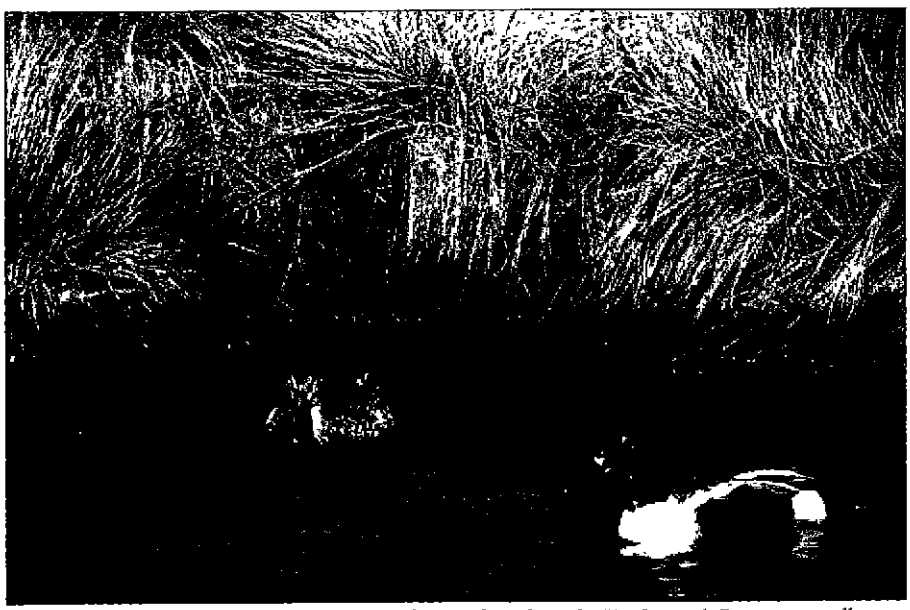
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Northern Shoveler is a common migrant in the marshes along the Hackensack River, especially in Kingsland or in Kearny Marsh East

PHOTO–Chip Krilowicz

Appendix 1.
Weekly Migratory Bird Counts at Nine Selected Sites on the Hackensack River.

Forest Migratory Bird Counts at Losen Slote—April - May 1995

Spotted Sandpiper*					1		
American Woodcock*					1		
Northern Flicker*	7	2	4	3	2	2	2
Eastern Wood Pewee						2	
Willow Flycatcher*						1	
Eastern Phoebe*	6	1	1				
Great Crested Flycatcher					1		
Eastern Kingbird						1	1
Barn Swallow*						1	
House Wren					2		
Ruby-crowned Kinglet	2		3	1	2		
Blue-gray Gnatcatcher			2	1	1		
Veery					1		1
Swainson's Thrush					1	2	
Hermit Thrush	1		3				
Wood Thrush					3		1
American Robin*	5	13	8	8	7	2	7
Gray Catbird*				5	4	7	7
Brown Thrasher*				2	1	1	1
American Pipit						1	
Cedar Waxwing							5
European Starling							
Solitary Vireo			4	1	2		
Warbling Vireo							1
Red-eyed Vireo				3			4
Nashville Warbler							1
Northern Parula				2	5		
Yellow Warbler*						2	2
Chestnut-sided Warbler					1		
Magnolia Warbler					1	3	
Black-throated Blue Warbler					2		
Yellow-rumped Warbler		2	28	12	23		
Black-throated Green Warbler				3		3	
Pine Warbler	1						
Palm Warbler	1	2	3		1		
Bay-breasted Warbler						2	
Blackpoll Warbler						5	
Black and White Warbler				6	1	1	1
American Redstart					1		
Ovenbird				4	6	2	
Common Yellowthroat*				2	3	3	3
Wilson's Warbler							1
Canada Warbler							4
Rose-breasted Grosbeak				2		1	1
Eastern Towhee		8	4	6	2	1	
Swamp Sparrow				3	1	1	
White-throated Sparrow	1	3	40	13	12		
Dark-eyed Junco	2	2					
Bobolink						2	
Red-winged Blackbird*		4	4	2	4	4	2
Common Grackle			8		1	1	
Brown-headed Cowbird	1	4		2			
Orchard Oriole						1	
Baltimore Oriole*						4	2
American Goldfinch		2	4	4	3	2	3

- **Permanent residents excluded.**
- **Pin oak - gum forest, about 14 acres.**
- **1 hour visits.**
- **Migratory birds breeding on site indicated by *.**

Forest Migratory Bird Counts at Oradell Gate 6—April - May 1995

Great Blue Heron				1			
Black-crowned Night Heron						2	
Wood Duck*		2					
Yellow-billed Cuckoo*?							1
Chimney Swift						2	
Belted Kingfisher	1					1	1
Northern Flicker*	2	8	8	4	1	4	2
Eastern Wood Pewee*						1	
Eastern Phoebe*			4				
Great Crested Flycatcher*						1	1
Eastern Kingbird*							2
Northern Rough-winged Swallow					2		
Bank Swallow				2	10		
Barn Swallow					5	5	
Fish Crow*	2	6	1	2	2	4	3
Red-breasted Nuthatch*		2					
Brown Creeper*		1	1		1	1	
House Wren*						2	
Golden-crowned Kinglet	8						
Ruby-crowned Kinglet	3	4	20	2			
Blue-gray Gnatcatcher			1	2	2	1	
Veery*						10	11
Hermit Thrush	3	5	1				
Wood Thrush*				1		6	11
American Robin*	10	8	4	4	3	3	5
Gray Catbird*				5	6	10	14
Brown Thrasher*		1		1			1
Cedar Waxwing*							8
Solitary Vireo			4	1	1		
Red-eyed Vireo*				2	2	13	11
Blue-winged Warbler*					2	2	
Northern Parula					2	1	1
Magnolia Warbler						1	
Yellow-rumped Warbler		1	2	40	20	2	
Blackburnian Warbler							1
Pine Warbler*	2	9	5	2	5	2	2
Prairie Warbler							1
Blackpoll Warbler							5
Black and White Warbler			3	3	3	1	
American Redstart				1			2
Ovenbird*				4	3	10	11
Common Yellowthroat*				4	5	6	5
Wilson's Warbler						1	
Scarlet Tanager*					2	2	2
Rose-breasted Grosbeak						2	
Indigo Bunting							1
Eastern Towhee*			9	4	8	6	5
Field Sparrow		1					
White-throated Sparrow	1	1	13	5			
Dark-eyed Junco	1	2		1			
Red-winged Blackbird*					1		3
Rusty Blackbird		2					
Common Grackle*		2		3	1		
Brown-headed Cowbird*		2		3	1		
Baltimore Oriole*						2	2
American Goldfinch	6	8	4	2	2		1

- **Permanent residents excluded.**
- **Sycamore, mixed hardwoods, conifer plantings, 50+ acres.**
- **1 hour visits. Figure eight path.**
- **Migratory birds breeding on site indicated by *.**

Forest Migratory Bird Counts at Old Tappan—April - May 1995

Great Blue Heron		1					
Wood Duck*	4	8	7	2	2		7
Sharp-shinned Hawk		1					
Red-shouldered Hawk*?					1		
Broad-winged Hawk		1					
Solitary Sandpiper						1	
Yellow-billed Cuckoo							1
Belted Kingfisher*		1		1		1	1
Northern Flicker*	4	8	5	5	5	4	3
Eastern Wood Pewee*						2	2
Eastern Phoebe	2	1					
Great Crested Flycatcher*					2	4	3
Eastern Kingbird*						1	
Barn Swallow						2	
Fish Crow	5	2	1	1	2		
House Wren*							1
Ruby-crowned Kinglet	1	3	5	1			
Veery*					1	5	10
Hermit Thrush		1	2				
Wood Thrush*				1	1	6	6
American Robin*	2	2	2	3	3	2	6
Gray Catbird*				2	2	8	18
Brown Thrasher*			1			1	
Cedar Waxwing						6	25
Solitary Vireo			1	2			
Red-eyed Vireo*				2		5	12
Blue-winged Warbler				1			1
Northern Parula				4		2	
Chestnut-sided Warbler				1			
Black-throated Blue Warbler						2	
Yellow-rumped Warbler			3	3	5	5	
Black-throated Green Warbler						1	
Blackburnian Warbler						1	
Pine Warbler		3					
Palm Warbler	1	12	2	1			
Blackpoll Warbler							5
Black and White Warbler				2	1		
American Redstart*				1			2
Worm-eating Warbler						1	
Ovenbird*				1	2	5	10
Common Yellowthroat*				1	1	5	4
Canada Warbler							1
Scarlet Tanager*						2	4
Rose-breasted Grosbeak*						1	2
Indigo Bunting							1
Eastern Towhee*		2	1	3	3	2	3
White-throated Sparrow		1	2	1			
Red-winged Blackbird				2	4		1
Rusty Blackbird	40	12	2	5			
Common Grackle*			24	5	4	6	12
Brown-headed Cowbird*?			1				
Baltimore Oriole						1	2
American Goldfinch				1	15		2

- **Permanent residents excluded**
- **Beech, mixed oak, hardwood swamp, riparian forest. 50+ acres.**
- **1 hour visits. Linear path.**
- **Migratory birds breeding on site indicated by *.**

Spring Migratory Bird Counts at Berry's Creek—April - May 1995

Double-crested Cormorant		2	3	1	4	1
American Bittern (T)			3			
Great Egret					2	
Snowy Egret		10	6	4	4	2
Black-crowned Night Heron			1			
Glossy Ibis			1			
Green-winged Teal	15		2			
Mallard Duck	12	10	10	8	15	1
Gadwall		12	12	7	4	3
Turkey Vulture		1				
Northern Harrier (E)			1	3	1	2
American Kestrel			1			
Clapper Rail						2
Common Moorhen			1			1
Killdeer	4	2	2	2	2	1
Greater Yellowlegs	14	5	14	3	3	
Lesser Yellowlegs		3				
Solitary Sandpiper						1
Spotted Sandpiper		2	1	1	8	1
Least Sandpiper	1		2	7		
Common Snipe		2				
Laughing Gull					1	
Ring-billed Gull		2	1		10	
Herring Gull			2			
Great Black-backed Gull			1		1	
Ruby-throated Hummingbird			1			
Northern Flicker		2		1		
Alder Flycatcher						1
Willow Flycatcher				6	2	16
Eastern Phoebe				1		
Eastern Kingbird						1
Tree Swallow	5	3	4	2	2	2
Northern Rough-winged Swallow				2		2
Barn Swallow		1	20	3	2	2
Fish Crow	3		1			
House Wren			1			
Marsh Wren			2	8	11	18
Ruby-crowned Kinglet		1				
Blue-gray Gnatcatcher	1					
American Robin	25	6	7	10	2	16
Gray Catbird		1	8	12	10	13
Brown Thrasher			1	4		
Cedar Waxwing						10
Warbling Vireo			1	2		1
Northern Parula						1
Yellow Warbler	4	5	15	19	8	17
Black-throated Blue Warbler					1	
Yellow-rumped Warbler	3	3	4			
American Redstart						1
Northern Waterthrush				2		
Common Yellowthroat		5	13	18	9	16
Rose-breasted Grosbeak			1			
Indigo Bunting			2			1
Eastern Towhee	3	2				
Savannah Sparrow (T)		6	2	4		
Song Sparrow	15	14	8	12	4	13
Swamp Sparrow	1	4	8	10	2	2
White-throated Sparrow		14	2			
Red-winged Blackbird	45	30	55	57	40	75
Common Grackle				1		1
Brown-headed Cowbird	2	2	5			1
Orchard Oriole			1			
Baltimore Oriole			2	2		2
American Goldfinch	8	6	10	10		1

• **Habitat – reed, overgrown fill, tidal creeks, salt marsh; duration of visits 2 1/4 hrs.; permanent residents excluded**

Spring Migratory Bird Counts at Moonachie Creek—April - May 1995

Double-crested Cormorant					1	
Great Egret				1	2	
Snowy Egret					6	
American Black Duck					2	
Mallard Duck	10	2	2		20	
Gadwall		2		2	3	
Lesser Scaup		1				
Northern Harrier (E)	2	2		1		1
Red-tailed Hawk				1		
Virginia Rail				1		
Sora Rail		1				
Killdeer	1					
Greater Yellowlegs	1	3	2		7	
Spotted Sandpiper			1		3	
Least Sandpiper					2	
Common Snipe		4				
Ring-billed Gull			1		15	1
Herring Gull				1	24	
Least Tern (E)					3	
Northern Flicker		2	1		1	
Willow Flycatcher					1	3
Eastern Kingbird					1	1
Tree Swallow	3					
Barn Swallow	8	2	10	12	18	10
Fish Crow			1			
Marsh Wren		2	1	2	10	10
American Robin		4	3	2		2
Gray Catbird		1	2	3		2
Cedar Waxwing					12	
Yellow Warbler			3	2	2	4
Yellow-rumped Warbler		2	2			
Blackpoll Warbler			1			
Black and White Warbler			1			
Common Yellowthroat		5	7	6	6	6
Savannah Sparrow (T)		2	2			
Song Sparrow	4	6	4	3		3
Lincoln's Sparrow						1
Swamp Sparrow		4	6	6	1	2
Red-winged Blackbird	12	18	25	19	4	17
American Goldfinch		4		2		

- Habitat – reed, tidal creeks, 1 small freshwater marsh.
- Permanent residents excluded from counts.
- Duration of visits – 3/4 hour.

Spring Migratory Bird Counts at Mill Creek—April - May 1995

Horned Grebe			1			
Double-crested Cormorant		1	3		1	2
Great Egret	1					
Snowy Egret	3	2	2	2	1	
Green-winged Teal			2			
Mallard Duck	2	2	2	2		
Gadwall	4				1	
Common Moorhen	1					
Greater Yellowlegs			3	1	1	
Spotted Sandpiper			3	1	1	2
Least Sandpiper			3	1		
Ring-billed Gull	10		3	1		
Herring Gull					10	
Least Tern (E)				3		
Tree Swallow	2		2	2	4	2
Barn Swallow	2			3	2	2
Marsh Wren			1		1	1
American Robin		1				
Common Yellowthroat					2	1
Song Sparrow					1	1
Red-winged Blackbird			6	4	4	8
American Goldfinch			3			

- Habitat – salt marsh, reed, upland islands (mitigation site).
- Permanent residents excluded from counts.
- Duration of visits – 1/4 to 1/2 hour.

Spring Migratory Bird Counts at Overpeck Creek—April - May 1995

Pied-billed Grebe	1						
Double-crested Cormorant	60	40	45	40	45	65	55
Great Egret	2					1	1
Black-crowned Night Heron				1		1	
Mallard Duck	10		4	2		4	8
Common Merganser	8						
Osprey (T)		1					
American Kestrel					1		
Killdeer	2	1	2	2	2	4	2
Greater Yellowlegs			1				
Solitary Sandpiper				2	1		
Spotted Sandpiper			1	4	4	2	4
Least Sandpiper					3		
Common Snipe			1				
Ring-billed Gull	16	10	22	5	12	2	3
Herring Gull	10	6		4	4	4	2
Great Black-backed Gull	6	3	6	1	8	6	8
Chimney Swift		1					
Ruby-throated Hummingbird					1		
Belted Kingfisher	1						
Northern Flicker	1	4					1
Willow Flycatcher						1	3
Eastern Kingbird				1	1		
Tree Swallow	4						
Barn Swallow	12	4	25	8	6	8	6
Fish Crow			1				
Hermit Thrush	1						
American Robin		3	8	3	2		2
Gray Catbird				1	4	2	2
Brown Thrasher			1	1			
Warbling Vireo				1	2	3	2
Northern Parula			1				
Yellow Warbler		1	5	9	6	6	7
Yellow-rumped Warbler		1	3				
Palm Warbler	2						
Common Yellowthroat			3	4	4	6	7
Indigo Bunting						1	4
Eastern Towhee			1	1	1		
Field Sparrow	1						
Savannah Sparrow (T)	3	18	24		10		
Song Sparrow	12	10	10	8	11	11	11
White-throated Sparrow				2			
Bobolink						5	
Red-winged Blackbird	4	4	9	9	7	7	9
Brown-headed Cowbird	2	2	2	4	2	1	5
Baltimore Oriole						2	1
American Goldfinch	4	8	4	6	3		5

- **Habitat – overgrown fill, occaslonal pools, tidal creek.**
- **Permanent residents excluded from counts.**
- **Duration of visits 1 hour.**

Spring Migratory Bird Counts at Bellman's Creek—April - May 1995

Double-crested Cormorant					1	
Great Egret			1			
Snowy Egret	1	3		1	3	2
Black-crowned Night Heron					1	
Green-winged Teal					3	
Mallard Duck	2		2	2	10	10
Gadwall					1	
Greater Yellowlegs					5	1
Lesser Yellowlegs			1			
Spotted Sandpiper					8	
Ring-billed Gull					4	
Herring Gull					5	
Willow Flycatcher					1	1
Northern Rough-winged Swallow						1
Barn Swallow					20	20
American Robin					1	
Gray Catbird			1			
Common Yellowthroat					1	1
Song Sparrow					1	1
Red-winged Blackbird	3	1	15	6		8

- **Habitat – reed, tidal creek, some fresh water marsh, upland islands, some salt marsh.**
- **Permanent residents excluded from counts.**
- **Duration of visits – 3/4 hour.**

Spring Migratory Bird Counts at Cromakill Creek—April - May 1995

Double-crested Cormorant					1	
Snowy Egret	2	4	2	4	4	2
Yellow-crowned Night Heron (T)					1	
Green-winged Teal		5	2			
Mallard Duck		2	4	3	8	5
Gadwall					3	
American Kestrel					1	
Greater Yellowlegs		1		1	2	
Spotted Sandpiper			1	1	5	
Ring-billed Gull				4		7
Herring Gull					4	1
Barn Swallow					30	20
Yellow Warbler					2	
Song Sparrow					1	
Red-winged Blackbird			2		10	15

- **Habitat – salt marsh, mud flat, upland islands (mitigation site).**
- **Permanent residents excluded from counts.**
- **Duration of visits – 1/4 to 1/2 hour.**

Fall Migratory Bird Counts at Berry's Creek, Part 1—July – Nov. 7, 1995

Double-crested Cormorant	1			1	4	2	120
Great Blue Heron (T)							1
Great Egret			3	3	1	1	
Snowy Egret	2	6	3	4	18	2	1
Little Blue Heron (T)							1
Green Heron					2		1
Glossy Ibis				1			
Black-crowned Night Heron	2	2					
Green-winged Teal						21	2
American Black Duck						8	
Mallard						15	
Blue-winged Teal						2	
Gadwall	1		2				1
Osprey						2	2
Northern Harrier (E)	3	3					2
American Kestrel						1	
Common Moorhen		2					
Semipalmated Plover						6	12
Killdeer	1		1		1	4	
Greater Yellowlegs		3		1	4	30	96
Lesser Yellowlegs		2	3			40	15
Spotted Sandpiper	2	1					
Semipalmated Sandpiper		80				6	10
Least Sandpiper			2			1	
Laughing Gull					19		
Ring-billed Gull		1					1
Herring Gull	1	2			4	2	1
Great Black-backed Gull		1		3	6	1	
Forster's Tern				1			
Belted Kingfisher							1
Northern Flicker		2	2			1	
Willow Flycatcher	12	15	13	12			
Eastern Kingbird	1	2	1			1	
Barn Swallow	8	12	5	5			
Marsh Wren	14	12	11	12		2	
American Robin	26	14	7	6		14	10
Gray Catbird	11	15	12	9		10	8
Brown Thrasher		1					
Cedar Waxwing	4						1
Warbling Vireo	1	1					
Red-eyed Vireo						1	
Yellow Warbler	13	2	4				
Palm Warbler						1	17
Blackpoll Warbler							1
Common Yellowthroat	22	12	9			9	6
Indigo Bunting		1	3			3	1
Savannah Sparrow (T)						3	1
Song Sparrow	13	13	13	11		9	10
Swamp Sparrow	4	8	8	6		1	
White-throated Sparrow							5
Bobolink (T)			2			2	5
Red-winged Blackbird	145	40	50	35	2	4	9
Common Grackle						1	
American Goldfinch	8	12	10			5	

• **Habitat – reed, overgrown fill, tidal creeks, salt marsh; permanent residents excluded.**

Fall Migratory Bird Counts at Berry's Creek, Part 2—July - Nov. 7, 1995

Double-crested Cormorant	1	2		1	1	
Great Blue Heron (T)		1	1	1		
Great Egret	1	1	4		3	2
Snowy Egret	3					
Green Heron	1					
Green-winged Teal	46	11	19	12	60	23
American Black Duck				2	4	
Mallard					4	
Gadwall	2	1	2			
Osprey (T)	1					
Northern Harrier (E)			2	2		1
Sharp-shinned Hawk		1	1			
Cooper's Hawk (E)		1	1			2
Red-tailed Hawk					2	3
American Kestrel	1	1		1		
Semipalmated Plover	2		1			
Killdeer	1					
Greater Yellowlegs	135	2	51	2	9	
Lesser Yellowlegs	10	1	4	1		
Semipalmated Sandpiper	1					
Least Sandpiper	1					
White-rumped Sandpiper	2					
Laughing Gull		4				
Ring-billed Gull		31				
Herring Gull		1	1	2	20	
Great Black-backed Gull		4	3			
Northern Flicker	12	5		2		1
Eastern Phoebe					1	
Black-capped Chickadee					8	
Brown Creeper			1			
House Wren			1			
Winter Wren						1
Marsh Wren		1		1		
Golden-crowned Kinglet			4	4	11	4
Ruby-crowned Kinglet			9	5	12	4
Swainson's Thrush		1				
Hermit Thrush			2	1	2	
American Robin	15	20	17	15	28	35
Gray Catbird	20	2	2	6		
American Pipit						2
Cedar Waxwing	3					
Yellow-rumped Warbler	6	110	310	345	155	80
Palm Warbler	10	15	10	7	1	
Blackpoll Warbler	3			1		
Common Yellowthroat	2		3	1		
Eastern Towhee		1	1			
American Tree Sparrow					2	
Field Sparrow		1		4		
Savannah Sparrow (T)		1	8	6		
Fox Sparrow					1	
Song Sparrow	7	55	20	35	44	27
Lincoln's Sparrow	1				1	
Swamp Sparrow	9	8	5	75	23	34
White-throated Sparrow	8	10	12	57	47	46
White-crowned Sparrow			3	4		
Dark-eyed Junco			3	5	6	
Lapland Longspur					1	
Bobolink (T)		1				
Red-winged Blackbird	6	25	76	74	55	22
Rusty Blackbird		2				
Common Grackle						25
Brown-headed Cowbird						3
Purple Finch	1	2	2	2		4
American Goldfinch		4	6	5		10

Fall Migratory Bird Counts at Moonachie Creek, Part 1—July - Nov. 7, 1995

Double-crested Cormorant			1		4		
Great Blue Heron (T)			1	1			
Great Egret		1					2
Snowy Egret	1				6		
Green Heron					1		
American Black Duck					2		
Mallard			1		35	2	
Osprey (T)					2		
Northern Harrier (E)						1	
Sharp-shinned Hawk							1
Common Moorhen	1						
Killdeer	1						
Greater Yellowlegs			1	6	7		
Lesser Yellowlegs				4			
Spotted Sandpiper				1	2		
Semipalmated Sandpiper			95	85	1		
Least Sandpiper	7	2					
Short-billed Dowitcher			15				
Laughing Gull				3	8	3	2
Ring-billed Gull				2	8		8
Herring Gull		5		4	20	6	9
Great Black-backed Gull				1	7	2	7
Forster's Tern				2	1		
Least Tern (E)			2				
Northern Flicker			2			1	
Willow Flycatcher	5	3					
Eastern Kingbird				1			
Purple Martin				1			
Bank Swallow				1			
Barn Swallow	12	10	17	20			
Marsh Wren	3	1	1	6		1	
American Robin	4	2					
Gray Catbird	1		2				
Yellow Warbler	3						
Common Yellowthroat	8	5	5			2	
Indigo Bunting			3			1	
Song Sparrow	5	3	5				
Swamp Sparrow	7	5	8	6			
Dark-eyed Junco							1
Bobolink (T)						23	
Red-winged Blackbird	30	7	12				3
American Goldfinch		6	2				

- **Habitat – reed, tidal creeks, 1 small freshwater marsh.**
- **Permanent residents excluded from counts.**

Fall Migratory Bird Counts at Moonachie Creek, Part 2—July - Nov. 7, 199

Pied-billed Grebe (E)			2			
Double-crested Cormorant		3				1
Great Blue Heron (T)		7	1			4
Great Egret	1					
Snowy Egret		1				
Green Heron		1				
Green-winged Teal		40		34		
American Black Duck	1		3			
Mallard		14			1	
Lesser Scaup						1
Bufflehead						6
Ruddy Duck		6			29	
Osprey (T)		1				
Northern Harrier						2
Sharp-shinned Hawk	1					
American Kestrel		1				
Red-tailed Hawk						3
Greater Yellowlegs			4		8	
Dunlin			2			
Laughing Gull	4	15	1		1	19
Ring-billed Gull	2	13	1		2	17
Herring Gull	1	2				8
Great Black-backed Gull		2				3
Belted Kingfisher		2				1
Northern Flicker	2					
Eastern Phoebe			1			
Black-capped Chickadee					8	
Winter Wren					1	
Golden-crowned Kinglet					8	
Ruby-crowned Kinglet			3		1	
American Robin	2			1		
Gray Catbird	2			1	1	
Yellow-rumped Warbler		35	20	40	25	
Palm Warbler	1	2	2	1		
Common Yellowthroat					1	
Field Sparrow					3	
Savannah Sparrow (T)	5	35	25	15		2
Song Sparrow			4	10	25	15
Swamp Sparrow		5		1	4	2
White-throated Sparrow	1	6		5	7	4
White-crowned Sparrow					3	
Dark-eyed Junco					16	2
Brown-headed Cowbird					150	
Red-winged Blackbird			16	10		20

Fall Migratory Bird Counts at Overpeck Creek, Part 1—July - Nov. 7, 1995

Double-crested Cormorant	10	8	22	34	60	120		110
Great Blue Heron (T)	5				1	1	3	3
Great Egret					1			
Snowy Egret		1			1			
Mallard		1			2			
Osprey (T)					1			1
Cooper's Hawk (E)								1
American Kestrel						3	12	5
Killdeer	3					1		
Spotted Sandpiper	1	11		1				
Least Sandpiper	2							
Laughing Gull						1		
Ring-billed Gull	16	32	13	18	3			2
Herring Gull	1	1	1	2	2	4		
Great Black-backed Gull			1	1	4	2		
Chimney Swift		3		1				2
Northern Flicker	1		1			2	7	10
Eastern Phoebe						1		1
Willow Flycatcher	1	3						
Eastern Kingbird	2		1	2				
Tree Swallow		1						
Bank Swallow		1	2					
Barn Swallow	17	25	5	4				
Blue Jay								3
Ruby-crowned Kinglet								2
American Robin	17	12	2					
Gray Catbird	5	3	3			7		
Brown Thrasher						1		
Cedar Waxwing	1				2			
Warbling Vireo	2							
Yellow Warbler	5	1	4	3		1		
Yellow-rumped Warbler								32
Black-throated Green Warbler								2
Palm Warbler						11	16	12
Bay-breasted Warbler						1		
American Redstart							1	
Northern Waterthrush		1						
Common Yellowthroat	10	7	3	2	1	3		
Indigo Bunting	7	8	7	7	1	1		
Eastern Towhee								1
Savannah Sparrow (T)						1	15	30
Song Sparrow	16	12	11	4	2	1	4	15
Swamp Sparrow	2							
White-throated Sparrow								1
Bobolink (T)	3			2	2			
Red-winged Blackbird	25	16	15	5		15		
Brown-headed Cowbird	3							
American Goldfinch	6	10		2	4	5	5	25

Fall Migratory Bird Counts at Overpeck Creek, Part 2—July - Nov. 7, 1995

Great Cormorant			1					
Double-crested Cormorant	200	200	200	200	325	200		
Great Blue Heron (T)	2	2	2	3	2			
Great Egret	1	1						
Northern Pintail			2					
Turkey Vulture				2				
Osprey (T)	2	2						
Northern Harrier (E)	1							
Sharp-shinned Hawk	1	1						
Cooper's Hawk (E)	2			1	1			
Red-shouldered Hawk (E)	1		1					
Red-tailed Hawk	1					1		
American Kestrel		1						

(continued on page 34)

Fall Migratory Bird Counts at Overpeck Creek, Part 2 (continued from page 33)

Merlin	1					
Peregrine Falcon (E)	2					
Killdeer	14					
Common Snipe	1	1				
Laughing Gull	5					
Ring-billed Gull	25	25	35	7	3	35
Herring Gull	4		10	8	15	6
Great Black-backed Gull	5	4	5	2	10	1
Ruby-throated Hummingbird		1				
Belted Kingfisher	1	1	1			
Yellow-bellied Sapsucker	1					
Northern Flicker	2	14	1		1	1
Eastern Phoebe	3	10	1		1	
Western Kingbird		1				
Horned Lark			1			
Tree Swallow		3	2			
Bank Swallow		1				
Blue Jay	35	45	14	3		
American Crow				95	200	
Black-capped Chickadee	10	12	12			
Tufted Titmouse			10	6		
Brown Creeper		2				
Marsh Wren	1	1				
Golden-crowned Kinglet	4	5	10	1	36	15
Ruby-crowned Kinglet	4	7	7		18	1
Eastern Bluebird					1	
Hermit Thrush				1		
American Robin		2			85	12
Gray Catbird	6			1		
American Pipit	12	4	2		2	
Cedar Waxwing	1	10				
Solitary Vireo		1			1	
Tennessee Warbler		1				
Orange-crowned Warbler						1
Nashville Warbler	1	4				
Magnolia Warbler		1				
Yellow-rumped Warbler	200	150	145	100	50	12
Black-throated Green Warbler		2				
Palm Warbler	75	200	38	7	1	
Blackpoll Warbler	1	3		1		
Common Yellowthroat	3	3	1		1	
Indigo Bunting		1				
Eastern Towhee		11	2			
American Tree Sparrow					1	
Chipping Sparrow		1				
Clay-colored Sparrow		1				
Field Sparrow		8	4	5	5	3
Vesper Sparrow		1	2	2	2	
Savannah Sparrow (T)	40	250	70	20	20	10
Henslow's Sparrow (E)		1				
Sharp-tailed Sparrow		1				
Fox Sparrow					1	1
Song Sparrow	30	45	39	10	130	25
Lincoln's Sparrow		4				
Swamp Sparrow		2		20	8	8
White-throated Sparrow	6	12	1	5	30	16
White-crowned Sparrow	1	12	13	6	4	1
Dark-eyed Junco		8			18	
Snow Bunting					2	
Bobolink (T)	1					
Red-winged Blackbird	25	35	27	20		30
Eastern Meadowlark		1		1		
Purple Finch		18	1		2	
American Goldfinch	40	175	35	20	8	4

- **Habitat – overgrown fill, occasional pools, tidal creeks.**
- **Permanent residents excluded from counts.**

Fall Migratory Bird Counts at Bellman's Creek, Part 1—July - Nov. 7, 1995

Pied-billed Grebe (E)					1		
Double-crested Cormorant				1			
Snowy Egret	1	2	6	2	3		
Green Heron					1		
Green-winged Teal					15	3	
American Black Duck			2	2	1		
Mallard	1			40	22		7
American Kestrel					1		
Common Moorhen					1		
Semipalmated Plover				4			
Killdeer				2	4		
Greater Yellowlegs				10	3		
Lesser Yellowlegs				12	1		
Semipalmated Sandpiper		130	20	203			
Least Sandpiper		2			2		
Spotted Sandpiper	1			5	6		
Laughing Gull					2		
Ring-billed Gull				60	1		
Herring Gull			1	3	3		
Barn Swallow	20	25		25			
Bank Swallow				1			
Marsh Wren				6			
Yellow Warbler				4			
Palm Warbler						1	
Common Yellowthroat	2						
Song Sparrow	5						
Red-winged Blackbird	20			10	1		1

Fall Migratory Bird Counts at Bellman's Creek, Part 2—July - Nov. 7, 1995

Double-crested Cormorant					3	
Snowy Egret		2				
Green-winged Teal		120	8	14		25
American Black Duck		2			3	
Mallard		22				
Gadwall	2	1				
Ruddy Duck		1				6
Red-tailed Hawk						1
Greater Yellowlegs					2	2
Ring-billed Gull	12			50	11	7
Herring Gull		1				
Black-capped Chickadee			1			
Yellow-rumped Warbler		20	7	2	6	32
Song Sparrow					5	
Swamp Sparrow				1		2
White-throated Sparrow					3	1
Red-winged Blackbird					5	6
Bobolink (T)		2				

- **Habitat – reed, tidal creek, some fresh water marsh, upland islands, some salt marsh.**
- **Permanent residents excluded from counts.**

Fall Migratory Bird Counts at Cromakill Creek, Part 1—July - Nov. 7, 1995

Double-crested Cormorant				1			
Great Blue Heron (T)					1		
Great Egret				2	1	1	
Snowy Egret	1	4	3	15	18	2	8
Green-winged Teal					20	10	6
Mallard	10	12			62	2	
Semipalmated Plover				2			
Killdeer				2			
Greater Yellowlegs				13			
Lesser Yellowlegs				1	2		
Spotted Sandpiper	1						
Semipalmated Sandpiper				1600	2		
Least Sandpiper					4		
Pectoral Sandpiper					1		
Laughing Gull					1		
Ring-billed Gull		6			90		20
Herring Gull	4				13		10
Great Black-backed Gull					7		
Forster's Tern					3	1	
Willow Flycatcher	1						
Barn Swallow	30	30	25	40			
Marsh Wren				2			

Fall Migratory Bird Counts at Cromakill Creek, Part 2—July - Nov. 7, 1995

Great Egret		1				
Snowy Egret	4	7				
Green-winged Teal	16	40	20		150	45
American Black Duck		2				
Mallard		10				
Northern Pintail				4		
Northern Shoveller		4				
Gadwall		2				
Bufflehead						6
Ruddy Duck		3				7
Northern Harrier (E)						1
Red-tailed Hawk						1
Rough-legged Hawk						1
American Kestrel					2	
Ring-billed Gull		10	35	150		20
Belted Kingfisher		2				
Yellow-rumped Warbler		30		5		12
Red-winged Blackbird		5				

- **Habitat – salt marsh, mud flat, upland islands (mitigation site).**
- **Permanent residents excluded from counts.**

Fall Migratory Bird Counts at Mill Creek, Part 1—July - Nov. 7, 1995

Species	7/11	7/19	7/25	8/01	9/05	9/21	9/19
Double-crested Cormorant		2			4		2
Great Egret			1			1	
Snowy Egret		2	4	6		5	
Green Heron				1	1		
Mallard	2	2					
Gadwall	5						
American Kestrel						1	
Common Moorhen		1		1			
Semipalmated Plover				1		1	
Greater Yellowlegs				2			
Spotted Sandpiper	1	1					
Semipalmated Sandpiper				200		6	
Least Sandpiper	2	20				1	
Laughing Gull				2	2	8	5
Herring Gull	6				3		
Great Black-backed Gull	2			2	2		
Forster's Tern				28	10	3	5
Least Tern (E)				1			
Belted Kingfisher				1			
Barn Swallow	2	10	30				
Marsh Wren		1		2			
Palm Warbler							3
Savannah Sparrow							1
Song Sparrow	3	1		2			
Red-winged Blackbird	4	6	2				

Fall Migratory Bird Counts at Mill Creek, Part 2—July - Nov. 7, 1995

Species	9/26	10/10	10/17	10/24	10/31	11/07
Double-crested Cormorant	5	4		1	1	2
Great Blue Heron (T)		1				3
Green Heron		1				
Green-winged Teal		195			42	270
American Black Duck		2				3
Mallard		4				
Hooded Merganser						2
Osprey (E)				1		
Northern Harrier (E)		1				2
Sharp-shinned Hawk						1
Red-tailed Hawk						1
American Kestrel		1				
Laughing Gull						3
Ring-billed Gull		1	30			1
Great Black-backed Gull		1				1
Forster's Tern	14					
Belted Kingfisher		2				
Northern Flicker						5
American Crow				4		
Golden-crowned Kinglet					2	
Ruby-crowned Kinglet					1	
Yellow-rumped Warbler		25	14	16	3	7
Palm Warbler		2				
Savannah Sparrow (T)		1	8	3		
Song Sparrow			3			
Swamp Sparrow		5				4
White-throated Sparrow	1					
Red-winged Blackbird	1	15				

- **Habitat – salt marsh, reed, upland islands (mitigation site), permanent residents excluded.**