

APPENDIX A

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APPENDIX B

COMMON AND SCIENTIFIC NAMES OF SPECIES
MENTIONED IN THE TEXT

(Does not include names of threatened, endangered or special concern species listed in Appendix D)

BIRDS

Bittern, American <i>Botaurus lentiginosus</i>	Gull, Laughing <i>Larus atricilla</i>
Blackbird, Brewers <i>Euphagus cyanocephalus</i>	Gull, Ring-billed <i>Larus delawarensis</i>
Blackbird, Red-winged <i>Agelaius phoeniceus</i>	Harrier, Northern <i>Circus cyaneus</i>
Blackbird, Rusty <i>Euphagus carolinus</i>	Hawk, Cooper's <i>Accipiter cooperii</i>
Blackbird, Yellow-headed <i>Xanthocephalus xanthocephalus</i>	Hawk, Harris's <i>Parabuteo unicinctus</i>
Brant, Atlantic <i>Branta bernicla</i>	Hawk, Red-tailed <i>Buteo jamaicensis</i>
Bufflehead, <i>Bucephala albeola</i>	Hawk, Rough-legged <i>Buteo lagopus</i>
Bunting, Snow <i>Plectrophenax nivalis</i>	Heron, Great Blue <i>Ardea Herodias</i>
Cardinal, Northern <i>Cardinalis cardinalis</i>	Heron, Green <i>Butorides virescens</i>
Catbird, Gray <i>Dumetella carolinensis</i>	Heron, Little Blue <i>Egretta caerulea</i>
Coot, American <i>Fulica americana</i>	Heron, Tricolored <i>Egretta tricolor</i>
Cormorant, Double-crested <i>Phalacrocorax auritus</i>	Ibis, Glossy <i>Plegadis falcinellus</i>
Cormorant, Great <i>Phalacrocorax auritus</i>	Jay, Blue <i>Cyanocitta cristata</i>
Cowbird, Brown-headed <i>Molothrus ater</i>	Junco, Dark-eyed <i>Junco hyemalis</i>
Crane, Sandhill <i>Grus canadensis</i>	Kestrel, American <i>Falco sparverius</i>
Crow, American <i>Corvus brachyrhynchos</i>	Killdeer <i>Charadrius vociferus</i>
Crow, Fish <i>Corvus ossifragus</i>	Lark, Horned <i>Eremophila alpestris</i>
Cuckoo, Yellow-billed <i>Coccyzus americanus</i>	Loon, Common <i>Gavia immer</i>
Dove, Mourning <i>Zenaida macroura</i>	Mallard <i>Anas platyrhynchos</i>
Dowitcher, Short-billed <i>Limnodromus griseus</i>	Meadowlark, Eastern <i>Sturnella magna</i>
Duck, American black <i>Anas rubripes</i>	Merganser, Common <i>Mergus merganser</i>
Duck, Long-tailed <i>Clangula hyemalis</i>	Merganser, Hooded <i>Lophodytes cucullatus</i>
Duck, Ring-necked <i>Aythya collaris</i>	Merlin <i>Falco columbarius</i>
Duck, Ruddy <i>Oxyura jamaicensis</i>	Mockingbird, Northern <i>Mimus polyglottos</i>
Duck, Wood <i>Aix sponsa</i>	Night-Heron, Black-crowned <i>Nycticorax nycticorax</i>
Dunlin <i>Calidris alpina</i>	Night-Heron, Yellow-crowned <i>Nyctanassa violacea</i>
Egret, Cattle <i>Bubulcus ibis</i>	Nighthawk, Common <i>Chordeiles minor</i>
Egret, Great <i>Ardea alba</i>	Osprey <i>Pandion haliaetus</i>
Falcon, Peregrine <i>Falco peregrinus</i>	Ovenbird <i>Seiurus aurocapillus</i>
Flicker, Northern <i>Colaptes auratus</i>	Owl, Barred <i>Strix varia</i>
Gadwall <i>Anas strepera</i>	Owl, Barn <i>Tyto alba</i>
Goose, Canada <i>Branta canadensis</i>	Owl, Burrowing <i>Athene cunicularia</i>
Goose, Snow <i>Chen caerulescens</i>	Owl, Great Horned <i>Bubo virginianus</i>
Grebe, Horned <i>Podiceps auritus</i>	Owl, Short-eared <i>Asio flammeus</i>
Grebe, Pied-billed <i>Podilymbus podiceps</i>	Owl, Long-eared <i>Asio otus</i>
Grebe, Red-necked <i>Podiceps grisegena</i>	Owl, Snowy <i>Bubo scandiacus</i>
Grackle, Boat-tailed <i>Quiscalus major</i>	Oriole, Baltimore <i>Icterus galbula</i>
Grackle, Common <i>Quiscalus quiscula</i>	Oystercatcher, American <i>Haematopus palliatus</i>
Gryfalcon <i>Falco rusticolus</i>	Pelican, American White <i>Pelecanus erythrorhynchos</i>
Gull, Great Black-backed <i>Larus marinus</i>	Pheasant, Ring-necked <i>Phasianus colchicus</i>
Gull, Herring <i>Larus atricilla</i>	Phoebe, Eastern, <i>Sayornis phoebe</i>
	Pigeon, Rock <i>Columba livia</i>
	Pintail, Northern <i>Anas acuta</i>
	Plover, American Golden <i>Pluvialis dominica</i>

Plover, Black-bellied *Pluvialis squatarola*
 Plover, Semipalmated *Charadrius semipalmatus*
 Rail, Clapper *Rallus longirostris*
 Rail, Virginia *Rallus limicola*
 Robin, American *Turdus migratorius*
 Sanderling *Calidris alba*
 Sandpiper, Least *Calidris minutilla*
 Sandpiper, Semipalmated *Calidris pusilla*
 Sandpiper, Upland *Bartramia longicuada*
 Skimmer, Black *Rynchops niger*
 Scaup, Greater *Aythya marila*
 Scaup, Lesser *Aythya affinis*
 Sparrow, Chipping *Spizella passerina*
 Sparrow, Field *Spizella pusilla*
 Sparrow, House *Passer domesticus*
 Sparrow, Savannah *Passerculus sandwichensis*
 Sparrow, Saltmarsh *Ammodramus caudacutus*
 Sparrow, Song *Melospiza melodia*
 Sparrow, White-throated *Zonotrichia albicollis*
 Starling, European *Sturnus vulgaris*
 Swallow, Barn *Hirundo rustica*
 Swallow, Tree *Tachycineta bicolor*
 Swan, Mute *Cygnus olor*
 Swift, Chimney *Chaetura pelagica*
 Teal, Blue-winged *Anas discors*
 Teal, Cinnamon *Anas cyanoptera*
 Teal, Green-winged *Anas crecca*
 Tern, Common *Sterna hirundo*
 Tern, Forster's *Sterna forsteri*
 Tern, Roseate *Sterna dougallii*
 Thrasher, Brown *Toxostoma rufium*
 Towhee, Eastern *Pipilo erythrophthalmus*
 Turkey, Wild *Meleagris gallopavo*
 Veery *Catharus fuscescens*
 Vulture, Turkey *Cathartes aura*
 Vulture, Black *Coragyps atratus*
 Warbler, Pine *Dendroica pinus*
 Warbler, Yellow *Dendroica petechia*

Waterthush, Northern *Seiurus noveboracensis*
 Wigeon, American *Anas americana*
 Willet *Tringa semipalmata*
 Woodcock, American *Scolopax minor*

MAMMALS

Cats, domestic *Felis catus*
 Dogs, domestic *Canis lupus familiaris*
 Ground Squirrel, *Citellus spp.*
 Jackrabbit, Black-tailed *Lepus californicus*
 Mouse, House *Mus musculus*
 Mouse, White-footed *Peromyscus leucopus*
 Nutria *Myocastor coypus*
 Prairie Dog *Cynomys spp.*
 Rabbit, Eastern Cottontail *Sylvilagus floridanus*
 Rat, Norway *Rattus norvegicus*
 Rat, Polynesian
 Vole, Meadow *Microtus pennsylvanicus*

REPTILES

Terrapin, Eastern Diamondback *Malaclemys terrapin*

CRUSTACEANS

Atlantic Horseshoe Crab *Limulus polyphemus*

INSECTS

Japanese Beetle *Popillia japonica*
 May Beetle *Phyllophaga spp.*

PLANTS

Northern Bayberry *Myrica pensylvanica*
 Eelgrass *Zoostera marina*

APPENDIX C

SUMMARY OF BIRD STRIKES AND AIRCRAFT DAMAGE AT JFK
1994-2009**Table 1.** On-airport bird strikes (JFKWMU database).

SPECIES	Total Strikes ^a	Total Birds Struck ^b	Air-Carrier Reported Strikes ^c	Reported Strikes with Damage ^d
Bird, Unknown	164	177	155	21
Bittern, American	1	1	0	0
Blackbird, Red-winged	4	5	3	0
Atlantic Brant	12	22	3	2
Bufflehead	2	2	0	0
Bunting, Snow	29	167	20	2
Coot, American	7	7	0	0
Cormorant, Double-crested	16	17	10	6
Cowbird, Brown-headed	16	71	4	1
Crow, American	14	18	1	0
Catbird, Grey	6	6	1	0
Cuckoo, Yellow-billed	1	1	0	0
Dove, Mourning	41	46	10	1
Duck, American Black	12	23	5	1
Duck, Ruddy	3	3	0	0
Duck, Wood	1	1	0	0
Dunlin	1	3	1	0
Egret, Great	7	7	1	0
Falcon, Peregrine	28	29	8	1
Flicker, Northern	17	17	2	0
Gadwall	2	2	1	0
Goose, Canada	15	24	7	5
Goose, Snow	1	1	0	0
Grebe, Horned	2	2	0	0
Grebe, Pied-billed	1	1	0	0
Grebe, Red-necked	1	1	0	0
Gull, Great Black-backed	41	43	7	3
Gull, Herring	326	344	62	20
Gull, Laughing	215	250	41	5
Gull, Ring-billed	36	39	7	1
Gyrfalcon	1	1	1	0
Harrier, Northern	30	31	9	1
Hawk, Red-tailed	4	4	1	1
Hawk, Rough-legged	2	2	0	0
Hawk, Cooper's	2	2	1	1
Heron, Great Blue	8	8	3	1
Ibis, Glossy	2	6	0	0

SPECIES	Total Strikes ^a	Total Birds Struck ^b	Air-Carrier Reported Strikes ^c	Reported Strikes with Damage ^d
Jay, Blue	1	1	0	0
Junco, Dark-eyed	1	1	0	0
Kestrel, American	91	94	13	0
Killdeer	15	17	2	0
Kittiwake, Black-legged	1	1	0	0
Lark, Horned	26	42	14	1
Longspur, Lapland	1	1	0	0
Loon, Common	2	2	0	0
Mallard	22	24	3	2
Meadowlark, Eastern	1	1	0	0
Merlin	8	8	1	0
Night Heron, Black-crowned	23	23	0	0
Night Heron, Yellow-crowned	1	1	1	0
Nighthawk, Common	5	5	1	0
Oriole, Baltimore	2	2	1	0
Osprey	33	33	12	4
Ovenbird	1	1	0	0
Owl, Barn	89	89	8	2
Owl, Barred	1	1	0	0
Owl, Long-eared	3	3	0	0
Owl, Short-eared Owl	17	17	4	0
Owl, Snowy	10	10	1	1
Oystercatcher, American	36	40	1	0
Pheasant, Ring-necked	6	6	2	0
Pigeon, Rock	63	111	13	3
Plover, American Golden	9	14	2	0
Plover, Black-bellied	7	7	1	0
Plover, Semipalmated	8	13	0	0
Rail, Clapper	3	3	0	0
Rail, Virginia	1	1	0	0
Robin, American	8	8	2	1
Sanderling	2	3	2	2
Sandpiper, Least	2	2	0	0
Sandpiper, Semipalmated	3	5	1	0
Sandpiper, Upland	2	2	0	0
Scaup, Greater	1	1	0	0
Scaup, Lesser	1	1	1	0
Skimmer, Black	8	8	1	1
Sparrow, House	2	4	1	0
Sparrow, Savannah	5	5	1	0
Sparrow, Vesper	1	1	1	0
Sparrow, White-throated	1	1	0	0
Starling, European	39	149	12	1
Swallow, Barn	39	68	13	0

SPECIES	Total Strikes ^a	Total Birds Struck ^b	Air-Carrier Reported Strikes ^c	Reported Strikes with Damage ^d
Swallow, Tree	27	380	13	2
Swan, Mute	1	1	0	0
Teal, Green-winged	3	4	0	0
Tern, Common	19	29	2	0
Tern, Forster's	9	10	1	1
Tern, Gull-billed	1	1	0	0
Tern, Roseate	1	1	0	0
Thrasher, Brown	1	1	0	0
Towhee, Rufus-sided	1	1	0	0
Veery	1	1	0	0
Warbler, Blackpoll	1	1	1	0
Warbler, Yellow-rumped	1	1	1	0
Waterthrush, Northern	2	2	1	0
Waxwing, Cedar	1	1	1	0
Willet	5	5	1	0
Woodcock, American	11	11	0	0
Wren, House	1	1	0	0
Wren, Winter	1	1	0	0
TOTAL	1759	2666	500	94

^a Number of aircraft involved with strikes, includes all reported strikes (see footnote c) plus unreported strikes (i.e., carcasses found within 200 feet of centerline of active runway which showed evidence of having interacted with aircraft).

^b Total number of birds involved with strikes, Includes all reported strikes (see footnote c) plus unreported strikes (i.e., carcasses found within 200 feet of centerline of active runway which showed evidence of having interacted with aircraft).

^c Strike or strike damage observed and reported by pilot or ground personnel.

^d Strike or strike damage observed and reported by pilot or ground personnel; strikes with damage to aircraft only.

Table 2. Off-Airport Bird Strikes at JFK during the period of 1994-2009. For purposes of the analysis, off-airport strikes are strikes reported to the FAA database which were reported as occurring during approach, descent, or climb and excluding strikes with no height reported or a reported height of 100ft or less.

Species	Strikes	Strikes with Damage Reported	Strikes with Reported Impact on Flight
Bird, Unknown-Large	12	5	0
Bird, Unknown-Medium	113	12	6
Bird, Unknown-Small	44	1	1 ^a
Gull	20	6	3 ^a
Gull, Herring	12	4	3
Gull, Laughing	8	1	1
Atlantic Brant	6	5	2
Goose, Snow	5	5	2
Cormorant, Double-crested	5	4	3
Goose, Canada	5	3	3 ^a
Mallard	3	1	1
Osprey	3	1	0
Pigeon, Rock	2	1	0
Robin, American	2	1	0
Gull, Ring-billed	2	1	0
Scaup, Lesser	2	0	0
Sparrows	2	0	0
Swallow, Tree	2	0	0
Warbler, Yellow-rumped	2	0	0
Bunting, Snow	1	1	1
Dowitcher, Short-billed	1	1	0
Duck, Long-tailed	1	1	1
Hawk, Red-tailed	1	1	0
Heron, Great Blue	1	1	1
Loon, Common	1	1	1
Starling, European	1	1	0
Birds, Perching	1	0	0
Blackbirds	1	0	0
Catbird, Gray	1	0	0
Ducks	1	0	0
Flicker, Northern	1	0	0
Gull, Great Black-backed	1	0	0
Killdeer	1	0	0
Lark, Horned	1	0	0
Sparrow, Lincoln's	1	0	0
Sparrow, White-throated	1	0	1
Swallows, Barn	1	0	0
Tern, Common	1	0	0

* Includes one avoidance maneuver with no report of damage

APPENDIX D

STATE AND FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

New York State- and Federally-Listed Bird Species			
Common Name	Scientific Name	Federal Status	State Status
Spruce Grouse	<i>Falcipennis Canadensis</i>		E
Golden Eagle	<i>Aquila chrysaetos</i>		E
Peregrine Falcon	<i>Falco peregrinus</i>		E
Black Rail	<i>Laterallus jamaicensis</i>		E
Piping Plover	<i>Charadrius melodus</i>	E	E
Eskimo Curlew	<i>Numenius borealis</i>	E	E
Roseate Tern	<i>Sterna dougallii dougallii</i>	E	E
Black Tern	<i>Chlidonias niger</i>		E
Short-eared Owl	<i>Asio flammeus</i>		E
Loggerhead Shrike	<i>Lanius ludovicianus</i>		E
Pied-billed Grebe	<i>Podilymbus podiceps</i>		T
Least Bittern	<i>Ixobrychus exilis</i>		T
Bald Eagle	<i>Haliaeetus leucocephalus</i>		T
Northern Harrier	<i>Circus cyaneus</i>		T
King Rail	<i>Rallus elegans</i>		T
Upland Sandpiper	<i>Bartramia longicauda</i>		T
Common Tern	<i>Sterna hirundo</i>		T
Least Tern	<i>Sterna antillarum</i>		T
Sedge Wren	<i>Cistothorus platensis</i>		T
Henslow's Sparrow	<i>Ammodramus henslowii</i>		T
Common Loon	<i>Gavia immer</i>		SC
American Bittern	<i>Botaurus lentiginosus</i>		SC
Osprey	<i>Pandion haliaetus</i>		SC
Sharp-shinned Hawk	<i>Accipiter striatus</i>		SC
Cooper's Hawk	<i>Accipiter cooperii</i>		SC
Northern Goshawk	<i>Accipiter gentilis</i>		SC
Red-shouldered Hawk	<i>Buteo lineatus</i>		SC
Black Skimmer	<i>Rynchops niger</i>		SC
Common Nighthawk	<i>Chordeiles minor</i>		SC
Whip-poor-will	<i>Caprimulgus vociferous</i>		SC
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>		SC
Horned Lark	<i>Eremophila alpestris</i>		SC
Bicknell's Thrush	<i>Catharus bicknelli</i>		SC
Golden-winged Warbler	<i>Vermivora chrysoptera</i>		SC
Cerulean Warbler	<i>Dendroica cerulean</i>		SC
Yellow-breasted Chat	<i>Icteria virens</i>		SC
Vesper Sparrow	<i>Poocetes gramineus</i>		SC
Grasshopper Sparrow	<i>Ammodramus maritimus</i>		SC
Seaside Sparrow	<i>Ammodramus maritimus</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federally-Listed Mammal Species			
Common Name	Scientific Name	Federal Status	State Status
Indiana Bat	<i>Myotis sodalist</i>	E	E
Allegheny Woodrat	<i>Neotoma magister</i>		E
Eastern Puma	<i>Puma concolor cougar</i>	E	E
Gray Wolf	<i>Canis lupus</i>	E	E
Finback Whale	<i>Balaenoptera physalus</i>	E	E
Humpback Whale	<i>Megaptera novaeangliae</i>	E	E
Right Whale	<i>Balaena glacialis</i>		E
Sperm Whale	<i>Physeter catodon</i>		E
Sei Whale	<i>Balaenoptera borealis</i>		E
Blue Whale	<i>Balaenoptera musculus</i>		E
Canada Lynx	<i>Lynx Canadensis</i>	T	T
Small-footed Bat	<i>Myotis leibii</i>		SC
New England Cottontail	<i>Sylvilagus transitionalis</i>		SC
Harbor Porpoise	<i>Phocoena phocoena</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Reptile Species			
Common Name	Scientific Name	Federal Status	State Status
Mud Turtle	<i>Kinosternon subrubrum</i>		E
Bog Turtle	<i>Clemmys mühlenbergii</i>	T	E
Atlantic Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	E	E
Atlantic Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E	E
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	E
Queen Snake	<i>Regina septemvittata</i>		E
Massasauga	<i>Sistrurus catenatus</i>	C	E
Blanding's Turtle	<i>Emydoidea blandingii</i>		T
Green Sea Turtle	<i>Chelonia mydas</i>	T	T
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T	T
Fence Lizard	<i>Sceloporus undulatus</i>		T
Timber Rattlesnake	<i>Crotalus horridus</i>		T
Spotted Turtle	<i>Clemmys guttata</i>		SC
Wood Turtle	<i>Clemmys insculpta</i>		SC
Eastern Box Turtle	<i>Terrapene Carolina</i>		SC
Eastern Hognose Snake	<i>Heterodon platyrhinos</i>		SC
Worm Snake	<i>Carphophis amoenus</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Fish Species			
Common Name	Scientific Name	Federal Status	State Status
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E
Silver Chub	<i>Macrhybopsis storeriana</i>		E
Pugnose Shiner	<i>Notropis anogenus</i>		E
Round Whitefish	<i>Prosopium cylindraceum</i>		E
Bluebreast Darter	<i>Etheostoma camurum</i>		E
Gilt Darter	<i>Percina evides</i>		E
Spoonhead Sculpin	<i>Cottus ricei</i>		E
Deepwater Sculpin	<i>Myoxocephalus thompsoni</i>		E
Lake Sturgeon	<i>Acipenser fulvescens</i>		T
Mooneye	<i>Hiodon tergisus</i>		T
Lake Chubsucker	<i>Erimyzon sucetta</i>		T
Gravel Chub	<i>Erimystax x-punctata</i>		T
Mud Sunfish	<i>Acantharchus pomotis</i>		T

New York State- and Federal-Listed Fish Species			
Common Name	Scientific Name	Federal Status	State Status
Banded Sunfish	<i>Enneacanthus obesus</i>		T
Longear Sunfish	<i>Lepomis megalotis</i>		T
Longhead Darter	<i>Percina macrocephala</i>		T
Eastern Sand Darter	<i>Ammocrypta pellucida</i>		T
Swamp Darter	<i>Etheostoma fusiforme</i>		T
Spotted Darter	<i>Etheostoma maculatum</i>		T
Mountain Brook Lamprey	<i>Ichthyomyzon greeleyi</i>		SC
Black Redhorse	<i>Moxostoma duquesnei</i>		SC
Streamline Chub	<i>Erymystax dissimilis</i>		SC
Redfin Shiner	<i>Lythrurus umbratilis</i>		SC
Ironcolor Shiner	<i>Notropis chalybaeus</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Amphibian Species			
Common Name	Scientific Name	Federal Status	State Status
Tiger Salamander	<i>Ambystoma tigrinum</i>		E
Northern Cricket Frog	<i>Acris crepitans</i>		E
Hellbender	<i>Cryptobranchus alleganiensis</i>		SC
Marbled Salamander	<i>Ambystoma opacum</i>		SC
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>		SC
Blue-spotted Salamander	<i>Ambystoma laterale</i>		SC
Longtail Salamander	<i>Eurycea longicauda</i>		SC
Eastern Spadefoot Toad	<i>Scaphiopus holbrookii</i>		SC
Southern Leopard Frog	<i>Rana sphenoccephala utricularius</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Insect Species			
Common Name	Scientific Name	Federal Status	State Status
Tomah Mayfly	<i>Siphonisca aerodromia</i>		E
American Burying Beetle	<i>Nicrophorus americanus</i>	E	E
Hessel's Hairstreak	<i>Callophrys hesseli</i>		E
Karner Blue Butterfly	<i>Lycaeides Melissa samuelis</i>	E	E
Regal Fritillary	<i>Speyeria idalia</i>		E
Persius Duskywing	<i>Erynnis persius</i>		E
Grizzled Skipper	<i>Pyrgus centaureae Wyandot</i>		E
Arogos Skipper	<i>Atrytone arogos arogos</i>		E
Bog Buckmoth	<i>Hemileuca species 1</i>		E
Pine Pinion Moth	<i>Lithophane lepida lepida</i>		E
Pine Barrens Bluet	<i>Enallagma recurvatum</i>		T
Scarlet Bluet	<i>Enallagma pictum</i>		T
Little Bluet	<i>Enallagma minisculum</i>		T
Northeastern Beach Tiger Beetle	<i>Cicindela dorsalis dorsalis</i>	T	T
Frosted Elf	<i>Callophrys irus</i>		T
Unnamed Dragonfly Species	<i>Gomphus spec. nov.</i>		SC
Southern Sprite	<i>Nehalennia integricollis</i>		SC
Extra Striped Snaketail	<i>Ophiogomphus anomalus</i>		SC
Pygmy Snaketail	<i>Ophiogomphus howei</i>		SC
Common Sanddragon	<i>Progomphus obscurus</i>		SC
Gray Petaltail	<i>Tachopteryx thoreyi</i>		SC
Checkered White	<i>Pontia protodice</i>		SC
Olympia Marble	<i>Euchloe Olympia</i>		SC

Henry's Elfin	<i>Callophrys henrici</i>		SC
Tawny Crescent	<i>Phyciodes batesii</i>		SC
Mottled Duskywing	<i>Erynnis martialis</i>		SC
Barrens Buckmoth	<i>Hemileuca maia</i>		SC
Herodias Underwing	<i>Catocala Herodias gerhardi</i>		SC
Jair Underwing	<i>Catocala jair</i>		SC
A Noctuid Moth	<i>Heterocampa varia</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Mollusk Species			
Common Name	Scientific Name	Federal Status	State Status
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	E	E
Pink Mucket	<i>Lampsilis abrupta</i>		E
Clubshell	<i>Pleurobema clava</i>		E
Fat Pocketbook	<i>Potamilus capax</i>		E
Rayed Bean	<i>Villosa fabalis</i>	C	E
Chittenango Ovate Amber Snail	<i>Novisuccinea chittenangoensis</i>	T	E
Brook Floater	<i>Alasmidonta varicose</i>		T
Wavy-rayed Lamppussel	<i>Lampsilis fasciola</i>		T
Green Floater	<i>Lasmigona subviridis</i>		T
Buffalo Pebble Snail	<i>Gillia altilis</i>		SC
Fringed Valvata	<i>Valvata lewisi</i>		SC
Mossy Valvata	<i>Valvata sincera</i>		SC

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

New York State- and Federal-Listed Plant Species			
Common Name	Scientific Name	Federal Status	State Status
Northeastern Bulrush	<i>Scirpus ancistrochaetus</i>	E	
American Chaffseed	<i>Schwalbea Americana</i>	E	
Swamp Pink	<i>Helonias bullata</i>	T	
Bog Asphodel		C	
Virginia Three-seeded Mercury	<i>Acalypha virginica</i> var. <i>virginica</i>		E
Moschatel	<i>Adoxa moschatellina</i>		E
Sandplain Gerardia	<i>Agalinis acuta</i>	E	E
Wild Leek	<i>Allium burdickii</i>		E
Seabeach Amaranth	<i>Amaranthus pumilus</i>	T	E
Nantucket Juneberry	<i>Amelanchier nantucketensis</i>		E
Champlain Beachgrass	<i>Ammophila champlainensis</i>		E
Peanut Grass	<i>Amphicarpum purshii</i>		E
Angelica	<i>Angelica lucida</i>		E
Alpine Sweetgrass	<i>Anthoxanthum monticolum</i> ssp. <i>orthanthum</i>		E
Puttyroot	<i>Aplectrum hyemale</i>		E
Drummond's Rock Cress	<i>Arabis drummondii</i>		E
Toothed Rock-cress	<i>Arabis shortii</i>		E
Virginia Snakeroot	<i>Aristolochia serpentaria</i>		E
Arnica	<i>Arnica lanceolata</i>		E
Wild Sage	<i>Artemisia campestris</i> var. <i>borealis</i>		E
White Milkweed	<i>Asclepias variegata</i>		E
Bradley's Spleenwort	<i>Asplenium bradleyi</i>		E
Green Spleenwort	<i>Asplenium trichomanes-ramosum</i>		E
Lindley's Aster	<i>Aster ciliolatus</i>		E
Silvery Aster	<i>Aster concolor</i>		E
Smooth Blue Aster	<i>Aster laevis</i> var. <i>concinus</i>		E
Tall White Aster	<i>Aster lanceolatus</i> var. <i>interior</i>		E
Calico Aster	<i>Aster lateriflorus</i> var.		E

	<i>hirsuticaulis</i>		
Sky-blue Aster	<i>Aster oolentangiensis</i>		E
Cornel-leaved Aster	<i>Aster puniceus</i> var. <i>firmus</i>		E
Swamp Aster	<i>Aster radula</i>		E
Cooper's Milkvetch	<i>Astragalus neglectus</i>		E
Seaside Orach	<i>Atriplex glabriuscula</i>		E
Orache	<i>Atriplex subspicata</i>		E
Screw-stem	<i>Bartonia paniculata</i>		E
Tundra Dwarf Birch	<i>Betula glandulosa</i>		E
Dwarf White Birch	<i>Betula minor</i>		E
Estuary Beggar-ticks	<i>Bidens hyperborea</i>		E
Downy Wood-mint	<i>Blephilia ciliata</i>		E
Prairie Dunewort	<i>Botrychium campestre</i>		E
Moonwort	<i>Botrychium lunaria</i>		E
Mingan Moonwort	<i>Botrychium minganense</i>		E
Blunt-lobe Grape Fern	<i>Botrychium oneidense</i>		E
Rugulose Grape Fern	<i>Botrychium rugulosum</i>		E
Side-oats Grama	<i>Bouteloua curtipendula</i>		E
Blue-hearts	<i>Buchnera americana</i>		E
Sweet-scented Indian-Plantain	<i>Cacalia suaveolens</i>		E
Wood Reedgrass	<i>Calamagrostis perplexa</i>		E
Porter's Reedgrass	<i>Calamagrostis porteri</i> ssp. <i>porteri</i>		E
Northern Reedgrass	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>		E
Autumnal Water-starwort	<i>Callitriche hermaphroditica</i>		E
Calypso	<i>Calypso bulbosa</i>		E
Mountain Watercress	<i>Cardamine rotundifolia</i>		E
Glomerate Sedge	<i>Carex aggregata</i>		E
Narrow-leaved Sedge	<i>Carex amphibola</i> var. <i>amphibola</i>		E
Northern Clustered Sedge	<i>Carex arcta</i>		E
Awned Sedge	<i>Carex atherodes</i>		E
Black Sedge	<i>Carex atratiformis</i>		E
Barratt's Sedge	<i>Carex barrattii</i>		E
Button Sedge	<i>Carex bullata</i>		E
Hair-like Sedge	<i>Carex capillaris</i>		E
Carolina Sedge	<i>Carex caroliniana</i>		E
Collins' Sedge	<i>Carex collinsii</i>		E
Soft Fox Sedge	<i>Carex conjuncta</i>		E
Cypress-knee Sedge	<i>Carex decomposita</i>		E
Emory's Sedge	<i>Carex emoryi</i>		E
Glaucous Sedge	<i>Carex flaccosperma</i> var. <i>glaucodea</i>		E
Frank's Sedge	<i>Carex frankii</i>		E
Elk Sedge	<i>Carex garberi</i>		E
Northern Bog Sedge	<i>Carex gynocrates</i>		E
Cloud Sedge	<i>Carex haydenii</i>		E
Loose-flowered Sedge	<i>Carex laxiflora</i> var. <i>serrulata</i>		E
Livid Sedge	<i>Carex livida</i> var. <i>radicaulis</i>		E
Mead's Sedge	<i>Carex meadii</i>		E
Midland Sedge	<i>Carex mesochorea</i>		E
Black Sedge	<i>Carex nigra</i>		E
Black-edge Sedge	<i>Carex nigromarginata</i>		E
Reflexed Sedge	<i>Carex retroflexa</i>		E
Canadian Single-spike Sedge	<i>Carex scirpoidea</i>		E
Short's Sedge	<i>Carex shortiana</i>		E
Straw Sedge	<i>Carex straminea</i>		E
Lined Sedge	<i>Carex striatula</i>		E
Bent Sedge	<i>Carex styloflexa</i>		E

Many-head Sedge	<i>Carex sychnocephala</i>		E
Sparse-flowered Sedge	<i>Carex tenuiflora</i>		E
Tinged Sedge	<i>Carex tinctoria</i>		E
Sheathed Sedge	<i>Carex vaginata</i>		E
Graceful Sedge	<i>Carex venusta</i> var. <i>minor</i>		E
Wiegand's Sedge	<i>Carex wiegandii</i>		E
Scarlet Indian-paintbrush	<i>Castilleja coccinea</i>		E
Prairie Redroot	<i>Ceanothus herbaceus</i>		E
Spreading Chervil	<i>Chaerophyllum procumbens</i>		E
Slender Spikegrass	<i>Chasmanthium laxum</i>		E
Woolly Lip-fern	<i>Cheilanthes lanosa</i>		E
Missouri Goosefoot	<i>Chenopodium album</i> var. <i>missouriense</i>		E
Large Calyx Goosefoot	<i>Chenopodium berlandieri</i> var. <i>macrocalycium</i>		E
Blue-eyed-Mary	<i>Collinsia verna</i>		E
Striped Coralroot	<i>Corallorhiza striata</i>		E
Broom Crowberry	<i>Corema conradii</i>		E
Rough-leaf Dogwood	<i>Cornus drummondii</i>		E
Pigmyweed	<i>Crassula aquatica</i>		E
Hawthorn	<i>Crataegus berberifolia</i>		E
Compact Hawthorn	<i>Crataegus compacta</i>		E
Downy Hawthorn	<i>Crataegus mollis</i>		E
Dwarf Hawthorn	<i>Crataegus uniflora</i>		E
Rattlebox	<i>Crotalaria sagittalis</i>		E
Button-bush Dodder	<i>Cuscuta cephalanthi</i>		E
Southern Dodder	<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>		E
Smartweed Dodder	<i>Cuscuta polygonorum</i>		E
Northern Wild Comfrey	<i>Cynoglossum virginianum</i> var. <i>boreale</i>		E
Wild Comfrey	<i>Cynoglossum virginianum</i> var. <i>virginianum</i>		E
Globose Flatsedge	<i>Cyperus echinatus</i>		E
Yellow Flatsedge	<i>Cyperus flavescens</i> var. <i>flavescens</i>		E
Coast Flatsedge	<i>Cyperus polystachyos</i> var. <i>texensis</i>		E
Retorse Flatsedge	<i>Cyperus retrorsus</i>		E
Small White Ladyslipper	<i>Cypripedium candidum</i>		E
Small Yellow Ladyslipper	<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>		E
Lowland Fragile Fern	<i>Cystopteris protrusa</i>		E
Northern Tansey-mustard	<i>Descurainia pinnata</i> ssp. <i>brachycarpa</i>		E
Spreading Tick-clover	<i>Desmodium humifusum</i>		E
Smooth Tick-clover	<i>Desmodium laevigatum</i>		E
Nuttall's Tick-clover	<i>Desmodium nuttallii</i>		E
Beggar-lice	<i>Desmodium obtusum</i>		E
Small-flowered Tick-clover	<i>Desmodium pauciflorum</i>		E
Beakgrass	<i>Diarrhena obovata</i>		E
Salt-meadow Grass	<i>Diplachne maritima</i>		E
Rock-cress	<i>Draba glabella</i>		E
American Dragonhead	<i>Dracocephalum parviflorum</i>		E
Log Fern	<i>Dryopteris celsa</i>		E
Fragrant Cliff Fern	<i>Dryopteris fragrans</i>		E
Yerba-de-tago	<i>Eclipta prostrata</i>		E
American Waterwort	<i>Elatine americana</i>		E
Slender Spikerush	<i>Eleocharis elliptica</i> var. <i>pseudoptera</i>		E

Engelmann's Spikerush	<i>Eleocharis engelmannii</i>		E
Creeping Spikerush	<i>Eleocharis fallax</i>		E
Blunt Spikerush	<i>Eleocharis obtusa</i> var. <i>ovata</i>		E
Angled Spikerush	<i>Eleocharis quadrangulata</i>		E
Three-ribbed Spikerush	<i>Eleocharis tricostata</i>		E
Purple Crowberry	<i>Empetrum eamesii</i> ssp. <i>atropurpureum</i>		E
Willow-herb	<i>Epilobium ciliatum</i> ssp. <i>glandulosum</i>		E
Alpine Willow-herb	<i>Epilobium hornemannii</i>		E
Smooth Scouring Rush	<i>Equisetum laevigatum</i>		E
Fireweed	<i>Erechtites hieraciifolia</i> var. <i>megalocarpa</i>		E
Harbinger-of-spring	<i>Erigenia bulbosa</i>		E
Daisy Fleabane	<i>Erigeron hyssopifolius</i>		E
Narrow-leaf Cottongrass	<i>Eriophorum angustifolium</i> ssp. <i>scabriusculum</i>		E
American Strawberry-bush	<i>Euonymus americana</i>		E
Small White Snakeroot	<i>Eupatorium aromaticum</i>		E
White Boneset	<i>Eupatorium leucolepis</i> var. <i>leucolepis</i>		E
Round-leaf Boneset	<i>Eupatorium rotundifolium</i> var. <i>ovatum</i>		E
Round-leaf Boneset	<i>Eupatorium rotundifolium</i> var. <i>rotundifolium</i>		E
Late Boneset	<i>Eupatorium serotinum</i>		E
Ipecac Spurge	<i>Euphorbia ipecacuanhae</i>		E
Sheep Fescue	<i>Festuca saximontana</i>		E
Shining Bedstraw	<i>Galium concinnum</i>		E
Northern Wild-licorice	<i>Galium kamschaticum</i>		E
Dwarf Huckleberry	<i>Gaylussacia dumosa</i> var. <i>bigeloviana</i>		E
Soapwort Gentian	<i>Gentiana saponaria</i>		E
Lesser Fringed Gentian	<i>Gentianopsis procera</i>		E
Purple Comandra	<i>Geocaulon lividum</i>		E
Spring Avens	<i>Geum vernum</i>		E
Rough Avens	<i>Geum virginianum</i>		E
Catfoot	<i>Gnaphalium helleri</i> var. <i>micradenium</i>		E
Purple Everlasting	<i>Gnaphalium purpureum</i>		E
Woodland Cudweed	<i>Gnaphalium sylvaticum</i>		E
Kentucky Coffee Tree	<i>Gymnocladus dioica</i>		E
Northern Stickseed	<i>Hackelia deflexa</i> var. <i>americana</i>		E
Spurred Gentian	<i>Halenia deflexa</i>		E
Mare's-tail	<i>Hippuris vulgaris</i>		E
Purple Bluets	<i>Houstonia purpurea</i> var. <i>calycosa</i>		E
Purple Bluets	<i>Houstonia purpurea</i> var. <i>purpurea</i>		E
Fir Clubmoss	<i>Huperzia selago</i>		E
Wild Hydrangea	<i>Hydrangea arborescens</i>		E
Floating Pennywort	<i>Hydrocotyle ranunculoides</i>		E
Water-pennywort	<i>Hydrocotyle verticillata</i>		E
Creeping St. John's-wort	<i>Hypericum adpressum</i>		E
Bushy St. John's-wort	<i>Hypericum densiflorum</i>		E
Coppery St. John's-wort	<i>Hypericum denticulatum</i>		E
St. Andrew's Cross	<i>Hypericum hypercoides</i> ssp. <i>multicaule</i>		E
Wild Potato-vine	<i>Ipomoea pandurata</i>		E
Southern Blueflag	<i>Iris virginica</i> var. <i>schrevei</i>		E
Quillwort	<i>Isoetes riparia</i>		E

Small Whorled Pogonia	<i>Isotria medeoloides</i>	T	E
Doubtful Toad-rush	<i>Juncus ambiguus</i>		E
Short-fruit Rush	<i>Juncus brachycarpus</i>		E
Weak Rush	<i>Juncus debilis</i>		E
Ensiform Rush	<i>Juncus ensifolius</i>		E
Large Grass-leaved Rush	<i>Juncus marginatus</i> var. <i>biflorus</i>		E
Scirpus-like Rush	<i>Juncus scirpoides</i>		E
Moor-rush	<i>Juncus stygius</i> ssp. <i>americanus</i>		E
Woods-rush	<i>Juncus subcaudatus</i>		E
Prostrate Juniper	<i>Juniperus horizontalis</i>		E
Carolina Redroot	<i>Lachnanthes caroliniana</i>		E
False Lettuce	<i>Lactuca floridana</i>		E
Downy Lettuce	<i>Lactuca hirsuta</i>		E
Rough Veiny Vetchling	<i>Lathyrus venosus</i>		E
Bead Pinweed	<i>Lechea pulchella</i> var. <i>moniliformis</i>		E
Minute Duckweed	<i>Lemna perpusilla</i>		E
Pale Duckweed	<i>Lemna valdiviana</i>		E
Leucospora	<i>Leucospora multifida</i>		E
Slender Blazing-star	<i>Liatris cylindracea</i>		E
Scotch Lovage	<i>Ligusticum scoticum</i>		E
Michigan Lily	<i>Lilium michiganense</i>		E
Wild Flax	<i>Linum medium</i> var. <i>medium</i>		E
Large Twayblade	<i>Liparis lilifolia</i>		E
Dwarf Bulrush	<i>Lipocarpha micrantha</i>		E
Auricled Twayblade	<i>Listera auriculata</i>		E
Southern Twayblade	<i>Listera australis</i>		E
Broad-lipped Twayblade	<i>Listera convallarioides</i>		E
Golden Puccoon	<i>Lithospermum caroliniense</i> ssp. <i>croceum</i>		E
American Shore-grass	<i>Littorella uniflora</i>		E
Alpine Azalea	<i>Loiseleuria procumbens</i>		E
Spiked Woodthrush	<i>Luzula spicata</i>		E
Carolina Clubmoss	<i>Lycopodiella caroliniana</i>		E
Northern Running-pine	<i>Lycopodium complanatum</i>		E
Sitka Clubmoss	<i>Lycopodium sitchense</i>		E
Gypsy-wort	<i>Lycopus rubellus</i>		E
Climbing Fern	<i>Lygodium palmatum</i>		E
Lance-leaved Loosestrife	<i>Lysimachia hybrida</i>		E
Four-flowered Loosestrife	<i>Lysimachia quadriflora</i>		E
Saltmarsh Loosestrife	<i>Lythrum lineare</i>		E
Sweetbay Magnolia	<i>Magnolia virginiana</i>		E
Bayard's Malaxis	<i>Malaxis bayardii</i>		E
American Crab	<i>Malus glaucescens</i>		E
Virginia Bunchflower	<i>Melanthium virginicum</i>		E
Basil-balm	<i>Monarda clinopodia</i>		E
Green Parrot's-feather	<i>Myriophyllum pinnatum</i>		E
Muenschel's Naiad	<i>Najas guadalupensis</i> var. <i>muenschelii</i>		E
Southern Naiad	<i>Najas guadalupensis</i> var. <i>olivacea</i>		E
Holly-leaved Naiad	<i>Najas marina</i>		E
Cut-leaved Evening-primrose	<i>Oenothera laciniata</i>		E
Clustered Bluets	<i>Oldenlandia uniflora</i>		E
Virginia False Gromwell	<i>Onosmodium virginianum</i>		E
Canada Ricegrass	<i>Oryzopsis canadensis</i>		E
Stiff Cowbane	<i>Oxypolis rigidior</i>		E
Leiberg's Panic Grass	<i>Panicum leibergii</i>		E
Few-flowered Panic Grass	<i>Panicum oligosanthes</i> var.		E

	<i>oligosanthes</i>		
Panic Grass	<i>Panicum scabriusculum</i>		E
Velvet Panic Grass	<i>Panicum scoparium</i>		E
Tall Flat Panic Grass	<i>Panicum stipitatum</i>		E
Wright's Panic Grass	<i>Panicum wrightianum</i>		E
Round Field Beadgrass	<i>Paspalum laeve</i> var. <i>circularae</i>		E
Hairy Field Beadgrass	<i>Paspalum laeve</i> var. <i>pilosum</i>		E
Slender Beadgrass	<i>Paspalum setaceum</i> var. <i>psammophilum</i>		E
Sweet Coltsfoot	<i>Petasites frigidus</i> var. <i>palmatius</i>		E
Wild Sweet-William	<i>Phlox maculata</i>		E
Downy Phlox	<i>Phlox pilosa</i>		E
Ground-cherry	<i>Physalis pubescens</i> var. <i>integrifolia</i>		E
Virginia Ground-cherry	<i>Physalis virginiana</i>		E
Ninebark	<i>Physocarpus opulifolius</i> var. <i>intermedius</i>		E
Virginia Pine	<i>Pinus virginiana</i>		E
Orange Fringed Orchis	<i>Platanthera ciliaris</i>		E
Crested Fringed Orchis	<i>Platanthera cristata</i>		E
Hooker's Orchid	<i>Platanthera hookeri</i>		E
Prairie Fringed Orchid	<i>Platanthera leucophaea</i>	T	E
Bluegrass	<i>Poa cuspidata</i>		E
Fernald Bluegrass	<i>Poa fernaldiana</i>		E
White Bluegrass	<i>Poa glauca</i>		E
Inland Bluegrass	<i>Poa interior</i>		E
Slender Marsh Bluegrass	<i>Poa paludigena</i>		E
Woodland Bluegrass	<i>Poa sylvestris</i>		E
Yellow Milkwort	<i>Polygala lutea</i>		E
Small's Knotweed	<i>Polygonum buxiforme</i>		E
Erect Knotweed	<i>Polygonum erectum</i>		E
Swamp Smartweed	<i>Polygonum setaceum</i> var. <i>interjectum</i>		E
Bear's-foot	<i>Polymnia uvedalia</i>		E
Northern Holly-fern	<i>Polystichum lonchitis</i>		E
Water-thread Pondweed	<i>Potamogeton diversifolius</i>		E
Slender Pondweed	<i>Potamogeton filiformis</i> var. <i>alpinus</i>		E
Sheathed Pondweed	<i>Potamogeton filiformis</i> var. <i>occidentalis</i>		E
Ogden's Pondweed	<i>Potamogeton ogdenii</i>		E
Straight-leaf Pondweed	<i>Potamogeton strictifolius</i>		E
Bushy Cinquefoil	<i>Potentilla paradoxa</i>		E
Boott's Rattlesnake-root	<i>Prenanthes boottii</i>		E
Nodding Rattlesnake-root	<i>Prenanthes crepidinea</i>		E
Dwarf Rattlesnake-root	<i>Prenanthes nana</i>		E
Low Sand-cherry	<i>Prunus pumila</i> var. <i>pumila</i>		E
Wafer-ash	<i>Ptelea trifoliata</i>		E
Giant Pine-drops	<i>Pterospora andromedea</i>		E
Mountain-mint	<i>Pycnanthemum clinopodioides</i>		E
Torrey's Mountain-mint	<i>Pycnanthemum torrei</i>		E
Whorled Mountain-mint	<i>Pycnanthemum verticillatum</i> var. <i>pilosum</i>		E
Mountain Pyrola	<i>Pyrola minor</i>		E
Pixies	<i>Pyxidantha barbulata</i>		E
Willow Oak	<i>Quercus phellos</i>		E
Seaside Crowfoot	<i>Ranunculus cymbalaria</i>		E
Swamp Buttercup	<i>Ranunculus hispidus</i> var. <i>nitidus</i>		E
Lapland Rosebay	<i>Rhododendron lapponicum</i>		E
Torrey's Beakrush	<i>Rhynchospora torreyana</i>		E

Prickly Rose	<i>Rosa acicularis</i> ssp. <i>sayi</i>		E
Shining Rose	<i>Rosa nitida</i>		E
Sand Blackberry	<i>Rubus cuneifolius</i>		E
Black-eyed-susan	<i>Rudbeckia hirta</i> var. <i>hirta</i>		E
Heart Sorrel	<i>Rumex hastatulus</i>		E
Golden Dock	<i>Rumex maritimus</i> var. <i>fueginus</i>		E
Rose-pink	<i>Sabatia angularis</i>		E
Slender Marsh-pink	<i>Sabatia campanulata</i>		E
Small-flowered Pearlwort	<i>Sagina decumbens</i>		E
Quill-leaf Arrowhead	<i>Sagittaria teres</i>		E
Sand Dune Willow	<i>Salix cordata</i>		E
Dwarf Willow	<i>Salix herbacea</i>		E
Lyre-leaf Sage	<i>Salvia lyrata</i>		E
Purple Mountain-Saxifrage	<i>Saxifraga oppositifolia</i>		E
White Mountain-Saxifrage	<i>Saxifraga paniculata</i>		E
Curlygrass	<i>Schizaea pusilla</i>		E
Clinton's Clubrush	<i>Scirpus clintonii</i>		E
Georgia Bulrush	<i>Scirpus georgianus</i>		E
Slender Bulrush	<i>Scirpus heterochaetus</i>		E
Seaside Bulrush	<i>Scirpus maritimus</i>		E
Saltmarsh Bulrush	<i>Scirpus novae-angliae</i>		E
Slender Nutrush	<i>Scleria minor</i>		E
Fewflower Nutrush	<i>Scleria pauciflora</i> var. <i>caroliniana</i>		E
Reticulate Nutrush	<i>Scleria reticularis</i> var. <i>pubescens</i>		E
Low Nutrush	<i>Scleria verticillata</i>		E
Hoary Skullcap	<i>Scutellaria incana</i>		E
Hyssop-skullcap	<i>Scutellaria integrifolia</i>		E
Leedy's Roseroot	<i>Sedum integrifolium</i> ssp. <i>leedyi</i>	T	E
Roseroot	<i>Sedum rosea</i>		E
Live-forever	<i>Sedum telephioides</i>		E
Sea Purslane	<i>Sesuvium maritimum</i>		E
Michaux's Blue-eyed-grass	<i>Sisyrinchium mucronatum</i>		E
False China-root	<i>Smilax pseudo-china</i>		E
Jacob's-ladder	<i>Smilax pulverulenta</i>		E
Coastal Goldenrod	<i>Solidago elliotii</i>		E
Houghton's Goldenrod	<i>Solidago houghtonii</i>		E
Rough Goldenrod	<i>Solidago rugosa</i> ssp. <i>aspera</i>		E
Tall Hairy Goldenrod	<i>Solidago rugosa</i> var. <i>sphagnophila</i>		E
Seaside Goldenrod	<i>Solidago sempervirens</i> var. <i>mexicana</i>		E
Mountain Goldenrod	<i>Solidago simplex</i> var. <i>racemosa</i>		E
Prairie Wedgegrass	<i>Sphenopholis obtusata</i> var. <i>obtusata</i>		E
Swamp Oats	<i>Sphenopholis pensylvanica</i>		E
Mountain Meadowsweet	<i>Spiraea septentrionalis</i>		E
Spring Ladies'-tresses	<i>Spiranthes vernalis</i>		E
Rough Rush-grass	<i>Sporobolus clandestinus</i>		E
Pink Wild Bean	<i>Strophostyles umbellata</i>		E
Narrow-leaf Sea-blite	<i>Suaeda linearis</i>		E
Roland's Sea-blite	<i>Suaeda rolandii</i>		E
Water Awlwort	<i>Subularia aquatica</i> var. <i>americana</i>		E
Veiny Meadow-rue	<i>Thalictrum venulosum</i>		E
Crane-fly Orchid	<i>Tipularia discolor</i>		E
Sticky False Asphodel	<i>Tofieldia glutinosa</i>		E
Filmy Fern	<i>Trichomanes intricatum</i>		E
Tiny Blue-curly	<i>Trichostema setaceum</i>		E

Nodding Trillium	<i>Trillium flexipes</i>		E
Toad-shade	<i>Trillium sessile</i>		E
Nodding Pogonia	<i>Triphora trianthophora</i>		E
Melic-oats	<i>Trisetum melicoides</i>		E
Large Floating Bladderwort	<i>Utricularia inflata</i>		E
Mountain Bellwort	<i>Uvularia puberula</i> var. <i>nitida</i>		E
Dwarf Blueberry	<i>Vaccinium cespitosum</i>		E
Marsh Valerian	<i>Valeriana uliginosa</i>		E
Goosefoot Corn-salad	<i>Valerianella chenopodiifolia</i>		E
Corn-salad	<i>Valerianella umbilicata</i>		E
Tall Ironweed	<i>Vernonia gigantea</i>		E
Poosum-haw	<i>Viburnum nudum</i> var. <i>nudum</i>		E
Coastal Violet	<i>Viola brittoniana</i> var. <i>brittoniana</i>		E
Southern Wood Violet	<i>Viola hirsutula</i>		E
Northern Bog Violet	<i>Viola nephrophylla</i>		E
New England Violet	<i>Viola novae-angliae</i>		E
Winter Grape	<i>Vitis vulpina</i>		E
Appalachian Vittaria	<i>Vittaria appalachiana</i>		E
Alpine Woodsia	<i>Woodsia alpina</i>		E
Smooth Woodsia	<i>Woodsia glabella</i>		E
Northern Monk's-hood	<i>Aconitum noveboracense</i>	T	T
Northern Gerardia	<i>Agalinis paupercula</i> var. <i>borealis</i>		T
Yellow Giant-hyssop	<i>Agastache nepetoides</i>		T
Woodland Agrimony	<i>Agrimonia rostellata</i>		T
Northern Bentgrass	<i>Agrostis mertensii</i>		T
Stargrass	<i>Aletris farinosa</i>		T
Wild Onion	<i>Allium cernuum</i>		T
Green Rock-cress	<i>Arabis missouriensis</i>		T
Swamp Pink	<i>Arethusa bulbosa</i>		T
Green Milkweed	<i>Asclepias viridiflora</i>		T
Pawpaw	<i>Asimina triloba</i>		T
Mountain Spleenwort	<i>Asplenium montanum</i>		T
Hart's-tongue Fern	<i>Asplenium scolopendrium</i> var. <i>americanum</i>	T	T
Rush Aster	<i>Aster borealis</i>		T
Heath Aster	<i>Aster pilosus</i> var. <i>pringlei</i>		T
Flax-leaf Whitetop	<i>Aster solidagineus</i>		T
Showy Aster	<i>Aster spectabilis</i>		T
Saltmarsh Aster	<i>Aster subulatus</i>		T
Swamp Birch	<i>Betula pumila</i>		T
Smooth Bur-marigold	<i>Bidens laevis</i>		T
Northern Reedgrass	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>		T
Terrestrial Starwort	<i>Callitriche terrestris</i>		T
Long's Bittercress	<i>Cardamine longii</i>		T
Thicket Sedge	<i>Carex abscondita</i>		T
Rocky Mountain Sedge	<i>Carex backii</i>		T
Bicknell's Sedge	<i>Carex bicknellii</i>		T
Bigelow's Sedge	<i>Carex bigelowii</i>		T
Brown Bog Sedge	<i>Carex buxbaumii</i>		T
Creeping Sedge	<i>Carex chordorrhiza</i>		T
Crawe's Sedge	<i>Carex crawei</i>		T
Clustered Sedge	<i>Carex cumulata</i>		T
Davis' Sedge	<i>Carex davisii</i>		T
Handsome Sedge	<i>Carex formosa</i>		T
Hitchcock's Sedge	<i>Carex hitchcockiana</i>		T
Marsh Straw Sedge	<i>Carex hormathodes</i>		T
Houghton's Sedge	<i>Carex houghtoniana</i>		T
Nebraska Sedge	<i>Carex jamesii</i>		T

Fernald's Sedge	<i>Carex merritt-fernaldii</i>		T
Mitchell's Sedge	<i>Carex mitchelliana</i>		T
Troublesome Sedge	<i>Carex molesta</i>		T
Sartwell's Sedge	<i>Carex sartwellii</i>		T
Schweinitz' Sedge	<i>Carex schweinitzii</i>		T
Weak Stellate Sedge	<i>Carex seorsa</i>		T
Cat-tail Sedge	<i>Carex typhina</i>		T
Willdenow's Sedge	<i>Carex willdenowii</i>		T
Big Shellbark Hickory	<i>Carya laciniosa</i>		T
Dune Sandspur	<i>Cenchrus tribuloides</i>		T
Prickly Hornwort	<i>Ceratophyllum echinatum</i>		T
Blazing-star	<i>Chamaelirium luteum</i>		T
Red Pigweed	<i>Chenopodium rubrum</i>		T
Golden Corydalis	<i>Corydalis aurea</i>		T
Hop Sedge	<i>Cyperus lupulinus</i> ssp. <i>lupulinus</i>		T
Ram's-head Ladyslipper	<i>Cypripedium arietinum</i>		T
Little-leaf Tick-trefoil	<i>Desmodium ciliare</i>		T
Diapensia	<i>Diapensia lapponica</i>		T
Slender Crabgrass	<i>Digitaria filiformis</i>		T
Persimmon	<i>Diospyros virginiana</i>		T
Rock-cress	<i>Draba arabisans</i>		T
Carolina Whitlow-grass	<i>Draba reptans</i>		T
Knotted Spikerush	<i>Eleocharis equisetoides</i>		T
Salt-marsh Spikerush	<i>Eleocharis halophila</i>		T
Long-tubercled Spikerush	<i>Eleocharis tuberculosa</i>		T
Meadow Horsetail	<i>Equisetum pratense</i>		T
Marsh Horsetail	<i>Equisetum palustre</i>		T
White Boneset	<i>Eupatorium album</i> var. <i>subvenosum</i>		T
Fringed Boneset	<i>Eupatorium hyssopifolium</i> var. <i>laciniatum</i>		T
Marsh Fimbrly	<i>Fimbristylis castanea</i>		T
Green Gentian	<i>Frasera caroliniensis</i>		T
Carolina Cranesbill	<i>Geranium carolinianum</i> var. <i>sphaerospermum</i>		T
Prairie-smoke	<i>Geum triflorum</i>		T
Mock-pennyroyal	<i>Hedeoma hispidum</i>		T
Bushy Rockrose	<i>Helianthemum dumosum</i>		T
Swamp Sunflower	<i>Helianthus angustifolius</i>		T
Featherfoil	<i>Hottonia inflata</i>		T
Appalachian Firmoss	<i>Huperzia appalachiana</i>		T
Golden-seal	<i>Hydrastis canadensis</i>		T
Shrubby St. John's-wort	<i>Hypericum prolificum</i>		T
Slender Blue Flag	<i>Iris prismatica</i>		T
Twin-leaf	<i>Jeffersonia diphylla</i>		T
Arctic Rush	<i>Juncus trifidus</i>		T
Slender Pinweed	<i>Lechea tenuifolia</i>		T
Velvety Lespedeza	<i>Lespedeza stuevei</i>		T
Northern Blazing-star	<i>Liatis borealis</i>		T
Lilaeopsis	<i>Lilaeopsis chinensis</i>		T
Sandplain Wild Flax	<i>Linum intercursum</i>		T
Southern Yellow Flax	<i>Linum medium</i> var. <i>texanum</i>		T
Yellow Wild Flax	<i>Linum sulcatum</i>		T
Globe-fruited Ludwigia	<i>Ludwigia sphaerocarpa</i>		T
Water-marigold	<i>Megalodonta beckii</i> var. <i>beckii</i>		T
Appalachian Sandwort	<i>Minuartia glabra</i>		T
Water Milfoil	<i>Myriophyllum alterniflorum</i>		T
Farwell's Water Milfoil	<i>Myriophyllum farwellii</i>		T
Evening Primrose	<i>Oenothera parviflora</i> var.		T

	<i>oakesiana</i>		
Golden Club	<i>Orontium aquaticum</i>		T
Violet Wood-sorrel	<i>Oxalis violacea</i>		T
Wiry Panic Grass	<i>Panicum flexile</i>		T
Slender Beadgrass	<i>Paspalum setaceum</i> var. <i>setaceum</i>		T
Swamp Lousewort	<i>Pedicularis lanceolata</i>		T
Smooth Cliff Brake	<i>Pellaea glabella</i>		T
Butterwort	<i>Pinguicula vulgaris</i>		T
Heartleaf Plantain	<i>Plantago cordata</i>		T
Seaside Plantain	<i>Plantago maritima</i> ssp. <i>juncooides</i>		T
Riverweed	<i>Podostemum ceratophyllum</i>		T
Carey's Smartweed	<i>Polygonum careyi</i>		T
Douglas Knotweed	<i>Polygonum douglassii</i>		T
Opelousa Smartweed	<i>Polygonum hydropiperoides</i> var. <i>opelousanum</i>		T
Swamp Cottonwood	<i>Populus heterophylla</i>		T
Northern Pondweed	<i>Potamogeton alpinus</i>		T
Algae-like Pondweed	<i>Potamogeton confervoides</i>		T
Hill's Pondweed	<i>Potamogeton hillii</i>		T
Spotted Pondweed	<i>Potamogeton pulcher</i>		T
Silverweed	<i>Potentilla anserina</i> ssp. <i>egedii</i>		T
Bird's-eye Primrose	<i>Primula mistassinica</i>		T
Comb-leaved Mermaid-weed	<i>Proserpinaca pectinata</i>		T
Dwarf Sand-cherry	<i>Prunus pumila</i> var. <i>depressa</i>		T
Blunt Mountain-mint	<i>Pycnanthemum muticum</i>		T
Whorled Mountain-mint	<i>Pycnanthemum verticillatum</i> var. <i>verticillatum</i>		T
Pink Wintergreen	<i>Pyrola asarifolia</i>		T
Small-flowered Crowfoot	<i>Ranunculus micranthus</i>		T
Rhodora	<i>Rhododendron canadense</i>		T
Drowned Horned Bush	<i>Rhynchospora inundata</i>		T
Short-beaked Bald-rush	<i>Rhynchospora nitens</i>		T
Lake-cress	<i>Rorippa aquatica</i>		T
Tooth-cup	<i>Rotala ramosior</i>		T
Sea-pink	<i>Sabatia stellaris</i>		T
Spongy Arrowhead	<i>Sagittaria calycina</i> var. <i>spongiosa</i>		T
Dwarf Glasswort	<i>Salicornia bigelovii</i>		T
Balsam Willow	<i>Salix pyrifolia</i>		T
Bearberry Willow	<i>Salix uva-ursi</i>		T
Yellow Mountain-saxifrage	<i>Saxifraga aizoides</i>		T
Deer's Hair Sedge	<i>Scirpus cespitosus</i>		T
Whip Nutrush	<i>Scleria triglomerata</i>		T
Alpine Goldenrod	<i>Solidago multiradiata</i> var. <i>arctica</i>		T
Ohio Golderod	<i>Solidago ohioensis</i>		T
Stiff-leaf Goldenrod	<i>Solidago rigida</i>		T
Mountain Goldenrod	<i>Solidago simplex</i> var. <i>randii</i>		T
Small Bur-reed	<i>Sparganium nutans</i>		T
Northern Dropseed	<i>Sporobolus heterolepis</i>		T
Rough Hedge-nettle	<i>Stachys hyssopifolia</i>		T
Starwort	<i>Stellaria longipes</i>		T
Marsh Arrow-grass	<i>Triglochin palustre</i>		T
Northern Gamma Grass	<i>Tripsacum dactyloides</i>		T
Cork Elm	<i>Ulmus thomasi</i>		T
Rush Bladderwort	<i>Utricularia juncea</i>		T
Lesser Bladderwort	<i>Utricularia minor</i>		T
Small Floating Bladderwort	<i>Utricularia radiata</i>		T
Bladderwort	<i>Utricularia striata</i>		T
High-mountain Blueberry	<i>Vaccinium boreale</i>		T

Wingstem	<i>Verbesina alternifolia</i>		T
Culver's root	<i>Veronicastrum virginicum</i>		T
Southern Arrowwood	<i>Viburnum dentatum</i> var. <i>venosum</i>		T
Squashberry	<i>Viburnum edule</i>		T
Primrose Violet	<i>Viola primulifolia</i>		T
White Camas	<i>Zigadenus elegans</i> ssp. <i>glaucus</i>		T

E = Endangered; T = Threatened; SC = Species of Concern; C = Candidate

APPENDIX E

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION BREEDING BIRD ATLAS DATA FOR THE AREA AROUND JFK



Block 5949B			
<u>Common Name</u>	<u>Scientific Name</u>	<u>Date</u>	<u>NY Legal Status</u>
Canada Goose	<i>Branta canadensis</i>	5/12/2000	Game Species
Osprey	<i>Pandion haliaetus</i>	7//2003	Protected-Special Concern
Northern Harrier	<i>Circus cyaneus</i>	7/5/2000	Threatened
American Kestrel	<i>Falco sparverius</i>	6/16/2000	Protected
Ring-necked Pheasant	<i>Phasianus colchicus</i>	8/15/2000	Game Species
Clapper Rail	<i>Rallus longirostris</i>	6/7/2000	Protected
Killdeer	<i>Charadrius vociferus</i>	5/18/2000	Protected
American Oystercatcher	<i>Haematopus palliatus</i>	5/18/2000	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	6/5/2000	Protected
Upland Sandpiper	<i>Bartramia longicauda</i>	6/5/2000	Threatened
Laughing Gull	<i>Larus atricilla</i>	6/7/2000	Protected
Rock Pigeon	<i>Columba livia</i>	6/12/2000	Unprotected
Northern Flicker	<i>Colaptes auratus</i>	6/14/2003	Protected
American Crow	<i>Corvus brachyrhynchos</i>	6/14/2003	Game Species
American Robin	<i>Turdus migratorius</i>	6/14/2003	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	6/14/2003	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	6/12/2004	Protected
Brown Thrasher	<i>Toxostoma rufum</i>	6/14/2003	Protected
European Starling	<i>Sturnus vulgaris</i>	6/14/2003	Unprotected
Saltmarsh Sparrow	<i>Ammodramus caudacutus</i>	6/6/2003	Protected
Song Sparrow	<i>Melospiza melodia</i>	6/14/2003	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	6/14/2003	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	6/14/2003	Protected
Eastern Meadowlark	<i>Sturnella magna</i>	6/12/2000	Protected
Boat-tailed Grackle	<i>Quiscalus major</i>	6/14/2003	Protected
House Sparrow	<i>Passer domesticus</i>	6/21/2003	Unprotected

Block 5949A			
<u>Common Name</u>	<u>Scientific Name</u>	<u>Date</u>	<u>NY Legal Status</u>
Pied-billed Grebe	<i>Podilymbus podiceps</i>	7/27/2002	Threatened
Least Bittern	<i>Ixobrychus exilis</i>	5/22/2004	Threatened

Great Egret	<i>Ardea alba</i>	6//2001	Protected
Snowy Egret	<i>Egretta thula</i>	6//2001	Protected
Little Blue Heron	<i>Egretta caerulea</i>	5/4/2003	Protected
Tricolored Heron	<i>Egretta tricolor</i>	6//2001	Protected
Cattle Egret	<i>Bubulcus ibis</i>	5/25/2004	Protected
Green Heron	<i>Butorides virescens</i>	8/4/2002	Protected
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	6//2001	Protected
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	5/16/2004	Protected
Glossy Ibis	<i>Plegadis falcinellus</i>	6//2001	Protected
Canada Goose	<i>Branta canadensis</i>	4/6/2002	Game Species
Mute Swan	<i>Cygnus olor</i>	4/26/2002	Protected
Wood Duck	<i>Aix sponsa</i>	7/13/2003	Game Species
Gadwall	<i>Anas strepera</i>	7/27/2002	Game Species
American Black Duck	<i>Anas rubripes</i>	7/27/2002	Game Species
Mallard	<i>Anas platyrhynchos</i>	7/27/2002	Game Species
Mallard x Am. Black Duck Hybrid	<i>Anas platyrhynchos x A. rubripes</i>	5/4/2003	Game Species
Blue-winged Teal	<i>Anas discors</i>	6/11/2004	Game Species
Green-winged Teal	<i>Anas crecca</i>	7/27/2002	Game Species
Ruddy Duck	<i>Oxyura jamaicensis</i>	4/29/2004	Game Species
Osprey	<i>Pandion haliaetus</i>	4/20/2002	Protected-Special Concern
Northern Harrier	<i>Circus cyaneus</i>	4/20/2002	Threatened
Clapper Rail	<i>Rallus longirostris</i>	8/18/2002	Protected
Virginia Rail	<i>Rallus limicola</i>	6/14/2005	Game Species
Common Moorhen	<i>Gallinula chloropus</i>	5/22/2004	Game Species
American Oystercatcher	<i>Haematopus palliatus</i>	5/24/2004	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	5/30/2003	Protected
Spotted Sandpiper	<i>Actitis macularia</i>	6/26/2004	Protected
American Woodcock	<i>Scolopax minor</i>	6//2003	Game Species
Herring Gull	<i>Larus argentatus</i>	6/26/2004	Protected
Great Black-backed Gull	<i>Larus marinus</i>	6/26/2004	Protected
Gull-billed Tern	<i>Sterna nilotica</i>	6/14/2004	Protected

Rock Pigeon	<i>Columba livia</i>	5/16/2004	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	4/15/2003	Protected
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	6/7/2003	Protected
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	6/26/2004	Protected
Barn Owl	<i>Tyto alba</i>	6/3/2004	Protected
Chimney Swift	<i>Chaetura pelagica</i>	8/3/2003	Protected
Downy Woodpecker	<i>Picoides pubescens</i>	8/4/2002	Protected
Northern Flicker	<i>Colaptes auratus</i>	6/8/2003	Protected
Willow Flycatcher	<i>Empidonax traillii</i>	8/7/2004	Protected
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	8/7/2004	Protected
Eastern Kingbird	<i>Tyrannus tyrannus</i>	8/4/2002	Protected
White-eyed Vireo	<i>Vireo griseus</i>	7/27/2002	Protected
Warbling Vireo	<i>Vireo gilvus</i>	5/13/2004	Protected
Red-eyed Vireo	<i>Vireo olivaceus</i>	6/20/2004	Protected
American Crow	<i>Corvus brachyrhynchos</i>	4/27/2002	Game Species
Fish Crow	<i>Corvus ossifragus</i>	7/27/2002	Protected
Tree Swallow	<i>Tachycineta bicolor</i>	4/20/2002	Protected
Barn Swallow	<i>Hirundo rustica</i>	8/4/2002	Protected
Carolina Wren	<i>Thryothorus ludovicianus</i>	5/14/2004	Protected
House Wren	<i>Troglodytes aedon</i>	5/10/2002	Protected
Marsh Wren	<i>Cistothorus palustris</i>	8/4/2002	Protected
American Robin	<i>Turdus migratorius</i>	6/8/2003	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	7/27/2002	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	7/4/2003	Protected
Brown Thrasher	<i>Toxostoma rufum</i>	5/30/2003	Protected
European Starling	<i>Sturnus vulgaris</i>	4/27/2002	Unprotected
Cedar Waxwing	<i>Bombycilla cedrorum</i>	7/27/2002	Protected
Yellow Warbler	<i>Dendroica petechia</i>	6/20/2003	Protected
Black-and-white Warbler	<i>Mniotilta varia</i>	6/20/2004	Protected
American Redstart	<i>Setophaga ruticilla</i>	8/7/2004	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	7/18/2003	Protected
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	8/2/2003	Protected

Field Sparrow	<i>Spizella pusilla</i>	7/16/2005	Protected
Saltmarsh Sparrow	<i>Ammodramus caudacutus</i>	5/20/2004	Protected
Seaside Sparrow	<i>Ammodramus maritimus</i>	5/10/2002	Protected-Special Concern
Song Sparrow	<i>Melospiza melodia</i>	7/27/2002	Protected
Swamp Sparrow	<i>Melospiza georgiana</i>	7/3/2003	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	7/27/2002	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	4/27/2002	Protected
Common Grackle	<i>Quiscalus quiscula</i>	4/27/2002	Protected
Boat-tailed Grackle	<i>Quiscalus major</i>	7/27/2002	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	7/3/2003	Protected
Orchard Oriole	<i>Icterus spurius</i>	6/26/2004	Protected
House Finch	<i>Carpodacus mexicanus</i>	5/4/2003	Protected
American Goldfinch	<i>Carduelis tristis</i>	7/27/2002	Protected
House Sparrow	<i>Passer domesticus</i>	4/27/2002	Unprotected

Block 5949C			
Common Name	Scientific Name	Date	NY Legal Status
Northern Bobwhite	<i>Colinus virginianus</i>	7/25/2004	Game Species
American Oystercatcher	<i>Haematopus palliatus</i>	5/25/2004	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	8/4/2004	Protected
Herring Gull	<i>Larus argentatus</i>	6/3/2004	Protected
Great Black-backed Gull	<i>Larus marinus</i>	6/3/2004	Protected
Common Tern	<i>Sterna hirundo</i>	6/3/2004	Threatened
Rock Pigeon	<i>Columba livia</i>	6/22/2003	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	7/19/2003	Protected
Barn Owl	<i>Tyto alba</i>	7/3/2004	Protected
Chimney Swift	<i>Chaetura pelagica</i>	7/19/2003	Protected
American Crow	<i>Corvus brachyrhynchos</i>	6/10/2003	Game Species
Black-capped Chickadee	<i>Poecile atricapillus</i>	7/19/2003	Protected
Carolina Wren	<i>Thryothorus ludovicianus</i>	6/22/2003	Protected
Marsh Wren	<i>Cistothorus palustris</i>	6/13/2003	Protected
American Robin	<i>Turdus migratorius</i>	6/13/2003	Protected

Gray Catbird	<i>Dumetella carolinensis</i>	7/19/2003	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	7/19/2003	Protected
European Starling	<i>Sturnus vulgaris</i>	6/13/2003	Unprotected
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	6/27/2004	Protected
Seaside Sparrow	<i>Ammodramus maritimus</i>	7/19/2003	Protected-Special Concern
Song Sparrow	<i>Melospiza melodia</i>	6/22/2003	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	7/19/2003	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	7/12/2003	Protected
Common Grackle	<i>Quiscalus quiscula</i>	6/10/2003	Protected
Boat-tailed Grackle	<i>Quiscalus major</i>	6/3/2004	Protected
House Finch	<i>Carpodacus mexicanus</i>	7/19/2003	Protected
House Sparrow	<i>Passer domesticus</i>	6/13/2003	Unprotected

Block 5949D			
Common Name	Scientific Name	Date	NY Legal Status
Ring-necked Pheasant	<i>Phasianus colchicus</i>	8/12/2000	Game Species
Piping Plover	<i>Charadrius melodus</i>	5/30/2000	Endangered
Killdeer	<i>Charadrius vociferus</i>	3/30/2000	Protected
American Oystercatcher	<i>Haematopus palliatus</i>	5/12/2000	Protected
Common Tern	<i>Sterna hirundo</i>	8/3/2000	Threatened
Least Tern	<i>Sterna antillarum</i>	6/16/2000	Threatened
Rock Pigeon	<i>Columba livia</i>	6/15/2000	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	6/1/2000	Protected
Willow Flycatcher	<i>Empidonax traillii</i>	6/22/2000	Protected
American Crow	<i>Corvus brachyrhynchos</i>	7/15/2000	Game Species
Barn Swallow	<i>Hirundo rustica</i>	7/15/2000	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	7/12/2000	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	5/13/2000	Protected
European Starling	<i>Sturnus vulgaris</i>	7/4/2000	Unprotected
Yellow Warbler	<i>Dendroica petechia</i>	6/22/2000	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	7/1/2000	Protected
Song Sparrow	<i>Melospiza melodia</i>	8/11/2002	Protected

Northern Cardinal	<i>Cardinalis cardinalis</i>	7/15/2000	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	7/15/2000	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	8/11/2002	Protected
House Sparrow	<i>Passer domesticus</i>	6/15/2000	Unprotected
Block 5950C			
<u>Common Name</u>	<u>Scientific Name</u>	<u>Date</u>	<u>NY Legal Status</u>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	6/26/2004	Protected
Mute Swan	<i>Cygnus olor</i>	5/10/2004	Protected
American Black Duck	<i>Anas rubripes</i>	4/29/2004	Game Species
Mallard	<i>Anas platyrhynchos</i>	4/18/2004	Game Species
Northern Harrier	<i>Circus cyaneus</i>	5/11/2004	Threatened
Ring-necked Pheasant	<i>Phasianus colchicus</i>	5/10/2004	Game Species
Willet	<i>Catoptrophorus semipalmatus</i>	6/26/2004	Protected
Rock Pigeon	<i>Columba livia</i>	3/20/2004	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	6/26/2004	Protected
Chimney Swift	<i>Chaetura pelagica</i>	6/26/2004	Protected
Northern Flicker	<i>Colaptes auratus</i>	6/26/2004	Protected
Willow Flycatcher	<i>Empidonax traillii</i>	5/23/2004	Protected
Eastern Kingbird	<i>Tyrannus tyrannus</i>	5/23/2004	Protected
American Crow	<i>Corvus brachyrhynchos</i>	5/11/2004	Game Species
Fish Crow	<i>Corvus ossifragus</i>	6/26/2004	Protected
Barn Swallow	<i>Hirundo rustica</i>	6/26/2004	Protected
House Wren	<i>Troglodytes aedon</i>	5/20/2004	Protected
Marsh Wren	<i>Cistothorus palustris</i>	5/11/2004	Protected
American Robin	<i>Turdus migratorius</i>	6/26/2004	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	5/11/2004	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	6/26/2004	Protected
Brown Thrasher	<i>Toxostoma rufum</i>	6/26/2004	Protected
European Starling	<i>Sturnus vulgaris</i>	3/20/2004	Unprotected
Yellow Warbler	<i>Dendroica petechia</i>	5/10/2004	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	6/26/2004	Protected
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	4/29/2004	Protected

Song Sparrow	<i>Melospiza melodia</i>	6/26/2004	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	3/26/2004	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	6/26/2004	Protected
Common Grackle	<i>Quiscalus quiscula</i>	3/26/2004	Protected
Boat-tailed Grackle	<i>Quiscalus major</i>	5/23/2004	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	5/10/2004	Protected
Baltimore Oriole	<i>Icterus galbula</i>	5/23/2004	Protected
House Finch	<i>Carpodacus mexicanus</i>	6/26/2004	Protected
American Goldfinch	<i>Carduelis tristis</i>	6/26/2004	Protected
House Sparrow	<i>Passer domesticus</i>	3/26/2004	Unprotected

Block 5950D			
Common Name	Scientific Name	Date	NY Legal Status
Green Heron	<i>Butorides virescens</i>	7/5/2005	Protected
Canada Goose	<i>Branta canadensis</i>	5/16/2004	Game Species
Wood Duck	<i>Aix sponsa</i>	7/5/2005	Game Species
American Black Duck	<i>Anas rubripes</i>	5/16/2004	Game Species
Mallard	<i>Anas platyrhynchos</i>	5/23/2004	Game Species
Red-tailed Hawk	<i>Buteo jamaicensis</i>	3/19/2005	Protected
Ring-necked Pheasant	<i>Phasianus colchicus</i>	7/5/2005	Game Species
Clapper Rail	<i>Rallus longirostris</i>	5/16/2004	Protected
Killdeer	<i>Charadrius vociferus</i>	3/17/2005	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	5/26/2004	Protected
American Woodcock	<i>Scolopax minor</i>	3/19/2005	Game Species
Rock Pigeon	<i>Columba livia</i>	5/14/2004	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	5/14/2004	Protected
Northern Flicker	<i>Colaptes auratus</i>	6/11/2005	Protected
Eastern Kingbird	<i>Tyrannus tyrannus</i>	5/26/2004	Protected
White-eyed Vireo	<i>Vireo griseus</i>	5/14/2004	Protected
Blue Jay	<i>Cyanocitta cristata</i>	7/23/2005	Protected
American Crow	<i>Corvus brachyrhynchos</i>	5/23/2004	Game Species
Tree Swallow	<i>Tachycineta bicolor</i>	5/16/2004	Protected
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	6/11/2005	Protected
Barn Swallow	<i>Hirundo rustica</i>	6/11/2005	Protected
Marsh Wren	<i>Cistothorus palustris</i>	5/14/2004	Protected
American Robin	<i>Turdus migratorius</i>	5/23/2004	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	6/27/2004	Protected

Northern Mockingbird	<i>Mimus polyglottos</i>	6/1/2000	Protected
Brown Thrasher	<i>Toxostoma rufum</i>	6/11/2005	Protected
European Starling	<i>Sturnus vulgaris</i>	5/14/2004	Unprotected
Yellow Warbler	<i>Dendroica petechia</i>	7/23/2005	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	5/16/2004	Protected
Seaside Sparrow	<i>Ammodramus maritimus</i>	7/23/2005	Protected-Special Concern
Song Sparrow	<i>Melospiza melodia</i>	5/16/2004	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	5/2/2000	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	5/23/2004	Protected
Common Grackle	<i>Quiscalus quiscula</i>	5/23/2004	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	5/16/2004	Protected
Baltimore Oriole	<i>Icterus galbula</i>	7/23/2005	Protected
House Finch	<i>Carpodacus mexicanus</i>	5/23/2004	Protected
House Sparrow	<i>Passer domesticus</i>	5/11/2000	Unprotected

Block 6050C			
Common Name	Scientific Name	Date	NY Legal Status
Green Heron	<i>Butorides virescens</i>	6/2/2002	Protected
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	5/30/2004	Protected
Canada Goose	<i>Branta canadensis</i>	7/15/2000	Game Species
Mute Swan	<i>Cygnus olor</i>	7/28/2001	Protected
Gadwall	<i>Anas strepera</i>	6/3/2001	Game Species
American Black Duck	<i>Anas rubripes</i>	6/23/2002	Game Species
Mallard	<i>Anas platyrhynchos</i>	7/15/2000	Game Species
Osprey	<i>Pandion haliaetus</i>	6/6/2004	Protected-Special Concern
Clapper Rail	<i>Rallus longirostris</i>	6/6/2004	Protected
Killdeer	<i>Charadrius vociferus</i>	6/23/2002	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	6/17/2001	Protected
Spotted Sandpiper	<i>Actitis macularia</i>	6/2/2002	Protected
Rock Pigeon	<i>Columba livia</i>	//2004	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	6/3/2001	Protected
Chimney Swift	<i>Chaetura pelagica</i>	6/5/2004	Protected
Belted Kingfisher	<i>Ceryle alcyon</i>	6/2/2002	Protected
Downy Woodpecker	<i>Picoides pubescens</i>	6/8/2003	Protected
Hairy Woodpecker	<i>Picoides villosus</i>	//2004	Protected
Northern Flicker	<i>Colaptes auratus</i>	6/5/2004	Protected

Great Crested Flycatcher	<i>Myiarchus crinitus</i>	6/12/2005	Protected
Eastern Kingbird	<i>Tyrannus tyrannus</i>	6/17/2001	Protected
Red-eyed Vireo	<i>Vireo olivaceus</i>	6/8/2003	Protected
Blue Jay	<i>Cyanocitta cristata</i>	6/3/2001	Protected
American Crow	<i>Corvus brachyrhynchos</i>	6/3/2001	Game Species
Fish Crow	<i>Corvus ossifragus</i>	7/7/2002	Protected
Tree Swallow	<i>Tachycineta bicolor</i>	7/15/2000	Protected
Barn Swallow	<i>Hirundo rustica</i>	6/8/2003	Protected
Black-capped Chickadee	<i>Poecile atricapillus</i>	6/17/2005	Protected
Tufted Titmouse	<i>Baeolophus bicolor</i>	6/6/2004	Protected
Carolina Wren	<i>Thryothorus ludovicianus</i>	6/23/2002	Protected
House Wren	<i>Troglodytes aedon</i>	7/3/2004	Protected
American Robin	<i>Turdus migratorius</i>	7/15/2000	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	7/13/2002	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	7/15/2000	Protected
European Starling	<i>Sturnus vulgaris</i>	7/15/2000	Unprotected
Cedar Waxwing	<i>Bombycilla cedrorum</i>	7/17/2004	Protected
Yellow Warbler	<i>Dendroica petechia</i>	6/8/2003	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	7/18/2004	Protected
Chipping Sparrow	<i>Spizella passerina</i>	7/3/2004	Protected
Song Sparrow	<i>Melospiza melodia</i>	6/22/2003	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	2/15/2000	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	6/22/2003	Protected
Common Grackle	<i>Quiscalus quiscula</i>	7/14/2001	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	7/24/2004	Protected
Baltimore Oriole	<i>Icterus galbula</i>	6/17/2005	Protected
House Finch	<i>Carpodacus mexicanus</i>	//2004	Protected
American Goldfinch	<i>Carduelis tristis</i>	7/7/2002	Protected
House Sparrow	<i>Passer domesticus</i>	6/3/2004	Unprotected

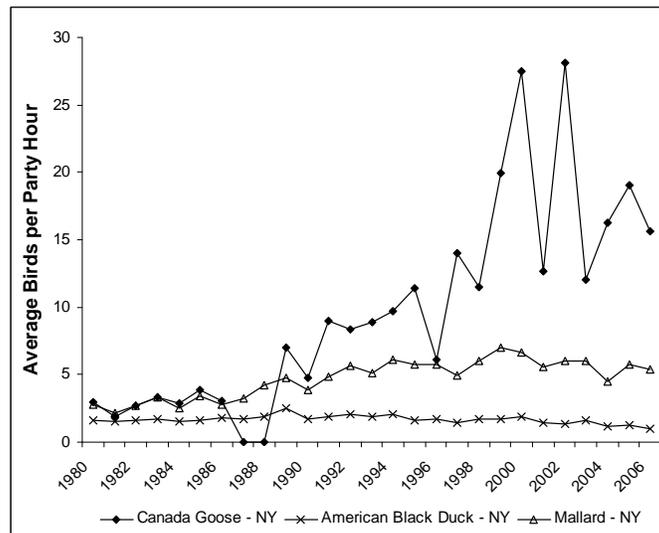
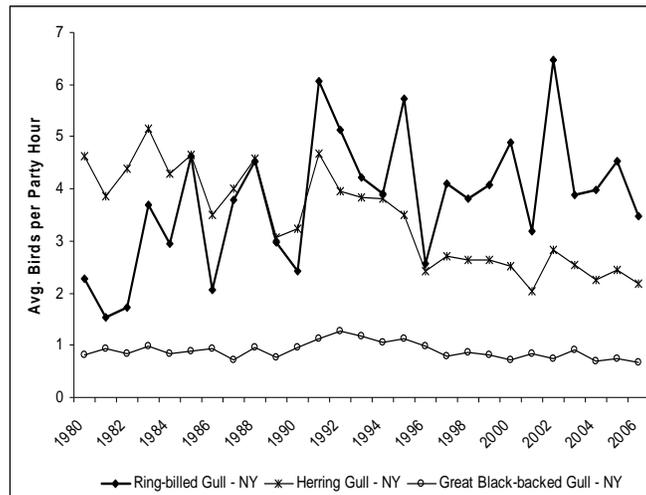
Block 6049A			
Common Name	Scientific Name	Date	NY Legal Status
Great Egret	<i>Ardea alba</i>	7/1/2000	Protected
Snowy Egret	<i>Egretta thula</i>	7/1/2000	Protected
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	6/6/2004	Protected
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	4/17/2002	Protected

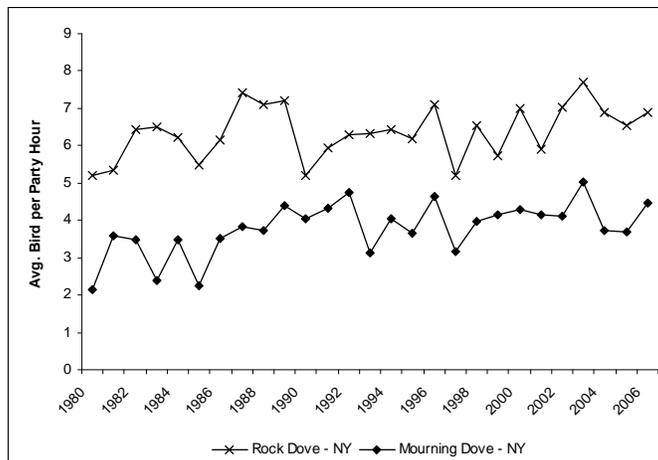
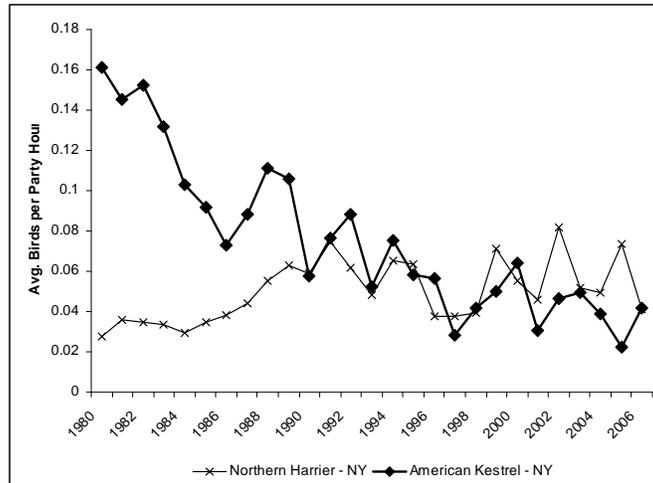
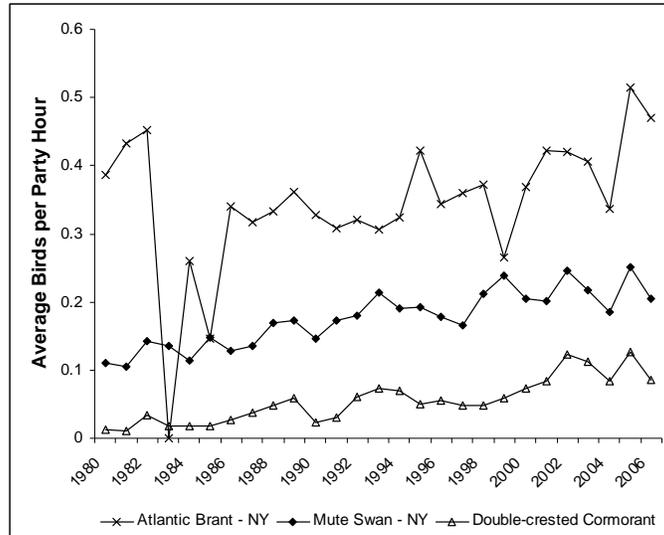
Glossy Ibis	<i>Plegadis falcinellus</i>	7/15/2000	Protected
Canada Goose	<i>Branta canadensis</i>	5/11/2001	Game Species
Mute Swan	<i>Cygnus olor</i>	7/13/2002	Protected
Gadwall	<i>Anas strepera</i>	6/5/2004	Game Species
American Black Duck	<i>Anas rubripes</i>	6/23/2002	Game Species
Mallard	<i>Anas platyrhynchos</i>	7/15/2000	Game Species
Osprey	<i>Pandion haliaetus</i>	7/15/2000	Protected-Special Concern
Clapper Rail	<i>Rallus longirostris</i>	6/3/2001	Protected
Killdeer	<i>Charadrius vociferus</i>	6/22/2003	Protected
Willet	<i>Catoptrophorus semipalmatus</i>	6/23/2002	Protected
Rock Pigeon	<i>Columba livia</i>	5/22/2003	Unprotected
Mourning Dove	<i>Zenaida macroura</i>	7/15/2000	Protected
Belted Kingfisher	<i>Ceryle alcyon</i>	6/8/2003	Protected
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	7/15/2000	Protected
Downy Woodpecker	<i>Picoides pubescens</i>	6/8/2003	Protected
Northern Flicker	<i>Colaptes auratus</i>	7/17/2004	Protected
Eastern Kingbird	<i>Tyrannus tyrannus</i>	6/23/2002	Protected
Red-eyed Vireo	<i>Vireo olivaceus</i>	6/6/2004	Protected
Blue Jay	<i>Cyanocitta cristata</i>	7/14/2001	Protected
American Crow	<i>Corvus brachyrhynchos</i>	6/2/2002	Game Species
Fish Crow	<i>Corvus ossifragus</i>	7/14/2001	Protected
Tree Swallow	<i>Tachycineta bicolor</i>	7/15/2000	Protected
Bank Swallow	<i>Riparia riparia</i>	7/1/2000	Protected
Barn Swallow	<i>Hirundo rustica</i>	7/17/2004	Protected
Black-capped Chickadee	<i>Poecile atricapillus</i>	6/5/2004	Protected
Tufted Titmouse	<i>Baeolophus bicolor</i>	7/18/2004	Protected
Carolina Wren	<i>Thryothorus ludovicianus</i>	7/15/2000	Protected
House Wren	<i>Troglodytes aedon</i>	6/8/2003	Protected
Marsh Wren	<i>Cistothorus palustris</i>	6/2/2002	Protected
American Robin	<i>Turdus migratorius</i>	7/15/2000	Protected
Gray Catbird	<i>Dumetella carolinensis</i>	6/2/2002	Protected
Northern Mockingbird	<i>Mimus polyglottos</i>	7/15/2000	Protected
Brown Thrasher	<i>Toxostoma rufum</i>	7/15/2000	Protected
European Starling	<i>Sturnus vulgaris</i>	7/15/2000	Unprotected
Cedar Waxwing	<i>Bombycilla cedrorum</i>	6/12/2004	Protected
Yellow Warbler	<i>Dendroica petechia</i>	7/24/2004	Protected
Common Yellowthroat	<i>Geothlypis trichas</i>	6/13/2004	Protected

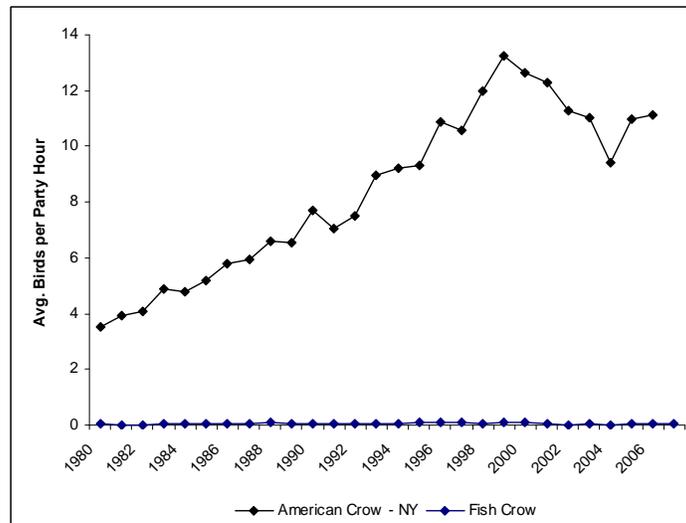
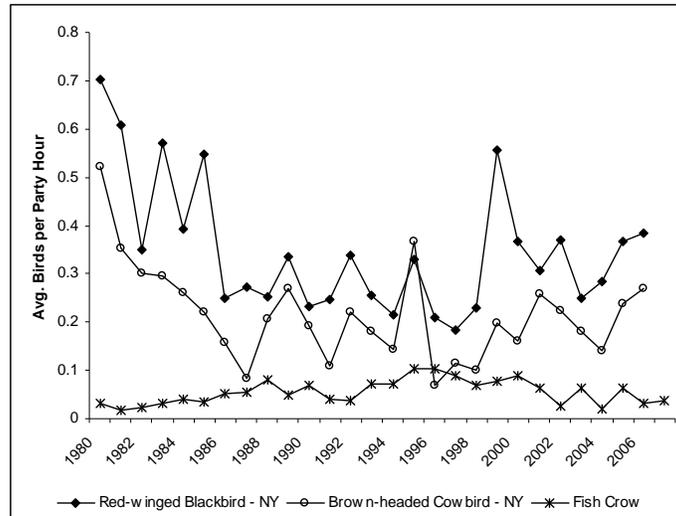
Chipping Sparrow	<i>Spizella passerina</i>	7/13/2002	Protected
Song Sparrow	<i>Melospiza melodia</i>	7/13/2002	Protected
Northern Cardinal	<i>Cardinalis cardinalis</i>	7/15/2000	Protected
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	7/29/2000	Protected
Eastern Meadowlark	<i>Sturnella magna</i>	5/30/2004	Protected
Common Grackle	<i>Quiscalus quiscula</i>	6/17/2001	Protected
Boat-tailed Grackle	<i>Quiscalus major</i>	7/17/2004	Protected
Brown-headed Cowbird	<i>Molothrus ater</i>	7/24/2004	Protected
Baltimore Oriole	<i>Icterus galbula</i>	7/15/2000	Protected
House Finch	<i>Carpodacus mexicanus</i>	7/15/2000	Protected
American Goldfinch	<i>Carduelis tristis</i>	7/7/2002	Protected
House Sparrow	<i>Passer domesticus</i>	7/1/2000	Unprotected

APPENDIX F

AUDUBON CHRISTMAS BIRD COUNT DATA FOR THE STATE OF NEW YORK







APPENDIX G

LIST OF PREPARERS

Lead Authors

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APPENDIX H

RESPONSE TO COMMENTS

The draft SEIS was made available for public review and comment from January 14, 2011 – February 28, 2011. The agencies received 10 comments from organizations and private individuals on the SEIS. This appendix contains the lead and cooperating agency response to comments provided on the draft SEIS. Comments are numbered and presented in bold text. The agencies' response follows each comment and is written in standard text. The Environmental Protection Agency (EPA) also reviewed the SEIS in accordance with their responsibilities under Section 102(2)(C) of the NEPA and Section 309 of the Clean Air Act. The EPA rated alternatives 1, 3, 5, and 6 as LO indicating they had a lack of objection. Alternatives 2 and 4 were rated LO-2 indicating that they had a lack of objection but were requesting additional information regarding off-airport bird hazard management. Specifically, the EPA requested clarification of the authority of the PANYNJ to manage bird hazards off-airport and asked for information on stress to birds in the review of the humaneness of each alternative. Agency responses to the issues raised in the EPA letter are provided in Responses 73 and 74.

NEED FOR ACTION

1. Is the risk from bird strikes overstated? The risk of a bird strike is low and the risk of a strike which has a substantial adverse impact on the flight is even lower. People who use aircraft accept the risks. Given the extraordinarily low risk birds pose to aircraft, use of lethal methods and resultant psychological and physical trauma to individuals who enjoy birds is not justified.

Although the risks of bird strikes are low, the potential consequences can be catastrophic. As explained in the 1994 FEIS and SEIS, a single bird strike has the potential to result in the deaths of hundreds of people. Federal Aviation Administration regulations (14 CFR 139.337) require airports such as JFK to assess wildlife hazards and, if needed, develop and implement a wildlife hazard management plan.

Individuals who use aircraft do so with the expectation that airports have taken reasonable and appropriate actions to ensure the safety of their flight. The 1994 FEIS and SEIS consider a range of options including nonlethal and lethal options. The proposed action combines the use of nonlethal and lethal methods and gives preference to the use and recommendation of nonlethal methods where practical and effective, thereby minimizing the need for lethal methods. Chapter 6 of the SEIS includes an analysis of the impacts of each alternative on sociological issues including perceived humaneness and aesthetic values. We realize that some people will be distressed by the lethal removal of birds. However, the lead and cooperating agencies believe these concerns must be considered in context of the potential trauma to individuals who could be involved in a serious bird strike, their friends and loved ones, the NYC community, and future aircraft passengers.

It is important to note that wildlife hazard management programs have been implemented at civil and military airports across the country for years. Relatively low strike rates at JFK and across the nation are, in part, attributable to these ongoing wildlife hazard management programs and ongoing efforts to improve management of wildlife hazards to aircraft.

2. Risk of serious bird strike is so low that it does not justify action. There are much higher risks to passengers from other factors including pilot error.

The FAA and airline industry strive to reduce all risks to passenger safety. The scope of this analysis is limited to the management of bird hazards to aircraft. Federal Aviation Administration regulations (14 CFR 139.337) require airports such as JFK to assess wildlife hazards and, if needed, develop and implement a wildlife hazard management plan. The existence of other risks does not preclude management of wildlife hazards at airports. We do not consider it reasonable to not implement practical and effective strategies for reducing bird hazards to aircraft just because there are other, potentially greater, hazards to aircraft. See Responses 1 and 12.

3. Please clarify the difference between strikes and ingestions as discussed in Section 1.5 of the SEIS. The SEIS should use data on bird ingestions instead of strikes.

Bird “ingestions” as used by commenters appears to refer to incidents where a bird is confirmed to have been ingested into an aircraft engine based on damage to the aircraft and the presence of carcasses, blood or tissue. The term “bird strike” that is used operationally by JFK in the SEIS (Section 1.5) and in the 1994 FEIS was developed by Bird Strike Committee Canada and has been endorsed by the International Civil Aviation Organization. A bird strike is considered to have occurred when 1) a pilot reports a bird strike, 2) aircraft maintenance personnel identify damage to an aircraft as having been caused by a bird or birds, 3) personnel on the ground report seeing an aircraft strike one or more birds, or 4) bird remains are found on active runways and taxiways (pavement) or within the safety areas around the runways or taxiways (unless another cause of death is apparent). Critics of this definition of “bird strike” note that there is potential for error in the system. Not all birds found dead near active runways and taxiways (pavement) or within the safety areas around the runways or taxiways (unless another cause of death is apparent) have been killed in a collision with aircraft. Some of the dead birds found near runways may have been killed by the wing-tip vortices generated by aircraft and not by direct collision with aircraft or may be dead for other reasons including illness and disease (Brown et al 2001). Others note that ground personnel may not be able to accurately identify the species of bird struck from a distance (criterion 3 above).

Advocates for the use of “ingestions” or “reported strikes” which only involve criterion 1 and 2 above assert that these data are incontrovertible and a more accurate depiction of bird hazards. Advocates for considering “ingestions” further assert that bird ingestions into engines are the real threat to aircraft operations. They point out that the increased risks associated with changes to aircraft with fewer engines or bigger intake areas are referring to ingestions, not other types of strikes. However, we feel that restricting evaluations to ingestions does not allow for effective management of bird hazards to aircraft. As noted in SEIS Section 1.5, for the purpose of evaluating the *risk* of bird strikes, the exact cause of the bird death is irrelevant. The fact that the

bird was in close enough proximity to the airfield and aircraft to be found dead near the runways indicates the bird posed a strike risk to aircraft. One of the goals of an effective hazard management program is to anticipate risks based on bird activity in the vicinity of the airfield and manage risks to prevent “ingestions”. Further, as noted in Response 24 below, not all bird strikes with detrimental impacts on the aircraft and risks to human health and safety involve engines. Ingestions are the most common kind of strike to do substantial damage to aircraft and pose risks to human safety, but they are not the only type of strike relevant to risk assessment.

4. Using ground observations (Section 1.5) as a criterion for recording strikes is not reliable because birds cannot be accurately identified at a distance.

Strike reports based solely on observations of bird strikes by individuals on the ground are rare (S. Wright, Wildlife Strike Database Manager, WS, Sandusky, OH, pers. comm.). We agree identification of birds at a distance is challenging and most bird strike observations from ground observers tend to be reported as “unknown bird”, with or without a comment as to the size of the bird. As such, these reports serve as an indicator of general bird activity and associated risk to aircraft. Observation of strikes also commonly trigger a search of the runway area where the strike occurred for carcasses which may help define the species involved in the strike. More detailed information from wildlife hazard assessments and strikes where the species is identified based on carcass recovery or identification of feathers and tissues by the Smithsonian bird identification lab area used to develop species-specific management strategies.

5. All damage should be represented as strikes per 10,000 aircraft movements. This would show how low the risk of a damaging strike is and how inappropriately extreme the proposed actions are.

Total annual bird strikes per 10,000 aircraft movements are presented in Figure 1-2. Format for presenting strike data is the same as that used in the 1994 FEIS. Although the risks of bird strikes are low, the potential consequences of an individual strike can be catastrophic. As explained in the 1994 FEIS and SEIS, a single bird strike has the potential to result in the deaths of hundreds of people. Data in Appendix C indicates that 2,666 birds were involved in 1,759 strikes at JFK over the period of 1994-2009. Federal Aviation Administration regulations (14 CFR 139.337) require airports to implement a wildlife hazard management plan to address strikes such as those which have occurred at JFK. See responses 1 and 12.

6. Increased use of modified wing tips, winglets, on large aircraft will give false impression that risk is decreasing because less wing vortices are generated and there will be fewer birds killed in wing vortices. This is another reason why ingestions and not dead birds should be used to assess hazard.

It is unclear whether the changes in wing vortices which might result from use of winglets would be of sufficient magnitude to impact the number of birds killed by wing vortices. Even with winglets, the large aircraft that comprise the majority of aircraft movements at JFK still create substantial wing vortices (J. Selden, PANYNJ, pers. comm.). Further, the FAA has not reduced aircraft wake turbulence separation requirements between aircraft due to winglets. Section 1.5 of the SEIS and Section 1.1.1 of the 1994 FEIS present detailed descriptions of the bird strike data

collection procedures in place at JFK. The definition of a bird strike used at JFK and in our analyses is used throughout the U.S. and has been accepted by the International Civil Aviation Administration and the FAA. We acknowledge that the collection of bird strike data is inexact. The strengths and weaknesses of the definition and collection procedure are discussed in the 1994 FEIS (Section 1.1.1) and SEIS (Section 1.5). As discussed in Response 3, exclusive use of ingestions would underestimate the risk to aircraft and could adversely impact human safety by limiting understanding of the problem. There is no technique available that would offer a 100% error free calculation or census of the true number of bird strikes that occur at JFK. The working definition in use is currently the best way to infer actual numbers of bird strikes and risk to aircraft.

7. Analysis indicates that presence of even one bird in JFK airspace would be unacceptable which is preposterous and unjustifiable. It is irrational to believe you can create a strike free zone.

The agencies agree that elimination of all strikes, although desirable, is not likely. We also understand that all species do not pose equal risk to aircraft at JFK. As presented in the SEIS, we do, however, believe that the risk of a serious strike associated with some species is such that extensive efforts should be made to bring the strike risk as close to zero as possible. The SEIS provides a targeted approach which focuses on managing risks associated with species of greatest concern. Appendix D contains a list of over 95 bird species which have been struck by aircraft at JFK. Chapter 1 of the SEIS focuses on species of greatest concern and only includes discussion of less than half of the total species which have been struck. Conflicts with most birds at JFK can and are being addressed through the use of on-airport nonlethal methods and the proposed action only includes provisions for lethal removal of approximately one third of the bird species which are struck at JFK. Proposed lethal take of many species is likely to be infrequent and limited to only a few individuals. Off-airport lethal bird management focuses on only 11 species (assumes 4 blackbird species and 2 crow species). As with on-airport lethal take of birds, some of the species which might be taken lethally off-airport under Alternatives 4 or 6 will only rarely be taken (e.g., blackbirds).

8. Is the current proposal based solely on WS desire for work?

The lead and cooperating agencies worked together to develop the best possible plan to reduce bird hazards to aircraft using JFK. All activities proposed for bird hazard management at JFK were included in the SEIS to enable the agencies to more clearly communicate the nature of bird hazards and bird hazard management activities to the public and enhance interagency coordination and communication regarding damage management efforts (Section 1.1). Considering all activities in one document also facilitates analysis of cumulative impacts of bird hazard management activities for JFK. Wildlife Services was involved as the lead agency because of their ongoing involvement in the gull hazard management program and the associated 1994 FEIS, and because of their expertise in the field of wildlife hazard management at airports. Although WS hopes to continue to be involved in bird hazard management at JFK, nothing about the actions proposed in this plan requires participation by WS. Roles currently filled by WS could be filled by private contractors or by the addition of specially trained staff to the JFKWMU.

9. Cost of damage needs to be presented in context of other expenses such as overall cost of aircraft, revenue generated by aircraft, cost of repairing other types of damage, availability of insurance, potential for tax write off.

Like the cost of damage associated with individual bird strikes, cost of aircraft and airline profits are highly variable. Information on the cost of aircraft and the possibility of insurance coverage will not fundamentally change the need for action established in the EA. Management of bird hazards to aircraft is required under FAA regulations (14 CFR 139.337) primarily to address the issue of risks to human health and safety. While the cost of aircraft damage and consequences of damage in terms of impact on flight and airport operations (e.g., precautionary landings, delayed or cancelled flights, impact on runway use, etc.) is important to air-carriers, airport operators and passengers, the cost of bird damage relative to other aircraft operating expenses does not change the fact that FAA regulations require effective bird hazard management. Furthermore, the fact that the cost of damage may be low relative to other expenses or airline investments does not preclude the desire to manage damage. The existence of insurance policies also does not preclude the need or desire to manage damage. Insurance policies are not free. Costs from damage claims eventually are reflected in increased insurance costs. To say that damage should be tolerated because it is low relative to other costs would be analogous to saying that homeowners should tolerate rodent, squirrel or raccoon damage to their house because the cost of damage is low relative to the total cost of the house and because their homeowner's insurance policy may cover some of the costs.

10. The SEIS should provide data on the size of the aircraft struck. Most aircraft using JFK are large and are not as vulnerable to bird strikes as small aircraft.

A table summarizing the make and model of aircraft involved in bird strikes has been added to section 1.6. Although the majority of aircraft which use JFK are large, smaller regional aircraft such as the SAAB 340, EMB 135, CL RJ100/200 and business/charter aircraft (e.g., C 560, Citation X, DA 50 Falcon) have also been involved in bird strikes at JFK. The airport is responsible for providing a safe flying environment for all aircraft which use JFK.

11. The SEIS should provide data on the part of the aircraft struck. If the majority of strikes are to areas other than engines than there is less of a risk than if strike is to other parts of aircraft.

Data on the portion of the aircraft involved in bird strikes is provided in Section 1.6 (Table 1-2). Engines were the aircraft part most commonly involved in reported bird strikes. Ingestions are also the most common kind of strike to do substantial damage to aircraft and pose risks to human safety, but they are not the only type of strike relevant to risk assessment. As noted in Response 24 below, not all bird strikes with detrimental impacts on the aircraft and risks to human health and safety involve engines.

11. Is JFK only conducting damage management actions because it will put them in a better place legally in the event of another strike like the 1995 Concorde incident?

No, the Federal Aviation Administration (14 CFR 139.337) requires airports like JFK to assess wildlife hazards and, if needed, develop and implement a wildlife hazard management plan. Implementation of a wildlife hazard management plan is a mandatory requirement for FAA certification of operations at JFK.

12. The SEIS must set measurable objectives for bird strike reductions. It is not sufficient to call for “reductions”, numeric values are needed. The SEIS should provide a cost benefit analysis which considers costs to local and regional bird population from reducing risks to aircraft by a specific amount. This evidence should help agencies determine whether they should stop, augment or continue efforts.

The issue of setting a numeric threshold on acceptable strike rates was addressed in the 1994 FEIS (1994 FEIS Responses 28a and b). The PANYNJ and FAA are responsible for providing a safe flying environment for air passengers. A single bird strike can compromise aviation safety and result in the loss of human lives. The PANYNJ and the FAA stated their positions on the issue of acceptable risk in letters included in Appendix F.2 of the 1994 FEIS. The FAA described the difficulties in defining an acceptable level of risk, “since by doing so we would be saying that any occurrence below the stated level is safe. Example: One might say that 2 bird strikes a year at JFK is acceptable. Does that mean that a single bird strike which brings down a fully loaded passenger aircraft with multiple fatalities is safe? As you can see this is a very difficult if not impossible issue.” The letters from the FAA and PANYNJ still accurately present agency positions on these issues. The alternatives in the SEIS are compared based on their relative reductions in bird collisions and their ability to achieve the established management objectives (Sections 1.9 and 6.2).

The 1994 FEIS and SEIS analyze the relative reduction in bird-aircraft hazards for a range of alternatives. The proposed action is a subset of the alternatives considered, and consists of methods which are feasible, effective, and which minimize potential negative environmental impacts while still allowing for effective reduction of bird hazards at JFK.

13. The majority of birds taken under the current and proposed resident Canada Goose removal program never posed a risk to aircraft. There will be no meaningful reduction in risks to aircraft because risk is already so low.

We do not concur. The SEIS provides available data and reasoning for reducing the resident Canada Goose population in the 5-mile radius around JFK and the supplemental removals in the 5-7 mile radius in Sections 1.1, 1.7.2, 3.3.4, and 4.6.5. Section 4.6.5 also provides information on anticipated utility of the proposed removals in reducing Canada Goose strikes at JFK. Because of their size and tendency to fly in flocks, and the relatively high proportion (51%) of strikes which result in damage (Dolbeer et al. 2011), resident Canada Geese are one of the species of greatest concern for aircraft safety at JFK. Information from a recent study of off-airport bird strike hazards with specific details on Canada Geese (Dolbeer 2011) has been added

to Section 1.7.2. The management objectives developed for the SEIS include several parameters for assessing relative risk to aircraft (Sections 1.9 and 6.2).

14. Stable hydrogen isotope reference data should be collected for NYC resident Canada Geese. Similar data from geese involved in the landing of U.S. Airways Flight 1549 on the Hudson River does not support management of resident Canada Geese.

While we agree that radio-isotope data on the Canada Geese would be informative, we feel that the data and information presented in Section 1.7.2 are sufficient explanation for the proposed resident Canada Goose management actions. The incident with Flight 1549 raised public awareness of the risks associated with bird strikes, it was not part of the reasoning the agencies used when developing resident Canada Goose management plan for JFK. The difference between the strike involving U.S. Airways flight 1549 and more common Canada Goose strikes are discussed in Section 1.7.2.

15. How many geese banded for the NYC resident Canada Goose movement study have been shot on-airport?

A review of JFK data from the time of banding through September 2011 indicates 9 of the resident Canada Geese from the NYC area that were banded in 2006 have been shot at JFK. However, this only represents a portion of the banded geese which have attempted to use sites at JFK or fly through JFK airspace. The majority of Canada geese which attempt to use JFK are harassed from the site using nonlethal methods. The JFKWMU does not keep records of the number of banded birds harassed at JFK, but JFKWMU personnel report seeing banded geese among the birds that they have harassed.

16. Data on Mute Swans do not justify Mute Swan management.

Section 1.7.4 clearly articulates agency reasons for concern regarding Mute Swans. Two Mute Swan strikes which have occurred since the completion of the SEIS further illustrate risks to aircraft (FAA Birdstrike Database). The first strike occurred in October 2010 and involved a flight departing from JFK. Pilots observed approximately 5 large birds in flight path immediately after take-off and took action to climb above the birds. Pilots reported bird activity to tower and tower reported bird remains on runway. Remains were collected and identified as Mute Swans. Damage to aircraft was classified as minor. The second strike occurred in March 2011. One bird was struck on approach resulting in damage to the edge flap on left wing. The flap was repaired temporarily at JFK and replaced upon return to Singapore. Delay of flight was not an issue because of the long layover for the aircraft.

17. Northern Harriers only weigh 1.7 pounds at most and don't flock, so why are they a hazard?

Bird strikes kill birds, damage aircraft and can pose a significant risk to human safety. The FAA regulations for aircraft engine design stipulate that an engine be able to withstand ingestion of a 4-pound bird without an uncontained failure. This means that the engine can be shut down in a controlled manner and that the engine is not damaged in such a way that pieces of the engine break off and pose an additional risk to other parts of the aircraft. It does not mean that the

engine will not sustain serious damage, up to and including the need to shut down the engine. Although risks of damage from Northern Harrier strikes are lower than for larger or flocking species, birds don't have to weigh over 4 pounds or flock to cause substantial damage. A Northern Harrier Strike in Alaska in 2000 caused \$200,000 damage to aircraft in a strike. Wright (2011) provides examples of strikes involving individual birds of species smaller than Northern Harriers doing substantial damage to aircraft including Short-eared Owls, an American Kestrel and a Great-tailed Grackle.

In general, JFK works to reduce all bird use of airport property with the understanding that modifications made to reduce one species create preferred habitat for another. Emphasis is placed on reducing utility to birds which pose the greatest risk to aircraft, specifically gulls and geese. As noted above in Response 14, modifications currently made at JFK tend to favor grassland species, which includes Northern Harriers. Northern Harriers are the most commonly observed raptor during bird hazard assessments at JFK, and 31 Northern Harriers were struck by aircraft over the period of 1994-2009. The management strategy for reducing Northern Harrier strikes is appropriate for the level of risk and is primarily comprised of nonlethal harassment. No adult Northern Harriers have been shot at JFK and only one nest with eggs was destroyed over the period of 1994-2009 to discourage bird activity at JFK. The proposed action may include capture and relocation, and efforts to reduce the prey base which may attract raptors. Increased emphasis on harassment of Northern Harriers makes it unlikely that additional nest and egg removal will be required and no lethal removal of Northern Harriers is proposed.

18. Why are small species such as Mourning Doves and American Oystercatchers targeted for lethal removal? American Oystercatchers are a federal species of conservation concern and reasons for using lethal methods on oystercatchers must be compelling. Please also clarify information on flocking in Mourning Doves in Section 1.7.11.

As noted in Response 17 above, FAA regulations state that aircraft engines must be designed to withstand the ingestion of a 4-lb bird without resulting in uncontained fire or engine failure. The requirement does not mean that a strike involving a smaller bird will not cause substantial damage to an aircraft. Data from Wright (2011) demonstrates that strikes involving individual small birds can have a serious adverse impact on a flight. Mourning Doves form flocks during much of the non-breeding season which increases the risk of serious damage. For example, a Boeing 737-300 struck a flock of Mourning Doves during the takeoff run from Birmingham International Airport. Although there was no apparent negative effect on the flight, repairs to the engine blades cost approximately \$900,000. A BA Jetstream 31 regional aircraft leaving Altoona-Blair County Airport struck a group of Mourning Doves and Killdeer (primarily Mourning Doves) in 1998. The strike resulted in the cancellation of the flight (17 passengers), removal of the engine for overhaul, 24 hours out of service and approximately \$56,000 in repair costs. Information from Otis et al. (2008) indicates that Mourning Doves may fly in large flocks of thousands birds during the non-breeding season. Consequently we have removed the term "small" from the description of Mourning Dove flocks in Section 1.7.11.

In addition to the potential damage to aircraft and associated risks to human safety, bird strikes usually result in the death of the bird(s). Permitting a species such as American Oystercatchers to attempt to nest in a high risk environment is not in the best interest of the birds. Data in

Appendix C indicate that 40 American Oystercatchers were involved in and likely killed by bird strikes over the period of 1994-2009.

19. There aren't many herons and egrets in the NYC harbor. These species should not be targeted. Agency should also check data on weight of harbor herons.

Information on strikes involving herons and egrets was provided, in part, as a follow-up to material presented in the 1994 FEIS. Section 1.7.10 provides details on the strike history for herons, egrets and ibis at JFK. It also provides national strike statistics which indicate that damage from strikes with these species can be substantial. Management actions have consisted primarily of habitat management and use of nonlethal harassment. Lethal methods were used to address imminent hazards from Glossy Ibis in 2004, and 2005, but no herons, egrets or ibis have been taken since that time. Removal of the last freshwater wetland areas in the AOA (near runway 4R) in 2009 eliminated the last of the primary attractants to herons, egrets and ibis at JFK and reduced risks to birds and aircraft. Lethal take of herons, egrets and ibis is not anticipated, but permits issued to JFK allow for limited emergency take of species which are not state or federally listed when migratory birds are posing a direct threat to human health and safety. These actions are a continuation of existing policy for heron, egret and ibis management by the JFKWMU. No changes in management of these species are proposed, and impacts on heron, egret and ibis populations are anticipated to be very low or nonexistent. Data on the weight of herons, egrets and ibis have been checked and updated as needed using information from the Cornell Laboratory of Ornithology Birds of North America online (Poole 2005).

20. Aircraft manufacturers have designed quieter engines with larger intake areas and greater vulnerability to bird strikes because strike risk is low. If FAA and airlines were really worried about bird strikes they wouldn't approve these designs or purchase these aircraft. By approving these engine designs for use the FAA has determined that economic considerations are more important than bird strikes.

Hazards associated with bird strikes are not the only factor considered in aircraft design. Aircraft engines are designed to address a variety of factors including performance under a wide range of weather conditions, noise, fuel economy and ability to withstand ingestion of objects such as birds. The issue on aircraft engineering and bird strikes was addressed in the 1994 FEIS Section 3.4.3 and is supplemented by a discussion of on-board deterrent devices provided in SEIS 4.3.2.

21. New engines will incur less damage from strikes because fans are rotating at a slower speed. Slower turning stage 1 fans will incur less damage because damage is proportional to speed of the blade striking the bird. Bird strikes are an even lower risk to new Ultra-high bypass engines because the engines are designed to maintain 75% power even if they ingest several 4-pound birds.

We agree that some new engine designs will be better able to withstand bird strikes. However, new aircraft and aircraft engines are a major investment and older engines will likely remain in service for an additional 3 or 4 decades. Airports are responsible for providing a safe environment for all aircraft using their facility. Additionally, as noted in Response 24, bird

strikes involving areas of the aircraft other than the engine can have a serious effect on flight and pose a risk to human safety.

22. Please clarify language regarding duck and cormorant strikes in Section 1.6 – Off-airport strikes.

Language has been clarified.

23. Please clarify what Figure 1-9 is intended to convey. I thought most strikes occur on-airport?

The title for Figure 1-9 clearly states that the figure illustrates where off-airport strikes occur relative to distance from the airport. This figure does not represent on-airport strikes. Figure 1-8 shows the relationship between on and off-airport strikes and the seasonal pattern in on and off-airport strikes.

ALTERNATIVES AND METHODS

24. Why don't you modify planes to withstand strikes instead of managing birds?

Bird strikes are one of the many issues considered when designing and building an aircraft and aircraft engines. Manufacturers consider noise, fuel economy, safe performance under a range of environmental conditions, ability to shut down safely in event of a bird strike, and a number of other issues when an engine is designed and built. The FAA has increased aircraft engine design standards to better withstand bird strikes (14 CFR 33.76, FAA Advisory Circular AC 33-76-1A). However, bird aircraft collisions continue to be a hazard to aircraft. Engineering aircraft to withstand strikes was addressed in the 1994 FEIS Section 3.4.3. Reasons for not advancing this alternative remain largely as presented in the 1994 FEIS. Specifically, although FAA anticipated increasing engine certification requirements relative to bird strikes, older engines would likely to remain in service for an additional 3 or 4 decades, and the FAA bird strike testing criteria cannot always reflect real-world bird strike situations. Aircraft continue to be vulnerable to these new and dynamic situations

Not all bird strikes with detrimental impacts on the aircraft and risks to human health and safety involve engines. Other areas include the windshield, nose, wing/rotor, fuselage, radome, and landing gear (Dolbeer et al. 2011, Wright 2011). The 2011 report of significant wildlife strikes to aircraft in the United States includes examples of birds smashing through windshields and injuring pilots, obstructing visual navigation and/or damaging aircraft controls; and damage to the aircraft stabilizer, elevator, flight control instruments, radome, fuel system, wings and other parts which have resulted in a precautionary or emergency landing or which have otherwise substantially disabled the aircraft.

25. Agencies should use OvoControl to reduce Canada Goose population.

OvoControl (active ingredient nicarbazin) is analyzed in detail in the SEIS Chapter 4. Limitations on method and reasons for not including it as a method to reduce populations remain as discussed.

26. Why doesn't the 1994 EIS or SEIS consider an alternative that only uses nonlethal methods? The goals can be accomplished using only nonlethal methods.

This question is addressed in SEIS 3.3.7. In brief, historical use of only nonlethal methods or nonlethal methods with only limited lethal to reduce habituation to harassment methods (No Action Alternative in 1994 FEIS) was not sufficient to address gull hazards at JFK. The 1994 FEIS analyzed a full range of on and off-airport nonlethal alternatives including expansion of the nonlethal methods in the existing on-airport program. The analysis concluded that these alternatives and methods were unlikely to achieve a satisfactory level of effectiveness. The SEIS also analyzed an alternative which involved only adding nonlethal methods on and off-airport to address current bird hazards at JFK. As with the 1994 FEIS, these methods, although helpful, were not deemed sufficient, in and of themselves, to adequately address the bird hazards to aircraft using JFK (Section 6.2.2).

27. Do the 1994 FEIS and SEIS place too much emphasis on lethal methods?

The SEIS (Chapter 4) and 1994 FEIS provide a thorough assessment of potentially available nonlethal and lethal methods and a reasoned explanation as to why each method is or is not included in the final alternatives. Methods are selected for inclusion in the final alternative based on the review of their potential utility in reducing strikes at JFK.

28. Will the 7-mile radius eventually be expanded to include all large-bodied birds?

The 7-mile radius recommendation was specific to resident Canada Geese and based on movement data for birds in the NYC area and data from the literature (Section 1.1). The actions conducted for bird hazard management at JFK are limited to those described in the SEIS and 1994 FEIS. Changes to the proposed action would require additional analysis in accordance with the NEPA.

29. There should be no lethal removal of birds on public land, especially at Gateway NRA.

The SEIS addresses the issue of public concerns and opposition to the use of lethal methods and the impact of lethal bird removal on opportunities to view and enjoy birds (Sections 3.2.2, and the evaluation of individual alternatives in Chapter 6). The SEIS also considers an alternative which would only use nonlethal methods to update the current bird hazard management program. Exclusive use of nonlethal methods was also considered in the 1994 FEIS (See Response 26 above). Although the lead and cooperating agencies would prefer to reduce the bird hazards to aircraft using only nonlethal methods, we believe the analysis presented in the 1994 FEIS and the SEIS indicates that the exclusive use of nonlethal methods will not be sufficient to adequately address bird hazards. The combined use of nonlethal and lethal methods will be the most effective in reducing hazards to aircraft. The proposed use of lethal methods would be conducted in accordance with applicable laws and regulations and would only be conducted with

the permission of the agency with management authority for the site. The proposed use of lethal methods at Gateway NRA is consistent with NPS policy and regulations. See Response 63.

30. There is no evidence that off-airport Double-crested Cormorant egg-oiling would reduce strikes. More data is needed on cormorant movements, the age and breeding status of birds taken at JFK and the seasonality of cormorant hazards to aircraft. Only a portion (45%) of cormorants taken on airport was breeding birds. Harbor-wide cormorant numbers do not appear to correlate to number of birds taken on airport. Double-crested Cormorant and other species management in the 5-mile radius needs to be targeted based on movement, not just numbers reduction.

The primary hazard to aircraft from cormorants is from birds passing through JFK airspace (e.g., transgression utility). As discussed in the 1994 FEIS (Section 2.2.1) and SEIS (Section 3.3.1) management of this type of hazard usually involves managing birds and off-airport features which contribute to movement patterns through JFK airspace. We agree that more information is needed before action is taken and the agencies have started investigating the area to determine if there are attractants, such as roost or nesting areas elsewhere on Long Island which may contribute to the cormorant flights through JFK airspace. There are nest and roost sites on Long Island which are not included in the Harbor Herons surveys. Cormorant egg oiling, as proposed in the SEIS, would only be conducted if observations of cormorant movements indicate that a particular colony is associated with much of movements through JFK airspace. The egg oiling would primarily be used as a method of discouraging cormorants from using a particular location and is not currently intended as an area-wide population management strategy. In this respect, the SEIS proposal is similar to discussions in the Harbor Herons Conservation Plan (HHCP, Elbin and Tshipoura 2010). However, it should be noted that the proposed action limits lethal management of birds within Gateway NRA to resident Canada Geese and Mute Swans.

The HHCP notes that Double-crested Cormorants are currently considered to be overabundant in some areas and are believed to be directly impacting habitat and co-nesting species at 6 of the island colonies (Elbin and Tshipoura 2010). Double-crested cormorants may directly compete with other waders for nests and strip trees of smaller branches for nest building. Guano from concentrations of nesting cormorants is highly acidic and can lead to loss of understory vegetation and nesting trees, thereby rendering some sites unsuitable for use by other waders. The HHCP provides several suggestions for addressing cormorant impacts on co-nesting waders including establishment of sustainable population objectives for the species, removing cormorant nests from wader portions of the colony, encouraging cormorant nesting in other areas where impacts on other waders would be minimal, and ongoing monitoring of cormorant and wader populations and habitat conditions at areas with and without cormorants. Based on the provisions in the Harbor Herons plans, we have added nest removal to egg oiling as a method which might be used to reduce cormorant use of specific colonies. See also Response 52.

31. Off-site control of local breeding Double-crested Cormorants is not practical because of number of colonies to be treated. They cannot all be treated at night to reduce risks to non-targets.

The goal of the proposed cormorant management would be to reduce movements through JFK airspace by discouraging cormorant use of specific sites. The proposed off-airport management of cormorants is not intended as a means of reducing the overall breeding population in the New York/New Jersey Harbor. If this method is chosen, it should be possible to treat a small number of colonies within the time frame necessary for an effective program.

32. Wouldn't it be better use more targeted approach to addressing risk and only focus on narrow approach and departure pathways?

Birds do not confine their movements to aircraft approach and departure routes. It is often bird movements through these pathways from points outside these areas which pose the risk to aircraft approaching and departing JFK. Management of these risks requires managing bird hazards outside the approach and departure paths. For example, bird movement data collected on resident Canada Geese banded near JFK found that the birds used from 5-14 locations in addition to the original banding site (Seamans et al. 2009). Review and management of hazards within the 5-mile radius of the airport is consistent with FAA Advisory Circular 150/5200-33A. Reasons for considering a larger area for resident Canada Geese are presented in Sections 1.1, 1.7.2, 3.3.4, and 4.6.5.

33. Killing geese will not stop problem, new geese will just move into the area. There is no evidence removing geese up to 7-miles from the project area will reduce aircraft strike risks. Killing geese wastes taxpayer dollars and perpetuates the cycle of violence. Habitat modification is best possible approach to reduce waterfowl risks.

We agree that habitat modification is instrumental to reducing resident Canada Goose activity in a given area. However, as noted in the SEIS, the radius around JFK has an abundance of parks, playing fields, golf courses, lawns, and other locations which provide habitat readily used by resident Canada Geese. Habitat modifications such as long grass management and planting bushes and shrubs to break up large open spaces of grass are incompatible with the intended use of many of these locations and unlikely to be implemented by landowners/managers. Adoption of these strategies at the remaining sites will help at the specific location where the modifications are implemented but will not reduce the overall hazard to aircraft because birds are likely to move to preferred habitat at nearby locations.

Section 4.6.5 provides information on the expected utility of lethal goose removal in reducing hazards to aircraft. Although birds can and will eventually re-colonize sites, data from the current program indicates that the number of geese which return remains greatly reduced from initial conditions. A total of 575 resident Canada geese were removed from NYC owned parks in 2011, a decrease of 934 geese from 2010 (Collins and Humberg 2011). There were 15 capture sites that were utilized by Canada Geese in either 2009 or 2010 that were surveyed and found to have none or so few geese that removals were not warranted in 2011 (Collins and Humberg 2011). Of the nine sites used in both 2010 and 2011, a total of 876 geese were observed on the

day of capture in 2010 and only 543 observed in 2011, a 38% decrease in total number of geese observed on the date of capture at those sites (Collins and Humberg 2011). Overall, the number of resident Canada geese surveyed and captured in 2011 has decreased greatly from 2009 and 2010 (Collins and Humberg 2011). The size of the area treated also influences recolonization rates. Removing resident Canada Geese from the 5-7 mile radius around JFK addresses specific groups of birds associated with risks at JFK but also reduces the rate of recolonization into core areas closest to the airport. Recolonization rates can be further reduced through the integrated use of habitat management, human behavior modification (establishing and enforcing bans on bird feeding) and reproductive control techniques such as egg oiling/addling/puncturing, the contraceptive nicalbazin or nest and egg destruction. The integrated use of these nonlethal and lethal methods is included in the proposed action.

34. Improved sanitation and insect control should be used in airport spaces to resolve problem by not attracting birds to these sites.

The current program and proposed action include on-airport use of insect control and sanitation management. However, as noted in the SEIS and 1994 FEIS, exclusive use of these methods is not adequate to resolve current bird strike hazards at JFK, in part because these methods only address bird activity at JFK and do not address the hazards associated with birds which move through JFK airspace.

35. Existing data shows that implementation of the current program, bird strikes have decreased and wildlife populations are better understood. Current standards and procedures are satisfactory for maintaining a safe environment for aviation.

As noted in Section 1.6, although the current program has substantially reduced hazards associated with gulls, there are increasing conflicts with species such as resident Canada Geese, Mute Swans, Double-crested Cormorants, and Brant. Strike records also indicated that modifications to the gull hazard management practices might also be warranted to improve the efficacy of the current program. The airport is concerned by the increasing number of large-bodied birds shot at JFK because they either posed an imminent risk to aircraft or because they were unresponsive to nonlethal deterrents at the time they were taken. Additionally, data on current gull strikes at JFK indicate that modifications in the existing program are warranted to address strikes involving species such as Herring Gulls which are present throughout the year.

36. EA inaccurately assumes that by expanding radius of work around airport from 5 to 7 miles the wildlife populations around airport property will be better understood. There is no evidence to support this assumption.

Commenter is mistaken as to the purpose of conducting management actions in the 5-7 mile radius around JFK. The EA proposes conducting resident Canada Goose management within a 7-mile radius of JFK as part of an integrated program to reduce risks to aircraft at JFK. Although the action includes monitoring of resident Canada Geese in the project area, and the PANYNJ is expected to continue to be a leader in wildlife hazard management research, the proposed action is not intended as an in depth study of local wildlife populations.

37. Manpower required to increase from 5 to 7 mile radius would substantially increase cost to FAA, airport, USDA, and ultimately, taxpayers. It would be better to identify points of extreme interest (landfills, parks, water) in 5 mile radius zone and make frequent visits rather than assessing everything within 5 mile radius.

Comment does not accurately represent proposed action. The 1994 FEIS did not include any off-airport operational management of birds except for proposals to reduce or relocate the Laughing Gull colony. The current program already focuses on areas of primary interest and uses an adaptive management approach to improve efficiency of resident Canada Goose surveys in the project area. Data on the location and habitat components of goose removal sites in 2009 and 2010 were used in 2011 to focus survey efforts on areas which were likely to be preferred molting sites. Consequently, WS was able to conduct goose surveys at 107 sites in 2011, an increase in 48 sites from 2010.

38. It is not clear what is meant by “by need basis” for work in 5-7 mile radius.

Resident Canada Geese would be removed from sites within the 5-7 mile radius if populations are high enough that the site could be a substantial source of birds moving into and within the 5 mile radius. In general, this is defined as sites with >20 geese.

39. Hiring more individuals to work on airport property would ultimately be more effective and be less expensive than expanding work from 5 to 7 miles from airport. Airport should increase staff during periods when bird activity is greatest.

Hiring more individuals to work on airport property could help reduce on-airport hazards but will not address the risk of low-elevation off-airport strikes involving aircraft approaching or departing from JFK. It also has limited utility in addressing hazards from birds moving through JFK airspace. It is unclear whether hiring more individuals for on-airport work would be less expensive than conducting the proposed off-airport work. Much would depend on whether the individuals hired on-airport would be needed seasonally or year-round. Proposed off-airport work to manage resident Canada Geese would only be conducted during approximately 2 months of the year.

40. Is data on hourly variation on aircraft traffic and strike rates still as presented in the 1994 FEIS? If so, then agencies could achieve a 50% reduction in strikes just by not scheduling aircraft during high-risk periods of day. If safety and not economics is the main concern, flights should be scheduled to avoid high-risk periods.

Adjusting flight schedules to avoid periods of greatest risk is used at a number of airports in the U.S. and around the world. The utility of this strategy generally depends on the amount of aircraft movements relative to the capacity of the airport. Airports with lower amounts of air traffic and greater room for flexibility in scheduling have the most success with this type of strategy. Current flight scheduling at JFK is based on a number of factors including passenger and air-carrier demand, the capacity of JFK to handle aircraft traffic, the need to coordinate traffic patterns with activity at nearby LaGuardia and Newark Liberty International Airports, and the need to coordinate arrival and departure times with destination airports. Because of the close

proximity of JFK, LaGuardia and Newark Airports, flight patterns and airspace at the 3 airports are closely coordinated in an interlocking network which addresses safety concerns and air carrier needs at all three airports (1994 FEIS Section 3.4.2). Significant changes in air traffic at one airport would necessitate shifts at LaGuardia and Newark, each of which have their own bird hazards to consider. In 2010, JFK handled an average of 33,543 aircraft movements per month (range 28,293-37,667) or approximately 1,100 movements per day or 46 aircraft movements per hour. Given that the majority of flights are scheduled during daylight hours, and constraints based on the proximity of LaGuardia and Newark, this level of activity leaves little room for adjusting airline schedules. Seasonal variations in the timing of bird hazards further complicate scheduling to reduce bird hazards at JFK (L. Francoeur, PANYNJ, pers. comm.).

At present, risks of strikes are lowest at night. Most of JFK's cargo traffic is handled at night, however most passengers are unwilling to fly in the middle of the night. Destination or connecting airports may not be open or able to support inbound passengers at odd hours. Passengers leaving on connecting flights which depart at night at JFK could end up waiting hours for connecting flights at airports which have most of their departing flights scheduled for later in the day. These multiple needs and the relatively heavy air traffic load at JFK make it generally impractical to use rescheduling as a bird hazard management strategy for JFK. The FAA manual on wildlife hazards at airports also acknowledges that aircraft flight schedule modification for regularly scheduled commercial aircraft on larger airports is generally not practical (Cleary and Dolbeer 2005).

41. Airport should integrate data on bird migration patterns and historical strike data into models to predict when and where strikes are most likely.

Strike data is being used to manage bird strikes and to plan actions to reduce the threat to aviation from bird strikes. Also, radar is being evaluated to learn about local bird movements so that the airport can work with adjacent property owners to manage habitat to reduce bird abundance. The management of adjacent property owner lands may only occur if the property owner agrees.

42. By using lethal methods and not improving aircraft, decision has been made that birds are entirely expendable but airline profits must be preserved.

The proposed action involves the integrated use of nonlethal and lethal methods to address bird hazard management at JFK in accordance with FAA regulations. The FAA reviews and modifies aircraft design standards as needed which includes review of standards for withstanding bird strikes. Based on impact analyses in Chapter 6 of the SEIS, the lead and cooperating agencies have determined that the proposed action will not jeopardize target or nontarget wildlife populations or ecosystems. The proposal takes into consideration the need to protect aircraft safety and the desired uses for land in the area surrounding JFK. We believe the proposed strategy provides a balance between the need to reduce damage and protect human safety and the need to protect wildlife populations.

43. Fresh Creek Park is supposed to be a bird sanctuary and nature preserve. Lethal removal of birds should not be conducted in this area.

Fresh Creek Nature Preserve is located at the edge of Jamaica Bay approximately 3 miles from JFK. The park is managed by the NYC Department of Parks and Recreation Department. Portions of the site are developed and open to public use but a large portion of the nature preserve contains valuable wildlife habitat including approximately 42 acres of saltmarsh habitat which is closed to public use. Fresh Creek Nature Preserve is part of the NYC Department of Parks and Recreation Forever Wild Program to preserve, protect and preserve the most ecologically valuable lands within the five boroughs. Actions which could occur at this site under the proposed action include Mute Swan and resident Canada Goose removal and egg-oiling and addling. Actions would only be conducted with the consent of the NYC Department of Parks and Recreation. Classification of the site as a nature preserve does not preclude removal of birds. The agencies understand that any lethal removal of birds especially geese and swans will be distressing to some individuals but that these concerns must be considered in context of the potential risks from strikes involving resident Canada Geese (Responses 1, 13, 29, 50 and 57). The analysis of environmental impacts in Section 6.6 includes review of risks and protective measures to minimize or prevent adverse impacts on saltmarsh and nontarget species. The analysis of alternative 5 also contains review of humaneness and sociological issues including aesthetics.

44. Atlantic Brant are a risk because they are abundant. WS research shows shooting doesn't keep them off airport. It is inappropriate to try and control the brant population because a large portion of the regional population overwinters in the area. More habitat management needs to be considered instead of shooting

The proposed action does not include any attempts to control the Atlantic Brant population. Off-airport lethal management of brant is not included in the proposed action. The issue of the increasing brant population and the likely role of habitat/ food limitations in contributing to hazards from brant are discussed in Section 1.7.3. Sections 1.4.2, 5.1.2 and 6.4.1 review the potential role ongoing efforts by the Gateway NRA to restore saltmarsh habitat and eelgrass beds may have in reducing hazards to aircraft from brant. Section 6.6.2 discusses the indirect benefits that the proposed reduction in year-round foraging pressure from Mute Swans and resident Canada Geese may have on saltmarsh habitat at Gateway NRA.

ENVIRONMENTAL IMPACTS

45. Wildlife Services needs to make information on their lethal take available to the public and tell the public where they will be conducting removals instead of leaving the public to find carcasses or sick birds.

WS actions are summarized in annual program reports. Program data report are available on the web at http://www.aphis.usda.gov/wildlife_damage/prog_data/2010_prog_data/index.shtml and from the USDA, APHIS, WS Operational Support Staff, 4700 River Road, Unit 87, Room 2D-07.3, Riverdale, MD 20737, (310) 734-7921.

Comment regarding carcasses and sick birds appears to have been made in context of WS use of the avicide DRC-1339 at other locations. The SEIS discusses limited use of DRC-1339 to reduce local flocks of Rock Pigeons, European Starlings, and crows that have been identified as posing a risk to aircraft using JFK.

As noted in the SEIS, DRC-1339 was developed as an avicide because it is much less toxic to mammals than birds. Additionally, DRC-1339 is only highly toxic to certain bird species (sensitive species) but only slightly toxic to other birds, including predatory birds (non-sensitive species). Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors, sparrows, and eagles are classified as non-sensitive. Secondary poisoning has not been observed with DRC-1339 treated baits. This can be attributed to relatively low toxicity to species that might scavenge on birds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers.

The majority of birds that consume the bait die within 24 hours, but most within 4 to 12 hours. Treated birds can travel some distance, most to the roost location or other sheltered stands of trees or shrubs, before dying. Instances of birds falling while in flight have not been documented. The communication plan established by New York WS for applying DRC-1339 includes notification of the USFWS law enforcement, 911 Dispatch, County Health Department, and NYSDEC Bureaus of Wildlife, Pesticide, Law Enforcement and Wildlife Pathology so that individuals who may encounter dead birds can get immediate and accurate answers from the agencies likely to receive their questions. Carcass disposal procedures are established during the planning phase of the project so that either WS and/or the cooperator requesting the bird removal is available to respond to requests to remove birds.

46. The SEIS should consider the ecological services provided by birds such as seed dispersal and insect consumption.

The SEIS Section 5.1.1 contains a discussion of Ecological Services provided by birds. The proposed action will not jeopardize the viability of any bird population in the state or region (SEIS Section 6.8). Consequently, there will not be a substantive decline in ecosystem services provided by the target bird species. There will be a substantial reduction in the resident Canada Goose population within the 7-mile radius of JFK. However, bird hazard management efforts in this area will not result in the eradication of the resident Canada Geese or other waterfowl, nor is it likely to substantively impact the populations of migrant geese and ducks. In situations where high densities of resident Canada Geese and/or non-native Mute Swans are damaging habitat, the proposed reductions in these species could have localized beneficial impacts on other birds and the ecosystem services they provide.

47. Will the cumulative impacts of the proposed action adversely impact target bird or nontarget wildlife populations in New York or other states? Doesn't killing birds harm the entire biotic community?

No, the analyses in the 1994 FEIS and in SEIS Section 6.8 indicate the proposed action is within levels that can be sustained by the target species populations and will not jeopardize the viability of target or nontarget species in New York or the Northeastern U.S although short-term localized reductions in target species may occur. The proposed action will substantially reduce local populations of resident Canada Geese within the 7-mile radius of JFK. However, these reductions are consistent with state management plans for the species and the USFWS FEIS on resident Canada Goose Damage Management (USFWS 2005). Analyses in the SEIS indicate the reductions will not jeopardize the viability of the resident Canada Goose population in NYC, New York State or the Region.

48. Is data from Partners in Flight (PIF) trustworthy? Do they want to promote hunting and killing birds?

Partners in Flight was not established to promote hunting. It was established in 1990 in response to growing concerns about declines in the populations of many landbird species. The initial focus was on neotropical migrants, species that breed in the North America and winter in Central and South America, but focus has spread to most landbirds and other species requiring terrestrial habitats. Partners in Flight is a cooperative effort involving federal, state and local government agencies, philanthropic foundations, professional organizations, conservation groups, industry, the academic community and private individuals. The PIF landbird population estimation database is discussed in detail in Section 6.3.1.

49. Jamaica Bay Wildlife Refuge is a globally recognized Important Bird Area. Ranking is based on specific species and their uses of area. The SEIS needs to consider impacts in context of each of these uses.

WS has reviewed the criterion listed for establishing Jamaica Bay as a Global Important Bird Area. Criterion include the presence of species at risk including Osprey, Piping Plover, American Oystercatcher, Common Tern, and Black Skimmer. Jamaica Bay was also listed as an important bird conservation area because it supports breeding populations of gulls, terns, and other waterbirds, migrating shorebirds and a diverse assemblage of wetland breeding birds including Glossy Ibis, Clapper Rail, Marsh Wren, Saltmarsh Sparrow and Seaside Sparrow. Impacts on nontarget species are addressed in Chapter 6.

50. The SEIS needs to address potential impacts on habitat, specifically saltmarsh and grassland habitats. Mitigation measures should be established for habitat loss and impact on bird populations.

Mitigations would only be warranted for actions with a significant adverse impact on habitat or bird species. Impacts of each alternative on habitat are addressed in the nontarget species impact sections of the SEIS with additional information in the 1994 FEIS. Habitat management recommendations for JFK include removal of woody vegetation at JFK and long grass

management. These practices are a continuation of ongoing management actions to reduce use by gulls and geese and should be an indirect benefit to grassland birds, most of which are generally small, don't flock and pose minimal risk to aircraft. Consequently, no mitigation is warranted for grassland habitats.

The 1994 FEIS and the SEIS discuss the possibility of adverse impacts to saltmarsh habitat from alternatives to relocate the Laughing Gull Colony (SEIS Alternative 5). For reasons discussed in Section 3.3.6 the lead and cooperating agencies have chosen not to include relocation of the Laughing Gull colony in the proposed action. Survey methods for the Laughing Gull colony have been modified to make increased use of aerial surveys and less use of ground surveys to reduce costs and impacts on the marsh. Canada Goose and Mute Swan egg oiling/addling and puncturing in Jamaica Bay could have impacts on saltmarsh. Actions to remove Canada Geese during molt in Gateway NRA would be restricted to Rulers Bar Hassock (at East and West Ponds) and Pennsylvania and Fountain Avenue Landfills and are not expected to be conducted in areas of saltmarsh. Section 6.6.2 includes provisions for minimizing impacts on nontarget species and native habitats during live-capture and removal of geese including specific measures for use in Gateway NRA. Additionally, as discussed in the SEIS, foraging by relatively high densities of Mute Swans and geese can adversely impact saltmarsh habitat. Reducing the year-round foraging pressure from geese and swans may help to reduce adverse impacts on saltmarsh and aid marsh restoration efforts (SEIS Section 6.6.2). The remaining alternatives are expected to have no or negligible impact on saltmarsh habitat and mitigation is not warranted.

Analysis of impacts on target and nontarget bird populations is provided for each of the proposed management alternatives in Chapter 6 of the SEIS. Based on analyses in the SEIS, the proposed action will not jeopardize state or regional bird populations. The action will result in reductions in local populations of Laughing Gulls and resident Canada Geese. However, review of the ongoing Laughing Gull program indicates that although the cumulative impacts of the on-airport shooting program and other factors have resulted in a reduction in the colony a viable colony of over 1,000 nesting pairs still remains. The regional Laughing Gull population is stable to increasing. Cumulative impacts of resident Canada Goose management efforts in the New York metropolitan area, including efforts proposed for JFK could reduce the local population to approximately 5-6,000 birds. However, this reduction is consistent with NYSDEC management objectives for the state resident Canada Goose population, the Atlantic Flyway resident Canada Goose Management Plan and the USFWS FEIS on resident Canada Goose management. Based on this review, the proposed action would not have a significant impact on bird populations warranting mitigation.

51. Harbor Herons survey numbers are not sufficiently accurate to use them as population estimates for gulls. Harbor Herons survey data should only be used as an index of population trends.

Agreed. Text in the SEIS has been modified accordingly.

52. Does the proposed action conflict with the Harbor Herons Conservation Plan (HHCP) of the New York/New Jersey Harbor Estuary Program (Elbin and Tsipoura 2010) or the Waterbird Conservation Plan?

The HHCP provides guidance for the protection and support of the colonial waterbirds that live and breed in the Greater New York Harbor. The plan defines the harbor heron group as including Great Egret, Snowy Egret, Black-crowned Night-Heron, Yellow-crowned Night-Heron, Glossy Ibis, Little Blue Heron, Great Blue Heron, Green Heron, Tricolored Heron, and Cattle Egret. The North American Waterbird Conservation Plan (Kushlan et al. 2002) establishes primary goals for waterbird conservation in North America and is linked to regional waterbird conservation plans. Although there is no legal mandate for consistency with these plans, we have included review of the plans in Section 5.6 of the SEIS.

Based on the information above, we conclude that the proposed bird hazard program is consistent with the HHCP. The proposed action will not have an adverse impact on harbor heron habitat, will not adversely impact harbor heron populations and includes adequate provisions to prevent unacceptable disturbance to nesting herons.

53. Does the SEIS contain provisions to prevent loss of saltmarsh habitat and loss of co-nesting species from Canada Goose round ups?

Yes, see sections 6.6.2 and Response 14.

54. Losing the Laughing Gull colony at JoCo Marsh would cost the state its Laughing Gull population.

Efforts to reduce or relocate the Laughing Gull colony are not guaranteed to result in the elimination of breeding Laughing Gulls in the state. The 1994 FEIS and SEIS include mitigations such as identifying suitable Laughing Gull habitat at safer locations in the state and efforts to encourage Laughing Gull use of the alternate sites. Actual impact on the state Laughing Gull population would depend on the success of these efforts. However, for reasons stated in the SEIS 3.3.6, the agencies have dropped proposals to relocate the Laughing Gull colony (Alternative 5) from the proposed action (Alternative 6).

55. Please state what method was used to estimate that there are 25,000 to 30,000 Canada Geese in NYC.

The estimate of the number of geese in the New York metropolitan area is an extrapolation from annual NYSDEC breeding waterfowl surveys (B. Swift, NYSDEC, pers. comm.). The annual estimates vary substantially with the current estimate at approximately 20,000-25,000 birds. The SEIS has been adjusted to reflect the most recent population estimate for resident Canada Geese in the NYC metropolitan area.

56. The SEIS should present a target population estimate for the NYC Metropolitan Area. The SEIS needs to discuss how JFK work relates to all other Canada Goose removals in the area.

Management of resident Canada Geese in the entire NYC metropolitan area involves consideration of many different potential issues and types of conflicts, not just bird hazard management at airports. The area involved is greater than the 7-mile radius around JFK considered in the SEIS. Consequently, establishment of a city-wide population management goal is relevant to but outside the scope of the SEIS. We have added information on the interaction between work conducted for JFK and other resident Canada Goose Damage management actions in the NYC area to the impacts section of the SEIS (Chapter 6).

The state or local agencies have not established a specific population management objective for the NYC metropolitan area. However, the NYSDEC did set a statewide management objective for the resident Canada Goose population for use in the Atlantic Flyway resident Canada Goose Management Plan (Atlantic Flyway Council 1999, 2011). The plan calls for a population density of (2.1 resident Canada Geese per mile² [0.8 geese/km²]). The management objective was developed as a balance among resident Canada Goose values and uses in the state including population health, bird watching, sport harvest and conflict management. Extrapolating the density estimate from the state management objective to the approximately 2,317 m² (6,000 km²) in the NYC, Long Island, and Lower Hudson Valley area, yields an estimate of 4,900 geese, roughly 4-5 times less than current population estimates for the area. The state objective of 2.1 geese per mile² is an average for the state. Management objectives for specific areas may be higher or lower than the number extrapolated from the statewide average.

57. Jamaica Bay Wildlife Refuge is a globally recognized Important Bird Area Actions conducted at Jamaica Bay to control over-abundant or nuisance species should be conducted to avoid impacts on habitat, nontarget species and the viewing public.

The EA nontarget species impact analyses in Chapter 6 of SEIS includes provisions for the protection of nontarget species and wildlife habitat and the proposed action is not anticipated to adversely impact wildlife habitat or nontarget species including state and federally-listed threatened and endangered species. The agencies would give preference to conducting off-airport bird damage management actions during periods when there is no or negligible visitor use of public areas (e.g., early in the morning) within the constraints of safety and minimizing potential adverse impacts on nontarget species.

58. Double-crested Cormorant population impact analysis should consider the likelihood that a nest will fail if one member of a pair is removed for the reduction of bird hazards at airports.

This issue has been included in the SEIS Chapter 6.

59. Assumptions of impacts on nontarget species from proposed Double-crested Cormorant egg-oiling are inaccurate. On most islands, DCCO are nesting in spindly trees. Attempts to oil cormorant eggs in these trees will have unacceptable impacts on co-nesting birds.

Egg oiling is only one method available for managing Double-crested Cormorant use of specific colony sites and will not be suitable for all locations. Impacts on nontarget species and proposed methods must be assessed on a case by case basis. Egg oiling would not be suitable for use on nests high in trees or in close proximity to co-nesting species. However in some situations it may be possible to treat eggs using an extended nozzle without undue disruption of surrounding vegetation or co-nesting birds. Egg oiling is also useful for ground-nests and some nests on artificial structures. The HHCP notes that Double-crested Cormorants are currently considered to be overabundant at some sites in the harbor and may be adversely impacting habitat and co-nesting species at 6 of island colonies (Elbin and Tsipoura 2010). The plan provides several suggestions for addressing cormorant impacts on co-nesting waders including removing cormorant nests from wader portions of the colony and encouraging nesting in other areas where impacts on other waders would be minimal. The management strategy of discouraging cormorant use of some locations is similar to that proposed for reducing hazards at JFK. Nest removal, as proposed in the HHCP, could also be used to discourage cormorant activity in areas which pose risks to aircraft. If some locations with co-nesting species are also identified as contributing to bird strike risks at JFK, cormorant management efforts for JFK could be coordinated with Harbor Heron management to serve a dual purpose. See Response 30.

60. What is the product used to control insects at JFK? Have there been studies looking for residue of the product in nontarget species in the NY Harbor?

The PANYNJ currently uses a product containing the insecticide carbaryl (Sevin). We are not aware of any analyses which test for carbaryl residue in species within Jamaica Bay. Carbaryl is a commonly used pesticide for insect control. In 1997 (prior to EPA reductions in the permitted application rates for carbaryl) the USGS conducted a survey for 25 pesticides in New York stream samples (Phillips et al. 1997). The highest concentrations of carbaryl were found in streams draining two types of watersheds – orchard/vineyard watersheds in western New York and urban/residential watersheds in southeastern New York, including Long Island. Amounts detected were below regulatory thresholds for the product. In 2005 (most recent data available) approximately 20,013.25 pounds of carbaryl were reported as used in Kings, Queens, Suffolk and Nassau counties. The majority of use was in Suffolk (11,278 lbs.) and Nassau counties (8,550 lbs.). Only 184.28 pounds of carbaryl were used in Queens County. Although JFK is unlikely to be the only source of carbaryl use in Queens County, even if all use was attributed to JFK it would only constitute 0.9% of total carbaryl use in the region. As noted in Section 6.3 of the SEIS, JFK applies carbaryl in strict accordance with requirements of the product label, and only treats a limited portion of the airfield for insect control twice per year to reduce insect hatches and on-airport food supplies for birds. The treatment site is situated and product is applied under environmental conditions (low or no wind) that will prevent drift to the surrounding watershed. The treatment area does not contain standing water or drain directly into the bay or adjacent wetlands. Provisions for the protection of nontarget species and water are discussed in Section 2.2.3 and section 6.3.

61. Please correct Double-crested Cormorant population information. Cormorant Numbers in New York Harbor have decreased since 1995 (1,809 nests). We recommend that population data for Harbor Herons and cormorants cover a longer period than presented in the SEIS.

Harbor Herons survey data (Section 6.3.1.3) indicate that although the current number of cormorant nests detected in the New York and New Jersey Harbor area is currently lower than 1995 peak levels, the long-term 1988-2011 trend would appear to indicate a general increase. The historical data is on cormorants and Harbor Herons is valuable and has been added to the SEIS. However, the recent increasing trend is also noteworthy because it has occurred at the same time that JFK has been shooting cormorants to reduce risk of cormorant strikes at JFK. Additionally, although the current population of cormorants is lower than that recorded for 1995, the HHCP (Elbin and Tsipoura 2010) notes that cormorants may be overabundant in some areas, and may be adversely impacting habitat and co-nesting species at 6 of the island colonies. See Response 30.

62. The SEIS does not include an analysis of cumulative impacts. The SEIS must include an analysis of the proposed action and all reasonably foreseeable future management actions including residential development, infrastructure alteration, recreational activities and other factors which may impact species.

Analyses in Chapter 6 have been revised to make the analysis of cumulative impacts easier to find and the analyses have been augmented to address factors listed above.

63. The SEIS must present a determination as to whether the proposed action would result in unacceptable impacts and impairment for each alternative consistent with the provisions of the Organic Act.

Determinations regarding the Organic Act have been added to the impact assessments for each of the Alternatives in Chapter 6.

64. The SEIS does not adequately consider impact of urban bird removal (especially geese) on people who have become accustomed to and who receive significant pleasure from feeding birds.

We do not agree. The SEIS does contain an analysis of the aesthetic impacts and public perceptions of humaneness for each of the alternatives. Review of this issue can be found in the assessment on impacts on Parks and Recreation, Humaneness and Aesthetic Impacts in Chapter 6.

65. Will the off-airport management endanger the environment and residential communities?

The SEIS reviews impacts on a wide range of factors including target species, nontarget species, water quality, noise, and human health and safety. Analyses presented in Chapter 6 indicate that most species populations will not be substantially impacted by the proposed action and the

proposed action will not jeopardize the viability of any bird species. Although a local reduction in resident Canada Geese would occur the proposed action is consistent with NYSDEC management objectives for the species and will not result in the loss of the species from the New York metropolitan area. The proposed action will not adversely impact nontarget species populations or associated biotic communities. Given the standard operating procedures in place, the proposed action would not endanger residential communities, but it will reduce risks to human health and safety from bird strikes.

66. The SEIS does not accurately assess or account for Canada Goose movement in a 7 mile radius. Likelihood of movement is great and birds are likely over-counted.

The timing of the Canada Goose counts was chosen to be conducted during late May and early June because goose movements are at a minimum or have ceased due to the oncoming molt. We chose to count geese during this time frame to maximize accuracy of local population surveys.

67. Shooting poses unnecessary risk to nontarget species with similar appearance to target species. Identification issues have arisen and USDA employees have killed nontarget threatened and endangered species.

This issue is addressed in Section 6.3.2. Similarity in appearance was likely a key factor in the unintentional shooting of 6 nontarget birds during the gull shooting program conducted from 1994-2009. The six birds included four Common Terns (one per year in 2003, 2005, 2006, and 2008) which are a state-listed threatened species. Take of the six nontarget birds was extremely low risk when considered in context of the 69,937 target gulls taken during the same period. The take was reported to the NYSDEC. Analysis in the SEIS indicates the unintentional take will not have a significant adverse impact on nontarget species populations. Wildlife Services has modified the gull shooting program to include use of a smaller number of trained specialists to reduce risks to nontarget species.

68. The SEIS should consider economic value of birds for bird watching, ecological role, and aesthetic value to residents and visitors in metropolitan areas. Extrinsic and intrinsic values are hard but not impossible to determine. Contingent evaluation is an economic tool to get at this type of information. SEIS must compare cost of damage to cost of birds lost.

Aesthetic values are one of the issues addressed in detail for each alternative in Chapter 6 of the SEIS as is an evaluation of the impacts of the program on target and nontarget species (e.g., ecological impacts). Information on the environmental services provided by birds is reviewed in Chapter 5. We have included additional information on economic value of wildlife and wildlife watching to the assessment of aesthetic values in Chapter 6 where available. However, as noted in Responses 1, 2 and 12, the reasons for conducting bird hazard management at airports are not based strictly on economics. While most strikes will result in little or no damage, a single strike has the potential for catastrophic consequences. Just as the FAA noted the difficulties in stating that some level of strikes are safe in Response 12, to state that it is acceptable to not take to manage bird hazards strictly because of economics is also problematical.

GENERAL**69. Is it appropriate to supplement the 1994 SEIS instead of replacing it with a new document?**

Yes, much of the science and reasoning which was used to address gull hazards is as relevant today as it was when the 1994 EIS was completed. Knowledge of previous methods which have been attempted at JFK and the biology and history of the conditions surrounding the bird hazard situation in comparison to current conditions and hazards is essential to development of an effective management program. Although current management actions have been effective in reducing gull strikes at JFK, especially Laughing Gull strikes; the issue remains and the alternatives and issues considered in the 1994 FEIS are still relevant. The agencies conducted a thorough review of the original 1994 FEIS and, where appropriate, have updated the material with current information and data in the SEIS.

70. Because the DEIS has inadequacies, a revised DEIS should be issued.

The Final SEIS adequately describes the bird strike problem at JFK, analyzes alternatives, environments, and impacts, and proposes a bird hazard reduction program to protect human safety by reducing bird-aircraft strikes. Adequate opportunity for public involvement was offered. All issues raised on the draft SEIS were addressed in the Final SEIS and responses to comments. The Final SEIS and responses to comments will be available for public review prior to issuance of agency Records of Decision.

72. Chart 1-7 is difficult to read.

Chart has been redesigned for greater clarity.

U.S. ENVIRONMENTAL PROTECTION AGENCY REVIEW**73. Please clarify the role of the JFKWMMU in off-airport bird hazard management.**

The JFKWMMU consults with and provides technical assistance to off-airport landowners and managers regarding the need for off-airport bird hazard management, specific issues pertaining to their property, and methods which may be used to reduce the hazard. In some instances the PANYNJ may choose to provide financial assistance for bird hazard management off-airport. We have incorporated this clarification throughout the document.

74. The SEIS should include a discussion of relative stress associated with the methods discussed.

We have included a discussion of relative stress associated with management methods in the analysis of humaneness for each of the alternatives considered in Chapter 6.