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PHASE 2 REPORT- REVIEW COPY
FURTHER SITE CHARACTERIZATION AND ANALYSIS

VOLUME 2E - BASELINE ECOLOGICAL RISK ASSESSMENT

HUDSON RIVER PCBs REASSESSMENT RI/FS

AUGUST 1999

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

For

U.S. Environmental Protection Agency
Region II
and
U.S. Army Corps of Engineers
Kansas City District

Book 2 of 3
Tables and Figures

TAMS Consultants, Inc.
Menzie-Cura & Associates, Inc.

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TABLE 2-1
HUDSON RIVER FISHES

Common Name	Scientific Name	Predominant Habitat
Anchovies - Family Engraulidae		
Bay anchovy	*Anchoa mitchilli*	Saltwater
Striped anchovy	*Anchoa hepsetus*	Saltwater
Basses (Sea) - Family Serranidae		
Black sea bass	*Centropristis striata*	Saltwater
Basses (Temperate) - Family Percichthyidae or Moronidae		
Striped bass	*Morone saxatilis*	Anadromous
White bass	*Morone chrysops*	Freshwater
White perch	*Morone americana*	Freshwater/brackish
Bluefishes - Family Pomatomidae		
Bluefish	*Pomatomus saltatrix*	Saltwater
Bowfins - Family Amiidae		
Bowfin	*Amia calva*	Freshwater
Butterfishes - Family Stromateidae		
Butterfish	*Peprilus triacanthus*	Saltwater
Catfishes - Family Ictaluridae		
Brown bullhead	*Ictalurus nebulosus*	Freshwater
Channel catfish	*Ictalurus punctatus*	Freshwater
Margined madtom	*Noturus insignis*	Freshwater
Stonecat	*Noturus flavus*	Freshwater
Tadpole madtom	*Noturus gyrinus*	Freshwater
White catfish	*Ictalurus catus*	Freshwater
Yellow bullhead	*Ictalurus natalis*	Freshwater
Codfishes - Family Gadidae		
Atlantic tomcod	*Microgadus tomcod*	Anadromous
Fourbeard rockling	*Enchelyopus cimbrius*	Saltwater
Red hake	*Urophycis chuss*	Saltwater
Silver hake	*Merluccius bilinearis*	Saltwate
Drums - Family Sciaenidae		
Atlantic croaker	*Micropogonias undulatus*	Saltwater
Spot	*Leiostomus xanthurus*	Saltwater
Weakfish	*Cynoscion regalis*	Saltwater
Eels (Freshwater) - Family Anguillidae		
American eel	*Anguilla rostrata*	Catadromous
Flounders (Lefteye) - Family Bothidae		
Smallmouth flounder	*Etropus microstomus*	Saltwater
Summer flounder	*Paralichthys dentatus*	Saltwater
Weakfish	*Cynoscion regalis*	Saltwater
Flounders (Righteye) - Family Pleuronectidae		
Winter flounder	*Pleuronectes americanus*	Saltwater
Gars - Family Lepisosteidae		
Longnose gar	*Lepisosteus osseus*	Saltwater
Gobies - Family Gobiidae		
Naked Goby	*Gobiosoma bosc*	Saltwater
Herrings - Family Clupeidae		
Alewife	*Alosa pseudoharengus*	Anadromous
American shad	*Alosa sapidissima*	Anadromous
Atlantic menhaden	*Brevoortia tyrannus*	Anadromous
Blueback herring	*Alosa aestavalis*	Anadromous
Gizzard shad	*Dorosoma cepedianum*	Freshwater
Hickory shad	*Alosa mediocris*	Anadromous
Jacks - Family Carangidae		
Crevalle jack	*Caranx hippos*	Saltwater
Killifishes- Family Cyprinodontidae		

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TABLE 2-1
HUDSON RIVER FISHES

Common Name	Scientific Name	Predominant Habitat
Banded killifish	*Fundulus diaphanus*	Freshwater/brackish
Mummichog	*Fundulus heteroclitus*	Freshwater/brackish
Sheepshead minnow	*Cyprinodon variegatus*	Saltwater
Striped killifish	*Fundulus majalis*	Freshwater
Lampreys - Family Petromyzontidae		
American brook lamprey	*Lampetra appendix*	Freshwater
Sea lamprey	*Petromyzon marinus*	Anandromous
Lizardfishes - Family Synodontidae		
Inshore lizardfish	*Synodus foetens*	Saltwater
Mackerels - Family Scombridae		
Atlantic mackerel	*Scomber scombrus*	Saltwater
Minnows - Family Cyprinidae		
Blacknose dace	*Rhinichthys atratulus*	Freshwater
Bluntnose minnow	*Pimephales notatus*	Freshwater
Bridle shiner	*Notropis bifrenatus*	Freshwater
Central stoneroller	*Campostoma anomalum*	Freshwater
Comely shiner	*Notropis amoenus*	Freshwater
Common carp	*Cyprinus carpio*	Freshwater
Common shiner	*Notropis cornutus*	Freshwater
Creek chub	*Semotilus atromaculatus*	Freshwater
Cutlips minnow	*Exoglossum maxillingua*	Freshwater
Emerald shiner	*Notropis atherinoides*	Freshwater
Fallfish	*Semotilus corporalis*	Freshwater
Fathead minnow	*Pimephales promelas*	Freshwater
Golden shiner	*Notemigonus crysoleucas*	Freshwater
Goldfish	*Carassius auratus*	Freshwater
Hornyhead chub	*Nocomis biguttatus*	Freshwater
Longnose dace	*Rhinichthys cataractae*	Freshwater
Northern redbelly dace	*Rhinichthys atratulus*	Freshwater
Pearl dace	*Margariscus margarita*	Freshwater
Roseyface shiner	*Notropis rubellus*	Freshwater
Satinfin shiner	*Notropis analostanus*	Freshwater
Silvery minnow	*Hybognathus regius*	Freshwater
Spotfin shiner	*Notropis spilopterus*	Freshwater
Spottail shiner	*Notropis hudsonius*	Freshwater
Mudminnows - Family Umbridae		
Central mudminnow	*Umbra limi*	Freshwater
Eastern mudminnow	*Umbra pygmaea*	Freshwater
Mullets - Family Mugilidae		
Striped mullet	*Mugil cephalus*	Saltwater
Needlefishes - Family Belonidae		
Atlantic needlefish	*Strongylura marina*	Saltwater
Perches - Family Percidae		
Fantail darter	*Etheostoma flabellare*	Freshwater
Greenside darter	*Etheostoma blennioides*	Freshwater
Logperch	*Percina caprodes*	Freshwater
Tessellated darter	*Etheostoma olmstedi*	Freshwater
Walleye	*Stizostedion v. vitreum*	Freshwater
Yellow perch	*Perca flavescens*	Freshwater
Pikes - Family Esocidae		
Chain pickerel	*Esox niger*	Freshwater
Northern pike	*Esox lucius*	Freshwater
Redfin pickerel	*Esox a. americanus*	Freshwater
Tiger muskellunge	*Northern pike X muskellunge*	Freshwater
Pipefishes - Family Sygnathidae		

TABLE 2-1
HUDSON RIVER FISHES

Common Name	Scientific Name	Predominant Habitat
Lined seahorse	*Hippocampus erectus*	Saltwater
Northern pipefish	*Syngnathus fuscus*	Saltwater
Porgies - Family Sparidae		
Scup	*Stenotomus chrysops*	Saltwater
Puffers - Family Tetraodontidae		
Northern puffer	*Sphoeroides maculatus*	Saltwater
Sculpins - Family Cottidae		
Grubby	*Myoxocephalus aenaeus*	Freshwater
Longhorn sculpin	*Myoxocephalus octodecemspinosus*	Freshwater
Slimy sculpin	*Cottus cognatus*	Freshwater
Searobins - Family Triglidae		
Northern searobin	*Prionotus carolinus*	Saltwater
Striped searobin	*Prionotus evolans*	Saltwater
Silversides - Family Atherinidae		
Atlantic silverside	*Menidia menidia*	Saltwater
Brook silverside	*Labidesthes sicculus*	Freshwater
Smelts - Family Osmeridae		
Rainbow smelt	*Osmerus mordax*	Anadromous
Soles - Family Soleidae		
Hogchoker	*Trinectes maculatus*	Saltwater
Stickelbacks - Family Gasterosteidae		
Brook stickleback	*Culaea inconstans*	Freshwater
Fourspine stickleback	*Apeltes quadracus*	Freshwater
Threespine stickleback	*Gasterosteus aculeatus*	Freshwater
Sturgeons - Family Acipenseridae		
Atlantic sturgeon	*Acipenser oxyrhynchus*	Freshwater
Shortnose sturgeon	*Acipenser breviostrum*	Freshwater
Suckers - Family Castostomidae		
Creek chubsucker	*Erimyzon oblongus*	Freshwater
Longnose sucker	*Catostomus catostomus*	Freshwater
Northern hogsucker	*Hypentelium nigricans*	Freshwater
Shorthead redhorse	*Moxostoma macrolepidotum*	Freshwater
White sucker	*Catastomus commersoni*	Freshwater
Sunfishes - Family Centrarchidae		
Black crappie	*Pomoxis nigromaculatus*	Freshwater
Bluegill	*Lepomis macrochirus*	Freshwater
Bluespotted sunfish	*Enneacanthus gloriosus*	Freshwater
Green sunfish	*Lepomis cyanellus*	Freshwater
Largemouth bass	*Micropterus salmoides*	Freshwater
Pumpkinseed	*Lepomis gibbosus*	Freshwater
Redbreast sunfish	*Lepomis auritus*	Freshwater
Rock bass	*Ambloplites rupestris*	Freshwater
Smallmouth bass	*Micropterus dolomieui*	Freshwater
Warmouth	*Lepomis gulosis*	Freshwater
White crappie	*Pomoxis annularis*	Freshwater
Trouts - Family Salmonidae		
Atlantic salmon	*Salmo salar*	Anandromous
Brook trout	*Salvelinus fontinalis*	Freshwater
Brown trout	*Salmo trutta*	Freshwater
Lake whitefish	*Coregonus clupeaformis*	Freshwater
Rainbow trout	*Oncorhynchus mykiss (formerly Salmo gairdneri)*	Freshwater
Round whitefish	*Prosopium cylindraceum*	Freshwater
Trout-perches - Family Percopsidae		

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TABLE 2-1
HUDSON RIVER FISHES

Common Name	Scientific Name	Predominant Habitat
Trout-perch	*Percopsis omiscomaycus*	Freshwater
Wrasses - Family Labridae		
Cunner	*Tautogolabrus adspersus*	Saltwater
Tautog	*Tautoga onitis*	Saltwater
Notes: Fish are not found exclusively in predominant habitats. Source: Haynes and Frisch, 1993 and NYSDEC, 1989.		

TABLE 2-2

TYPICAL FISH AGGREGATIONS IN THE UPPER HUDSON RIVER

Widespread species American eel Blueback herring Alewife American shad Common carp Spottail shiner White perch Striped bass Pumpkinseed	**Shore area** Banded killifish Golden shiner Emerald shiner Gizzard shad Bay anchovy Bluegill Smallmouth bass Yellow perch
Rock pile White catfish Smallmouth bass Largemouth bass Rock bass Redbreast sunfish	**Tailwater** White sucker Golden shiner White catfish Largemouth bass Walleye
Vegetated backwater Brown bullhead Yellow perch Goldfish Golden shiner Banded killifish Largemouth bass White catfish White sucker Gizzard shad Northern pike Emerald shiner Rock bass Redbreast sunfish Bluegill Smallmouth bass	**Major tributaries** White sucker Smallmouth bass Redbreast sunfish Yellow perch Largemouth bass Goldfish Golden shiner Rock bass Bluegill Black crappie
Offshore shoals and channel Tessellated darter White catfish Brown bullhead	 Hogchoker Shortnose sturgeon White sucker
Notes: Species are listed in order of abundance, excluding widespread species. Source: NYSDEC, 1989.	

TABLE 2-3

AMPHIBIANS POTENTIALLY FOUND ALONG THE HUDSON RIVER

Common Name	Scientific Name
Order Caudauta - Salamanders	
Allegheny Dusky Salamander	*Desmognathus ochrophaeus*
Blue-spotted Salamander	*Ambystoma laterale*
Common Mudpuppy	*Necturus maculosus*
Four-toed Salamander	*Hemidactylium scutatum*
Jefferson Salamander	*Ambystoma jeffersonianum*
Marbled Salamander	*Ambystoma opacum*
Northern Dusky Salamander	*Desmognathus fuscus*
Northern Spring Salamander	*Gyrinophilus p. porphyriticus*
Northern Redback Salamander	*Plethodon c. cinereus*
Northern Slimy Salamander	*Plethodon glutinosus*
Northern Two-lined Salamander	*Eurycea bislineata*
Northern Red Salamander	*Pseudotriton r. ruber*
Red-spotted or Eastern Newt	*Notophthalmus v. viridescens*
Spotted Salamander	*Ambystoma maculatum*
Order Anura - Toads and Frogs	
Toads	
Eastern American Toad	*Bufo a. americanus*
Eastern Spadefoot	*Scaphiopus holbrookii*
Fowler's Toad	*Bufo fowleri*
Family Ranida- True Frogs	
Bullfrog	*Rana catesbeiana*
Gray Treefrog	*Hyla versicolor*
Green Frog	*Rana clamitans melanota*
Northern Spring Peeper	*Pseudacris c. crucifer*
Northern Cricket Frog	*Acris c. crepitans*
Northern Leopard Frog	*Rana pipiens*
Pickerel Frog	*Rana palustris*
Source: New York State Amphibian and Reptile Atlas 1990- 1998 (NYSDEC, 1999).	

TABLE 2-4

REPTILES POTENTIALLY FOUND ALONG THE HUDSON RIVER

Common Name	Scientific Name
Turtles - Order Testudines	
Blanding's Turtle	*Emydoidea blandingii*
Bog turtle	*Clemmys muhlenbergi*
Common snapping turtle	*Chelydra serpentina*
Diamondback terrapin	*Malaclemys terrapin*
Eastern box turtle	*Terrapene carolina*
Map turtle	*Graptemys geographica*
Northern water snake	*Nerodia sipedon*
Painted turtle	*Chrysemys picta*
Red-eared Slider	*Trachemys scripta elegans*
Spotted turtle	*Clemmys guttata*
Stinkpot/ common musk turtle	*Sternotherus odoratus*
Wood turtle	*Clemmys insculpta*
Order Squamata - Lizards and Snakes	
Suborder Lacertilla - Lizards	
Five-lined Skink	*Eumeces fasciatus*
Northern Coal Skink	*Eumeces a. anthracinus*
Northern Fence Lizard	*Sceloporus undulatus hyacinthinus*
Suborder Serpente- Snakes	
Northern Water Snake	*Nerodia s. sipedon*
Northern Redbelly Snake	*Storeria o. occipitomaculata*
Common Garter Snake	*Thamnophis sirtalis*
Eastern Ribbon Snake	*Thamnophis sauritus*
Eastern Hognose Snake	*Heterodon platirhinos*
Northern Ringneck Snake	*Diadophis punctatus edwardsii*
Eastern Worm Snake	*Carphophis a. amoenus*
Northern Black Racer	*Coluber c. constrictor*
Smooth Green Snake	*Liochlorophis vernalis*
Black Rat Snake	*Elaphe o. obsoleta*
Eastern Milk Snake	*Lampropeltis t. triangulum*
Northern Copperhead	*Agkistrodon contortrix mokasen*
Timber Rattlesnake	*Crotalus horridus*
Northern Brown Snake	*Storeria d. dekayi*
Source: New York State Amphibian and Reptile Atlas 1990- 1998 (NYSDEC, 1999).	

TABLE 2-5

BREEDING BIRDS OF THE HUDSON RIVER

Common Name	*Scientific Name*
Acadian Flycatcher	*Empidonax virescens*
Alder Flycatcher	*Empidonax alnorum*
American Bittern	*Botaurus lentiginosus*
American Robin	*Turdus migratorius*
American Kestrel	*Falco sparverius*
American Goldfinch	*Carduelis tristis*
American Coot	*Fulica americana**
American Black Duck	*Anas rubripes*
American Crow	*Corvus brachyrhynchos*
American Redstart	*Setophaga ruticilla*
American Woodcock	*Scolopax minor*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Barred Owl	*Strix varia*
Belted Kingfisher	*Ceryle alcyon*
Black-and-white Warbler	*Mniotilta varia*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Black-capped Chickadee	*Parus atricapillus*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Black-throated Blue Warbler	*Dendroica caerulescens*
Black-throated Green Warbler	*Dendroica virens*
Blackburnian Warbler	*Dendroica fusca*
Blue Jay	*Cyanocitta cristata*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Blue-winged Teal	*Anas discors*
Blue-winged Warbler	*Vermivora pinus*
Blue-winged & Golden-winged Warbler Hybrids	*Vermivora pinus & Vermivora chrysoptera*
Bobolink	*Dolichonyx oryzivorus*
Broad-winged Hawk	*Buteo platypterus*
Brown Thrasher	*Toxostoma rufum*
Brown Creeper	*Certhia americana*
Brown-headed Cowbird	*Molothrus ater*
Canada Warbler	*Wilsonia canadensis*
Canada Goose	*Branta canadensis*
Carolina Wren	*Thryothorus ludovicianus*
Cattle Egret	*Bubulcus ibis**
Cedar Waxwing	*Bombycilla cedrorum*
Cerulean Warbler	*Dendroica cerulea*
Chestnut-sided Warbler	*Dendroica pensylvanica*
Chimney Swift	*Chaetura pelagica*
Chipping Sparrow	*Spizella passerina*
Clapper Rail	*Rallus longirostris**
Cliff Swallow	*Hirundo pyrrhonota*
Common Grackle	*Quiscalus quiscula*
Common Moorhen	*Gallinule chlorous*
Common Nighthawk	*Chordeiles minor*
Common Barn-Owl	*Tyto alba*
Common Yellowthroat	*Geothlypis trichas*
Common Merganser	*Mergus merganser*

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TABLE 2-5

BREEDING BIRDS OF THE HUDSON RIVER

Common Name	*Scientific Name*
Common Snipe	*Gallinago gallinago*
Cooper's Hawk	*Accipiter cooperii*
Dark-eyed Junco	*Junco hyemalis*
Double-crested Cormorant	*Phalacrocorax auritus*
Downy Woodpecker	*Picoides pubescens*
Eastern Meadowlark	*Sturnella magna*
Eastern Phoebe	*Sayornis phoebe*
Eastern Wood-Pewee	*Contopus virens*
Eastern Kingbird	*Tyrannus tyrannus*
Eastern Bluebird	*Sialia sialis*
Eastern Screech-Owl	*Otus asio*
European Starling	*Sturnus vulgaris*
Field Sparrow	*Spizella pusilla*
Fish Crow	*Corvis ossifragus*
Gadwall	*Anas strepera*
Glossy Ibis	*Plegadis falcinellus**
Golden-crowned Kinglet	*Regulus satrapa*
Golden-winged Warbler	*Vermivora chrysoptera*
Grasshopper Sparrow	*Ammodramus savannarum*
Gray Catbird	*Dumetella carolinensis*
Great Horned Owl	*Bubo virginianus*
Great Egret	*Casmerodius albus**
Great Blue Heron	*Ardea herodias*
Great Crested Flycatcher	*Myiarchus crinitus*
Great Black-backed Gull	*Larus marinus*
Green-backed Heron	*Butorides striatus*
Green-winged Teal	*Arias crecca*
Hairy Woodpecker	*Picoides villosus*
Henslow's Sparrow	*Ammodramus henslowii*
Hermit Thrush	*Catharus guttatus*
Herring Gull	*Larus argentatus**
Hooded Merganser	*Lophodytes cucullatus*
Hooded Warbler	*Wilsonia citrina*
Horned Lark	*Eremophila alpestris*
House Sparrow	*Passer domesticus*
House Finch	*Carpodacus mexicanus*
House Wren	*Troglodytes aedon*
Indigo Bunting	*Passerina cyanea*
Kentucky Warbler	*Oporornis formosus*
Killdeer	*Charadrius vociferus*
King Rail	*Rallus elegans*
Laughing Gull	*Larus atricilla**
Least Bittern	*Ixobrychus exilis*
Least Flycatcher	*Empidonax minimus*
Loggerhead Shrike	*Lanius ludovicianus*
Long-earned Owl	*Asio otus*
Louisiana Waterthrush	*Seiurus motacilla*
Magnolia Warbler	*Dendroica magnolia*
Mallard x American Black Duck	*Anas platyrhynchos x rubripes*
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*
Mourning Dove	*Zenaida macroura*

TABLE 2-5

BREEDING BIRDS OF THE HUDSON RIVER

Common Name	*Scientific Name*
Mute Swan	*Cygnus olor*
Nashville Warbler	*Vermivora ruficapilla*
Northern Bobwhite	*Colinus virginianus*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Northern Saw-whet Owl	*Aegolius acadicus*
Northern Oriole	*Icterus galbula*
Northern Pintail	*Anas acuta*
Northern Waterthrush	*Seiurus noveboracensis*
Northern Goshawk	*Accipiter gentilis*
Northern Flicker	*Colaptes auratus*
Northern Mockingbird	*Mimus polyglottos*
Northern Harrier	*Circus cyaneus*
Northern Cardinal	*Cardinalis cardinalis*
Orchard Oriole	*Icterus spurius*
Osprey	*Pandion haliaetus*
Ovenbird	*Seiurus aurocapillus*
Pied-billed Grebe	*Podilymbus podiceps*
Pileated Woodpecker	*Dryocopus pileatus*
Pine Warbler	*Dendroica pinus*
Prairie Warbler	*Dendroica discolor*
Purple Martin	*Progne subis*
Purple Finch	*Carpodacus purpureus*
Red-bellied Woodpecker	*Melanerpes carolinus*
Red-breasted Merganser	*Mergus serrator*
Red-breasted Nuthatch	*Sitta canadensis*
Red-eyed Vireo	*Vireo olivaceus*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-necked Pheasant	*Phasianus colchicus*
Rock Dove	*Columba livia*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Ruby-throated Hummingbird	*Archilochus colubris*
Ruddy Duck	*Oxyura jamaicensis*
Ruffed Grouse	*Bonasa umbellus*
Rufous-sided Towhee	*Pipilo erythrophthalmus*
Savannah Sparrow	*Passerculus sandwichensis*
Scarlet Tanager	*Piranga olivacea*
Sharp-shinned Hawk	*Accipiter striatus*
Snowy Egret	*Egretta thula**
Solitary Vireo	*Vireo solitarius*
Song Sparrow	*Melospiza melodia*
Sora	*Porzana carolina*
Spotted Sandpiper	*Actitis macularia*
Swamp Sparrow	*Melospiza georgiana*
Tree Swallow	*Tachycineta bicolor*
Tufted Titmouse	*Parus bicolor*
Turkey Vulture	*Cathartes aura*
Upland Sandpiper	*Bartramia longicauda*
Veery	*Catharus fuscescens*
Vesper Sparrow	*Pooecetes gramineus*

TABLE 2-5

BREEDING BIRDS OF THE HUDSON RIVER

Common Name	***Scientific Name***
Virginia Rail	*Rallus limicola*
Warbling Vireo	*Vireo gilvus*
Western Meadowlark	*Sturnella neglecta*
Whip-poor-will	*Caprimulgus vociferus*
White-breasted Nuthatch	*Sitta carolinensis*
White-eyed Vireo	*Vireo griseus*
White-throated Sparrow	*Zonotrichia albicollis*
Wild Turkey	*Meleagris gallopavo*
Willow Flycatcher	*Empiddonax traillii*
Winter Wren	*Troglodytes troglodytes*
Wood Duck	*Aix sponsa*
Wood Thrush	*Hylocichla mustelina*
Worm-eating Warbler	*Helmitheros vermivorus*
Yellow Warbler	*Dendroica petechia*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Yellow-billed Cuckoo	*Coccyzus americanus*
Yellow-breasted Chat	*Icteria virens*
Yellow-crowned Night-Heron	*Nycticorax violaceus**
Yellow-rumped Warbler	*Dendroica coronata*
Yellow-throated Vireo	*Vireo flavifrons*

Notes: * coastal breeding birds
Source: Andrle, R.F. and J.R. Carroll (Editors). 1988. The Atlas of Breeding Birds in New York State. Cornell University Press. Ithaca, New York. 551 pp.

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TABLE 2-6

MAMMALS POTENTIALLY FOUND ALONG THE HUDSON RIVER

Common Name	*Scientific Name*
Order Artiodacyla - Even-toed Ungulates	
Family Cervidae - Cervids	
Whitetail deer	*Odocoileus virginianus*
Order Carnivora	
Family Canidae - Canids	
Coyote	*Canis latrans*
Gray fox	*Urocyon cinereoargenteus*
Red fox	*Vulpes vulpes*
Family Felidae- Cats	
Bobcat	*Lynx rufus*
Family Mustelidae - Weasels	
Common striped skunk	*Mephitis mephitis*
Ermine	*Martes erminea*
Fisher	*Martes pennanti*
Least weasel	*Martes nivalis*
Longtail weasel	*Mustela frenata*
Marten	*Martes americana*
Mink	*Mustela vison*
River otter	*Lutra canadensis*
Family Procyonidae- Raccoons	
Raccoon	*Procyon lotor*
Family Ursidae - Bears	
Black bear	*Ursus americanus*
Order Chiroptera - Bats	
Family Vespertilionidae - Vespertilionid Bats	
Big brown bat	*Eptesicus fuscus*
Eastern pipistrelle	*Pipistrellus subflavus*
Eastern small-footed myotis	*Myotis leibii*
Evening bat	*Nycticeius humeralis*
Hoary bat	*Lasiurus cinereus*
Indiana myotis	*Myotis sodalis*
Little brown bat	*Myotis lucifugus*
Keen's myotis	*Myotis keenii or M. septentrionalis*
Red bat	*Lasiurus borealis*
Silver-haired bat	*Lasionycteris noctivagans*
Order Insectivora- Insectivores	
Family Soricidae - Shrews	
Least shrew	*Cryptotis parva*
Masked shrew	*Sorex cinereus*
Northern short-tailed shrew	*Blarina brevicauda*
Pygmy shrew	*Sorex hoyi*
Rock shrew	*Sorex dispar*
Smokey shrew	*Sorex fumeus*
Water shrew	*Sorex palustris*
Family Talpidae - Moles	
Eastern mole	*Scalopus aquaticus*
Hairy-tailed mole	*Parascalops breweri*
Star-nosed mole	*Condylura cristata*

TABLE 2-6

MAMMALS POTENTIALLY FOUND ALONG THE HUDSON RIVER

Common Name	*Scientific Name*
Order Lagomorpha	
Family Leporidae - Hares and Rabbits	
Black-tailed jackrabbit	*Lepus californicus*
Cottontail	*Sylvilagus floridanus*
European rabbit	*Orytolagus cuniculus*
New England cottontial	*Sylvilagus transitionalis*
Snowshoe hare	*Lepus americanus*
Order Marsupialia - Marsupials	
Family Didelphidae - Oppossums	
Virginia opposum	*Didelphis virginiana*
Order Rodentia - Rodents	
Family Castoridae - Beavers	
Beaver	*Castor canadensis*
Family Cricetidae - Cricetids	
Deer mouse	*Peromyscus maniculatus*
Meadow vole	*Microtus pennsylvanicus*
Muskrat	*Ondatra zibethicus*
Pine vole	*Microtus pientorum*
Rock or yellow nose vole	*Microtus chrotorrhinus*
Southern bog lemming	*Synaptomys cooperi*
Southern red-backed vole	*Clethrionomys gappeeri*
White-footed mouse	*Peromyscus leucopus*
Family Erethizontidae - New World Porcupine	
Porcupine	*Erethizon dorsatum*
Family Muridae - Murids	
Norway rat	*Rattus norvegicus*
Black rat	*Rattus rattus*
House mouse	*Mus musculus*
Eastern woodrat	*Neotoma magister*
Family Myocastoridae - Myocastorids	
Nutria	*Myocastor coypus*
Family Sciuridae - Squirrels	
Chipmunk	*Tamias striatus*
Eastern gray squirrel	*Sciurus carolinensis*
Fox squirrel	*Sciurus niger*
Northern flying squirrel	*Glaucomys sabrinus*
Red squirrel	*Tamiasciurus hudsonicus*
Southern flying squirrel	*Glaucomys volans*
Woodchuck	*Marmota monax*
Family Zapodidae - Jumping Mice	
Meadow jumping mouse	*Zapus hudsonius*
Woodland jumping mouse	*Napaeozapus insignis*
Sources: NYSM, 1999; NYSDOS, 1990.	

TABLE 2-7

ASSESSMENT AND MEASUREMENT ENDPOINTS

Assessment Endpoint	Specific Ecological Receptor ("Endpoint Species")	Measures	
		Exposure	**Effect**
Benthic community structure as food source for local fish and wildlife.	· Benthic macroinvertebrate community	· Ecological community indices (diversity, evenness, dominance) · PCB levels in sediments and water column	· Differences in benthic community indices · Exceedance of ambient water quality criteria (AWQC) and sediment guidelines
Survival, growth, and reproduction of local forage fish populations.	· Spottail shiner · Pumpkinseed	· Measured PCB body burdens · Modeled PCB body burdens · PCB concentrations in sediments and water column	· Estimated exceedance of TRVs[1] · Exceedance of AWQC and sediment guidelines · Field observations
Survival, growth, and reproduction of local piscivorous/semi-piscivorous fish populations.	· Yellow perch · White perch · Largemouth bass · Striped bass	· Measured PCB body burdens · Modeled PCB body burdens · PCB concentrations in sediments and water column	· Estimated exceedance of TRVs · Exceedance of AWQC and sediment guidelines · Field observations
Survival, growth, and reproduction of local omnivorous fish populations.	· Shortnose sturgeon · Brown bullhead	· Measured PCB body burdens · Modeled PCB body burdens · PCB concentrations in sediments and water column	· Estimated exceedance of TRVs · Exceedance of AWQC and sediment guidelines · Field observations
Protection (i.e., survival and reproduction) of insectivorous birds and mammals.	· Tree swallow · Little brown bat	· Measured PCB concentrations in prey items (aquatic insects/benthic invertebrates) · Modeled PCB concentrations in prey items (aquatic insects) · PCB concentrations in the water column	· Estimated exceedance of TRVs · Exceedance of AWQC for the protection of wildlife · Field observations
Protection (i.e., survival and reproduction) of waterfowl.	· Mallard	· Measured PCB concentrations in prey (invertebrates, macrophytes) · Modeled PCB concentrations in prey (invertebrates, macrophytes) · PCB concentrations in the water column	· Estimated exceedance of TRVs · Exceedance of AWQC for the protection of wildlife · Field observations
Protection of piscivorous/semi-piscivorous birds and mammals.	· Belted kingfisher · Great blue heron · Mink · River Otter	· Measured PCB concentrations in prey (forage fish, invertebrates) · Modeled PCB concentrations in prey (forage fish, invertebrates) · PCB concentrations in sediments and water column	· Estimated exceedance of TRVs · Exceedance of AWQC for the protection of wildlife · Field observations

TABLE 2-7

ASSESSMENT AND MEASUREMENT ENDPOINTS

Assessment Endpoint	Specific Ecological Receptor ("Endpoint Species")	Measures	
		Exposure	Effect
Protection of omnivorous mammals.	· Raccoon	· Measured PCB concentrations in prey items (fish, invertebrates) · PCB concentrations in the water column	· Estimated exceedance of TRVs · Exceedance of AWQC for the protection of wildlife · Field observations
Protection of endangered and threatened species.	· Bald eagle · Shortnose sturgeon	· Modeled PCB body burdens (sturgeon) · Measured PCB concentrations in prey (fish) · Modeled PCB concentrations in prey (fish) · PCB concentrations in sediments and water column	· Estimated exceedance of TRVs · Exceedance of AWQC sediment guidelines for the protection of wildlife · Field observations
Protection of significant habitats.	· Hudson River NERR · Selected NYSDOS significant habitats	· PCB concentrations in sediments and water column	· Exceedance of federal and state AWQC and sediment guidelines

Notes: 1: Individual-level effects are considered to occur when the TQ is greater to or equal to one.
Receptor species are surrogates, representative of a wide range of species likely to use the Hudson River as habitat or foraging source.

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TABLE 2-8

HUDSON RIVER RECEPTOR SPECIES

Receptor Species	Habitat/Feeding Characteristics	Similar Feeding Groups (general comparison)	
Benthic Invertebrate Community	Benthic Macroinvertebrates- Planktivorous, Deposit-feeders, Omnivorous		
Spottail Shiner Pumpkinseed	Nektonic Forage Fish - Planktivorous, Insectivorous, Omnivorous	<u>Fish</u> Sunfishes Minnows Killifish River Herring	<u>Amphibians</u> Medium-sized Ranids (True Frogs)
Yellow Perch White Perch Largemouth Bass Striped Bass	Nektonic Fishes- Piscivorous	Basses Bluefish Weakfish	
Brown Bullhead Shortnose Sturgeon	Aquatic Feeders - Omnivorous, Scavengers, Detritivores	<u>Fish</u> Catfish Sturgeon Flatfishes Eels	<u>Amphibians</u> Salamanders Newts Larger Ranids <u>Reptiles</u> Turtles
Tree Swallow	Perching Birds of Wetlands- Insectivorous	Thrushes Wrens Sparrows	Flycatchers Jays Blackbirds
Mallard	Swimming Birds - Aquatic Herbivorous/Insectivorous	<u>Birds</u> Ducks Geese Swans Coots	<u>Mammals</u> Muskrat
Great Blue Heron	Wading Birds - Piscivorous	Shorebirds Herons, egrets, and bitterns Cormorants Mergansers Rails	
Belted Kingfisher	Wide-ranging River Birds - Piscivorous	Gulls Kingfishers	
Bald Eagle	Raptors (Birds of Prey) - Piscivorous/Carnivorous/ Scavengers	Eagles Hawks Falcons Osprey	
Little Brown Bat	Flying Mammals -Insectivorous	Bats	
Mink	Semi-piscivorous/Carnivorous Mammals	Other mustelids	
River Otter	Piscivorous mammals	Harbor Seal	
Raccoon	Facultative Wetland Mammals - Omnivorous	Foxes Dogs Cats	
Notes: Habitat/feeding characteristics are generalized and may not apply to all individuals of a group or species.			

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TABLE 2-9

RECEPTOR TROPHIC LEVELS, EXPOSURE PATHWAYS, AND FOOD SOURCES

Endpoint Species	Level	Exposure Pathways	General Food Sources
FISH			
Benthic Invertebrates	1	A Direct contact with sediments A Direct contact with interstitial water A Direct contact with water (epibenthic and filter feeders)	Species dependent; food sources include detritus, plants, other invertebrates, zooplankton and phytoplankton in interstitial water
Pumpkinseed	2	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	80% pelagic invertebrates 20% benthic invertebrates
Spottail Shiner	2	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	50% benthic invertebrates 50% pelagic invertebrates
Brown Bullhead	2	A Direct contact with water (respiration, Dermal) A Food chain exposure (primarily Sediment-based) A Direct contact with sediment	90% benthic invertebrates, <10% pelagic invertebrates or forage fish
Yellow Perch	2-3	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	<10% forage fish 20-30% benthic invertebrates 60-80% pelagic invertebrates
White Perch	2-3	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	10-20% forage fish 30-40% benthic invertebrates 50-60% pelagic invertebrates
Largemouth Bass	3	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	90% forage fish 10% benthic invertebrates
Striped Bass	3	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	Predominantly forage fish

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TABLE 2-9

RECEPTOR TROPHIC LEVELS, EXPOSURE PATHWAYS, AND FOOD SOURCES

Endpoint Species	Level	Exposure Pathways	General Food Sources
Shortnose Sturgeon	3	A Direct contact with water (respiration, Dermal) A Food chain exposure (both water and Sediment-based) A Direct contact with sediments	Predominantly forage fish
BIRDS			
Tree Swallow	2	A Water ingestion A Food chain exposure	Emergent aquatic and terrestrial insects
Mallard	2	A Water ingestion A Food chain exposure	Vegetation, benthic invertebrates
Belted Kingfisher	3	A Water ingestion A Food chain exposure	Forage fish, aquatic invertebrates
Great Blue Heron	3	A Water ingestion A Food chain exposure A Direct contact with sediments	Forage fish, aquatic invertebrates
Bald Eagle	4	A Ingestion of water A Food chain exposures	Forage fish, small mammals, carrion
MAMMALS			
Little Brown Bat	2	A Ingestion of water A Food chain exposure	Emergent aquatic and terrestrial insects
Raccoon	3	A Ingestion of water A Food chain exposure A Direct contact with sediments	Forage fish, insects, invertebrates
Mink	4-5	A Ingestion of water A Food chain exposure A Direct contact with sediments	Forage fish, invertebrates, small mammals
River Otter	4-5	A Ingestion of water A Food chain exposures A Direct contact with sediments	Forage and piscivorous fish, waterfowl, frogs, invertebrates

TABLE 2-10

NYS RARE AND LISTED SPECIES AND HABITATS OCCURRING IN THE VICINITY OF THE HUDSON RIVER

Common Name	Scientific Name	NYS Status	State Rank	Precision Value
Plants - known occurrences (i.e., precision value S)				
American waterwort	*Elantine americana*	Endangered	S1	S
Bicknell's sedge	*Carex bicknelli*	Rare	S2/S3	S
Carey's smartweed	*Polygonum careyi*	Unprotected	S2	S
Clustered sedge	*Carex cumulata*	Rare	S2S3	S
Corn-salad	*Valerianella umbilicata*	Unprotected	SH	S
Davis' sedge	*Carex davisii*	Rare	S1	S
Estuary beggar-ticks	*Bidens bidentoides*	Threatened	S3	S
False hop sedge	*Carex lupiformes*	Rare	S3	S
Fissidens (non-vascular)	*Fissidens Fontanus*	Unprotected	S3?	S
Frank sedge	*Carex frankii*	Unprotected	S1	S
Glaucous sedge	*Carex Flaccosperma var. glaucodea*	Rare	S1	S
Golden club	*Orontium aquaticum*	Unprotected	S2	S
Golden seal	*Hydrastis canadensis*	Threatened	S2	S
Gypsy-wort	*Lycopus rubellus*	Unprotected	S1	S
Heartleaf plantain	*Plantago cordata*	Threatened	S3	S
Illinois pinweed	*Lechea racemulosa*	Rare	S3	S
Liliaeopsis	*Lilaeopsis chinensis*	Unprotected	S2	S
Lined sedge	*Carex striatula*	Unprotected	S1	S
Long's bittercress	*Cardamine longii*	Unprotected	S2	S
Marsh straw sedge	*Carex hormathodes*	Rare	S2/S3	S
Midland sedge	*Carex mesocorea*	Unprotected	S1	S
Mock-pennyroyal	*Hedeoma hispidum*	Rare	S2/S3	S

TABLE 2-10

NYS RARE AND LISTED SPECIES AND HABITATS OCCURRING IN THE VICINITY OF THE HUDSON RIVER

Common Name	Scientific Name	NYS Status	State Rank	Precision Value
Narrow-leaved sedge	*Carex amphibola var. amphibola*	Unprotected	S1	S
Saltmarsh bulrush	*Scirpus novae-angliae*	Endangered	S1	S
Schweinitz's flatsedge	*Cyperus schweinitizii*	Rare	S3	S
Slender crabgrass	*Digitaria filiformis*	Rare	S2	S
Small-flowered crowfoot	*Ranunculus micranthus*	Unprotected	S2	S
Smooth bur-marigold	*Bidens laevis*	Rare	S2	S
Southern yellow flax	*Linum medium var. texanum*	Threatened	S2	S
Southern dodder	*Cuscata obtusiflora car. glandulosa*	Unprotected	S1	S
Spongy arrowhead	*Sagittaria calycina var. spongiosa*	Rare	S2	S
Starwort	*Callitriche terrestris*	Unprotected	S2S3	S
Swamp lousewort	*Pedicularis lanceolata*	Rare	S2	S
Swamp cottonwood	*Populus heterophylla*	Threatened	S2	S
Taxiphyllum (non-vascular)	*Taxiphyllum taxirameum*	Unprotected	S1	S
Violet wood-sorrel	*Oxalis violacea*	Unprotected	S1S2	S
Violet lespedeza	*Lespedeza violacea*	Rare	S3	S
Water pigmyweed	*Crassula aquatica*	Endangered	S1	S
Weak stellate sedge	*Carex seorsa*	Rare	S2	S
Invertebrates				
American rubyspot dragonfly	*Hetaerina americana*	Unprotected	S2/S3	S
Arrowhead spiketail dragonfly	*Cordulegaster obliqua*	Unprotected	S2S3	S
Gray petaltail dragonfly	*Tachopteryx thoreyi*	Unprotected	S2	S

TABLE 2-10

NYS RARE AND LISTED SPECIES AND HABITATS OCCURRING IN THE VICINITY OF THE HUDSON RIVER

Common Name	Scientific Name	NYS Status	State Rank	Precision Value
Tawny emperor butterfly	*Asterocampa clyton*	Unprotected	S3	S
Riverine clubtail	*Stylurus amnicola*	Unprotected	SH	M
Fish				
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered	S1	S
Bluespotted sunfish	*Enneacanthus gloriosus*	Unprotected	S2	M
Reptiles				
Bog turtle	*Clemmys muhlenbergii*	Endangered	S2	M
Blanding's turtle	*Emydoidea blandingii*	Threatened	S2	M
Fence lizard	*Sceloporus undulatus*	Unprotected	S1	S
Timber rattlesnake	*Crotalus horridus*	Threatened	S3	M
Birds				
Peregrine falcon	*Falco peregrinus*	Endangered	S2	S
Bald eagle	*Haliaeetus Leucocephalus*	Endangered	S1B, S1N	S
King rail	*Rallus elegans*	Protected	S1	M
Barn Owl	*Tyto alba*	Protected- Special Concern	S3	M
Short-eared owl	*Asio flammeus*	Protected- Special Concern	S2	S
Osprey	*Pandion halietus*	Threatened	S4	M
Mammals				
Eastern woodrat	*Neotoma magister*	Endangered	SH	M
Communities				
19 Freshwater Intertidal Mudflats Communities				S
25 Freshwater Tidal Marsh Communities				S

TABLE 2-10

NYS RARE AND LISTED SPECIES AND HABITATS OCCURRING IN THE VICINITY OF THE HUDSON RIVER

Common Name	Scientific Name	NYS Status	State Rank	Precision Value
9 Freshwater Tidal Swamp Communities				S
8 Freshwater Intertidal Shore Communiies				S
7 Brackish Intertidal Mudflats Communities				S
7 Brackish Tidal Marsh Communities				S
1 Brackish Subtidal Aquatic Bed Community				S
1 Calcareous Cliff Community				S
Areas of Concern				
16 Anadromous Fish Concentration Areas				S
12 Waterfowl Concentration Areas				S
3 Raptor Concentration Areas				S
1 Warm Water Fish Concentration Area				S

Notes:
State Rank:
S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres or miles of stream in NYS
S2 = Typically 6 to 20 occurrences, very few remaining individuals, acres or miles of stream in NYS
S3 = Typically 21 to 100 occurrences, limited acreage or miles of stream in NYS
S4 = Apparently secure in NYS
S5 = Demostrably secure in NYS
Precision Rank:
A precision value of "S" indicates that a species is known to be found along the Hudson River.
A precision value of "M" indicates that a species may occur along the Hudson River in an appropriate habitat.
Source: NYSDEC, May 1999.

TABLE 2-11

HUDSON RIVER SIGNIFICANT HABITATS

Freshwater Habitats
Normans Kill
Papascanee Marsh and Creek
Shad and Schermerhorn Island
Schodack and Houghtaling Islands and Schodack Creek
Coeymans Creek
Hannacroix Creek
Mill Creek Wetlands
Stuyvesant Marshes*
Coxsackie Creek
Coxsackie Island Backwater
Stockport Creek and Flats
Vosburgh Swamp and Middle Ground Flats
Roger's Island
Catskill Creek
Ramshorn Marsh
Inbocht Bay and Duck Cove
Roeliff-Jansen Kill
Smith's Landing Cementon*
Germantown/Clermont Flats
Esopus Estuary
North and South Tivoli Bays
Mudder Kill*
The Flats
Roundout Creek
Kingston Deepwater Habitat
Vanderburgh Cove and Shallows
Esopus Meadows
Poughkeepsie Deepwater Habitat
Crum Elbow Marsh*
Brackish Water Habitats
Wappinger Creek
Fishkill Creek
Moodna Creek
Hudson River Miles 44-56
Constitution Marsh
Iona Island Marsh
Camp Smith Marsh and Annsville Creek*
Salt Water Habitats
Haverstraw Bay
Croton River and Bay
Piermont Marsh
Notes: * Indicates an area that is recognized by the NYS Natural Heritage Program as containing rare/important species or communities, but is not a designated Significant Habitat. Source: NYSDOS, 1990.

TABLE 3-1
AVERAGE PROPORTION OF FISH-BASED TEQ CONGENERS USING EPA 1993 DATASET AND USFWS 1995 DATASET

	BZ#77	**BZ#81**	**BZ#105**	BZ#114	**BZ#118**	BZ#123	**BZ#126**	BZ#156	BZ#157	BZ#167	BZ#169	BZ#189
Upper River Mean	**0.28**		**0.06**	0.01	**0.11**	0.00	**0.52**	0.01	0.00	0.00	0.01	0.00
Lower River Mean	**0.05**		**0.02**	0.00	**0.05**	0.00	**0.85**	0.00	0.00	0.00	0.01	0.00
Whole River Mean	**0.15**		**0.03**	0.00	**0.07**	0.00	**0.71**	0.01	0.00	0.00	0.01	0.00
Egg Mean	**0.32**	**0.11**	**0.04**	0.01	**0.07**	0.03	**0.40**	0.01	0.00	0.00	0.00	0.00
Chick Mean	**0.38**	**0.13**	**0.04**	0.01	**0.08**	0.03	**0.33**	0.01	0.00	0.00	0.00	0.00
Odonate Mean	**0.34**	**0.05**	**0.03**	0.00	**0.05**	0.01	**0.49**	0.01	0.00	0.00	0.00	0.00
Insect Mean	**0.34**	**0.11**	**0.04**	0.01	**0.05**	0.02	**0.42**	0.00	0.00	0.00	0.00	0.00

Source: TAMS/Gradient Database Release 4.1b

Note: Dominant congeners are bold.

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TABLE 3-2: FRACTION OF TRI+ CHLORINATED CONGENERS EXPRESSED AS TOXIC EQUIVALENCIES (TEQ)

	<<<<<<< ---- **Whole Water Concentrations** ---- >>>>>>>					
	Value 1 Fish	Value 2 Fish	Value 1 Mammal	Value 2 Mammal	Value 1 Avian	Value 2 Avian
Upper River	2.82E-04	4.43E-06	6.33E-03	4.73E-04	8.17E-03	8.92E-04
Lower River	2.92E-05	4.72E-07	6.53E-04	5.49E-05	8.50E-04	8.83E-05
Whole River	2.57E-04	4.03E-06	5.75E-03	4.31E-04	7.43E-03	8.10E-04
	<<<<<<< ---- **Fish Concentrations** ---- >>>>>>>					
	Value 1 Fish	Value 2 Fish	Value 1 Mammal	Value 2 Mammal	Value 1 Avian	Value 2 Avian
Upper River	2.27E-06	1.22E-06	4.29E-05	1.78E-05	2.57E-04	2.36E-04
Lower River	5.46E-06	1.20E-06	1.17E-04	2.19E-05	1.90E-04	1.02E-04
Whole River	4.13E-06	1.21E-06	8.59E-05	2.02E-05	2.18E-04	1.58E-04
	<<<<<<< ---- **Sediment Concentrations** ---- >>>>>>>					
	Value 1 Fish	Value 2 Fish	Value 1 Mammal	Value 2 Mammal	Value 1 Avian	Value 2 Avian
Upper River	3.94E-05	5.75E-06	7.78E-04	3.86E-05	2.78E-03	2.10E-03
Lower River	1.46E-05	7.86E-06	2.46E-04	8.33E-05	2.19E-03	2.05E-03
Whole River	2.68E-05	6.83E-06	5.06E-04	6.15E-05	2.48E-03	2.08E-03
	<<<<<<< ---- **Dissolved Water Concentrations** ---- >>>>>>>					
	Value 1 Fish	Value 2 Fish	Value 1 Mammal	Value 2 Mammal	Value 1 Avian	Value 2 Avian
Upper River	4.10E-06	1.49E-06	7.62E-03	2.80E-04	9.38E-03	4.27E-05
Lower River	5.36E-07	5.10E-07	5.12E-04	8.45E-05	6.15E-04	4.50E-05
Whole River	3.74E-06	1.39E-06	6.90E-03	2.60E-04	8.50E-03	4.30E-05
	<<<<<<< ---- **Benthic Invertebrate Concentrations** ---- >>>>>>>					
	Value 1 Fish	Value 2 Fish	Value 1 Mammal	Value 2 Mammal	Value 1 Avian	Value 2 Avian
Upper River	1.38E-06	1.06E-07	2.97E-05	1.55E-06	5.33E-05	1.88E-05
Lower River	4.82E-06	1.05E-07	1.08E-04	2.07E-06	1.39E-04	3.96E-06
Whole River	2.21E-06	1.06E-07	4.85E-05	1.67E-06	7.38E-05	1.52E-05

Factors obtained by multiplying media-specific TEF in Table 4-2 by individual congener concentrations for each sample, averaging across location and summing

Source: TAMS/Gradient Database Release 4.1b

TABLE 3-3: WHOLE WATER CONCENTRATIONS BASED ON 1993 USEPA PHASE 2 DATASET

Hudson River	Tri+ PCB		Avian Based TEF		Mammalian Based TEF	
Location	Average Conc. in Water mg/L	95% UCL Conc. In Water mg/L	Average Conc. in Water mg/L	95% UCL Conc. In Water mg/L	Average Conc. in Water mg/L	95% UCL Conc. In Water mg/L
Upper River						
Thompson Island Pool (189)	7.36E-05	2.33E-04	6.01E-07	1.90E-06	4.66E-07	1.47E-06
Stillwater (168)	1.31E-04	4.15E-04	1.07E-06	3.39E-06	8.27E-07	2.62E-06
Federal Dam (154)	9.14E-05	1.96E-04	7.47E-07	1.60E-06	5.78E-07	1.24E-06
Lower River						
143.5	7.07E-05	7.70E-04	6.01E-08	6.55E-07	4.62E-08	5.03E-07
137.2	7.07E-05	7.70E-04	6.01E-08	6.55E-07	4.62E-08	5.03E-07
122.4	3.24E-05	4.15E-04	2.76E-08	3.53E-07	2.11E-08	2.71E-07
113.8	3.24E-05	4.15E-04	2.76E-08	3.53E-07	2.11E-08	2.71E-07
100	3.24E-05	4.15E-04	2.76E-08	3.53E-07	2.11E-08	2.71E-07
88.9	2.13E-05	9.48E-05	1.82E-08	8.06E-08	1.39E-08	6.19E-08
58.7	2.13E-05	9.48E-05	1.82E-08	8.06E-08	1.39E-08	6.19E-08
47.3	2.13E-05	9.48E-05	1.82E-08	8.06E-08	1.39E-08	6.19E-08
25.8	2.13E-05	9.48E-05	1.82E-08	8.06E-08	1.39E-08	6.19E-08

Notes:

Source: TAMS/Gradient Database Release 4.1b

Water concentrations estimated from Phase 2 dataset -- data averaged across appropriate lower river water column sampling locations

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TABLE 3-4: DRY WEIGHT SEDIMENT CONCENTRATIONS BASED ON USEPA PHASE 2 DATASET

Location	Tri+ PCB Average Sediment Conc. mg/Kg	Tri+ PCB 95% UCL Sediment Conc. mg/Kg	Avian Based TEF Average Sediment Conc. mg/Kg	Avian Based TEF 95% UCL Sediment Conc. mg/Kg	Mammalian Based TEF Average Sediment Conc. mg/Kg	Mammalian Based TEF 95% UCL Sediment Conc. mg/Kg
Upper River						
Thompson Island Pool (189)	11.879	17.381	3.30E-02	4.83E-02	9.24E-03	1.35E-02
Stillwater (168)	31.030	54.170	8.62E-02	1.50E-01	2.41E-02	4.21E-02
Federal Dam (154)	2.793	4.684	7.76E-03	1.30E-02	2.17E-03	3.64E-03
Lower River						
143.5	0.860	0.942	1.88E-03	2.06E-03	2.12E-04	2.32E-04
137.2	1.519	3.069	3.32E-03	6.71E-03	3.74E-04	7.56E-04
122.4	0.963	1.069	2.10E-03	2.34E-03	2.37E-04	2.63E-04
113.8	1.009	1.667	2.21E-03	3.64E-03	2.48E-04	4.11E-04
100	0.399	8.613	8.72E-04	1.88E-02	9.82E-05	2.12E-03
88.9	0.781	2.284	1.71E-03	4.99E-03	1.92E-04	5.62E-04
58.7	0.252	2.794	5.51E-04	6.11E-03	6.20E-05	6.88E-04
47.3	1.537	6.000	3.36E-03	1.31E-02	3.79E-04	1.48E-03
25.8	0.578	1.563	1.26E-03	3.42E-03	1.42E-04	3.85E-04

Source: TAMS/Gradient Database Release 4.1b

301582

TABLE 3-5: BENTHIC INVERTEBRATE CONCENTRATIONS BASED ON USEPA PHASE 2 DATASET

Location	Tri+ PCB Average Benthic Invert Conc mg/Kg	Tri+ PCB 95% UCL Benthic Conc mg/Kg	Avian Based TEF Average Benthic Invert Conc mg/Kg	Avian Based TEF 95% UCL Benthic Conc mg/Kg	Mammalian Based TEF Average Benthic Invert Conc mg/Kg	Mammalian Based TEF 95% UCL Benthic Conc mg/Kg
Upper River						
Thompson Island Pool (189)	14.138	22.210	7.53E-04	1.18E-03	4.20E-04	6.59E-04
Stillwater (168)	26.377	45.912	1.41E-03	2.45E-03	7.83E-04	1.36E-03
Federal Dam (154)	6.286	10.942	3.35E-04	5.83E-04	1.87E-04	3.25E-04
Lower River						
143.5	0.876	1.524	1.21E-04	2.11E-04	9.45E-05	1.64E-04
137.2	1.725	3.002	2.39E-04	4.16E-04	1.86E-04	3.24E-04
122.4	0.804	2.021	1.11E-04	2.80E-04	8.68E-05	2.18E-04
113.8	0.691	1.203	9.57E-05	1.67E-04	7.45E-05	1.30E-04
100	0.380	2.598	5.27E-05	3.60E-04	4.10E-05	2.80E-04
88.9	0.191	0.339	2.64E-05	4.69E-05	2.06E-05	3.65E-05
58.7	0.491	0.854	6.80E-05	1.18E-04	5.29E-05	9.21E-05
47.3	0.666	4.891	9.23E-05	6.78E-04	7.19E-05	5.28E-04
25.8	0.197	0.335	2.73E-05	4.64E-05	2.13E-05	3.61E-05

Source: TAMS/Gradient Database Release 4.1b

301583

TABLE 3-6: FORAGE FISH CONCENTRATIONS BASED ON USEPA PHASE 2 DATASET

Location	Tri+ PCB Average Conc mg/Kg	Tri+ PCB 95% UCL Conc mg/Kg	Avian Based TEF Average Conc mg/Kg	Avian Based TEF 95% UCL Conc mg/Kg	Mammalian Based TEF Average Conc mg/Kg	Mammalian Based TEF 95% UCL Conc mg/Kg
Upper River						
Thompson Island Pool (189)	20.919	42.716	5.37E-03	1.10E-02	8.97E-04	1.83E-03
Stillwater (168)	7.062	10.099	1.81E-03	2.59E-03	3.03E-04	4.33E-04
Federal Dam (154)	1.657	2.405	4.25E-04	6.17E-04	7.11E-05	1.03E-04
Lower River						
143.5	1.927	2.314	3.66E-04	4.39E-04	2.25E-04	2.70E-04
137.2	3.898	8.453	7.40E-04	1.60E-03	4.55E-04	9.86E-04
122.4	1.488	2.407	2.82E-04	4.57E-04	1.74E-04	2.81E-04
113.8	1.560	1.618	2.96E-04	3.07E-04	1.82E-04	1.89E-04
100	0.676	1.167	1.28E-04	2.21E-04	7.89E-05	1.36E-04
88.9	1.345	1.845	2.55E-04	3.50E-04	1.57E-04	2.15E-04
58.7	1.465	1.661	2.78E-04	3.15E-04	1.71E-04	1.94E-04
47.3	1.304	1.728	2.47E-04	3.28E-04	1.52E-04	2.02E-04
25.8	0.981	1.179	1.86E-04	2.24E-04	1.14E-04	1.38E-04

Source: TAMS/Gradient Database Release 4.1b

TABLE 3-7: OBSERVED CONCENTRATIONS IN PPM FOR FISH SPECIES FOR RIVER MILES 113, 152, 168 AND 189 FROM NYSDEC DATASET

<<<<<<<<<<<<<< -------------------------------- WET WEIGHT CONCENTRATIONS -------------------------------->>>>>>>>>>>

	Largemouth Bass			Largemouth Bass			Brown Bullhead			Largemouth Bass			Brown Bullhead		
	113			168			168			189			189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	11.12	*	34.36	16.79	21.63	38.12	12.75	20.03	26.00	94.49	182.86	345.84	25.52	49.75	42.28
1994	15.66	36.04	52.09	13.68	27.41	31.79	8.59	20.00	27.08	45.07	68.02	96.35	26.28	34.44	103.77
1995	8.17	10.72	29.76	13.11	18.07	28.67	9.01	11.53	19.17	56.13	93.61	128.03	19.69	26.06	27.05
1996	9.32	16.09	26.70							27.90	37.34	56.96	16.13	*	18.81

<<<<<<<<<<<<< -------------------------------- LIPID NORMALIZED CONCENTRATIONS -------------------------------->>>>>>>>>>

	Largemouth Bass			Largemouth Bass			Brown Bullhead			Largemouth Bass			Brown Bullhead		
	113			168			168			189			189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	129.94	269.40	225.31	504.50	589.56	790.13	244.29	*	377.87	2215.67	3374.69	4993.02	942.50	1583.04	1783.53
1994	150.43	225.71	435.87	480.44	892.00	1115.37	165.28	344.97	763.25	1237.36	1558.14	2569.30	718.47	1006.55	3088.33
1995	143.41	174.17	226.37	557.58	658.90	978.39	161.85	194.03	489.69	1077.61	1661.12	1822.26	341.76	421.82	612.17
1996	115.88	161.28	237.33							779.19	990.00	1411.89	356.67	*	410.64

<<<<<<<<<<<<<< -------------------------------- WET WEIGHT CONCENTRATIONS -------------------------------->>>>>>>>>>>

	White Perch			White Perch			Yellow Perch			Yellow Perch			Yellow Perch		
	113			152			113			168			189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	2.54	5.37	5.60	2.42	4.97	3.69	1.06	1.26	3.25	10.53	*	21.21	36.25	66.22	131.33
1994	1.04	1.73	2.23	4.81	9.34	8.67	0.51	0.66	0.80						
1995															
1996	4.94	*	8.84	2.78	5.40	8.14									

<<<<<<<<<<<<< -------------------------------- LIPID NORMALIZED CONCENTRATIONS -------------------------------->>>>>>>>>>

	White Perch			White Perch			Yellow Perch			Yellow Perch			Yellow Perch		
	113			152			113			168			189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	119.96	174.09	215.41	106.16	121.40	160.87	108.84	132.50	427.33	478.90	*	708.98	2724.70	3980.41	13539.37
1994	110.50	161.09	192.59	308.69	376.11	651.61	52.32	69.06	71.97						
1995															
1996	150.33	389.55	346.93	92.13	105.80	175.91									

* Indicates that the calculated UCL exceeded the maximum due to small sample size.

Source: TAMS/Gradient Database Release 4.1b

TABLE 3-8
OBSERVED STRIPED BASS CONCENTRATIONS FROM NYSDEC
FOR THE HUDSON RIVER

River Mile	Year	Average Wet Weight (mg/Kg)	95%UCL (mg/Kg)	Average Lipid Normalized (mg PCB /Kg Lipid)	95% UCL (mg PCB /Kg Lipid)
12	1993	1.33	2.13	25.09	38.48
27	1993	2.55	4.09	46.12	69.02
33	1993	4.25	8.46	54.81	96.75
40	1993	1.61	2.03	32.28	43.61
74	1993	3.15	4.90	75.92	135.09
112	1993	3.74	5.63	121.90	204.94
152	1993	12.38	17.67	306.41	533.77
26	1994	1.65	2.56	36.28	53.31
37	1994	1.95	3.03	46.46	84.32
40	1994	1.78	2.91	40.01	58.23
74	1994	2.54	4.22	49.58	75.02
112	1994	3.05	8.35	132.69	476.15
152	1994	6.40	9.79	254.45	338.72
27	1995	1.99	2.86	53.47	90.59
36	1995	1.30	1.70	26.03	35.97
59	1995	2.26	2.83	165.82	250.65
76	1995	1.72	2.05	29.85	35.79
113	1995	1.69	2.68	35.14	58.11
152	1995	6.51	8.42	174.47	235.65
12	1996	1.26	1.87	35.97	52.95
29	1996	1.92	2.74	44.94	58.94
40	1996	1.69	2.31	47.40	71.61
74	1996	1.81	2.49	46.47	68.76
112	1996	1.90	3.11	86.86	186.24
152	1996	4.89	11.26	216.03	531.63

TABLE 3-9: OBSERVED MAMMALIAN AND AVIAN PCB CONCENTRATIONS

Species and Statistic	North Hudson Valley	South Hudson Valley	Hudson Valley	Other NY State
	1983 - 1986 Mink and Otter Concentrations in mg/kg			
Mink liver - average	0.6	0.7		
Mink liver - minimum	0.1	0.1		
Mink liver - maximum	1.7	3.4		
Otter liver - average			2.3	
Otter liver - minimum			0.7	
Otter liver - maximum			7.3	
	Tree Swallow Concentrations in mg/kg			
	Lock 9	Remnant	SA13	Saratoga
Eggs	0.852	6.55	29.6	18.5
	2.57	22.9	77.3	2.37
	5.72	12.9	17.6	15.7
	16	4.6	44	13
EGG AVERAGE	6.28	11.7	42.1	12.4
Nestlings	0.51	31.1	54.8	9.78
	0.244	27.1	56.8	0.721
NESTLING AVERAGE	0.377	29.1	55.8	5.25

TABLE 3-10: SUMMARY OF TRI+ WHOLE WATER CONCENTRATIONS FROM THE HUDTOX MODEL AND TEQ-BASED PREDICTIONS FOR 1993 - 2018

	Tri+ Average PCB Results			Tri+ 95% UCL Results			Average Avian TEF			95% Avian TEF			Average Mammalian TEF			95% UCL Mammalian TEF		
Year	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l	189 Whole Water Conc mg/l	168 Whole Water Conc mg/l	154 Whole Water Conc mg/l
1993	4.9E-05	7.3E-05	4.9E-05	4.9E-05	7.5E-05	1.1E-05	4.0E-07	6.0E-07	4.0E-07	4.0E-07	6.1E-07	9.1E-08	3.1E-07	4.6E-07	3.1E-07	3.1E-07	4.7E-07	7.1E-08
1994	4.1E-05	5.7E-05	3.8E-05	4.2E-05	5.9E-05	8.5E-06	3.4E-07	4.6E-07	3.1E-07	3.4E-07	4.8E-07	6.9E-08	2.6E-07	3.6E-07	2.4E-07	2.6E-07	3.7E-07	5.4E-08
1995	6.6E-05	9.6E-05	6.0E-05	6.6E-05	9.9E-05	1.4E-05	5.3E-07	7.9E-07	4.9E-07	5.4E-07	8.1E-07	1.2E-07	4.1E-07	6.1E-07	3.8E-07	4.2E-07	6.2E-07	8.9E-08
1996	2.6E-05	4.0E-05	2.6E-05	2.6E-05	4.4E-05	7.0E-06	2.1E-07	3.3E-07	2.1E-07	2.1E-07	3.6E-07	5.7E-08	1.6E-07	2.5E-07	1.6E-07	1.7E-07	2.8E-07	4.4E-08
1997	2.8E-05	4.8E-05	3.2E-05	2.8E-05	4.9E-05	9.5E-06	2.2E-07	4.0E-07	2.6E-07	2.3E-07	4.0E-07	7.7E-08	1.7E-07	3.1E-07	2.0E-07	1.8E-07	3.1E-07	6.0E-08
1998	2.9E-05	5.0E-05	2.7E-05	2.9E-05	5.0E-05	2.7E-05	2.4E-07	4.0E-07	2.2E-07	2.4E-07	4.1E-07	2.2E-07	1.8E-07	3.1E-07	1.7E-07	1.9E-07	3.2E-07	1.7E-07
1999	2.4E-05	4.3E-05	2.5E-05	2.4E-05	4.4E-05	2.7E-05	2.0E-07	3.5E-07	2.0E-07	2.0E-07	3.6E-07	2.2E-07	1.5E-07	2.7E-07	1.6E-07	1.5E-07	2.8E-07	1.7E-07
2000	2.0E-05	3.6E-05	2.2E-05	2.1E-05	3.8E-05	2.4E-05	1.6E-07	3.0E-07	1.8E-07	1.7E-07	3.1E-07	2.0E-07	1.3E-07	2.3E-07	1.4E-07	1.3E-07	2.4E-07	1.5E-07
2001	2.6E-05	4.2E-05	2.6E-05	2.7E-05	4.3E-05	2.6E-05	2.1E-07	3.5E-07	2.1E-07	2.2E-07	3.5E-07	2.2E-07	1.6E-07	2.7E-07	1.6E-07	1.7E-07	2.7E-07	1.7E-07
2002	2.2E-05	3.9E-05	2.2E-05	2.2E-05	4.1E-05	2.4E-05	1.8E-07	3.2E-07	1.8E-07	1.8E-07	3.3E-07	1.9E-07	1.4E-07	2.5E-07	1.4E-07	1.4E-07	2.6E-07	1.5E-07
2003	1.7E-05	3.1E-05	1.9E-05	1.7E-05	3.2E-05	2.1E-05	1.4E-07	2.5E-07	1.5E-07	1.4E-07	2.6E-07	1.7E-07	1.1E-07	2.0E-07	1.2E-07	1.1E-07	2.0E-07	1.3E-07
2004	1.6E-05	2.9E-05	1.9E-05	1.6E-05	3.1E-05	2.2E-05	1.3E-07	2.4E-07	1.6E-07	1.3E-07	2.5E-07	1.8E-07	9.8E-08	1.9E-07	1.2E-07	1.0E-07	2.0E-07	1.4E-07
2005	1.9E-05	3.4E-05	2.2E-05	1.9E-05	3.5E-05	2.3E-05	1.5E-07	2.8E-07	1.8E-07	1.6E-07	2.9E-07	1.8E-07	1.2E-07	2.2E-07	1.4E-07	1.2E-07	2.2E-07	1.4E-07
2006	1.9E-05	3.4E-05	2.2E-05	1.9E-05	3.5E-05	2.3E-05	1.5E-07	2.8E-07	1.8E-07	1.6E-07	2.9E-07	1.8E-07	1.2E-07	2.2E-07	1.4E-07	1.2E-07	2.2E-07	1.4E-07
2007	1.0E-05	1.9E-05	1.0E-05	1.0E-05	1.9E-05	1.1E-05	8.3E-08	1.5E-07	8.3E-08	8.5E-08	1.6E-07	9.0E-08	6.4E-08	1.2E-07	6.5E-08	6.5E-08	1.2E-07	7.0E-08
2008	1.4E-05	2.4E-05	1.5E-05	1.4E-05	2.6E-05	1.7E-05	1.1E-07	2.0E-07	1.2E-07	1.1E-07	2.1E-07	1.4E-07	8.7E-08	1.5E-07	9.7E-08	8.9E-08	1.6E-07	1.1E-07
2009	1.6E-05	2.8E-05	1.6E-05	1.7E-05	2.9E-05	1.8E-05	1.3E-07	2.3E-07	1.3E-07	1.4E-07	2.4E-07	1.4E-07	1.0E-07	1.8E-07	1.0E-07	1.1E-07	1.8E-07	1.1E-07
2010	9.6E-06	1.8E-05	1.0E-05	9.8E-06	1.9E-05	1.1E-05	7.8E-08	1.5E-07	8.3E-08	8.0E-08	1.5E-07	9.2E-08	6.1E-08	1.1E-07	6.4E-08	6.2E-08	1.2E-07	7.1E-08
2011	9.4E-06	1.8E-05	1.1E-05	9.6E-06	2.0E-05	1.3E-05	7.7E-08	1.5E-07	9.0E-08	7.9E-08	1.6E-07	1.0E-07	5.9E-08	1.2E-07	7.0E-08	6.1E-08	1.3E-07	8.1E-08
2012	1.2E-05	2.3E-05	1.4E-05	1.2E-05	2.4E-05	1.5E-05	1.0E-07	1.9E-07	1.2E-07	1.0E-07	1.9E-07	1.2E-07	7.7E-08	1.5E-07	9.0E-08	7.8E-08	1.5E-07	9.4E-08
2013	8.8E-06	1.6E-05	8.7E-06	8.9E-06	1.7E-05	9.5E-06	7.2E-08	1.3E-07	7.1E-08	7.3E-08	1.4E-07	7.7E-08	5.6E-08	1.0E-07	5.5E-08	5.7E-08	1.1E-07	6.0E-08
2014	7.4E-06	1.9E-05	1.1E-05	7.5E-06	1.9E-05	1.1E-05	6.0E-08	1.5E-07	8.8E-08	6.1E-08	1.5E-07	9.1E-08	4.7E-08	1.2E-07	6.8E-08	4.7E-08	1.2E-07	7.1E-08
2015	7.2E-06	1.4E-05	7.9E-06	7.3E-06	1.4E-05	8.5E-06	5.8E-08	1.1E-07	6.4E-08	6.0E-08	1.2E-07	6.9E-08	4.5E-08	8.6E-08	5.0E-08	4.6E-08	8.9E-08	5.4E-08
2016	1.2E-05	2.4E-05	1.4E-05	1.2E-05	2.4E-05	1.4E-05	9.9E-08	1.9E-07	1.1E-07	1.0E-07	2.0E-07	1.2E-07	7.6E-08	1.5E-07	8.6E-08	7.8E-08	1.5E-07	8.9E-08
2017	5.5E-06	1.1E-05	6.2E-06	5.6E-06	1.2E-05	7.0E-06	4.5E-08	8.8E-08	5.1E-08	4.6E-08	9.6E-08	5.7E-08	3.5E-08	6.8E-08	3.9E-08	3.6E-08	7.4E-08	4.4E-08
2018	6.6E-06	1.4E-05	8.8E-06	6.8E-06	1.4E-05	9.5E-06	5.4E-08	1.1E-07	7.2E-08	5.5E-08	1.2E-07	7.7E-08	4.2E-08	8.7E-08	5.6E-08	4.3E-08	9.0E-08	6.0E-08

TABLE 3-11: SUMMARY OF TRI+ SEDIMENT CONCENTRATIONS FROM THE HUDTOX MODEL AND TEQ-BASED PREDICTIONS FOR 1993 - 2018

	Tri+ Average PCB Results			Tri+ 95% UCL Results			Average Avian TEF			95% Avian TEF			Average Mammalian TEF			95% UCL Mammalian TEF		
Year	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg	189 Total Sed Conc mg/kg	168 Total Sed Conc mg/kg	154 Total Sed Conc mg/kg
1993	28.81	9.28	4.13	30.40	9.33	4.16	8.0E-02	2.6E-02	1.1E-02	8.4E-02	2.6E-02	1.2E-02	2.2E-02	7.2E-03	3.2E-03	2.4E-02	7.3E-03	3.2E-03
1994	26.69	8.74	3.79	28.16	8.75	3.80	7.4E-02	2.4E-02	1.1E-02	7.8E-02	2.4E-02	1.1E-02	2.1E-02	6.8E-03	3.0E-03	2.2E-02	6.8E-03	3.0E-03
1995	25.12	8.48	3.70	26.49	8.48	3.71	7.0E-02	2.4E-02	1.0E-02	7.4E-02	2.4E-02	1.0E-02	2.0E-02	6.6E-03	2.9E-03	2.1E-02	6.6E-03	2.9E-03
1996	22.81	7.61	3.11	24.04	7.64	3.13	6.3E-02	2.1E-02	8.6E-03	6.7E-02	2.1E-02	8.7E-03	1.8E-02	5.9E-03	2.4E-03	1.9E-02	5.9E-03	2.4E-03
1997	21.07	6.90	2.71	22.21	6.92	2.72	5.9E-02	1.9E-02	7.5E-03	6.2E-02	1.9E-02	7.5E-03	1.6E-02	5.4E-03	2.1E-03	1.7E-02	5.4E-03	2.1E-03
1998	19.01	6.19	2.33	20.04	6.23	2.36	5.3E-02	1.7E-02	6.5E-03	5.6E-02	1.7E-02	6.5E-03	1.5E-02	4.8E-03	1.8E-03	1.6E-02	4.8E-03	1.8E-03
1999	17.34	5.66	2.06	18.28	5.67	2.06	4.8E-02	1.6E-02	5.7E-03	5.1E-02	1.6E-02	5.7E-03	1.3E-02	4.4E-03	1.6E-03	1.4E-02	4.4E-03	1.6E-03
2000	15.83	5.17	1.78	16.69	5.19	1.80	4.4E-02	1.4E-02	5.0E-03	4.6E-02	1.4E-02	5.0E-03	1.2E-02	4.0E-03	1.4E-03	1.3E-02	4.0E-03	1.4E-03
2001	14.97	5.06	1.66	15.79	5.07	1.67	4.2E-02	1.4E-02	4.6E-03	4.4E-02	1.4E-02	4.6E-03	1.2E-02	3.9E-03	1.3E-03	1.2E-02	3.9E-03	1.3E-03
2002	14.16	4.88	1.59	14.94	4.88	1.60	3.9E-02	1.4E-02	4.4E-03	4.1E-02	1.4E-02	4.4E-03	1.1E-02	3.8E-03	1.2E-03	1.2E-02	3.8E-03	1.2E-03
2003	13.19	4.65	1.51	13.90	4.66	1.51	3.7E-02	1.3E-02	4.2E-03	3.9E-02	1.3E-02	4.2E-03	1.0E-02	3.6E-03	1.2E-03	1.1E-02	3.6E-03	1.2E-03
2004	12.08	4.33	1.39	12.74	4.34	1.39	3.4E-02	1.2E-02	3.9E-03	3.5E-02	1.2E-02	3.9E-03	9.4E-03	3.4E-03	1.1E-03	9.9E-03	3.4E-03	1.1E-03
2005	11.13	3.88	1.22	11.74	3.89	1.23	3.1E-02	1.1E-02	3.4E-03	3.3E-02	1.1E-02	3.4E-03	8.7E-03	3.0E-03	9.5E-04	9.1E-03	3.0E-03	9.5E-04
2006	10.71	3.74	1.16	11.30	3.75	1.16	3.0E-02	1.0E-02	3.2E-03	3.1E-02	1.0E-02	3.2E-03	8.3E-03	2.9E-03	9.0E-04	8.8E-03	2.9E-03	9.0E-04
2007	10.06	3.47	1.04	10.60	3.49	1.05	2.8E-02	9.7E-03	2.9E-03	2.9E-02	9.7E-03	2.9E-03	7.8E-03	2.7E-03	8.1E-04	8.2E-03	2.7E-03	8.1E-04
2008	9.37	3.25	0.95	9.87	3.26	0.96	2.6E-02	9.0E-03	2.6E-03	2.7E-02	9.1E-03	2.7E-03	7.3E-03	2.5E-03	7.4E-04	7.7E-03	2.5E-03	7.4E-04
2009	8.92	3.10	0.91	9.40	3.10	0.98	2.5E-02	8.6E-03	2.5E-03	2.6E-02	8.6E-03	2.7E-03	6.9E-03	2.4E-03	7.1E-04	7.3E-03	2.4E-03	7.7E-04
2010	8.35	2.97	0.88	8.80	2.98	0.89	2.3E-02	8.3E-03	2.5E-03	2.4E-02	8.3E-03	2.5E-03	6.5E-03	2.3E-03	6.9E-04	6.8E-03	2.3E-03	6.9E-04
2011	7.38	2.68	0.80	7.78	2.70	0.80	2.1E-02	7.5E-03	2.2E-03	2.2E-02	7.5E-03	2.2E-03	5.7E-03	2.1E-03	6.2E-04	6.0E-03	2.1E-03	6.2E-04
2012	6.79	2.53	0.74	7.16	2.53	0.74	1.9E-02	7.0E-03	2.1E-03	2.0E-02	7.0E-03	2.1E-03	5.3E-03	2.0E-03	5.8E-04	5.6E-03	2.0E-03	5.8E-04
2013	6.43	2.47	0.73	6.79	2.47	0.73	1.8E-02	6.9E-03	2.0E-03	1.9E-02	6.9E-03	2.0E-03	5.0E-03	1.9E-03	5.7E-04	5.3E-03	1.9E-03	5.7E-04
2014	5.93	2.27	0.64	6.27	2.27	0.65	1.6E-02	6.3E-03	1.8E-03	1.7E-02	6.3E-03	1.8E-03	4.6E-03	1.8E-03	5.0E-04	4.9E-03	1.8E-03	5.0E-04
2015	5.57	2.17	0.61	5.89	2.18	0.61	1.5E-02	6.0E-03	1.7E-03	1.6E-02	6.0E-03	1.7E-03	4.3E-03	1.7E-03	4.7E-04	4.6E-03	1.7E-03	4.7E-04
2016	5.31	2.12	0.60	5.62	2.12	0.60	1.5E-02	5.9E-03	1.7E-03	1.6E-02	5.9E-03	1.7E-03	4.1E-03	1.7E-03	4.6E-04	4.4E-03	1.7E-03	4.7E-04
2017	4.87	1.94	0.51	5.15	1.95	0.51	1.4E-02	5.4E-03	1.4E-03	1.4E-02	5.4E-03	1.4E-03	3.8E-03	1.5E-03	3.9E-04	4.0E-03	1.5E-03	4.0E-04
2018	4.59	1.83	0.47	4.85	1.83	0.47	1.3E-02	5.1E-03	1.3E-03	1.3E-02	5.1E-03	1.3E-03	3.6E-03	1.4E-03	3.6E-04	3.8E-03	1.4E-03	3.6E-04

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TABLE 3-12: SUMMARY OF TRI+ BENTHIC INVERTEBRATE CONCENTRATIONS FROM THE FISHRAND MODEL AND TEQ-BASED PREDICTIONS FOR 1993 - 2018

	Tri+ Average PCB Results			Tri+ 95% UCL Results			Average Avian TEF			95% Avian TEF			Average Mammalian TEF			95% UCL Mammalian TEF		
Year	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg	189 Total Benthic Conc mg/kg	168 Total Benthic Conc mg/kg	154 Total Benthic Conc mg/kg
1993	14.822	8.209	3.610	21.698	12.953	3.878	7.9E-04	4.4E-04	1.9E-04	1.2E-03	6.9E-04	2.1E-04	4.4E-04	2.4E-04	1.1E-04	6.4E-04	3.8E-04	1.2E-04
1994	13.910	7.812	3.405	20.580	12.409	3.682	7.4E-04	4.2E-04	1.8E-04	1.1E-03	6.6E-04	2.0E-04	4.1E-04	2.3E-04	1.0E-04	6.1E-04	3.7E-04	1.1E-04
1995	13.004	7.352	3.124	18.806	11.637	3.363	6.9E-04	3.9E-04	1.7E-04	1.0E-03	6.2E-04	1.8E-04	3.9E-04	2.2E-04	9.3E-05	5.6E-04	3.5E-04	1.0E-04
1996	11.722	6.562	2.644	17.161	10.360	2.867	6.2E-04	3.5E-04	1.4E-04	9.1E-04	5.5E-04	1.5E-04	3.5E-04	1.9E-04	7.8E-05	5.1E-04	3.1E-04	8.5E-05
1997	10.776	5.987	2.304	15.698	9.505	2.471	5.7E-04	3.2E-04	1.2E-04	8.4E-04	5.1E-04	1.3E-04	3.2E-04	1.8E-04	6.8E-05	4.7E-04	2.8E-04	7.3E-05
1998	9.882	5.399	2.006	14.126	8.557	2.157	5.3E-04	2.9E-04	1.1E-04	7.5E-04	4.6E-04	1.1E-04	2.9E-04	1.6E-04	6.0E-05	4.2E-04	2.5E-04	6.4E-05
1999	8.931	4.912	1.750	13.237	7.817	1.889	4.8E-04	2.6E-04	9.3E-05	7.1E-04	4.2E-04	1.0E-04	2.7E-04	1.5E-04	5.2E-05	3.9E-04	2.3E-04	5.6E-05
2000	8.214	4.633	1.573	11.823	7.325	1.690	4.4E-04	2.5E-04	8.4E-05	6.3E-04	3.9E-04	9.0E-05	2.4E-04	1.4E-04	4.7E-05	3.5E-04	2.2E-04	5.0E-05
2001	7.757	4.521	1.482	11.289	7.181	1.599	4.1E-04	2.4E-04	7.9E-05	6.0E-04	3.8E-04	8.5E-05	2.3E-04	1.3E-04	4.4E-05	3.3E-04	2.1E-04	4.7E-05
2002	7.249	4.315	1.405	10.752	6.863	1.521	3.9E-04	2.3E-04	7.5E-05	5.7E-04	3.7E-04	8.1E-05	2.2E-04	1.3E-04	4.2E-05	3.2E-04	2.0E-04	4.5E-05
2003	6.767	4.074	1.314	9.888	6.469	1.419	3.6E-04	2.2E-04	7.0E-05	5.3E-04	3.4E-04	7.6E-05	2.0E-04	1.2E-04	3.9E-05	2.9E-04	1.9E-04	4.2E-05
2004	6.287	3.741	1.189	9.075	5.911	1.277	3.3E-04	2.0E-04	6.3E-05	4.8E-04	3.1E-04	6.8E-05	1.9E-04	1.1E-04	3.5E-05	2.7E-04	1.8E-04	3.8E-05
2005	5.805	3.465	1.082	8.509	5.494	1.166	3.1E-04	1.8E-04	5.8E-05	4.5E-04	2.9E-04	6.2E-05	1.7E-04	1.0E-04	3.2E-05	2.5E-04	1.6E-04	3.5E-05
2006	5.582	3.280	1.001	8.126	5.215	1.082	3.0E-04	1.7E-04	5.3E-05	4.3E-04	2.8E-04	5.8E-05	1.7E-04	9.7E-05	3.0E-05	2.4E-04	1.5E-04	3.2E-05
2007	5.200	3.078	0.913	7.514	4.881	0.983	2.8E-04	1.6E-04	4.9E-05	4.0E-04	2.6E-04	5.2E-05	1.5E-04	9.1E-05	2.7E-05	2.2E-04	1.4E-04	2.9E-05
2008	4.947	2.879	0.845	7.086	4.567	0.916	2.6E-04	1.5E-04	4.5E-05	3.8E-04	2.4E-04	4.9E-05	1.5E-04	8.5E-05	2.5E-05	2.1E-04	1.4E-04	2.7E-05
2009	4.665	2.761	0.817	6.683	4.376	0.883	2.5E-04	1.5E-04	4.4E-05	3.6E-04	2.3E-04	4.7E-05	1.4E-04	8.2E-05	2.4E-05	2.0E-04	1.3E-04	2.6E-05
2010	4.224	2.575	0.766	6.202	4.101	0.832	2.3E-04	1.4E-04	4.1E-05	3.3E-04	2.2E-04	4.4E-05	1.3E-04	7.6E-05	2.3E-05	1.8E-04	1.2E-04	2.5E-05
2011	3.828	2.375	0.702	5.548	3.792	0.759	2.0E-04	1.3E-04	3.7E-05	3.0E-04	2.0E-04	4.0E-05	1.1E-04	7.0E-05	2.1E-05	1.6E-04	1.1E-04	2.3E-05
2012	3.564	2.266	0.666	5.181	3.591	0.719	1.9E-04	1.2E-04	3.5E-05	2.8E-04	1.9E-04	3.8E-05	1.1E-04	6.7E-05	2.0E-05	1.5E-04	1.1E-04	2.1E-05
2013	3.299	2.157	0.625	4.927	3.416	0.673	1.8E-04	1.1E-04	3.3E-05	2.6E-04	1.8E-04	3.6E-05	9.8E-05	6.4E-05	1.9E-05	1.5E-04	1.0E-04	2.0E-05
2014	3.078	2.020	0.572	4.534	3.219	0.616	1.6E-04	1.1E-04	3.0E-05	2.4E-04	1.7E-04	3.3E-05	9.1E-05	6.0E-05	1.7E-05	1.3E-04	9.6E-05	1.8E-05
2015	2.876	1.951	0.547	4.287	3.103	0.590	1.5E-04	1.0E-04	2.9E-05	2.3E-04	1.7E-04	3.1E-05	8.5E-05	5.8E-05	1.6E-05	1.3E-04	9.2E-05	1.8E-05
2016	2.730	1.853	0.503	3.942	2.944	0.544	1.5E-04	9.9E-05	2.7E-05	2.1E-04	1.6E-04	2.9E-05	8.1E-05	5.5E-05	1.5E-05	1.2E-04	8.7E-05	1.6E-05
2017	2.525	1.735	0.449	3.746	2.753	0.487	1.3E-04	9.2E-05	2.4E-05	2.0E-04	1.5E-04	2.6E-05	7.5E-05	5.1E-05	1.3E-05	1.1E-04	8.2E-05	1.4E-05
2018	2.501	1.693	0.436	3.728	2.686	0.470	1.3E-04	9.0E-05	2.3E-05	2.0E-04	1.4E-04	2.5E-05	7.4E-05	5.0E-05	1.3E-05	1.1E-04	8.0E-05	1.4E-05

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TABLE 3-13: LARGEMOUTH BASS PREDICTED TRI+ CONCENTRATIONS FOR 1993 - 2018

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	21.01	43.93	81.72	16.80	33.96	58.88	7.87	16.39	29.91
1994	11.76	25.15	58.63	11.99	23.60	40.09	5.70	11.74	20.66
1995	13.16	27.86	64.51	13.37	26.25	44.38	6.41	12.83	22.21
1996	10.86	23.82	66.18	10.22	20.83	35.65	5.14	10.91	20.35
1997	8.05	18.55	48.77	9.32	18.43	31.17	4.48	9.45	17.26
1998	7.17	15.67	42.07	8.14	16.45	28.09	4.00	8.10	14.41
1999	5.70	13.14	37.31	6.40	13.23	23.55	2.86	6.02	11.34
2000	5.35	12.26	35.22	6.22	12.62	21.92	2.86	5.85	10.51
2001	4.97	11.51	32.22	5.95	12.11	21.39	2.68	5.59	10.05
2002	4.99	11.39	32.09	6.25	12.92	22.01	2.76	5.90	10.58
2003	4.30	9.84	28.50	5.17	10.78	18.82	2.33	5.01	8.98
2004	4.07	9.32	26.13	5.14	10.57	18.24	2.43	5.19	9.33
2005	3.49	8.10	23.80	4.02	8.10	14.19	1.85	3.92	7.07
2006	3.64	8.10	23.84	4.40	8.81	15.77	2.08	4.20	7.52
2007	3.21	7.34	22.00	3.77	7.41	13.23	1.62	3.25	5.90
2008	2.90	6.87	20.32	3.28	6.61	12.04	1.45	3.07	5.81
2009	3.09	7.20	19.44	3.59	7.19	12.75	1.58	3.32	6.25
2010	2.84	6.33	17.95	3.19	6.53	11.42	1.38	2.81	5.17
2011	2.27	5.36	15.79	2.73	5.57	9.79	1.24	2.67	4.98
2012	2.29	5.45	14.83	2.73	5.63	9.88	1.25	2.61	5.00
2013	2.24	5.23	14.56	2.82	5.85	10.13	1.19	2.51	4.80
2014	2.11	4.84	13.04	2.76	5.59	9.86	1.14	2.34	4.25
2015	1.90	4.39	12.12	2.45	4.93	8.58	0.99	2.13	3.88
2016	2.00	4.54	12.27	2.73	5.52	9.68	1.13	2.33	4.19
2017	1.61	3.75	11.17	2.05	4.17	7.42	0.82	1.81	3.76
2018	1.63	3.68	10.94	1.97	3.99	7.21	0.79	1.68	3.34

TABLE 3-14: BROWN BULLHEAD PREDICTED TRI+ CONCENTRATIONS FOR 1993 - 2018

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	9.80	25.30	82.32	6.83	14.97	33.37	3.20	6.87	15.14
1994	7.81	22.41	76.09	5.76	13.16	30.81	2.64	5.95	13.55
1995	8.13	22.69	73.63	6.22	13.99	31.16	2.91	6.42	13.45
1996	7.03	20.65	72.72	4.97	11.61	27.65	2.24	5.03	11.74
1997	6.06	18.30	61.04	4.69	10.65	24.92	2.08	4.56	9.89
1998	5.38	16.19	56.16	3.96	9.30	22.66	1.70	3.77	8.65
1999	4.66	14.62	51.42	3.48	8.31	20.35	1.38	3.20	7.49
2000	4.47	13.51	46.82	3.39	7.83	19.06	1.32	2.92	6.68
2001	4.29	12.74	44.27	3.21	7.70	18.90	1.23	2.79	6.41
2002	4.06	11.87	42.79	3.26	7.47	17.84	1.23	2.69	5.97
2003	3.68	11.18	38.83	2.85	6.78	16.88	1.07	2.46	5.65
2004	3.44	10.46	35.04	2.75	6.45	15.63	1.07	2.39	5.31
2005	3.08	9.56	31.95	2.30	5.65	13.97	0.86	1.94	4.51
2006	3.03	9.19	32.51	2.36	5.68	13.82	0.86	1.95	4.39
2007	2.78	8.57	29.40	2.08	5.06	12.51	0.72	1.66	3.81
2008	2.70	7.95	27.31	2.02	4.81	11.90	0.68	1.58	3.68
2009	2.62	7.69	25.27	1.91	4.68	11.43	0.69	1.57	3.54
2010	2.19	6.95	23.97	1.77	4.30	10.56	0.62	1.39	3.22
2011	2.03	6.37	21.30	1.59	3.88	9.59	0.57	1.30	2.91
2012	1.95	5.96	19.94	1.63	3.91	9.38	0.57	1.30	2.87
2013	1.82	5.55	19.62	1.51	3.64	8.86	0.52	1.18	2.68
2014	1.66	5.14	17.33	1.47	3.46	8.45	0.50	1.11	2.50
2015	1.58	4.83	16.28	1.37	3.26	8.05	0.45	1.03	2.32
2016	1.60	4.64	15.69	1.37	3.29	7.82	0.47	1.03	2.24
2017	1.39	4.17	14.76	1.16	2.85	7.12	0.38	0.85	1.94
2018	1.33	4.15	14.36	1.18	2.83	7.10	0.37	0.83	1.90

TABLE 3-15: WHITE PERCH PREDICTED TRI+ CONCENTRATIONS FOR 1993 - 2018

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	6.78	20.61	60.01	3.53	20.43	58.28	1.05	3.07	8.85
1994	6.08	18.92	55.70	3.11	18.84	54.09	0.93	2.82	8.32
1995	6.04	18.14	53.62	3.17	18.05	52.03	0.96	2.76	7.91
1996	5.03	15.63	45.59	2.38	15.50	44.32	0.72	2.17	6.35
1997	4.57	14.62	43.14	2.18	14.49	41.84	0.69	2.03	5.76
1998	4.10	13.25	39.03	2.05	13.47	37.80	0.57	1.68	4.88
1999	3.69	12.02	35.66	1.65	11.88	34.40	0.51	1.52	4.36
2000	3.42	11.08	32.99	1.63	10.98	31.91	0.48	1.37	3.94
2001	3.23	10.48	31.22	1.57	10.32	30.20	0.45	1.27	3.64
2002	3.03	9.82	29.31	1.57	9.72	28.37	0.42	1.21	3.47
2003	2.82	9.13	27.09	1.39	9.02	26.22	0.40	1.14	3.28
2004	2.59	8.38	24.87	1.34	8.27	24.08	0.37	1.03	2.94
2005	2.40	7.83	23.33	1.17	7.69	22.63	0.33	0.94	2.70
2006	2.30	7.47	22.23	1.13	7.37	21.47	0.32	0.87	2.48
2007	2.14	7.00	20.75	1.03	6.86	20.10	0.30	0.82	2.31
2008	2.02	6.55	19.51	0.96	6.45	18.90	0.27	0.74	2.10
2009	1.93	6.21	18.45	0.94	6.14	17.87	0.26	0.71	2.01
2010	1.75	5.73	16.85	0.90	5.58	16.24	0.28	0.71	1.93
2011	1.57	5.13	15.18	0.81	5.02	14.63	0.25	0.66	1.78
2012	1.48	4.76	14.16	0.77	4.69	13.68	0.26	0.62	1.70
2013	1.38	4.47	13.24	0.78	4.39	12.73	0.25	0.59	1.58
2014	1.29	4.17	12.32	0.72	4.08	11.87	0.22	0.53	1.46
2015	1.21	3.91	11.61	0.69	3.82	11.22	0.21	0.51	1.38
2016	1.17	3.69	10.98	0.67	3.64	10.55	0.21	0.49	1.33
2017	1.07	3.44	10.23	0.59	3.37	9.83	0.18	0.43	1.14
2018	1.03	3.33	10.07	0.56	3.29	9.69	0.15	0.40	1.11

TABLE 3-16: YELLOW PERCH PREDICTED TRI+ CONCENTRATIONS FOR 1993 - 2018

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	4.08	12.79	38.05	2.21	5.34	13.00	0.62	1.86	5.29
1994	3.47	11.25	34.55	1.88	4.57	11.83	0.58	1.73	4.90
1995	3.58	11.75	35.10	2.00	4.67	12.42	0.59	1.79	5.06
1996	2.94	9.50	28.63	1.44	3.62	9.74	0.44	1.33	3.85
1997	2.60	8.69	26.89	1.46	3.38	9.04	0.43	1.23	3.45
1998	2.28	7.78	24.10	1.13	3.03	8.14	0.35	1.04	2.99
1999	2.08	7.08	22.16	1.04	2.63	7.26	0.32	0.91	2.61
2000	1.90	6.56	20.29	0.95	2.47	6.78	0.32	0.85	2.33
2001	1.82	6.21	19.17	1.02	2.51	6.66	0.28	0.79	2.17
2002	1.68	5.82	18.05	0.90	2.35	6.41	0.25	0.74	2.05
2003	1.56	5.39	16.80	0.85	2.17	6.00	0.27	0.71	1.95
2004	1.43	4.97	15.45	0.77	2.04	5.60	0.23	0.64	1.78
2005	1.35	4.61	14.37	0.68	1.81	5.05	0.22	0.58	1.60
2006	1.28	4.42	13.67	0.69	1.79	4.88	0.20	0.54	1.49
2007	1.19	4.12	12.75	0.60	1.62	4.46	0.21	0.52	1.39
2008	1.12	3.88	12.01	0.55	1.50	4.23	0.17	0.46	1.26
2009	1.12	3.69	11.38	0.60	1.52	4.07	0.17	0.45	1.22
2010	0.99	3.37	10.61	0.52	1.39	3.86	0.17	0.45	1.18
2011	0.88	3.02	9.49	0.46	1.25	3.49	0.16	0.41	1.09
2012	0.84	2.83	8.70	0.52	1.25	3.39	0.18	0.41	1.04
2013	0.78	2.64	8.21	0.46	1.18	3.20	0.16	0.38	0.96
2014	0.73	2.45	7.57	0.44	1.10	2.98	0.14	0.34	0.89
2015	0.68	2.30	7.16	0.41	1.04	2.86	0.13	0.33	0.84
2016	0.65	2.19	6.74	0.43	1.05	2.78	0.15	0.34	0.82
2017	0.59	2.02	6.28	0.34	0.92	2.55	0.11	0.28	0.71
2018	0.58	1.98	6.08	0.33	0.88	2.45	0.10	0.25	0.66

TABLE 3-17
EXPOSURE PARAMETERS FOR THE TREE SWALLOW (*Tachycineta bicolor*)

	Exposure Parameters		Range Reported for Species
Common Name	Tree Swallow		-
Genus	*Tachycineta*		-
Species	*bicolor*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	0.0210	0.0206	0.017-0.0255 (M and F)
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.018	0.018	0.016-0.020
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.005	-	No Contact with Sediments
General Dietary Characterization	Insectivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	0%		0%
Aquatic Invertebrates (Total Component)[5]	100%		95.0% - 100.0%
Non-river Related Diet Sources	0%		0%
Water Consumption Rate (L/day) [6]	0.0044		0.0038-0.0050
Percent Incidental Sediment Ingestion in Diet[7]	0.00%		No Contact with Sediments
Foraging Territory (km) [8]	0.1		0.1-0.2
Behavioral Modification Factors in the Exposure Assessment[9]			
Temporal Migration CorrectionFactor (1-%Annual Temporal Displaceme	1		-
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/	1		-
Habitat Use Factor (Temporal use factor %)	1		Feeds over open water habitats
Temporal Reproductive Period (Mating/Gestation/Birth)[10, 11]	April - June		April - June

Notes: [1] Secord and McCarty (1997), Robertson et al. (1992); [2] Estimated from Nagy (1987) and USEPA (December, 1993); [3] No contact with sediments; [4] Secord and McCarty (1997), McCarty and Winkler (In Press); [5] Emergent forms of insects with partial aquatic life histories; [6] Calder and Braun (1983 In USE December 1993), Davis (1982); [7] Robertson et al. (1992); [8] McCarty and Winkler (In Press); [9] Robertson et al. (1992), see text for rationale; [10] Bull (1998), And (1988).

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TABLE 3-18
EXPOSURE PARAMETERS FOR THE MALLARD (*Anas platyrhynchos*)

	Exposure Parameters		Range Reported for Species
Common Name	Mallard		-
Genus	*Anas*		-
Species	*platyrhychos*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg)[1]	1.06	1.24	1.01 - 1.11 F/M 1.21 - 1.27
Total Daily Dietary Ingestion (kg/day wet wt.)[2]	0.292	0.322	0.270-0.279 F/0.317-0.326 M
Total Daily Dietary Ingestion (kg/day dry wt.)[3]	0.061	0.067	0.058-0.063 F/ 0.066-0.068 M
General Dietary Characterization	Opportunistic Omnivore		-
Percent Diet Composition (% wet wt.)[4]			
Fish (Total Component)	0%		0%
Aquatic Invertebrates (Total Component)	50%		10 - 100%
Aquatic Vegetation/Seeds	50%		8 - 90 %
Water Consumption Rate (L/day)[5]	0.061	0.068	0.059-0.063 F/ 0.067 - 0.069 M
Percent Incidental Sediment Ingestion in Diet[6]	2.00%		2.00%
Foraging Territory (km)[7]	540.0	620.0	40.0-1440.0 Ha
Behavioral Modification Factors in the Exposure Assessment[8]			
Temporal Migration CorrectionFactor (1-%Annual Temporal Displaceme	1		Resident
Temporal Hibernation/Asctivation Correction Factor (1-%Temporal Hib/	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth)[9,10]	February -May		February -May

Notes: [1] Dunning (1993), USEPA (December 1993); [2] Estimated from Nagy (1987) and USEPA (December 1993); [3] Estimated from USEPA (December 1993); [4] Average of diet study summaries presented in USEPA (December 1993); [5] Calder and Braun (1983 In USEPA, December 1993); [6] Beyer et al. (1994); [7] Kirby et al. (1985 In USEPA, December 1993); [8] Bull (1998), USEPA (December 1993); [9 10] Bull (1998), Andrle and Carroll (1988).

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TABLE 3-19
EXPOSURE PARAMETERS FOR BELTED KINGFISHER (*Ceryle alcyon*)

	Exposure Parameters		Range Reported for Species
Common Name	Belted Kingfisher		-
Genus	*Ceryle*		-
Species	*alcyon*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	0.147	0.147	0.136-0.158 M and F
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.058	0.058	0.055-0.060 M and F
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.017	0.017	-
General Dietary Characterization	Opportunistic Piscivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	78%		46% - 100%
Aquatic Invertebrates (Total Component)	22%		5% - 41%
Non-river Related Diet Sources	0%		0-4.3%
Water Consumption Rate (L/day) [5]	0.016		0.015-0.017
Percent Incidental Sediment Ingestion in Diet [6]	1.00%		nests in banks, grooming
Foraging Territory (km) [7]	0.70		0.389-1.03
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual TemporalDisplacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Hatching)[9,10]	April - June		April - June

Notes: [1] Brooks and Davis (1987), Poole (1932); [2] Estimated from Nagy (1987) and USEPA (December 1993); [3] Estimated from USEPA (1993b); [4] Gould unpublished data (In USEPA, December 1993), Davis (1982); [5] Calder and Braun (1983 In USEPA December 1993); [6] Best Professional Judgment based on Davis (1982); [7] Davis (1982); [8] Bull (1998), USEPA (December 1993); [9, 10] Bull (1998), Andrle and Carroll (1988).

TABLE 3-20
EXPOSURE PARAMETERS FOR GREAT BLUE HERON (*Ardea herodias*)

	Exposure Parameters		Range Reported for Species
Common Name	Great Blue Heron		-
Genus	*Ardea*		-
Species	*herodias*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juvenile)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	2.20	2.58	1.87-2.54 F/ 2.28-2.88 M
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.352	0.390	0.284-0.431 F/ 0.331-0.455 M
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.097	0.108	
General Dietary Characterization	Opportunistic Piscivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	98%		72-98%
Aquatic Invertebrates (Total Component)	1%		1-18%
Non-river Related Diet Sources	1%		0-4.3%
Water Consumption Rate (L/day) [5]	0.100	0.111	0.089-0.110 F/ 0.102-0.119 M
Percent Incidental Sediment Ingestion in Diet [6]	2.00%		-
Foraging Territory (km) [7]	0.98		0.6-1.37
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual Temporal Displacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth) [9,10]	March - June		March -June

Notes: [1] Dunning (1993) ; [2] Estimated from Nagy (1987) and USEPA (December 1993); [3] Estimated from USEPA (1993b); 4 Alexander (1977 In USEPA, December 1993), Cotaam and Uhler (1945); [5] Calder and Braun (1983 In USEPA, December 1993); [6] Best Professional Judgement based on Eckert and Karalus (1988); [7] Peifer (1979 In USEPA (December, 1993); [8] USEPA (December, 1993); [9, 10] Bull (1998) and Andrle and Carroll (1988).

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TABLE 3-21
EXPOSURE PARAMETERS FOR BALD EAGLE (*Haliaeetus leucocephalus*)

	Exposure Parameters		Range Reported for Species
Common Name	Bald Eagle		-
Genus	*Haliaeetus*		-
Species	*leucocephalus*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juvenile)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	5.10	3.20	4.5-5.6 F/M 3.0-3.4
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.65	0.46	0.60-0.69 F/0.46-0.49 M
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	-	-	-
General Dietary Characterization [4]	Opportunistic Piscivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	100%		70-100%
Aquatic Invertebrates (Total Component)	0%		0-18%
Non-river Related Diet Sources	0%		0-4.3%
Water Consumption Rate (L/day) [5]	0.175	0.129	0.162-0.187 F/0.123-0.134 M
Percent Incidental Sediment Ingestion in Diet [6]	0.00%		0.00%
Foraging Territory (km) [7]	5.0		3.0-7.0 Km
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual Temporal Displacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth)[9,10]	February - May		February - May

[1] Bopp (1999), USEPA (December 1993), Dunning (1993); [2], [3] Estimated from Nagy (1987) and USEPA (December 1993);
[4] Nye (1999), Bull (1998), USEPA (December 1993), Nye and Suring (1978); [5] Caluder and Braun (1983 In USEPA December 1993);
[6] Best Professional Judgement - USEPA (December 1993);
[7] Craig et al. (1988 In USEPA, December 1993); [8] Nye (1999), USEPA (December 1993); [9 10] Nye (1999), Andrle and Carroll (1988).

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TABLE 3-22
EXPOSURE PARAMETERS FOR LITTLE BROWN BAT (*Myotis lucifugus*)

	Exposure Parameters		Proximal Range Reported for Species
Common Name	Little Brown Bat		-
Genus	*Myotis*		-
Species	*lucifugus*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	0.0071	0.0069	0.0042-0.0094 /0.0055-0.0077
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.0025	0.0025	0.0025-0.0037 F/ No Male Data
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	-	-	-
General Dietary Characterization [4]	Insectivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	*0.0%*		0%
Aquatic Invertebrates (Total Component)	*100.0%*		87.0 % - 100.0%
Non-river Related Diet Sources	*0.0%*		0 % - 13.0 %
Water Consumption Rate (L/day) [5]	0.0011	0.0011	Based upon 0.007 Kg
Percent Incidental Sediment Ingestion in Diet [6]	0.00%	0.00%	0.00%
Home Range (km) [7]	0.1	>0.1	0.1 - >0.1
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual Temporal Displacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		See text
Habitat Use Factor (Temporal use factor %)	1		Feeds over waterbody
Temporal Reproductive Period (Mating/Gestation/Birth) [9, 10]	April to July	-	April to July

[1] Bopp (1999); [2] Fenton and Barclay (1980); [3] Dry weight basis of ingestion not required;
[4] Anthony and Kunz (1977), Belwood and Fenton (1976), Buchler (1976); [5] Farrell and Wood (1968c In USEPA, December 1993); [6] No contact with sediments; [7] Bulcher (1976); [8] Davis and Hitchcock (1965); [9, 10] Belwood and Fenton (1976), Wimbatt (1945).

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TABLE 3-23
EXPOSURE PARAMETERS FOR RACCOON (*Proycon lotor*)

	Exposure Parameters		Proximal Range Reported for Species
Common Name	Raccoon		-
Genus	*Procyon*		-
Species	*lotor*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	6.400	7.600	5.6-7.1 F/7.0-8.3 M
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.99	1.20	0.866-1.1 F/1.1-1.30 M
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.316	0.364	0.283-0.344 F/0.340-0.391 M
General Dietary Characterization [4]	Opportunistic Omnivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	*3.0%*		0-3%
Aquatic Invertebrates (Total Component)	*37.0%*		1.4-37.0%
Non-river Related Diet Sources	*60.0%*		0-1.5%
Water Consumption Rate (L/day) [5]	0.526	0.614	0.467-0.578 F/0.571-0.665 M
Percent Incidental Sediment Ingestion in Diet [6]	9.4%	9.4%	9.40%
Home Range (km) [7]	48.0	48.0	5.3-376 F/18.2-814 M
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual TemporalDisplacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth) [9, 10]	January to May	-	January to May

[1] Bopp (1999), Sanderson (1984), USEPA (December 1993); [2], [3] Estimated from NFMR and ME in USEPA (December 1993) and Nagy (1987);
[4] Tabatabai and Kennedy)1988), Newell et al. (1987), Llewellyn and Uhler (1952), Hamilton (1951); [5] Farrell and Wood (1968c In USEPA, 1993a);
[6] Beyer et al. (1994); [7] Urban (1970), Stuewer (1943); [8] USEPA (December, 1993), Hamilton (1951); [9 10] USEPA (December, 1993), Stuewer (1943).

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TABLE 3-24
EXPOSURE PARAMETERS FOR MINK (*Mustela vison*)

	Exposure Parameters		Proximal Range Reported for Species
Common Name	Mink		-
Genus	*Mustela*		-
Species	*vision*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	0.83	1.02	0.550-1.101 F/0.681-1.362 M
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.132	0.132	0.145 F/ 0.119 M
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.059	0.069	0.042-1.013 F/0.050-0.089 M
General Dietary Characterization [4]	Opportunistic Piscivore/Carnivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	34.0%		18.8-34.0%
Aquatic Invertebrates (Total Component)	16.5%		13.9-16.5%
Non-river Related Diet Sources	49.5%		49.5 % - 67.0 %
Water Consumption Rate (L/day) [5]	0.084	0.101	0.052-0.107 F/0.070-0.131 M
Percent Incidental Sediment Ingestion in Diet [6]	1.0%		1.0%
Home Range (km) [7]	1.9	3.4	1.0-2.8 km F/1.8-5.0 km M
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual TemporalDisplacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth)[8]	March to June		March to June

[1] Mitchell (1961); J. Bopp (1999), [2] Bleavins and Aulerich (1981); [3] Estimated from Nagy (1987) and USEPA (December, 1993); [4] Hamilton (1951), Hamilton (1940), Hamilton (1936); [5] Farrell and Wood (1968c In USEPA, December 1993); [6] Best Professional Judgement - based upon observations in Hamilton (1940); [7] Gerell (1970), Mitchell (1961); [8] Allen (1986).

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TABLE 3-25
EXPOSURE PARAMETERS FOR RIVER OTTER (*Lutra canadensis*)

	Exposure Parameters		Proximal Range Reported for Species
Common Name	River Otter		-
Genus	*Lutra*		-
Species	*canadensis*		-
Sex (M/F)	Female	Male	-
Age (Adult/Juv.)	Adult, Breeding		-
Male/Female Body Weight (kg) [1]	7.32	10.9	6.73-7.90 F/9.20-12.7 M
Total Daily Dietary Ingestion (kg/day wet wt.) [2]	0.900	0.900	0.7-1.1
Total Daily Dietary Ingestion (kg/day dry wt.) [3]	0.353	0.491	0.329-0.376 F/0.425-0.555 M
General Dietary Characterization [4]	Opportunistic Piscivore		-
Percent Diet Composition (% wet wt.) [4]			
Fish (Total Component)	*100%*		70-100%
Aquatic Invertebrates (Total Component)	*0.0%*		5-15%
Non-river Related Diet Sources	0.0%		0-25%
Water Consumption Rate (L/day) [5]	0.594	0.853	0.551-0.636 F/0.730-0.975 M
Percent Incidental Sediment Ingestion in Diet [6]	1.0%		1.0%
Home Range (km) [7]	10.0		1.5-22.3 Km
Behavioral Modification Factors in the Exposure Assessment [8]			
Temporal Migration CorrectionFactor (1-%Annual TemporalDisplacement)	1		Resident
Temporal Hibernation/Asetivation Correction Factor (1-%Temporal Hib/Aset.)	1		Active Year Round
Habitat Use Factor (Temporal use factor %)	1		Riparian habitats preferred
Temporal Reproductive Period (Mating/Gestation/Birth) [9]	March to March [10]		March to March

[1] Spinola et al., (undated), Bopp (1999), USEPA (December 1993); [2], [3] Harris (1968 In USEPA, December 1993), Penrod (1999); [4] Spinola (1999), Newell et al. (1987), Hamilton (1961); [5] Farrell and Wood (1968c In USEPA, December 1993); [6] Best Professional Judgement - based upon Liers (1951) In USEPA, 1993); [7] Spinola et al. (undated); [8] USEPA (December 1993a); [9] Hamilton and Eadie (1964); [10] Period between mating and birth extends for one full year due to delayed implantation of zygote.

TABLE 3-26: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water Expected	Benthic Invertebrate Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Average Predicted Egg Conc (mg/Kg)
Upper River				
Thompson Island Pool (189)	1.54E-05	1.09E+01	1.09E+01	2.54E+01
Stillwater (168)	2.74E-05	1.91E+01	1.91E+01	4.45E+01
Federal Dam (154)	1.92E-05	4.54E+00	4.54E+00	1.06E+01
Lower River				
143.5	1.48E-05	6.33E-01	6.33E-01	1.48E+00
137.2	1.48E-05	1.25E+00	1.25E+00	2.91E+00
122.4	6.79E-06	6.89E-01	6.89E-01	1.61E+00
113.8	6.79E-06	7.09E-01	7.09E-01	1.65E+00
100	6.79E-06	3.26E-01	3.26E-01	7.60E-01
88.9	4.47E-06	1.63E-01	1.63E-01	3.81E-01
58.7	4.47E-06	5.03E-01	5.03E-01	1.17E+00
47.3	4.47E-06	5.71E-01	5.71E-01	1.33E+00
25.8	4.47E-06	1.69E-01	1.69E-01	3.95E-01

TABLE 3-27: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water 95% UCL	Benthic Invertebrate 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)	95% UCL Predicted Egg Conc (mg/Kg)
Upper River				
Thompson Island Pool (189)	4.88E-05	1.90E+01	1.90E+01	4.44E+01
Stillwater (168)	8.69E-05	8.93E+01	8.93E+01	2.08E+02
Federal Dam (154)	4.11E-05	7.72E+00	7.72E+00	1.80E+01
Lower River				
143.5	1.61E-04	1.55E+00	1.55E+00	3.62E+00
137.2	1.61E-04	5.06E+00	5.06E+00	1.18E+01
122.4	8.70E-05	1.73E+00	1.73E+00	4.04E+00
113.8	8.70E-05	2.75E+00	2.75E+00	6.41E+00
100	8.70E-05	2.23E+00	2.23E+00	5.20E+00
88.9	1.99E-05	2.90E-01	2.90E-01	6.77E-01
58.7	1.99E-05	4.60E+00	4.60E+00	1.07E+01
47.3	1.99E-05	4.19E+00	4.19E+00	9.78E+00
25.8	1.99E-05	2.87E-01	2.87E-01	6.69E-01

TABLE 3-28: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	Total Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	1.27E+01	7.04E+00	3.09E+00	2.96E+01	1.64E+01	7.22E+00
1994	1.19E+01	6.70E+00	2.92E+00	2.78E+01	1.56E+01	6.81E+00
1995	1.11E+01	6.30E+00	2.68E+00	2.60E+01	1.47E+01	6.25E+00
1996	1.00E+01	5.62E+00	2.27E+00	2.34E+01	1.31E+01	5.29E+00
1997	9.24E+00	5.13E+00	1.97E+00	2.16E+01	1.20E+01	4.61E+00
1998	8.47E+00	4.63E+00	1.72E+00	1.98E+01	1.08E+01	4.01E+00
1999	7.66E+00	4.21E+00	1.50E+00	1.79E+01	9.82E+00	3.50E+00
2000	7.04E+00	3.97E+00	1.35E+00	1.64E+01	9.27E+00	3.15E+00
2001	6.65E+00	3.88E+00	1.27E+00	1.55E+01	9.04E+00	2.96E+00
2002	6.21E+00	3.70E+00	1.20E+00	1.45E+01	8.63E+00	2.81E+00
2003	5.80E+00	3.49E+00	1.13E+00	1.35E+01	8.15E+00	2.63E+00
2004	5.39E+00	3.21E+00	1.02E+00	1.26E+01	7.48E+00	2.38E+00
2005	4.98E+00	2.97E+00	9.28E-01	1.16E+01	6.93E+00	2.16E+00
2006	4.78E+00	2.81E+00	8.58E-01	1.12E+01	6.56E+00	2.00E+00
2007	4.46E+00	2.64E+00	7.82E-01	1.04E+01	6.16E+00	1.83E+00
2008	4.24E+00	2.47E+00	7.24E-01	9.89E+00	5.76E+00	1.69E+00
2009	4.00E+00	2.37E+00	7.00E-01	9.33E+00	5.52E+00	1.63E+00
2010	3.62E+00	2.21E+00	6.57E-01	8.45E+00	5.15E+00	1.53E+00
2011	3.28E+00	2.04E+00	6.02E-01	7.66E+00	4.75E+00	1.40E+00
2012	3.05E+00	1.94E+00	5.71E-01	7.13E+00	4.53E+00	1.33E+00
2013	2.83E+00	1.85E+00	5.36E-01	6.60E+00	4.31E+00	1.25E+00
2014	2.64E+00	1.73E+00	4.90E-01	6.16E+00	4.04E+00	1.14E+00
2015	2.47E+00	1.67E+00	4.69E-01	5.75E+00	3.90E+00	1.09E+00
2016	2.34E+00	1.59E+00	4.31E-01	5.46E+00	3.71E+00	1.01E+00
2017	2.16E+00	1.49E+00	3.84E-01	5.05E+00	3.47E+00	8.97E-01
2018	2.14E+00	1.45E+00	3.74E-01	5.00E+00	3.39E+00	8.72E-01

TABLE 3-29: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	1.86E+01	1.11E+01	3.32E+00	4.34E+01	2.59E+01	7.76E+00
1994	1.76E+01	1.06E+01	3.16E+00	4.12E+01	2.48E+01	7.36E+00
1995	1.61E+01	9.97E+00	2.88E+00	3.76E+01	2.33E+01	6.73E+00
1996	1.47E+01	8.88E+00	2.46E+00	3.43E+01	2.07E+01	5.73E+00
1997	1.35E+01	8.15E+00	2.12E+00	3.14E+01	1.90E+01	4.94E+00
1998	1.21E+01	7.33E+00	1.85E+00	2.83E+01	1.71E+01	4.31E+00
1999	1.13E+01	6.70E+00	1.62E+00	2.65E+01	1.56E+01	3.78E+00
2000	1.01E+01	6.28E+00	1.45E+00	2.36E+01	1.47E+01	3.38E+00
2001	9.68E+00	6.15E+00	1.37E+00	2.26E+01	1.44E+01	3.20E+00
2002	9.22E+00	5.88E+00	1.30E+00	2.15E+01	1.37E+01	3.04E+00
2003	8.48E+00	5.55E+00	1.22E+00	1.98E+01	1.29E+01	2.84E+00
2004	7.78E+00	5.07E+00	1.09E+00	1.81E+01	1.18E+01	2.55E+00
2005	7.29E+00	4.71E+00	1.00E+00	1.70E+01	1.10E+01	2.33E+00
2006	6.96E+00	4.47E+00	9.28E-01	1.63E+01	1.04E+01	2.16E+00
2007	6.44E+00	4.18E+00	8.42E-01	1.50E+01	9.76E+00	1.97E+00
2008	6.07E+00	3.91E+00	7.85E-01	1.42E+01	9.13E+00	1.83E+00
2009	5.73E+00	3.75E+00	7.57E-01	1.34E+01	8.75E+00	1.77E+00
2010	5.32E+00	3.52E+00	7.14E-01	1.24E+01	8.20E+00	1.66E+00
2011	4.76E+00	3.25E+00	6.51E-01	1.11E+01	7.58E+00	1.52E+00
2012	4.44E+00	3.08E+00	6.17E-01	1.04E+01	7.18E+00	1.44E+00
2013	4.22E+00	2.93E+00	5.77E-01	9.85E+00	6.83E+00	1.35E+00
2014	3.89E+00	2.76E+00	5.28E-01	9.07E+00	6.44E+00	1.23E+00
2015	3.67E+00	2.66E+00	5.06E-01	8.57E+00	6.21E+00	1.18E+00
2016	3.38E+00	2.52E+00	4.66E-01	7.88E+00	5.89E+00	1.09E+00
2017	3.21E+00	2.36E+00	4.17E-01	7.49E+00	5.51E+00	9.74E-01
2018	3.20E+00	2.30E+00	4.03E-01	7.46E+00	5.37E+00	9.41E-01

TABLE 3-30: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water Expected	Macrophyte Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Average Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	4.24E-06	1.43E-01	1.95E+00	1.37E-02	2.10E+00	4.24E+01
Stillwater (168)	7.53E-06	2.31E-01	3.63E+00	3.57E-02	3.90E+00	7.91E+01
Federal Dam (154)	5.26E-06	2.25E-01	8.66E-01	3.21E-03	1.09E+00	1.89E+01
Lower River						
143.5	4.07E-06	1.28E-01	1.21E-01	9.90E-04	2.50E-01	2.63E+00
137.2	4.07E-06	1.28E-01	2.38E-01	1.75E-03	3.67E-01	5.17E+00
122.4	1.86E-06	7.60E-02	1.11E-01	1.11E-03	1.88E-01	2.41E+00
113.8	1.86E-06	7.60E-02	9.52E-02	1.16E-03	1.72E-01	2.07E+00
100	1.86E-06	7.60E-02	5.23E-02	4.59E-04	1.29E-01	1.14E+00
88.9	1.23E-06	5.56E-02	2.63E-02	8.98E-04	8.28E-02	5.72E-01
58.7	1.23E-06	5.56E-02	6.76E-02	2.90E-04	1.23E-01	1.47E+00
47.3	1.23E-06	5.56E-02	9.18E-02	1.77E-03	1.49E-01	2.00E+00
25.8	1.23E-06	5.56E-02	2.72E-02	6.66E-04	8.35E-02	5.92E-01

TABLE 3-31: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water 95% UCL	Macrophyte 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (95% UCL) (mg/Kg)
Upper River						
Thompson Island Pool (189)	1.34E-05	5.65E-01	3.06E+00	2.00E-02	3.64E+00	6.66E+01
Stillwater (168)	2.39E-05	6.19E-01	6.32E+00	6.23E-02	7.01E+00	1.38E+02
Federal Dam (154)	1.13E-05	4.68E-01	1.51E+00	5.39E-03	1.98E+00	3.28E+01
Lower River						
143.5	4.43E-05	3.83E-01	2.10E-01	1.08E-03	5.94E-01	4.57E+00
137.2	4.43E-05	3.83E-01	4.14E-01	3.53E-03	8.00E-01	9.01E+00
122.4	2.39E-05	1.17E+00	2.78E-01	1.23E-03	1.45E+00	6.06E+00
113.8	2.39E-05	1.17E+00	1.66E-01	1.92E-03	1.34E+00	3.61E+00
100	2.39E-05	1.17E+00	3.58E-01	9.91E-03	1.54E+00	7.79E+00
88.9	5.46E-06	1.08E+00	4.67E-02	2.63E-03	1.13E+00	1.02E+00
58.7	5.46E-06	1.08E+00	1.18E-01	3.22E-03	1.20E+00	2.56E+00
47.3	5.46E-06	1.08E+00	6.74E-01	6.91E-03	1.76E+00	1.47E+01
25.8	5.46E-06	1.08E+00	4.61E-02	1.80E-03	1.13E+00	1.00E+00

TABLE 3-32: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	2.36E+00	1.47E+00	5.59E-01	4.45E+01	2.46E+01	1.08E+01
1994	2.27E+00	1.46E+00	5.33E-01	4.17E+01	2.34E+01	1.02E+01
1995	2.17E+00	1.38E+00	5.30E-01	3.90E+01	2.21E+01	9.37E+00
1996	1.78E+00	1.08E+00	4.00E-01	3.52E+01	1.97E+01	7.93E+00
1997	1.66E+00	1.10E+00	3.74E-01	3.23E+01	1.80E+01	6.91E+00
1998	1.42E+00	8.43E-01	3.16E-01	2.96E+01	1.62E+01	6.02E+00
1999	1.31E+00	8.03E-01	2.81E-01	2.68E+01	1.47E+01	5.25E+00
2000	1.19E+00	7.30E-01	2.55E-01	2.46E+01	1.39E+01	4.72E+00
2001	1.15E+00	7.80E-01	2.33E-01	2.33E+01	1.36E+01	4.45E+00
2002	1.07E+00	7.10E-01	2.15E-01	2.17E+01	1.29E+01	4.22E+00
2003	9.90E-01	6.69E-01	2.17E-01	2.03E+01	1.22E+01	3.94E+00
2004	9.18E-01	6.39E-01	1.93E-01	1.89E+01	1.12E+01	3.57E+00
2005	8.49E-01	5.47E-01	1.81E-01	1.74E+01	1.04E+01	3.25E+00
2006	8.27E-01	5.51E-01	1.61E-01	1.67E+01	9.84E+00	3.00E+00
2007	7.61E-01	4.94E-01	1.58E-01	1.56E+01	9.23E+00	2.74E+00
2008	7.19E-01	4.47E-01	1.33E-01	1.48E+01	8.64E+00	2.53E+00
2009	7.00E-01	4.65E-01	1.33E-01	1.40E+01	8.28E+00	2.45E+00
2010	6.25E-01	4.21E-01	1.34E-01	1.27E+01	7.73E+00	2.30E+00
2011	5.56E-01	3.67E-01	1.17E-01	1.15E+01	7.13E+00	2.11E+00
2012	5.35E-01	3.81E-01	1.27E-01	1.07E+01	6.80E+00	2.00E+00
2013	4.85E-01	3.51E-01	1.15E-01	9.90E+00	6.47E+00	1.87E+00
2014	4.56E-01	3.28E-01	1.10E-01	9.23E+00	6.06E+00	1.71E+00
2015	4.23E-01	3.12E-01	9.79E-02	8.63E+00	5.85E+00	1.64E+00
2016	4.11E-01	3.10E-01	1.01E-01	8.19E+00	5.56E+00	1.51E+00
2017	3.68E-01	2.65E-01	7.78E-02	7.58E+00	5.21E+00	1.35E+00
2018	3.78E-01	2.97E-01	9.80E-02	7.50E+00	5.08E+00	1.31E+00

TABLE 3-33: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	3.32E+00	2.13E+00	5.97E-01	6.51E+01	3.89E+01	1.16E+01
1994	3.20E+00	2.10E+00	5.72E-01	6.17E+01	3.72E+01	1.10E+01
1995	2.98E+00	1.97E+00	5.65E-01	5.64E+01	3.49E+01	1.01E+01
1996	2.53E+00	1.60E+00	4.31E-01	5.15E+01	3.11E+01	8.60E+00
1997	2.34E+00	1.59E+00	3.98E-01	4.71E+01	2.85E+01	7.41E+00
1998	2.01E+00	1.28E+00	3.37E-01	4.24E+01	2.57E+01	6.47E+00
1999	1.90E+00	1.21E+00	3.01E-01	3.97E+01	2.35E+01	5.67E+00
2000	1.69E+00	1.10E+00	2.72E-01	3.55E+01	2.20E+01	5.07E+00
2001	1.64E+00	1.15E+00	2.50E-01	3.39E+01	2.15E+01	4.80E+00
2002	1.55E+00	1.06E+00	2.31E-01	3.23E+01	2.06E+01	4.56E+00
2003	1.42E+00	1.00E+00	2.32E-01	2.97E+01	1.94E+01	4.26E+00
2004	1.30E+00	9.40E-01	2.06E-01	2.72E+01	1.77E+01	3.83E+00
2005	1.22E+00	8.28E-01	1.93E-01	2.55E+01	1.65E+01	3.50E+00
2006	1.18E+00	8.19E-01	1.73E-01	2.44E+01	1.56E+01	3.25E+00
2007	1.08E+00	7.44E-01	1.68E-01	2.25E+01	1.46E+01	2.95E+00
2008	1.01E+00	6.80E-01	1.43E-01	2.13E+01	1.37E+01	2.75E+00
2009	9.79E-01	6.89E-01	1.43E-01	2.00E+01	1.31E+01	2.65E+00
2010	8.98E-01	6.32E-01	1.43E-01	1.86E+01	1.23E+01	2.50E+00
2011	7.94E-01	5.62E-01	1.26E-01	1.66E+01	1.14E+01	2.28E+00
2012	7.59E-01	5.65E-01	1.35E-01	1.55E+01	1.08E+01	2.16E+00
2013	7.10E-01	5.25E-01	1.22E-01	1.48E+01	1.02E+01	2.02E+00
2014	6.57E-01	4.94E-01	1.17E-01	1.36E+01	9.66E+00	1.85E+00
2015	6.18E-01	4.72E-01	1.04E-01	1.29E+01	9.31E+00	1.77E+00
2016	5.78E-01	4.61E-01	1.07E-01	1.18E+01	8.83E+00	1.63E+00
2017	5.36E-01	4.06E-01	8.34E-02	1.12E+01	8.26E+00	1.46E+00
2018	5.48E-01	4.35E-01	1.04E-01	1.12E+01	8.06E+00	1.41E+00

TABLE 3-34: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Average Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	8.01E-06	6.37E+00	1.09E+00	1.35E-02	7.48E+00	5.68E+02
Stillwater (168)	1.42E-05	2.15E+00	1.91E+00	3.53E-02	4.10E+00	3.09E+02
Federal Dam (154)	9.95E-06	5.05E-01	4.55E-01	3.17E-03	9.64E-01	7.30E+01
Lower River						
143.5	7.70E-06	5.87E-01	6.34E-02	9.78E-04	6.52E-01	4.95E+01
137.2	7.70E-06	1.19E+00	1.25E-01	1.73E-03	1.31E+00	9.98E+01
122.4	3.53E-06	4.53E-01	6.91E-02	1.09E-03	5.24E-01	3.97E+01
113.8	3.53E-06	4.75E-01	7.11E-02	1.15E-03	5.47E-01	4.15E+01
100	3.53E-06	2.06E-01	3.27E-02	4.53E-04	2.39E-01	1.81E+01
88.9	2.32E-06	4.10E-01	1.64E-02	8.87E-04	4.27E-01	3.24E+01
58.7	2.32E-06	4.47E-01	5.05E-02	2.86E-04	4.97E-01	3.78E+01
47.3	2.32E-06	3.97E-01	5.73E-02	1.75E-03	4.56E-01	3.46E+01
25.8	2.32E-06	2.99E-01	1.70E-02	6.57E-04	3.16E-01	2.40E+01

TABLE 3-35: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water 95% UCL	Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (95 % UCL) (mg/Kg)
Upper River						
Thompson Island Pool (189)	2.54E-05	1.30E+01	1.91E+00	1.98E-02	1.49E+01	1.13E+03
Stillwater (168)	4.52E-05	3.08E+00	8.95E+00	6.16E-02	1.21E+01	9.14E+02
Federal Dam (154)	2.13E-05	7.33E-01	7.74E-01	5.32E-03	1.51E+00	1.15E+02
Lower River						
143.5	8.39E-05	7.05E-01	1.56E-01	1.07E-03	8.62E-01	6.54E+01
137.2	8.39E-05	2.58E+00	5.07E-01	3.49E-03	3.09E+00	2.34E+02
122.4	4.52E-05	7.33E-01	1.74E-01	1.22E-03	9.08E-01	6.90E+01
113.8	4.52E-05	4.93E-01	2.75E-01	1.89E-03	7.70E-01	5.84E+01
100	4.52E-05	3.56E-01	2.23E-01	9.79E-03	5.89E-01	4.40E+01
88.9	1.03E-05	5.62E-01	2.91E-02	2.60E-03	5.94E-01	4.49E+01
58.7	1.03E-05	5.06E-01	4.62E-01	3.17E-03	9.71E-01	7.36E+01
47.3	1.03E-05	5.27E-01	4.20E-01	6.82E-03	9.54E-01	7.20E+01
25.8	1.03E-05	3.59E-01	2.88E-02	1.78E-03	3.90E-01	2.95E+01

TABLE 3-36: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	7.92E+00	3.92E+00	1.93E+00	5.94E+02	2.95E+02	1.46E+02
1994	4.33E+00	3.26E+00	1.51E+00	3.21E+02	2.45E+02	1.13E+02
1995	4.01E+00	3.52E+00	1.73E+00	2.97E+02	2.65E+02	1.30E+02
1996	4.02E+00	2.45E+00	1.16E+00	2.99E+02	1.84E+02	8.73E+01
1997	3.12E+00	2.17E+00	1.07E+00	2.31E+02	1.63E+02	8.02E+01
1998	2.72E+00	1.94E+00	8.71E-01	2.01E+02	1.45E+02	6.55E+01
1999	2.36E+00	1.58E+00	6.60E-01	1.74E+02	1.18E+02	4.95E+01
2000	1.98E+00	1.47E+00	5.82E-01	1.46E+02	1.10E+02	4.37E+01
2001	1.92E+00	1.54E+00	6.55E-01	1.42E+02	1.16E+02	4.93E+01
2002	1.79E+00	1.48E+00	6.02E-01	1.32E+02	1.11E+02	4.53E+01
2003	1.71E+00	1.27E+00	5.38E-01	1.26E+02	9.52E+01	4.04E+01
2004	1.52E+00	1.21E+00	5.25E-01	1.12E+02	9.07E+01	3.95E+01
2005	1.45E+00	1.02E+00	4.32E-01	1.07E+02	7.61E+01	3.25E+01
2006	1.29E+00	1.05E+00	4.24E-01	9.48E+01	7.84E+01	3.19E+01
2007	1.27E+00	9.57E-01	3.58E-01	9.33E+01	7.17E+01	2.69E+01
2008	1.16E+00	8.52E-01	3.19E-01	8.55E+01	6.38E+01	2.40E+01
2009	1.11E+00	9.03E-01	3.71E-01	8.19E+01	6.78E+01	2.79E+01
2010	1.07E+00	8.93E-01	3.39E-01	7.86E+01	6.70E+01	2.55E+01
2011	1.00E+00	7.02E-01	2.80E-01	7.39E+01	5.26E+01	2.10E+01
2012	8.84E-01	8.05E-01	3.25E-01	6.51E+01	6.04E+01	2.45E+01
2013	8.43E-01	7.51E-01	2.76E-01	6.22E+01	5.64E+01	2.08E+01
2014	7.98E-01	6.79E-01	2.55E-01	5.89E+01	5.10E+01	1.92E+01
2015	7.28E-01	6.58E-01	2.39E-01	5.37E+01	4.94E+01	1.80E+01
2016	6.93E-01	6.47E-01	2.73E-01	5.11E+01	4.86E+01	2.05E+01
2017	6.52E-01	5.29E-01	1.97E-01	4.81E+01	3.97E+01	1.48E+01
2018	6.14E-01	5.24E-01	1.84E-01	4.53E+01	3.93E+01	1.38E+01

TABLE 3-37: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	1.35E+01	5.24E+00	3.39E+00	1.01E+03	3.96E+02	2.56E+02
1994	6.99E+00	4.16E+00	2.31E+00	5.23E+02	3.13E+02	1.75E+02
1995	6.31E+00	4.71E+00	2.97E+00	4.72E+02	3.56E+02	2.25E+02
1996	6.55E+00	3.15E+00	2.03E+00	4.91E+02	2.37E+02	1.54E+02
1997	5.55E+00	2.77E+00	1.67E+00	4.15E+02	2.09E+02	1.26E+02
1998	4.50E+00	2.54E+00	1.41E+00	3.36E+02	1.91E+02	1.07E+02
1999	4.14E+00	2.04E+00	9.89E-01	3.10E+02	1.53E+02	7.46E+01
2000	3.67E+00	1.90E+00	9.33E-01	2.74E+02	1.43E+02	7.04E+01
2001	3.42E+00	1.99E+00	1.07E+00	2.55E+02	1.50E+02	8.11E+01
2002	3.26E+00	1.90E+00	9.52E-01	2.43E+02	1.43E+02	7.19E+01
2003	3.07E+00	1.64E+00	8.94E-01	2.29E+02	1.23E+02	6.75E+01
2004	2.83E+00	1.54E+00	8.90E-01	2.12E+02	1.16E+02	6.73E+01
2005	2.65E+00	1.32E+00	6.95E-01	1.98E+02	9.89E+01	5.25E+01
2006	2.37E+00	1.35E+00	7.12E-01	1.77E+02	1.01E+02	5.38E+01
2007	2.32E+00	1.24E+00	6.00E-01	1.74E+02	9.29E+01	4.53E+01
2008	2.08E+00	1.10E+00	5.16E-01	1.55E+02	8.27E+01	3.90E+01
2009	2.05E+00	1.17E+00	6.53E-01	1.53E+02	8.82E+01	4.93E+01
2010	1.97E+00	1.14E+00	5.65E-01	1.47E+02	8.61E+01	4.27E+01
2011	1.74E+00	9.17E-01	4.82E-01	1.30E+02	6.89E+01	3.64E+01
2012	1.59E+00	1.05E+00	5.34E-01	1.19E+02	7.89E+01	4.04E+01
2013	1.51E+00	9.57E-01	4.56E-01	1.13E+02	7.20E+01	3.44E+01
2014	1.43E+00	8.81E-01	4.27E-01	1.06E+02	6.63E+01	3.23E+01
2015	1.29E+00	8.38E-01	3.69E-01	9.64E+01	6.31E+01	2.79E+01
2016	1.21E+00	8.62E-01	5.63E-01	9.02E+01	6.49E+01	4.26E+01
2017	1.22E+00	6.91E-01	3.66E-01	9.13E+01	5.20E+01	2.77E+01
2018	1.13E+00	6.78E-01	2.98E-01	8.44E+01	5.10E+01	2.25E+01

TABLE 3-38: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	3.34E-06	3.24E+00	2.01E-02	1.05E-02	3.27E+00	6.28E+02
Stillwater (168)	5.93E-06	1.09E+00	3.52E-02	2.74E-02	1.16E+00	2.12E+02
Federal Dam (154)	4.15E-06	2.57E-01	8.38E-03	2.47E-03	2.68E-01	4.97E+01
Lower River						
143.5	3.21E-06	2.99E-01	1.17E-03	7.60E-04	3.01E-01	5.78E+01
137.2	3.21E-06	6.04E-01	2.30E-03	1.34E-03	6.08E-01	1.17E+02
122.4	1.47E-06	2.31E-01	1.27E-03	8.50E-04	2.33E-01	4.46E+01
113.8	1.47E-06	2.42E-01	1.31E-03	8.91E-04	2.44E-01	4.68E+01
100	1.47E-06	1.05E-01	6.01E-04	3.52E-04	1.06E-01	2.03E+01
88.9	9.68E-07	2.08E-01	3.01E-04	6.90E-04	2.09E-01	4.04E+01
58.7	9.68E-07	2.27E-01	9.28E-04	2.23E-04	2.28E-01	4.40E+01
47.3	9.68E-07	2.02E-01	1.05E-03	1.36E-03	2.05E-01	3.91E+01
25.8	9.68E-07	1.52E-01	3.12E-04	5.11E-04	1.53E-01	2.94E+01

TABLE 3-39: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water 95% UCL	Fish 95% UCL	Benthic Invertebrate 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River					
Thompson Island Pool (189)	1.06E-05	6.62E+00	3.51E-02	6.67E+00	1.28E+03
Stillwater (168)	1.88E-05	1.56E+00	1.65E-01	1.78E+00	3.03E+02
Federal Dam (154)	8.90E-06	3.73E-01	1.42E-02	3.91E-01	7.22E+01
Lower River					
143.5	3.50E-05	3.59E-01	2.86E-03	3.62E-01	6.94E+01
137.2	3.50E-05	1.31E+00	9.33E-03	1.32E+00	2.54E+02
122.4	1.88E-05	3.73E-01	3.20E-03	3.77E-01	7.22E+01
113.8	1.88E-05	2.51E-01	5.07E-03	2.57E-01	4.85E+01
100	1.88E-05	1.81E-01	4.11E-03	1.93E-01	3.50E+01
88.9	4.30E-06	2.86E-01	5.36E-04	2.88E-01	5.53E+01
58.7	4.30E-06	2.57E-01	8.49E-03	2.68E-01	4.98E+01
47.3	4.30E-06	2.68E-01	7.73E-03	2.81E-01	5.18E+01
25.8	4.30E-06	1.83E-01	5.29E-04	1.85E-01	3.54E+01

TABLE 3-40: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	3.37E+00	1.64E+00	8.25E-01	6.43E+02	3.13E+02	1.58E+02
1994	1.58E+00	1.32E+00	6.18E-01	2.98E+02	2.51E+02	1.18E+02
1995	1.46E+00	1.47E+00	7.42E-01	2.75E+02	2.81E+02	1.42E+02
1996	1.52E+00	9.59E-01	4.75E-01	2.88E+02	1.82E+02	9.07E+01
1997	1.11E+00	8.44E-01	4.42E-01	2.08E+02	1.60E+02	8.44E+01
1998	9.43E-01	7.50E-01	3.56E-01	1.76E+02	1.43E+02	6.79E+01
1999	8.03E-01	5.90E-01	2.59E-01	1.50E+02	1.12E+02	4.93E+01
2000	6.44E-01	5.44E-01	2.28E-01	1.19E+02	1.03E+02	4.33E+01
2001	6.34E-01	5.88E-01	2.69E-01	1.18E+02	1.12E+02	5.13E+01
2002	5.88E-01	5.67E-01	2.45E-01	1.09E+02	1.08E+02	4.68E+01
2003	5.69E-01	4.69E-01	2.17E-01	1.06E+02	8.88E+01	4.13E+01
2004	4.93E-01	4.53E-01	2.16E-01	9.14E+01	8.58E+01	4.11E+01
2005	4.83E-01	3.67E-01	1.73E-01	8.97E+01	6.93E+01	3.29E+01
2006	4.09E-01	3.90E-01	1.72E-01	7.56E+01	7.38E+01	3.29E+01
2007	4.14E-01	3.53E-01	1.42E-01	7.68E+01	6.68E+01	2.71E+01
2008	3.72E-01	3.08E-01	1.26E-01	6.89E+01	5.83E+01	2.39E+01
2009	3.59E-01	3.40E-01	1.53E-01	6.66E+01	6.44E+01	2.92E+01
2010	3.55E-01	3.42E-01	1.39E-01	6.60E+01	6.49E+01	2.65E+01
2011	3.40E-01	2.54E-01	1.12E-01	6.33E+01	4.80E+01	2.13E+01
2012	2.92E-01	3.11E-01	1.36E-01	5.42E+01	5.91E+01	2.60E+01
2013	2.83E-01	2.88E-01	1.13E-01	5.26E+01	5.48E+01	2.16E+01
2014	2.70E-01	2.58E-01	1.05E-01	5.03E+01	4.89E+01	2.01E+01
2015	2.43E-01	2.50E-01	9.76E-02	4.52E+01	4.75E+01	1.86E+01
2016	2.31E-01	2.49E-01	1.17E-01	4.30E+01	4.72E+01	2.23E+01
2017	2.20E-01	1.94E-01	8.08E-02	4.09E+01	3.67E+01	1.54E+01
2018	2.02E-01	1.93E-01	7.46E-02	3.75E+01	3.66E+01	1.42E+01

TABLE 3-41: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	5.89E+00	2.11E+00	1.10E+00	1.13E+03	4.03E+02	2.10E+02
1994	2.66E+00	1.58E+00	7.70E-01	5.03E+02	3.01E+02	1.47E+02
1995	2.39E+00	1.90E+00	9.74E-01	4.52E+02	3.62E+02	1.87E+02
1996	2.58E+00	1.16E+00	6.35E-01	4.91E+02	2.20E+02	1.22E+02
1997	2.14E+00	1.00E+00	5.56E-01	4.05E+02	1.90E+02	1.06E+02
1998	1.67E+00	9.22E-01	4.57E-01	3.16E+02	1.75E+02	8.75E+01
1999	1.53E+00	7.01E-01	3.21E-01	2.89E+02	1.32E+02	6.13E+01
2000	1.35E+00	6.53E-01	2.93E-01	2.54E+02	1.23E+02	5.59E+01
2001	1.25E+00	7.02E-01	3.47E-01	2.35E+02	1.33E+02	6.64E+01
2002	1.19E+00	6.71E-01	3.11E-01	2.24E+02	1.27E+02	5.94E+01
2003	1.13E+00	5.55E-01	2.82E-01	2.14E+02	1.05E+02	5.40E+01
2004	1.04E+00	5.30E-01	2.83E-01	1.97E+02	1.00E+02	5.42E+01
2005	9.78E-01	4.34E-01	2.22E-01	1.85E+02	8.16E+01	4.24E+01
2006	8.51E-01	4.62E-01	2.26E-01	1.60E+02	8.73E+01	4.31E+01
2007	8.54E-01	4.19E-01	1.87E-01	1.61E+02	7.90E+01	3.58E+01
2008	7.49E-01	3.63E-01	1.62E-01	1.41E+02	6.84E+01	3.10E+01
2009	7.52E-01	4.08E-01	2.05E-01	1.42E+02	7.72E+01	3.92E+01
2010	7.32E-01	4.06E-01	1.81E-01	1.38E+02	7.68E+01	3.46E+01
2011	6.41E-01	3.03E-01	1.49E-01	1.21E+02	5.71E+01	2.84E+01
2012	5.82E-01	3.79E-01	1.75E-01	1.10E+02	7.18E+01	3.36E+01
2013	5.55E-01	3.40E-01	1.47E-01	1.05E+02	6.43E+01	2.81E+01
2014	5.27E-01	3.10E-01	1.37E-01	9.95E+01	5.86E+01	2.62E+01
2015	4.69E-01	2.93E-01	1.22E-01	8.85E+01	5.54E+01	2.34E+01
2016	4.42E-01	3.12E-01	1.68E-01	8.35E+01	5.92E+01	3.23E+01
2017	4.57E-01	2.33E-01	1.11E-01	8.65E+01	4.40E+01	2.13E+01
2018	4.12E-01	2.30E-01	9.59E-02	7.78E+01	4.33E+01	1.83E+01

TABLE 3-42: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water Expected	Piscivorous Fish Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River				
Thompson Island Pool (189)	2.53E-06	1.20E+01	1.20E+01	2.65E+03
Stillwater (168)	4.49E-06	2.14E+00	2.14E+00	4.70E+02
Federal Dam (154)	3.14E-06	1.55E+00	1.55E+00	3.41E+02
Lower River				
143.5	2.43E-06	1.55E+00	1.55E+00	3.41E+02
137.2	2.43E-06	5.86E+00	5.86E+00	1.29E+03
122.4	1.11E-06	1.36E+00	1.36E+00	3.00E+02
113.8	1.11E-06	1.23E+00	1.23E+00	2.71E+02
100	1.11E-06	1.42E+00	1.42E+00	3.11E+02
88.9	7.32E-07	9.13E-01	9.13E-01	2.01E+02
58.7	7.32E-07	1.06E+00	1.06E+00	2.33E+02
47.3	7.32E-07	1.21E+00	1.21E+00	2.67E+02
25.8	7.32E-07	8.58E-01	8.58E-01	1.88E+02

TABLE 3-43: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON 1993 DATA USING SUM OF TRI+ CONGENERS

Location	Drinking Water 95% UCL	Piscivorous Fish 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (95% UCL) (mg/Kg)
Upper River				
Thompson Island Pool (189)	8.00E-06	2.33E+01	2.33E+01	5.12E+03
Stillwater (168)	1.42E-05	2.76E+00	2.76E+00	6.06E+02
Federal Dam (154)	6.73E-06	2.79E+00	2.79E+00	6.13E+02
Lower River				
143.5	2.64E-05	2.79E+00	2.79E+00	6.13E+02
137.2	2.64E-05	1.39E+01	1.39E+01	3.06E+03
122.4	1.42E-05	1.88E+00	1.88E+00	4.12E+02
113.8	1.42E-05	1.73E+00	1.73E+00	3.79E+02
100	1.42E-05	4.38E+00	4.38E+00	9.62E+02
88.9	3.25E-06	1.74E+00	1.74E+00	3.81E+02
58.7	3.25E-06	1.57E+00	1.57E+00	3.45E+02
47.3	3.25E-06	3.27E+00	3.27E+00	7.18E+02
25.8	3.25E-06	1.70E+00	1.70E+00	3.74E+02

TABLE 3-44: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	6.68E+00	5.04E+00	2.48E+00	1.47E+03	1.11E+03	5.45E+02
1994	4.06E+00	3.47E+00	1.76E+00	8.92E+02	7.61E+02	3.86E+02
1995	4.48E+00	3.85E+00	1.90E+00	9.83E+02	8.45E+02	4.17E+02
1996	4.08E+00	3.09E+00	1.67E+00	8.97E+02	6.79E+02	3.66E+02
1997	3.18E+00	2.71E+00	1.44E+00	6.99E+02	5.95E+02	3.16E+02
1998	2.65E+00	2.44E+00	1.21E+00	5.83E+02	5.35E+02	2.65E+02
1999	2.31E+00	1.99E+00	9.20E-01	5.07E+02	4.37E+02	2.02E+02
2000	2.16E+00	1.88E+00	8.77E-01	4.74E+02	4.12E+02	1.93E+02
2001	2.01E+00	1.81E+00	8.42E-01	4.43E+02	3.97E+02	1.85E+02
2002	1.99E+00	1.93E+00	8.96E-01	4.37E+02	4.23E+02	1.97E+02
2003	1.74E+00	1.62E+00	7.64E-01	3.81E+02	3.55E+02	1.68E+02
2004	1.63E+00	1.58E+00	7.88E-01	3.57E+02	3.46E+02	1.73E+02
2005	1.44E+00	1.20E+00	5.94E-01	3.17E+02	2.65E+02	1.31E+02
2006	1.42E+00	1.31E+00	6.27E-01	3.12E+02	2.88E+02	1.38E+02
2007	1.31E+00	1.10E+00	4.86E-01	2.87E+02	2.41E+02	1.07E+02
2008	1.24E+00	9.90E-01	4.71E-01	2.71E+02	2.17E+02	1.03E+02
2009	1.25E+00	1.07E+00	5.06E-01	2.75E+02	2.35E+02	1.11E+02
2010	1.10E+00	9.75E-01	4.23E-01	2.41E+02	2.14E+02	9.30E+01
2011	9.62E-01	8.31E-01	4.11E-01	2.11E+02	1.83E+02	9.02E+01
2012	9.55E-01	8.42E-01	3.99E-01	2.10E+02	1.85E+02	8.77E+01
2013	9.18E-01	8.75E-01	3.85E-01	2.02E+02	1.92E+02	8.46E+01
2014	8.35E-01	8.34E-01	3.52E-01	1.83E+02	1.83E+02	7.74E+01
2015	7.65E-01	7.32E-01	3.25E-01	1.68E+02	1.61E+02	7.14E+01
2016	7.80E-01	8.21E-01	3.50E-01	1.71E+02	1.80E+02	7.69E+01
2017	6.72E-01	6.22E-01	2.87E-01	1.48E+02	1.37E+02	6.31E+01
2018	6.51E-01	5.97E-01	2.61E-01	1.43E+02	1.31E+02	5.73E+01

TABLE 3-45: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON TRI+ CONGENERS FOR PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	8.38E+00	6.15E+00	3.09E+00	1.84E+03	1.35E+03	6.79E+02
1994	5.47E+00	4.17E+00	2.16E+00	1.20E+03	9.17E+02	4.76E+02
1995	5.99E+00	4.62E+00	2.31E+00	1.32E+03	1.02E+03	5.07E+02
1996	5.89E+00	3.77E+00	2.10E+00	1.29E+03	8.29E+02	4.62E+02
1997	4.58E+00	3.26E+00	1.80E+00	1.01E+03	7.17E+02	3.95E+02
1998	3.78E+00	2.96E+00	1.48E+00	8.29E+02	6.51E+02	3.26E+02
1999	3.42E+00	2.46E+00	1.16E+00	7.52E+02	5.40E+02	2.55E+02
2000	3.21E+00	2.29E+00	1.08E+00	7.04E+02	5.04E+02	2.38E+02
2001	2.98E+00	2.22E+00	1.05E+00	6.54E+02	4.87E+02	2.30E+02
2002	2.93E+00	2.36E+00	1.12E+00	6.43E+02	5.18E+02	2.47E+02
2003	2.59E+00	2.00E+00	9.61E-01	5.68E+02	4.39E+02	2.11E+02
2004	2.39E+00	1.93E+00	9.88E-01	5.25E+02	4.24E+02	2.17E+02
2005	2.17E+00	1.47E+00	7.44E-01	4.78E+02	3.23E+02	1.63E+02
2006	2.10E+00	1.61E+00	7.70E-01	4.62E+02	3.53E+02	1.69E+02
2007	1.97E+00	1.33E+00	5.97E-01	4.34E+02	2.93E+02	1.31E+02
2008	1.88E+00	1.22E+00	5.96E-01	4.14E+02	2.68E+02	1.31E+02
2009	1.83E+00	1.31E+00	6.38E-01	4.02E+02	2.87E+02	1.40E+02
2010	1.60E+00	1.20E+00	5.25E-01	3.53E+02	2.63E+02	1.15E+02
2011	1.46E+00	1.02E+00	5.22E-01	3.21E+02	2.24E+02	1.15E+02
2012	1.41E+00	1.04E+00	5.04E-01	3.10E+02	2.28E+02	1.11E+02
2013	1.36E+00	1.08E+00	4.88E-01	2.98E+02	2.37E+02	1.07E+02
2014	1.21E+00	1.02E+00	4.37E-01	2.66E+02	2.25E+02	9.60E+01
2015	1.12E+00	8.92E-01	4.10E-01	2.47E+02	1.96E+02	9.00E+01
2016	1.13E+00	1.00E+00	4.34E-01	2.48E+02	2.21E+02	9.53E+01
2017	1.02E+00	7.65E-01	3.78E-01	2.24E+02	1.68E+02	8.31E+01
2018	9.73E-01	7.36E-01	3.35E-01	2.14E+02	1.62E+02	7.36E+01

TABLE 3-46: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water Expected	Benthic Invertebrate Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Average Predicted Egg Conc (mg/Kg)
Upper River				
Thompson Island Pool (189)	1.26E-07	5.80E-04	5.80E-04	4.74E-03
Stillwater (168)	2.24E-07	1.02E-03	1.02E-03	8.29E-03
Federal Dam (154)	1.56E-07	2.42E-04	2.42E-04	1.98E-03
Lower River				
143.5	1.21E-07	3.37E-05	3.38E-05	2.75E-04
137.2	1.21E-07	6.64E-05	6.65E-05	5.42E-04
122.4	5.54E-08	3.67E-05	3.68E-05	3.00E-04
113.8	5.54E-08	3.78E-05	3.78E-05	3.08E-04
100	5.54E-08	1.74E-05	1.74E-05	1.42E-04
88.9	3.65E-08	8.70E-06	8.74E-06	7.11E-05
58.7	3.65E-08	2.68E-05	2.68E-05	2.19E-04
47.3	3.65E-08	3.04E-05	3.05E-05	2.49E-04
25.8	3.65E-08	9.01E-06	9.05E-06	7.36E-05

TABLE 3-47: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water 95% UCL	Benthic Invertebrate 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)	95% UCL Predicted Egg Conc (mg/Kg)
Upper River				
Thompson Island Pool (189)	3.99E-07	1.01E-03	1.01E-03	8.28E-03
Stillwater (168)	7.10E-07	4.76E-03	4.76E-03	3.88E-02
Federal Dam (154)	3.36E-07	4.11E-04	4.12E-04	3.36E-03
Lower River				
143.5	1.32E-06	8.27E-05	8.40E-05	6.75E-04
137.2	1.32E-06	2.69E-04	2.71E-04	2.20E-03
122.4	7.10E-07	9.23E-05	9.30E-05	7.54E-04
113.8	7.10E-07	1.46E-04	1.47E-04	1.20E-03
100	7.10E-07	1.19E-04	1.19E-04	9.69E-04
88.9	1.62E-07	1.55E-05	1.56E-05	1.26E-04
58.7	1.62E-07	2.45E-04	2.45E-04	2.00E-03
47.3	1.62E-07	2.23E-04	2.24E-04	1.82E-03
25.8	1.62E-07	1.53E-05	1.54E-05	1.25E-04

TABLE 3-48: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

Year	Total Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	6.77E-04	3.75E-04	1.65E-04	5.53E-03	3.06E-03	1.35E-03
1994	6.35E-04	3.57E-04	1.56E-04	5.19E-03	2.91E-03	1.27E-03
1995	5.94E-04	3.36E-04	1.43E-04	4.85E-03	2.74E-03	1.16E-03
1996	5.35E-04	3.00E-04	1.21E-04	4.37E-03	2.45E-03	9.86E-04
1997	4.92E-04	2.73E-04	1.05E-04	4.02E-03	2.23E-03	8.59E-04
1998	4.51E-04	2.47E-04	9.17E-05	3.69E-03	2.01E-03	7.48E-04
1999	4.08E-04	2.24E-04	8.00E-05	3.33E-03	1.83E-03	6.53E-04
2000	3.75E-04	2.12E-04	7.19E-05	3.06E-03	1.73E-03	5.87E-04
2001	3.54E-04	2.07E-04	6.77E-05	2.89E-03	1.69E-03	5.53E-04
2002	3.31E-04	1.97E-04	6.42E-05	2.70E-03	1.61E-03	5.24E-04
2003	3.09E-04	1.86E-04	6.00E-05	2.52E-03	1.52E-03	4.90E-04
2004	2.87E-04	1.71E-04	5.43E-05	2.34E-03	1.40E-03	4.44E-04
2005	2.65E-04	1.58E-04	4.95E-05	2.16E-03	1.29E-03	4.04E-04
2006	2.55E-04	1.50E-04	4.58E-05	2.08E-03	1.22E-03	3.73E-04
2007	2.37E-04	1.41E-04	4.17E-05	1.94E-03	1.15E-03	3.40E-04
2008	2.26E-04	1.32E-04	3.86E-05	1.84E-03	1.07E-03	3.15E-04
2009	2.13E-04	1.26E-04	3.73E-05	1.74E-03	1.03E-03	3.05E-04
2010	1.93E-04	1.18E-04	3.50E-05	1.58E-03	9.60E-04	2.86E-04
2011	1.75E-04	1.08E-04	3.21E-05	1.43E-03	8.86E-04	2.62E-04
2012	1.63E-04	1.04E-04	3.04E-05	1.33E-03	8.45E-04	2.48E-04
2013	1.51E-04	9.85E-05	2.86E-05	1.23E-03	8.04E-04	2.33E-04
2014	1.41E-04	9.23E-05	2.61E-05	1.15E-03	7.53E-04	2.13E-04
2015	1.31E-04	8.91E-05	2.50E-05	1.07E-03	7.28E-04	2.04E-04
2016	1.25E-04	8.46E-05	2.30E-05	1.02E-03	6.91E-04	1.88E-04
2017	1.15E-04	7.93E-05	2.05E-05	9.42E-04	6.47E-04	1.67E-04
2018	1.14E-04	7.73E-05	1.99E-05	9.33E-04	6.31E-04	1.63E-04

TABLE 3-49: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE TREE SWALLOW FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

Year	Total 95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	9.91E-04	5.92E-04	1.77E-04	8.09E-03	4.83E-03	1.45E-03
1994	9.40E-04	5.67E-04	1.68E-04	7.68E-03	4.63E-03	1.37E-03
1995	8.59E-04	5.32E-04	1.54E-04	7.01E-03	4.34E-03	1.25E-03
1996	7.84E-04	4.73E-04	1.31E-04	6.40E-03	3.86E-03	1.07E-03
1997	7.17E-04	4.34E-04	1.13E-04	5.85E-03	3.54E-03	9.21E-04
1998	6.45E-04	3.91E-04	9.85E-05	5.27E-03	3.19E-03	8.04E-04
1999	6.05E-04	3.57E-04	8.63E-05	4.94E-03	2.92E-03	7.04E-04
2000	5.40E-04	3.35E-04	7.72E-05	4.41E-03	2.73E-03	6.30E-04
2001	5.16E-04	3.28E-04	7.31E-05	4.21E-03	2.68E-03	5.96E-04
2002	4.91E-04	3.13E-04	6.95E-05	4.01E-03	2.56E-03	5.67E-04
2003	4.52E-04	2.95E-04	6.48E-05	3.69E-03	2.41E-03	5.29E-04
2004	4.14E-04	2.70E-04	5.83E-05	3.38E-03	2.20E-03	4.76E-04
2005	3.89E-04	2.51E-04	5.33E-05	3.17E-03	2.05E-03	4.35E-04
2006	3.71E-04	2.38E-04	4.95E-05	3.03E-03	1.94E-03	4.04E-04
2007	3.43E-04	2.23E-04	4.49E-05	2.80E-03	1.82E-03	3.66E-04
2008	3.24E-04	2.09E-04	4.18E-05	2.64E-03	1.70E-03	3.41E-04
2009	3.05E-04	2.00E-04	4.03E-05	2.49E-03	1.63E-03	3.29E-04
2010	2.83E-04	1.87E-04	3.80E-05	2.31E-03	1.53E-03	3.10E-04
2011	2.53E-04	1.73E-04	3.47E-05	2.07E-03	1.41E-03	2.83E-04
2012	2.37E-04	1.64E-04	3.29E-05	1.93E-03	1.34E-03	2.68E-04
2013	2.25E-04	1.56E-04	3.08E-05	1.84E-03	1.27E-03	2.51E-04
2014	2.07E-04	1.47E-04	2.82E-05	1.69E-03	1.20E-03	2.30E-04
2015	1.96E-04	1.42E-04	2.70E-05	1.60E-03	1.16E-03	2.20E-04
2016	1.80E-04	1.34E-04	2.49E-05	1.47E-03	1.10E-03	2.03E-04
2017	1.71E-04	1.26E-04	2.22E-05	1.40E-03	1.03E-03	1.82E-04
2018	1.70E-04	1.23E-04	2.15E-05	1.39E-03	1.00E-03	1.75E-04

TABLE 3-50: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON 1993 DATA ON A TEQ BASIS

Location	Drinking Water Expected	Macrophyte Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Average Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	3.46E-08	1.16E-03	1.04E-04	3.80E-05	1.31E-03	2.11E-02
Stillwater (168)	6.15E-08	1.89E-03	1.94E-04	9.92E-05	2.18E-03	3.93E-02
Federal Dam (154)	4.30E-08	1.84E-03	4.61E-05	8.93E-06	1.89E-03	9.38E-03
Lower River						
143.5	3.32E-08	1.05E-03	6.43E-06	2.75E-06	1.05E-03	1.31E-03
137.2	3.32E-08	1.05E-03	1.27E-05	4.86E-06	1.06E-03	2.57E-03
122.4	1.52E-08	6.21E-04	5.90E-06	3.08E-06	6.30E-04	1.20E-03
113.8	1.52E-08	6.21E-04	5.07E-06	3.23E-06	6.29E-04	1.03E-03
100	1.52E-08	6.21E-04	2.79E-06	1.27E-06	6.25E-04	5.67E-04
88.9	1.00E-08	4.54E-04	1.40E-06	2.50E-06	4.58E-04	2.84E-04
58.7	1.00E-08	4.54E-04	3.60E-06	8.05E-07	4.59E-04	7.32E-04
47.3	1.00E-08	4.54E-04	4.89E-06	4.91E-06	4.64E-04	9.94E-04
25.8	1.00E-08	4.54E-04	1.45E-06	1.85E-06	4.58E-04	2.94E-04

TABLE 3-51: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD BASED ON 1993 DATA ON A TEQ BASIS

Location	Drinking Water 95% UCL	Macrophyte 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (95% UCL) (mg/Kg)
Upper River						
Thompson Island Pool (189)	1.10E-07	4.61E-03	1.63E-04	5.56E-05	4.83E-03	3.31E-02
Stillwater (168)	1.95E-07	5.05E-03	3.37E-04	1.73E-04	5.56E-03	6.85E-02
Federal Dam (154)	9.22E-08	3.82E-03	8.03E-05	1.50E-05	3.91E-03	1.63E-02
Lower River						
143.5	3.62E-07	3.13E-03	1.12E-05	3.01E-06	3.14E-03	2.27E-03
137.2	3.62E-07	3.13E-03	2.20E-05	9.81E-06	3.16E-03	4.48E-03
122.4	1.95E-07	9.56E-03	1.48E-05	3.42E-06	9.58E-03	3.02E-03
113.8	1.95E-07	9.56E-03	8.82E-06	5.33E-06	9.57E-03	1.79E-03
100	1.95E-07	9.56E-03	1.91E-05	2.75E-05	9.61E-03	3.88E-03
88.9	4.45E-08	8.82E-03	2.49E-06	7.30E-06	8.83E-03	5.05E-04
58.7	4.45E-08	8.82E-03	6.27E-06	8.93E-06	8.84E-03	1.27E-03
47.3	4.45E-08	8.82E-03	3.59E-05	1.92E-05	8.88E-03	7.30E-03
25.8	4.45E-08	8.82E-03	2.46E-06	5.00E-06	8.83E-03	4.99E-04

TABLE 3-52: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD ON A TEQ BASIS FOR PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	2.55E-03	2.75E-03	5.04E-04	2.21E-02	1.22E-02	5.38E-03
1994	2.85E-03	3.12E-03	5.22E-04	2.08E-02	1.17E-02	5.08E-03
1995	3.04E-03	2.94E-03	8.17E-04	1.94E-02	1.10E-02	4.66E-03
1996	1.29E-03	1.39E-03	2.92E-04	1.75E-02	9.79E-03	3.94E-03
1997	1.37E-03	2.22E-03	4.61E-04	1.61E-02	8.93E-03	3.44E-03
1998	4.50E-04	7.94E-04	3.21E-04	1.47E-02	8.05E-03	2.99E-03
1999	5.87E-04	1.02E-03	3.28E-04	1.33E-02	7.33E-03	2.61E-03
2000	4.51E-04	7.36E-04	3.15E-04	1.23E-02	6.91E-03	2.35E-03
2001	6.11E-04	1.27E-03	2.38E-04	1.16E-02	6.74E-03	2.21E-03
2002	5.19E-04	9.30E-04	1.76E-04	1.08E-02	6.44E-03	2.10E-03
2003	4.38E-04	8.64E-04	2.93E-04	1.01E-02	6.08E-03	1.96E-03
2004	3.95E-04	9.94E-04	2.42E-04	9.38E-03	5.58E-03	1.77E-03
2005	3.74E-04	5.57E-04	2.62E-04	8.66E-03	5.17E-03	1.61E-03
2006	4.53E-04	7.98E-04	1.89E-04	8.33E-03	4.89E-03	1.49E-03
2007	3.39E-04	5.65E-04	2.61E-04	7.76E-03	4.59E-03	1.36E-03
2008	2.86E-04	4.01E-04	1.35E-04	7.38E-03	4.30E-03	1.26E-03
2009	4.46E-04	6.82E-04	1.71E-04	6.96E-03	4.12E-03	1.22E-03
2010	3.28E-04	5.33E-04	2.31E-04	6.30E-03	3.84E-03	1.14E-03
2011	2.20E-04	3.15E-04	1.68E-04	5.71E-03	3.54E-03	1.05E-03
2012	3.45E-04	5.56E-04	2.86E-04	5.32E-03	3.38E-03	9.93E-04
2013	2.31E-04	4.33E-04	2.36E-04	4.92E-03	3.22E-03	9.32E-04
2014	2.47E-04	4.01E-04	2.56E-04	4.59E-03	3.01E-03	8.53E-04
2015	2.04E-04	3.48E-04	1.84E-04	4.29E-03	2.91E-03	8.16E-04
2016	2.70E-04	4.39E-04	2.56E-04	4.07E-03	2.76E-03	7.50E-04
2017	1.50E-04	2.06E-04	1.31E-04	3.77E-03	2.59E-03	6.69E-04
2018	2.62E-04	5.12E-04	3.10E-04	3.73E-03	2.53E-03	6.51E-04

TABLE 3-53: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE MALLARD ON A TEQ BASIS FOR PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	2.65E-03	2.84E-03	5.17E-04	3.24E-02	1.93E-02	5.79E-03
1994	2.96E-03	3.22E-03	5.34E-04	3.07E-02	1.85E-02	5.49E-03
1995	3.15E-03	3.03E-03	8.36E-04	2.81E-02	1.74E-02	5.02E-03
1996	1.36E-03	1.45E-03	3.00E-04	2.56E-02	1.55E-02	4.28E-03
1997	1.43E-03	2.29E-03	4.72E-04	2.34E-02	1.42E-02	3.69E-03
1998	4.91E-04	8.32E-04	3.29E-04	2.11E-02	1.28E-02	3.22E-03
1999	6.31E-04	1.06E-03	3.36E-04	1.97E-02	1.17E-02	2.82E-03
2000	4.88E-04	7.69E-04	3.23E-04	1.76E-02	1.09E-02	2.52E-03
2001	6.50E-04	1.32E-03	2.44E-04	1.68E-02	1.07E-02	2.39E-03
2002	5.56E-04	9.66E-04	1.80E-04	1.60E-02	1.02E-02	2.27E-03
2003	4.70E-04	8.98E-04	3.00E-04	1.48E-02	9.65E-03	2.12E-03
2004	4.24E-04	1.03E-03	2.47E-04	1.35E-02	8.82E-03	1.90E-03
2005	4.01E-04	5.83E-04	2.68E-04	1.27E-02	8.20E-03	1.74E-03
2006	4.82E-04	8.28E-04	1.94E-04	1.21E-02	7.78E-03	1.61E-03
2007	3.63E-04	5.89E-04	2.67E-04	1.12E-02	7.28E-03	1.47E-03
2008	3.08E-04	4.21E-04	1.38E-04	1.06E-02	6.81E-03	1.37E-03
2009	4.70E-04	7.07E-04	1.76E-04	9.97E-03	6.53E-03	1.32E-03
2010	3.50E-04	5.54E-04	2.36E-04	9.25E-03	6.12E-03	1.24E-03
2011	2.38E-04	3.31E-04	1.72E-04	8.28E-03	5.66E-03	1.13E-03
2012	3.64E-04	5.77E-04	2.92E-04	7.73E-03	5.36E-03	1.07E-03
2013	2.48E-04	4.51E-04	2.41E-04	7.35E-03	5.10E-03	1.00E-03
2014	2.62E-04	4.18E-04	2.62E-04	6.76E-03	4.80E-03	9.19E-04
2015	2.18E-04	3.63E-04	1.88E-04	6.40E-03	4.63E-03	8.81E-04
2016	2.85E-04	4.56E-04	2.62E-04	5.88E-03	4.39E-03	8.12E-04
2017	1.62E-04	2.17E-04	1.34E-04	5.59E-03	4.11E-03	7.26E-04
2018	2.76E-04	5.30E-04	3.17E-04	5.56E-03	4.01E-03	7.02E-04

TABLE 3-54: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	6.54E-08	1.64E-03	5.82E-05	3.75E-05	1.73E-03	8.16E-02
Stillwater (168)	1.16E-07	5.52E-04	1.02E-04	9.79E-05	7.52E-04	3.15E-02
Federal Dam (154)	8.13E-08	1.30E-04	2.43E-05	8.82E-06	1.63E-04	7.41E-03
Lower River						
143.5	6.29E-08	1.51E-04	3.38E-06	2.72E-06	1.57E-04	7.42E-03
137.2	6.29E-08	3.05E-04	6.66E-06	4.79E-06	3.16E-04	1.50E-02
122.4	2.88E-08	1.16E-04	3.68E-06	3.04E-06	1.23E-04	5.78E-03
113.8	2.88E-08	1.22E-04	3.79E-06	3.18E-06	1.29E-04	6.06E-03
100	2.88E-08	5.29E-05	1.74E-06	1.26E-06	5.59E-05	2.63E-03
88.9	1.90E-08	1.05E-04	8.73E-07	2.46E-06	1.09E-04	5.11E-03
58.7	1.90E-08	1.15E-04	2.69E-06	7.95E-07	1.18E-04	5.65E-03
47.3	1.90E-08	1.02E-04	3.05E-06	4.85E-06	1.10E-04	5.06E-03
25.8	1.90E-08	7.67E-05	9.03E-07	1.83E-06	7.94E-05	3.74E-03

TABLE 3-55: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water 95% UCL	Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (95 % UCL) (mg/Kg)
Upper River						
Thompson Island Pool (189)	2.07E-07	3.34E-03	1.02E-04	5.49E-05	3.50E-03	1.66E-01
Stillwater (168)	3.69E-07	7.90E-04	4.77E-04	1.71E-04	1.44E-03	6.10E-02
Federal Dam (154)	1.74E-07	1.88E-04	4.12E-05	1.48E-05	2.44E-04	1.10E-02
Lower River						
143.5	6.85E-07	1.81E-04	8.29E-06	2.97E-06	1.93E-04	9.11E-03
137.2	6.85E-07	6.61E-04	2.70E-05	9.69E-06	6.98E-04	3.31E-02
122.4	3.69E-07	1.88E-04	9.26E-06	3.38E-06	2.01E-04	9.51E-03
113.8	3.69E-07	1.27E-04	1.47E-05	5.26E-06	1.47E-04	6.80E-03
100	3.69E-07	9.12E-05	1.19E-05	2.72E-05	1.31E-04	4.97E-03
88.9	8.43E-08	1.44E-04	1.55E-06	7.21E-06	1.53E-04	7.02E-03
58.7	8.43E-08	1.30E-04	2.46E-05	8.82E-06	1.63E-04	7.44E-03
47.3	8.43E-08	1.35E-04	2.24E-05	1.89E-05	1.77E-04	7.59E-03
25.8	8.43E-08	9.22E-05	1.53E-06	4.93E-06	9.87E-05	4.51E-03

TABLE 3-56: SUMMARY OF ADD$_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	2.06E-03	9.55E-04	4.74E-04	8.40E-02	4.11E-02	2.06E-02
1994	1.13E-03	7.86E-04	3.65E-04	4.05E-02	3.32E-02	1.56E-02
1995	1.05E-03	8.58E-04	4.25E-04	3.74E-02	3.68E-02	1.85E-02
1996	1.05E-03	5.89E-04	2.83E-04	3.87E-02	2.43E-02	1.20E-02
1997	8.22E-04	5.21E-04	2.60E-04	2.85E-02	2.14E-02	1.11E-02
1998	7.13E-04	4.64E-04	2.12E-04	2.43E-02	1.91E-02	8.96E-03
1999	6.21E-04	3.76E-04	1.59E-04	2.08E-02	1.51E-02	6.58E-03
2000	5.22E-04	3.47E-04	1.40E-04	1.68E-02	1.40E-02	5.78E-03
2001	5.06E-04	3.67E-04	1.59E-04	1.65E-02	1.50E-02	6.77E-03
2002	4.73E-04	3.54E-04	1.46E-04	1.53E-02	1.45E-02	6.18E-03
2003	4.51E-04	3.01E-04	1.30E-04	1.48E-02	1.20E-02	5.47E-03
2004	3.99E-04	2.88E-04	1.28E-04	1.29E-02	1.16E-02	5.42E-03
2005	3.82E-04	2.39E-04	1.04E-04	1.25E-02	9.46E-03	4.37E-03
2006	3.40E-04	2.48E-04	1.03E-04	1.07E-02	9.99E-03	4.35E-03
2007	3.34E-04	2.26E-04	8.63E-05	1.08E-02	9.06E-03	3.61E-03
2008	3.05E-04	2.01E-04	7.66E-05	9.74E-03	7.95E-03	3.19E-03
2009	2.93E-04	2.14E-04	8.99E-05	9.39E-03	8.69E-03	3.85E-03
2010	2.83E-04	2.14E-04	8.23E-05	9.22E-03	8.72E-03	3.50E-03
2011	2.63E-04	1.65E-04	6.74E-05	8.79E-03	6.55E-03	2.83E-03
2012	2.32E-04	1.92E-04	7.91E-05	7.59E-03	7.91E-03	3.42E-03
2013	2.23E-04	1.80E-04	6.71E-05	7.33E-03	7.35E-03	2.85E-03
2014	2.10E-04	1.62E-04	6.20E-05	6.99E-03	6.58E-03	2.64E-03
2015	1.92E-04	1.56E-04	5.77E-05	6.30E-03	6.39E-03	2.46E-03
2016	1.83E-04	1.55E-04	6.71E-05	6.00E-03	6.33E-03	2.92E-03
2017	1.72E-04	1.25E-04	4.78E-05	5.69E-03	4.99E-03	2.03E-03
2018	1.60E-04	1.23E-04	4.42E-05	5.26E-03	4.96E-03	1.88E-03

TABLE 3-57: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE BELTED KINGFISHER FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	3.38E-03	1.21E-03	8.43E-04	1.47E-01	5.34E-02	3.84E-02
1994	1.71E-03	9.37E-04	5.67E-04	6.77E-02	4.05E-02	2.53E-02
1995	1.55E-03	1.09E-03	7.40E-04	6.09E-02	4.80E-02	3.37E-02
1996	1.62E-03	7.04E-04	5.03E-04	6.54E-02	2.99E-02	2.26E-02
1997	1.37E-03	6.14E-04	4.12E-04	5.43E-02	2.59E-02	1.84E-02
1998	1.11E-03	5.63E-04	3.49E-04	4.28E-02	2.38E-02	1.56E-02
1999	1.01E-03	4.43E-04	2.41E-04	3.92E-02	1.83E-02	1.05E-02
2000	9.00E-04	4.12E-04	2.28E-04	3.45E-02	1.71E-02	1.00E-02
2001	8.38E-04	4.35E-04	2.64E-04	3.20E-02	1.83E-02	1.18E-02
2002	7.96E-04	4.16E-04	2.34E-04	3.05E-02	1.75E-02	1.04E-02
2003	7.54E-04	3.53E-04	2.20E-04	2.90E-02	1.46E-02	9.78E-03
2004	6.95E-04	3.35E-04	2.20E-04	2.68E-02	1.38E-02	9.86E-03
2005	6.49E-04	2.81E-04	1.70E-04	2.51E-02	1.15E-02	7.55E-03
2006	5.79E-04	2.92E-04	1.75E-04	2.19E-02	1.21E-02	7.83E-03
2007	5.71E-04	2.67E-04	1.47E-04	2.19E-02	1.10E-02	6.54E-03
2008	5.09E-04	2.35E-04	1.26E-04	1.93E-02	9.59E-03	5.56E-03
2009	5.04E-04	2.55E-04	1.62E-04	1.93E-02	1.06E-02	7.27E-03
2010	4.85E-04	2.52E-04	1.39E-04	1.87E-02	1.05E-02	6.23E-03
2011	4.26E-04	1.96E-04	1.18E-04	1.64E-02	8.00E-03	5.27E-03
2012	3.89E-04	2.31E-04	1.32E-04	1.49E-02	9.80E-03	5.96E-03
2013	3.70E-04	2.10E-04	1.12E-04	1.42E-02	8.83E-03	5.03E-03
2014	3.49E-04	1.92E-04	1.05E-04	1.35E-02	8.07E-03	4.73E-03
2015	3.15E-04	1.82E-04	9.05E-05	1.21E-02	7.64E-03	4.04E-03
2016	2.97E-04	1.91E-04	1.41E-04	1.13E-02	8.08E-03	6.47E-03
2017	2.99E-04	1.49E-04	9.05E-05	1.17E-02	6.13E-03	4.09E-03
2018	2.73E-04	1.45E-04	7.30E-05	1.06E-02	6.03E-03	3.27E-03

TABLE 3-58: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	2.73E-08	8.32E-04	1.07E-06	2.91E-05	8.62E-04	1.02E-01
Stillwater (168)	4.85E-08	2.81E-04	1.87E-06	7.61E-05	3.59E-04	3.44E-02
Federal Dam (154)	3.39E-08	6.59E-05	4.46E-07	6.85E-06	7.32E-05	8.08E-03
Lower River						
143.5	2.62E-08	7.66E-05	6.22E-08	2.11E-06	7.88E-05	9.40E-03
137.2	2.62E-08	1.55E-04	1.22E-07	3.73E-06	1.59E-04	1.90E-02
122.4	1.20E-08	5.92E-05	6.77E-08	2.36E-06	6.16E-05	7.25E-03
113.8	1.20E-08	6.20E-05	6.97E-08	2.48E-06	6.46E-05	7.61E-03
100	1.20E-08	2.69E-05	3.20E-08	9.79E-07	2.79E-05	3.30E-03
88.9	7.91E-09	5.35E-05	1.61E-08	1.92E-06	5.54E-05	6.56E-03
58.7	7.91E-09	5.83E-05	4.95E-08	6.18E-07	5.90E-05	7.15E-03
47.3	7.91E-09	5.19E-05	5.61E-08	3.77E-06	5.57E-05	6.36E-03
25.8	7.91E-09	3.90E-05	1.66E-08	1.42E-06	4.05E-05	4.78E-03

TABLE 3-59: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water 95% UCL	Forage Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Average Daily Dose$_{95\%UCL}$ (mg/Kg/day)	Total Concentration in Eggs (mg/Kg)
Upper River						
Thompson Island Pool (189)	8.64E-08	1.70E-03	1.87E-06	4.26E-05	1.74E-03	2.08E-01
Stillwater (168)	1.54E-07	4.02E-04	8.77E-06	1.33E-04	5.43E-04	4.92E-02
Federal Dam (154)	7.27E-08	9.57E-05	7.59E-07	1.15E-05	1.08E-04	1.17E-02
Lower River						
143.5	2.85E-07	9.20E-05	1.53E-07	2.31E-06	9.48E-05	1.13E-02
137.2	2.85E-07	3.36E-04	4.97E-07	7.53E-06	3.45E-04	4.12E-02
122.4	1.54E-07	9.57E-05	1.70E-07	2.62E-06	9.87E-05	1.17E-02
113.8	1.54E-07	6.44E-05	2.70E-07	4.09E-06	6.89E-05	7.89E-03
100	1.54E-07	4.64E-05	2.19E-07	2.11E-05	6.79E-05	5.69E-03
88.9	3.51E-08	7.34E-05	2.85E-08	5.60E-06	7.90E-05	8.99E-03
58.7	3.51E-08	6.61E-05	4.53E-07	6.86E-06	7.34E-05	8.10E-03
47.3	3.51E-08	6.87E-05	4.12E-07	1.47E-05	8.39E-05	8.43E-03
25.8	3.51E-08	4.69E-05	2.82E-08	3.84E-06	5.08E-05	5.75E-03

TABLE 3-60: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	9.25E-04	4.38E-04	2.20E-04	1.05E-01	5.09E-02	2.57E-02
1994	4.62E-04	3.55E-04	1.66E-04	4.84E-02	4.08E-02	1.92E-02
1995	4.27E-04	3.93E-04	1.98E-04	4.47E-02	4.56E-02	2.31E-02
1996	4.38E-04	2.61E-04	1.28E-04	4.68E-02	2.97E-02	1.47E-02
1997	3.28E-04	2.30E-04	1.19E-04	3.38E-02	2.61E-02	1.37E-02
1998	2.81E-04	2.05E-04	9.59E-05	2.87E-02	2.32E-02	1.10E-02
1999	2.42E-04	1.62E-04	7.06E-05	2.43E-02	1.82E-02	8.02E-03
2000	1.98E-04	1.50E-04	6.19E-05	1.94E-02	1.68E-02	7.04E-03
2001	1.93E-04	1.61E-04	7.22E-05	1.91E-02	1.81E-02	8.34E-03
2002	1.80E-04	1.55E-04	6.61E-05	1.78E-02	1.75E-02	7.61E-03
2003	1.73E-04	1.30E-04	5.85E-05	1.72E-02	1.44E-02	6.71E-03
2004	1.51E-04	1.25E-04	5.80E-05	1.49E-02	1.40E-02	6.69E-03
2005	1.47E-04	1.02E-04	4.67E-05	1.46E-02	1.13E-02	5.34E-03
2006	1.27E-04	1.07E-04	4.65E-05	1.23E-02	1.20E-02	5.34E-03
2007	1.27E-04	9.73E-05	3.86E-05	1.25E-02	1.09E-02	4.41E-03
2008	1.15E-04	8.55E-05	3.41E-05	1.12E-02	9.47E-03	3.88E-03
2009	1.11E-04	9.32E-05	4.11E-05	1.08E-02	1.05E-02	4.75E-03
2010	1.08E-04	9.36E-05	3.74E-05	1.07E-02	1.06E-02	4.31E-03
2011	1.02E-04	7.04E-05	3.02E-05	1.03E-02	7.80E-03	3.46E-03
2012	8.88E-05	8.47E-05	3.64E-05	8.81E-03	9.60E-03	4.23E-03
2013	8.58E-05	7.88E-05	3.05E-05	8.55E-03	8.90E-03	3.51E-03
2014	8.14E-05	7.06E-05	2.82E-05	8.17E-03	7.95E-03	3.26E-03
2015	7.38E-05	6.84E-05	2.62E-05	7.34E-03	7.71E-03	3.03E-03
2016	7.03E-05	6.80E-05	3.11E-05	6.99E-03	7.67E-03	3.63E-03
2017	6.64E-05	5.35E-05	2.17E-05	6.65E-03	5.96E-03	2.51E-03
2018	6.12E-05	5.31E-05	2.00E-05	6.10E-03	5.95E-03	2.31E-03

TABLE 3-61: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE GREAT BLUE HERON FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	1.57E-03	5.58E-04	2.89E-04	1.84E-01	6.55E-02	3.42E-02
1994	7.38E-04	4.21E-04	2.05E-04	8.17E-02	4.89E-02	2.40E-02
1995	6.66E-04	5.02E-04	2.57E-04	7.35E-02	5.89E-02	3.04E-02
1996	7.11E-04	3.11E-04	1.69E-04	7.98E-02	3.57E-02	1.98E-02
1997	5.93E-04	2.69E-04	1.48E-04	6.58E-02	3.09E-02	1.73E-02
1998	4.69E-04	2.48E-04	1.22E-04	5.14E-02	2.84E-02	1.42E-02
1999	4.29E-04	1.90E-04	8.65E-05	4.69E-02	2.15E-02	9.96E-03
2000	3.79E-04	1.77E-04	7.87E-05	4.14E-02	2.00E-02	9.09E-03
2001	3.52E-04	1.89E-04	9.22E-05	3.82E-02	2.16E-02	1.08E-02
2002	3.34E-04	1.81E-04	8.29E-05	3.64E-02	2.07E-02	9.66E-03
2003	3.18E-04	1.51E-04	7.54E-05	3.47E-02	1.70E-02	8.78E-03
2004	2.93E-04	1.44E-04	7.54E-05	3.21E-02	1.62E-02	8.81E-03
2005	2.74E-04	1.18E-04	5.93E-05	3.00E-02	1.33E-02	6.88E-03
2006	2.41E-04	1.25E-04	6.01E-05	2.61E-02	1.42E-02	7.01E-03
2007	2.40E-04	1.14E-04	5.01E-05	2.62E-02	1.28E-02	5.81E-03
2008	2.12E-04	9.90E-05	4.35E-05	2.30E-02	1.11E-02	5.03E-03
2009	2.12E-04	1.10E-04	5.45E-05	2.31E-02	1.25E-02	6.38E-03
2010	2.05E-04	1.09E-04	4.81E-05	2.25E-02	1.25E-02	5.63E-03
2011	1.80E-04	8.27E-05	3.97E-05	1.97E-02	9.28E-03	4.62E-03
2012	1.64E-04	1.02E-04	4.64E-05	1.79E-02	1.17E-02	5.46E-03
2013	1.56E-04	9.17E-05	3.90E-05	1.70E-02	1.05E-02	4.56E-03
2014	1.48E-04	8.36E-05	3.64E-05	1.62E-02	9.53E-03	4.26E-03
2015	1.32E-04	7.91E-05	3.25E-05	1.44E-02	9.01E-03	3.80E-03
2016	1.25E-04	8.39E-05	4.43E-05	1.36E-02	9.62E-03	5.25E-03
2017	1.28E-04	6.33E-05	2.96E-05	1.41E-02	7.15E-03	3.47E-03
2018	1.15E-04	6.22E-05	2.55E-05	1.26E-02	7.04E-03	2.98E-03

TABLE 3-62: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water Expected	Piscivorous Fish Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)	Average Concentration in Eggs (mg/Kg)
Upper River				
Thompson Island Pool (189)	2.06E-08	3.09E-03	3.09E-03	4.61E-01
Stillwater (168)	3.67E-08	5.49E-04	5.49E-04	8.19E-02
Federal Dam (154)	2.56E-08	3.98E-04	3.99E-04	5.94E-02
Lower River				
143.5	1.98E-08	3.98E-04	3.98E-04	5.94E-02
137.2	1.98E-08	1.50E-03	1.50E-03	2.24E-01
122.4	9.08E-09	3.50E-04	3.50E-04	5.22E-02
113.8	9.08E-09	3.17E-04	3.17E-04	4.72E-02
100	9.08E-09	3.64E-04	3.64E-04	5.42E-02
88.9	5.98E-09	2.34E-04	2.34E-04	3.49E-02
58.7	5.98E-09	2.72E-04	2.72E-04	4.06E-02
47.3	5.98E-09	3.12E-04	3.12E-04	4.65E-02
25.8	5.98E-09	2.20E-04	2.20E-04	3.28E-02

TABLE 3-63: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE BASED ON 1993 DATA ON TEQ BASIS

Location	Drinking Water 95% UCL	Piscivorous Fish 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)	Upper Bound Concentration in Eggs (95% UCL) (mg/Kg)
Upper River				
Thompson Island Pool (189)	6.53E-08	5.98E-03	5.98E-03	8.92E-01
Stillwater (168)	1.16E-07	7.07E-04	7.08E-04	1.05E-01
Federal Dam (154)	5.49E-08	7.16E-04	7.16E-04	1.07E-01
Lower River				
143.5	2.16E-07	7.16E-04	7.16E-04	1.07E-01
137.2	2.16E-07	3.58E-03	3.58E-03	5.33E-01
122.4	1.16E-07	4.81E-04	4.82E-04	7.18E-02
113.8	1.16E-07	4.43E-04	4.43E-04	6.60E-02
100	1.16E-07	1.12E-03	1.12E-03	1.68E-01
88.9	2.66E-08	4.46E-04	4.46E-04	6.64E-02
58.7	2.66E-08	4.03E-04	4.03E-04	6.01E-02
47.3	2.66E-08	8.39E-04	8.39E-04	1.25E-01
25.8	2.66E-08	4.37E-04	4.37E-04	6.52E-02

TABLE 3-64: SUMMARY OF $ADD_{Expected}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

	Average Dietary Dose (mg/Kg/day)			Average Egg Concentration (mg/Kg)		
Year	189	168	154	189	168	154
1993	1.71E-03	1.29E-03	6.36E-04	2.56E-01	1.93E-01	9.49E-02
1994	1.04E-03	8.90E-04	4.51E-04	1.55E-01	1.33E-01	6.72E-02
1995	1.15E-03	9.88E-04	4.87E-04	1.71E-01	1.47E-01	7.27E-02
1996	1.05E-03	7.94E-04	4.28E-04	1.56E-01	1.18E-01	6.38E-02
1997	8.16E-04	6.95E-04	3.69E-04	1.22E-01	1.04E-01	5.50E-02
1998	6.81E-04	6.25E-04	3.10E-04	1.02E-01	9.32E-02	4.62E-02
1999	5.92E-04	5.10E-04	2.36E-04	8.83E-02	7.61E-02	3.52E-02
2000	5.54E-04	4.82E-04	2.25E-04	8.25E-02	7.18E-02	3.36E-02
2001	5.17E-04	4.64E-04	2.16E-04	7.71E-02	6.91E-02	3.22E-02
2002	5.10E-04	4.94E-04	2.30E-04	7.60E-02	7.37E-02	3.43E-02
2003	4.45E-04	4.15E-04	1.96E-04	6.64E-02	6.19E-02	2.92E-02
2004	4.17E-04	4.04E-04	2.02E-04	6.22E-02	6.03E-02	3.02E-02
2005	3.70E-04	3.09E-04	1.53E-04	5.52E-02	4.61E-02	2.27E-02
2006	3.64E-04	3.37E-04	1.61E-04	5.43E-02	5.02E-02	2.40E-02
2007	3.36E-04	2.81E-04	1.25E-04	5.01E-02	4.20E-02	1.86E-02
2008	3.17E-04	2.54E-04	1.21E-04	4.73E-02	3.79E-02	1.80E-02
2009	3.21E-04	2.74E-04	1.30E-04	4.78E-02	4.09E-02	1.94E-02
2010	2.82E-04	2.50E-04	1.09E-04	4.20E-02	3.73E-02	1.62E-02
2011	2.47E-04	2.13E-04	1.05E-04	3.68E-02	3.18E-02	1.57E-02
2012	2.45E-04	2.16E-04	1.03E-04	3.65E-02	3.22E-02	1.53E-02
2013	2.36E-04	2.25E-04	9.89E-05	3.51E-02	3.35E-02	1.47E-02
2014	2.14E-04	2.14E-04	9.04E-05	3.19E-02	3.19E-02	1.35E-02
2015	1.96E-04	1.88E-04	8.34E-05	2.93E-02	2.80E-02	1.24E-02
2016	2.00E-04	2.11E-04	8.98E-05	2.99E-02	3.14E-02	1.34E-02
2017	1.72E-04	1.60E-04	7.37E-05	2.57E-02	2.38E-02	1.10E-02
2018	1.67E-04	1.53E-04	6.69E-05	2.49E-02	2.28E-02	9.97E-03

TABLE 3-65: SUMMARY OF $ADD_{95\%UCL}$ AND EGG CONCENTRATIONS FOR FEMALE EAGLE FOR THE PERIOD 1993 - 2018 ON TEQ BASIS

Year	95% UCL Dietary Dose (mg/Kg/day)			95% UCL Egg Concentration (mg/Kg)		
	189	168	154	189	168	154
1993	2.15E-03	1.58E-03	7.93E-04	3.21E-01	2.35E-01	1.18E-01
1994	1.40E-03	1.07E-03	5.56E-04	2.09E-01	1.60E-01	8.28E-02
1995	1.54E-03	1.19E-03	5.93E-04	2.29E-01	1.77E-01	8.83E-02
1996	1.51E-03	9.68E-04	5.40E-04	2.25E-01	1.44E-01	8.05E-02
1997	1.18E-03	8.37E-04	4.62E-04	1.75E-01	1.25E-01	6.89E-02
1998	9.69E-04	7.60E-04	3.81E-04	1.44E-01	1.13E-01	5.67E-02
1999	8.79E-04	6.31E-04	2.98E-04	1.31E-01	9.41E-02	4.44E-02
2000	8.23E-04	5.89E-04	2.78E-04	1.23E-01	8.78E-02	4.14E-02
2001	7.64E-04	5.69E-04	2.69E-04	1.14E-01	8.49E-02	4.01E-02
2002	7.51E-04	6.05E-04	2.88E-04	1.12E-01	9.02E-02	4.30E-02
2003	6.64E-04	5.13E-04	2.47E-04	9.89E-02	7.64E-02	3.68E-02
2004	6.14E-04	4.96E-04	2.54E-04	9.15E-02	7.39E-02	3.78E-02
2005	5.58E-04	3.78E-04	1.91E-04	8.32E-02	5.63E-02	2.85E-02
2006	5.39E-04	4.13E-04	1.98E-04	8.04E-02	6.15E-02	2.94E-02
2007	5.07E-04	3.42E-04	1.53E-04	7.55E-02	5.10E-02	2.28E-02
2008	4.83E-04	3.13E-04	1.53E-04	7.20E-02	4.66E-02	2.28E-02
2009	4.69E-04	3.35E-04	1.64E-04	6.99E-02	5.00E-02	2.44E-02
2010	4.12E-04	3.07E-04	1.35E-04	6.14E-02	4.58E-02	2.01E-02
2011	3.75E-04	2.62E-04	1.34E-04	5.59E-02	3.91E-02	2.00E-02
2012	3.62E-04	2.66E-04	1.29E-04	5.40E-02	3.97E-02	1.93E-02
2013	3.49E-04	2.77E-04	1.25E-04	5.20E-02	4.12E-02	1.87E-02
2014	3.11E-04	2.62E-04	1.12E-04	4.64E-02	3.91E-02	1.67E-02
2015	2.88E-04	2.29E-04	1.05E-04	4.29E-02	3.41E-02	1.57E-02
2016	2.90E-04	2.58E-04	1.11E-04	4.32E-02	3.84E-02	1.66E-02
2017	2.61E-04	1.96E-04	9.71E-05	3.89E-02	2.93E-02	1.45E-02
2018	2.50E-04	1.89E-04	8.59E-05	3.72E-02	2.82E-02	1.28E-02

TABLE 3-66: SUMMARY OF $ADD_{Expected}$ FOR FEMALE BAT USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water Expected	Benthic Invertebrate Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River			
Thompson Island Pool (189)	1.14E-05	4.47E+00	4.47E+00
Stillwater (168)	2.03E-05	7.83E+00	7.83E+00
Federal Dam (154)	1.42E-05	1.87E+00	1.87E+00
Lower River			
143.5	1.10E-05	2.60E-01	2.60E-01
137.2	1.10E-05	5.12E-01	5.12E-01
122.4	5.02E-06	2.83E-01	2.83E-01
113.8	5.02E-06	2.91E-01	2.91E-01
100	5.02E-06	1.34E-01	1.34E-01
88.9	3.31E-06	6.71E-02	6.71E-02
58.7	3.31E-06	2.07E-01	2.07E-01
47.3	3.31E-06	2.35E-01	2.35E-01
25.8	3.31E-06	6.95E-02	6.95E-02

TABLE 3-67: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE BAT USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water 95% UCL	Benthic Invertebrate 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River			
Thompson Island Pool (189)	3.61E-05	7.82E+00	7.82E+00
Stillwater (168)	6.43E-05	3.67E+01	3.67E+01
Federal Dam (154)	3.04E-05	3.17E+00	3.17E+00
Lower River			
143.5	1.19E-04	6.38E-01	6.38E-01
137.2	1.19E-04	2.08E+00	2.08E+00
122.4	6.43E-05	7.12E-01	7.12E-01
113.8	6.43E-05	1.13E+00	1.13E+00
100	6.43E-05	9.15E-01	9.15E-01
88.9	1.47E-05	1.19E-01	1.19E-01
58.7	1.47E-05	1.89E+00	1.89E+00
47.3	1.47E-05	1.72E+00	1.72E+00
25.8	1.47E-05	1.18E-01	1.18E-01

TABLE 3-68: SUMMARY OF $ADD_{Expected}$ FOR FEMALE BAT BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	4.47E+00	1.76E+00	7.75E-01
1994	5.01E+00	1.68E+00	7.32E-01
1995	4.64E+00	1.57E+00	6.69E-01
1996	4.25E+00	1.42E+00	5.71E-01
1997	3.88E+00	1.28E+00	4.95E-01
1998	3.52E+00	1.16E+00	4.30E-01
1999	3.21E+00	1.06E+00	3.77E-01
2000	2.98E+00	9.96E-01	3.37E-01
2001	2.82E+00	9.68E-01	3.18E-01
2002	2.65E+00	9.28E-01	3.03E-01
2003	2.45E+00	8.75E-01	2.83E-01
2004	2.25E+00	8.01E-01	2.55E-01
2005	2.11E+00	7.42E-01	2.32E-01
2006	2.01E+00	7.04E-01	2.15E-01
2007	1.88E+00	6.56E-01	1.95E-01
2008	1.77E+00	6.19E-01	1.82E-01
2009	1.67E+00	5.92E-01	1.76E-01
2010	1.53E+00	5.52E-01	1.65E-01
2011	1.37E+00	5.08E-01	1.51E-01
2012	1.28E+00	4.86E-01	1.43E-01
2013	1.20E+00	4.62E-01	1.34E-01
2014	1.11E+00	4.32E-01	1.22E-01
2015	1.05E+00	4.18E-01	1.18E-01
2016	9.86E-01	3.97E-01	1.09E-01
2017	9.27E-01	3.73E-01	9.71E-02
2018	9.02E-01	3.62E-01	9.35E-02

TABLE 3-69: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE BAT BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	6.74E+00	2.02E+00	9.86E-01
1994	6.29E+00	1.92E+00	9.31E-01
1995	5.83E+00	1.80E+00	8.51E-01
1996	5.33E+00	1.63E+00	7.26E-01
1997	4.87E+00	1.47E+00	6.29E-01
1998	4.42E+00	1.33E+00	5.47E-01
1999	4.03E+00	1.21E+00	4.79E-01
2000	3.74E+00	1.14E+00	4.29E-01
2001	3.54E+00	1.11E+00	4.05E-01
2002	3.32E+00	1.07E+00	3.86E-01
2003	3.07E+00	1.00E+00	3.60E-01
2004	2.82E+00	9.20E-01	3.25E-01
2005	2.65E+00	8.52E-01	2.95E-01
2006	2.52E+00	8.08E-01	2.74E-01
2007	2.36E+00	7.53E-01	2.48E-01
2008	2.22E+00	7.10E-01	2.32E-01
2009	2.10E+00	6.79E-01	2.23E-01
2010	1.91E+00	6.34E-01	2.09E-01
2011	1.72E+00	5.83E-01	1.91E-01
2012	1.61E+00	5.58E-01	1.82E-01
2013	1.50E+00	5.30E-01	1.71E-01
2014	1.40E+00	4.96E-01	1.55E-01
2015	1.32E+00	4.80E-01	1.50E-01
2016	1.24E+00	4.55E-01	1.38E-01
2017	1.16E+00	4.28E-01	1.24E-01
2018	1.13E+00	4.16E-01	1.19E-01

TABLE 3-70: SUMMARY OF $ADD_{Expected}$ FOR FEMALE RACCOON USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	6.05E-06	9.38E-02	7.27E-01	5.51E-02	8.76E-01
Stillwater (168)	1.08E-05	1.26E-02	1.27E+00	1.44E-01	1.43E+00
Federal Dam (154)	7.51E-06	7.69E-03	3.03E-01	1.30E-02	3.24E-01
Lower River					
143.5	5.81E-06	8.92E-03	4.22E-02	3.99E-03	5.52E-02
137.2	5.81E-06	1.79E-02	8.32E-02	7.05E-03	1.08E-01
122.4	2.66E-06	6.82E-03	4.60E-02	4.47E-03	5.73E-02
113.8	2.66E-06	7.24E-03	4.73E-02	4.68E-03	5.92E-02
100	2.66E-06	3.11E-03	2.18E-02	1.85E-03	2.67E-02
88.9	1.75E-06	6.18E-03	1.09E-02	3.62E-03	2.07E-02
58.7	1.75E-06	6.79E-03	3.36E-02	1.17E-03	4.16E-02
47.3	1.75E-06	6.03E-03	3.81E-02	7.14E-03	5.13E-02
25.8	1.75E-06	4.55E-03	1.13E-02	2.68E-03	1.85E-02

TABLE 3-71: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE RACCOON USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water 95% UCL	Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	1.92E-05	1.43E-01	1.27E+00	8.07E-02	1.50E+00
Stillwater (168)	3.41E-05	2.32E-02	5.96E+00	2.51E-01	6.24E+00
Federal Dam (154)	1.61E-05	1.10E-02	5.15E-01	2.17E-02	5.48E-01
Lower River					
143.5	6.33E-05	1.06E-02	1.04E-01	4.37E-03	1.19E-01
137.2	6.33E-05	3.80E-02	3.38E-01	1.42E-02	3.90E-01
122.4	3.41E-05	1.07E-02	1.16E-01	4.96E-03	1.31E-01
113.8	3.41E-05	7.51E-03	1.83E-01	7.74E-03	1.99E-01
100	3.41E-05	5.28E-03	1.49E-01	4.00E-02	1.94E-01
88.9	7.79E-06	8.11E-03	1.94E-02	1.06E-02	3.81E-02
58.7	7.79E-06	7.65E-03	3.07E-01	1.30E-02	3.28E-01
47.3	7.79E-06	7.94E-03	2.80E-01	2.78E-02	3.16E-01
25.8	7.79E-06	5.45E-03	1.92E-02	7.25E-03	3.19E-02

TABLE 3-72: SUMMARY OF $ADD_{Expected}$ FOR FEMALE RACCOON BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	8.93E-01	3.44E-01	1.84E-01
1994	9.68E-01	3.27E-01	1.74E-01
1995	9.03E-01	3.09E-01	1.60E-01
1996	8.21E-01	2.76E-01	1.36E-01
1997	7.51E-01	2.51E-01	1.18E-01
1998	6.79E-01	2.24E-01	1.02E-01
1999	6.20E-01	2.05E-01	8.99E-02
2000	5.73E-01	1.92E-01	8.04E-02
2001	5.43E-01	1.88E-01	7.57E-02
2002	5.10E-01	1.80E-01	7.20E-02
2003	4.72E-01	1.70E-01	6.76E-02
2004	4.33E-01	1.56E-01	6.10E-02
2005	4.06E-01	1.43E-01	5.53E-02
2006	3.87E-01	1.37E-01	5.14E-02
2007	3.62E-01	1.27E-01	4.67E-02
2008	3.40E-01	1.19E-01	4.33E-02
2009	3.22E-01	1.15E-01	4.19E-02
2010	2.95E-01	1.07E-01	3.95E-02
2011	2.65E-01	9.81E-02	3.60E-02
2012	2.46E-01	9.44E-02	3.44E-02
2013	2.31E-01	8.98E-02	3.23E-02
2014	2.14E-01	8.39E-02	2.93E-02
2015	2.03E-01	8.09E-02	2.82E-02
2016	1.90E-01	7.73E-02	2.63E-02
2017	1.78E-01	7.20E-02	2.32E-02
2018	1.73E-01	6.99E-02	2.24E-02

TABLE 3-73: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE RACCOON BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose		
	189	168	154
1993	1.27E+00	3.87E-01	1.85E-01
1994	1.18E+00	3.68E-01	1.74E-01
1995	1.10E+00	3.47E-01	1.61E-01
1996	1.00E+00	3.10E-01	1.36E-01
1997	9.19E-01	2.82E-01	1.18E-01
1998	8.32E-01	2.53E-01	1.03E-01
1999	7.59E-01	2.31E-01	9.01E-02
2000	7.02E-01	2.17E-01	8.06E-02
2001	6.65E-01	2.12E-01	7.58E-02
2002	6.25E-01	2.02E-01	7.22E-02
2003	5.78E-01	1.91E-01	6.77E-02
2004	5.31E-01	1.76E-01	6.11E-02
2005	4.98E-01	1.62E-01	5.54E-02
2006	4.74E-01	1.54E-01	5.15E-02
2007	4.44E-01	1.43E-01	4.68E-02
2008	4.17E-01	1.35E-01	4.34E-02
2009	3.94E-01	1.29E-01	4.23E-02
2010	3.61E-01	1.21E-01	3.96E-02
2011	3.24E-01	1.11E-01	3.61E-02
2012	3.02E-01	1.06E-01	3.45E-02
2013	2.83E-01	1.01E-01	3.23E-02
2014	2.63E-01	9.45E-02	2.94E-02
2015	2.48E-01	9.12E-02	2.82E-02
2016	2.33E-01	8.70E-02	2.63E-02
2017	2.18E-01	8.11E-02	2.33E-02
2018	2.12E-01	7.88E-02	2.24E-02

TABLE 3-74: SUMMARY OF $ADD_{Expected}$ FOR FEMALE MINK USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	7.45E-06	1.09E+00	3.33E-01	8.44E-03	1.43E+00
Stillwater (168)	1.32E-05	1.46E-01	5.83E-01	2.21E-02	7.52E-01
Federal Dam (154)	9.25E-06	8.96E-02	1.39E-01	1.99E-03	2.31E-01
Lower River					
143.5	7.16E-06	1.04E-01	1.94E-02	6.12E-04	1.24E-01
137.2	7.16E-06	2.09E-01	3.81E-02	1.08E-03	2.48E-01
122.4	3.28E-06	7.94E-02	2.11E-02	6.84E-04	1.01E-01
113.8	3.28E-06	8.43E-02	2.17E-02	7.17E-04	1.07E-01
100	3.28E-06	3.63E-02	9.97E-03	2.84E-04	4.65E-02
88.9	2.16E-06	7.20E-02	5.00E-03	5.55E-04	7.75E-02
58.7	2.16E-06	7.91E-02	1.54E-02	1.79E-04	9.47E-02
47.3	2.16E-06	7.03E-02	1.75E-02	1.09E-03	8.89E-02
25.8	2.16E-06	5.30E-02	5.18E-03	4.11E-04	5.86E-02

TABLE 3-75: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE MINK USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water 95% UCL	Forage Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	2.36E-05	1.67E+00	5.83E-01	1.24E-02	2.26E+00
Stillwater (168)	4.20E-05	2.70E-01	2.73E+00	3.85E-02	3.04E+00
Federal Dam (154)	1.98E-05	1.29E-01	2.36E-01	3.33E-03	3.68E-01
Lower River					
143.5	7.80E-05	1.23E-01	4.75E-02	6.69E-04	1.71E-01
137.2	7.80E-05	4.42E-01	1.55E-01	2.18E-03	6.00E-01
122.4	4.20E-05	1.25E-01	5.30E-02	7.60E-04	1.79E-01
113.8	4.20E-05	8.75E-02	8.41E-02	1.19E-03	1.73E-01
100	4.20E-05	6.15E-02	6.82E-02	6.12E-03	1.36E-01
88.9	9.59E-06	9.46E-02	8.89E-03	1.62E-03	1.05E-01
58.7	9.59E-06	8.91E-02	1.41E-01	1.99E-03	2.32E-01
47.3	9.59E-06	9.25E-02	1.28E-01	4.26E-03	2.25E-01
25.8	9.59E-06	6.35E-02	8.78E-03	1.11E-03	7.34E-02

TABLE 3-76: SUMMARY OF $ADD_{Expected}$ FOR FEMALE MINK BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	7.25E-01	3.16E-01	1.16E-01
1994	7.40E-01	2.99E-01	1.11E-01
1995	7.29E-01	2.89E-01	1.09E-01
1996	6.23E-01	2.30E-01	8.59E-02
1997	5.56E-01	2.28E-01	7.67E-02
1998	4.93E-01	1.78E-01	6.50E-02
1999	4.53E-01	1.69E-01	5.82E-02
2000	4.17E-01	1.51E-01	5.42E-02
2001	3.98E-01	1.58E-01	4.98E-02
2002	3.70E-01	1.45E-01	4.67E-02
2003	3.43E-01	1.37E-01	4.56E-02
2004	3.15E-01	1.28E-01	4.03E-02
2005	2.97E-01	1.14E-01	3.72E-02
2006	2.83E-01	1.13E-01	3.46E-02
2007	2.63E-01	1.01E-01	3.29E-02
2008	2.48E-01	9.30E-02	2.86E-02
2009	2.36E-01	9.47E-02	3.01E-02
2010	2.15E-01	8.72E-02	2.86E-02
2011	1.92E-01	7.65E-02	2.58E-02
2012	1.81E-01	8.11E-02	2.70E-02
2013	1.70E-01	7.38E-02	2.36E-02
2014	1.58E-01	7.07E-02	2.22E-02
2015	1.49E-01	6.65E-02	2.16E-02
2016	1.40E-01	6.55E-02	2.11E-02
2017	1.31E-01	5.67E-02	1.72E-02
2018	1.27E-01	5.74E-02	1.75E-02

TABLE 3-77: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE MINK BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	9.25E-01	3.44E-01	1.36E-01
1994	8.63E-01	3.26E-01	1.30E-01
1995	8.47E-01	3.15E-01	1.27E-01
1996	7.29E-01	2.53E-01	1.01E-01
1997	6.52E-01	2.48E-01	8.92E-02
1998	5.81E-01	1.97E-01	7.61E-02
1999	5.33E-01	1.86E-01	6.79E-02
2000	4.92E-01	1.66E-01	6.27E-02
2001	4.69E-01	1.73E-01	5.80E-02
2002	4.36E-01	1.60E-01	5.45E-02
2003	4.05E-01	1.51E-01	5.27E-02
2004	3.72E-01	1.40E-01	4.68E-02
2005	3.49E-01	1.26E-01	4.31E-02
2006	3.33E-01	1.24E-01	4.00E-02
2007	3.10E-01	1.12E-01	3.79E-02
2008	2.92E-01	1.03E-01	3.33E-02
2009	2.78E-01	1.04E-01	3.45E-02
2010	2.53E-01	9.61E-02	3.28E-02
2011	2.27E-01	8.46E-02	2.96E-02
2012	2.13E-01	8.88E-02	3.07E-02
2013	1.99E-01	8.12E-02	2.71E-02
2014	1.85E-01	7.75E-02	2.53E-02
2015	1.75E-01	7.31E-02	2.46E-02
2016	1.65E-01	7.17E-02	2.38E-02
2017	1.54E-01	6.26E-02	1.96E-02
2018	1.50E-01	6.31E-02	1.99E-02

TABLE 3-78: SUMMARY OF $ADD_{Expected}$ FOR FEMALE OTTER USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water Expected	Piscivorous Fish Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River				
Thompson Island Pool (189)	5.97E-06	1.16E+01	5.73E-03	1.16E+01
Stillwater (168)	1.06E-05	2.06E+00	1.50E-02	2.08E+00
Federal Dam (154)	7.42E-06	1.50E+00	1.35E-03	1.50E+00
Lower River				
143.5	5.74E-06	1.50E+00	4.15E-04	1.50E+00
137.2	5.74E-06	5.65E+00	7.32E-04	5.65E+00
122.4	2.63E-06	1.32E+00	4.64E-04	1.32E+00
113.8	2.63E-06	1.19E+00	4.87E-04	1.19E+00
100	2.63E-06	1.37E+00	1.92E-04	1.37E+00
88.9	1.73E-06	8.81E-01	3.76E-04	8.81E-01
58.7	1.73E-06	1.02E+00	1.21E-04	1.02E+00
47.3	1.73E-06	1.17E+00	7.41E-04	1.17E+00
25.8	1.73E-06	8.27E-01	2.79E-04	8.28E-01

TABLE 3-79: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE OTTER USING 1993 DATA BASED ON TRI+ CONGENERS

Location	Drinking Water 95% UCL	Piscivorous Fish 95% UCL	Sediment 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River				
Thompson's Island Pool (189)	1.89E-05	2.25E+01	8.38E-03	2.25E+01
Stillwater (168)	3.37E-05	2.66E+00	2.61E-02	2.69E+00
Federal Dam (154)	1.59E-05	2.69E+00	2.26E-03	2.69E+00
Lower River				
143.5	6.25E-05	2.69E+00	4.54E-04	2.69E+00
137.2	6.25E-05	1.34E+01	1.48E-03	1.34E+01
122.4	3.37E-05	1.81E+00	5.16E-04	1.81E+00
113.8	3.37E-05	1.67E+00	8.04E-04	1.67E+00
100	3.37E-05	4.22E+00	4.15E-03	4.23E+00
88.9	7.69E-06	1.68E+00	1.10E-03	1.68E+00
58.7	7.69E-06	1.52E+00	1.35E-03	1.52E+00
47.3	7.69E-06	3.15E+00	2.89E-03	3.16E+00
25.8	7.69E-06	1.64E+00	7.54E-04	1.64E+00

TABLE 3-80: SUMMARY OF $ADD_{Expected}$ FOR FEMALE OTTER BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	6.46E+00	4.87E+00	2.39E+00
1994	3.93E+00	3.35E+00	1.70E+00
1995	4.33E+00	3.72E+00	1.83E+00
1996	3.95E+00	2.99E+00	1.61E+00
1997	3.08E+00	2.62E+00	1.39E+00
1998	2.57E+00	2.35E+00	1.17E+00
1999	2.24E+00	1.92E+00	8.89E-01
2000	2.09E+00	1.81E+00	8.47E-01
2001	1.95E+00	1.75E+00	8.14E-01
2002	1.92E+00	1.86E+00	8.65E-01
2003	1.68E+00	1.56E+00	7.38E-01
2004	1.57E+00	1.52E+00	7.61E-01
2005	1.40E+00	1.16E+00	5.74E-01
2006	1.37E+00	1.27E+00	6.05E-01
2007	1.27E+00	1.06E+00	4.69E-01
2008	1.20E+00	9.56E-01	4.54E-01
2009	1.21E+00	1.03E+00	4.89E-01
2010	1.06E+00	9.42E-01	4.09E-01
2011	9.32E-01	8.03E-01	3.97E-01
2012	9.25E-01	8.13E-01	3.86E-01
2013	8.88E-01	8.46E-01	3.72E-01
2014	8.08E-01	8.06E-01	3.40E-01
2015	7.40E-01	7.07E-01	3.14E-01
2016	7.55E-01	7.93E-01	3.38E-01
2017	6.50E-01	6.01E-01	2.77E-01
2018	6.30E-01	5.77E-01	2.52E-01

TABLE 3-81: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE OTTER BASED ON TRI+ PREDICTIONS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	8.10E+00	5.94E+00	2.98E+00
1994	5.29E+00	4.03E+00	2.09E+00
1995	5.79E+00	4.46E+00	2.23E+00
1996	5.69E+00	3.64E+00	2.03E+00
1997	4.43E+00	3.15E+00	1.74E+00
1998	3.65E+00	2.86E+00	1.43E+00
1999	3.31E+00	2.37E+00	1.12E+00
2000	3.10E+00	2.22E+00	1.05E+00
2001	2.88E+00	2.14E+00	1.01E+00
2002	2.83E+00	2.28E+00	1.08E+00
2003	2.50E+00	1.93E+00	9.27E-01
2004	2.31E+00	1.87E+00	9.54E-01
2005	2.10E+00	1.42E+00	7.18E-01
2006	2.03E+00	1.55E+00	7.43E-01
2007	1.91E+00	1.29E+00	5.76E-01
2008	1.82E+00	1.18E+00	5.75E-01
2009	1.77E+00	1.26E+00	6.16E-01
2010	1.55E+00	1.16E+00	5.07E-01
2011	1.41E+00	9.86E-01	5.03E-01
2012	1.37E+00	1.00E+00	4.86E-01
2013	1.31E+00	1.04E+00	4.72E-01
2014	1.17E+00	9.88E-01	4.22E-01
2015	1.09E+00	8.61E-01	3.96E-01
2016	1.09E+00	9.69E-01	4.19E-01
2017	9.84E-01	7.39E-01	3.65E-01
2018	9.41E-01	7.11E-01	3.23E-01

TABLE 3-82: SUMMARY OF $ADD_{Expected}$ FOR FEMALE BAT USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water Expected	Benthic Invertebrate Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River			
Thompson Island Pool (189)	7.21E-08	1.33E-04	1.33E-04
Stillwater (168)	1.28E-07	2.32E-04	2.32E-04
Federal Dam (154)	8.96E-08	5.54E-05	5.54E-05
Lower River			
143.5	6.93E-08	7.71E-06	7.78E-06
137.2	6.93E-08	1.52E-05	1.53E-05
122.4	3.18E-08	8.40E-06	8.43E-06
113.8	3.18E-08	8.64E-06	8.67E-06
100	3.18E-08	3.97E-06	4.00E-06
88.9	2.09E-08	1.99E-06	2.01E-06
58.7	2.09E-08	6.13E-06	6.15E-06
47.3	2.09E-08	6.96E-06	6.98E-06
25.8	2.09E-08	2.06E-06	2.08E-06

TABLE 3-83: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE BAT USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water 95% UCL	Benthic Invertebrate 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River			
Thompson Island Pool (189)	2.28E-07	2.32E-04	2.32E-04
Stillwater (168)	4.07E-07	1.09E-03	1.09E-03
Federal Dam (154)	1.92E-07	9.41E-05	9.43E-05
Lower River			
143.5	7.55E-07	1.89E-05	1.97E-05
137.2	7.55E-07	6.17E-05	6.24E-05
122.4	4.07E-07	2.11E-05	2.15E-05
113.8	4.07E-07	3.35E-05	3.39E-05
100	4.07E-07	2.71E-05	2.76E-05
88.9	9.29E-08	3.54E-06	3.63E-06
58.7	9.29E-08	5.61E-05	5.62E-05
47.3	9.29E-08	5.11E-05	5.12E-05
25.8	9.29E-08	3.50E-06	3.59E-06

TABLE 3-84: SUMMARY OF $ADD_{Expected}$ FOR FEMALE BAT ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	1.33E-04	5.22E-05	2.31E-05
1994	1.49E-04	4.98E-05	2.18E-05
1995	1.38E-04	4.67E-05	1.99E-05
1996	1.26E-04	4.20E-05	1.70E-05
1997	1.15E-04	3.80E-05	1.47E-05
1998	1.04E-04	3.44E-05	1.28E-05
1999	9.53E-05	3.14E-05	1.12E-05
2000	8.84E-05	2.96E-05	1.00E-05
2001	8.36E-05	2.88E-05	9.47E-06
2002	7.86E-05	2.76E-05	9.02E-06
2003	7.26E-05	2.60E-05	8.43E-06
2004	6.67E-05	2.38E-05	7.60E-06
2005	6.27E-05	2.20E-05	6.91E-06
2006	5.96E-05	2.09E-05	6.41E-06
2007	5.58E-05	1.95E-05	5.80E-06
2008	5.25E-05	1.84E-05	5.42E-06
2009	4.96E-05	1.76E-05	5.23E-06
2010	4.53E-05	1.64E-05	4.90E-06
2011	4.07E-05	1.51E-05	4.48E-06
2012	3.80E-05	1.44E-05	4.27E-06
2013	3.55E-05	1.37E-05	3.99E-06
2014	3.30E-05	1.28E-05	3.64E-06
2015	3.12E-05	1.24E-05	3.50E-06
2016	2.93E-05	1.18E-05	3.23E-06
2017	2.75E-05	1.11E-05	2.89E-06
2018	2.68E-05	1.08E-05	2.78E-06

TABLE 3-85: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE BAT ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	2.00E-04	5.99E-05	2.93E-05
1994	1.87E-04	5.71E-05	2.76E-05
1995	1.73E-04	5.36E-05	2.53E-05
1996	1.58E-04	4.83E-05	2.15E-05
1997	1.45E-04	4.36E-05	1.87E-05
1998	1.31E-04	3.94E-05	1.63E-05
1999	1.20E-04	3.60E-05	1.42E-05
2000	1.11E-04	3.40E-05	1.28E-05
2001	1.05E-04	3.30E-05	1.20E-05
2002	9.86E-05	3.17E-05	1.15E-05
2003	9.11E-05	2.98E-05	1.07E-05
2004	8.37E-05	2.73E-05	9.66E-06
2005	7.86E-05	2.53E-05	8.78E-06
2006	7.49E-05	2.40E-05	8.15E-06
2007	7.00E-05	2.24E-05	7.38E-06
2008	6.59E-05	2.11E-05	6.89E-06
2009	6.23E-05	2.02E-05	6.64E-06
2010	5.68E-05	1.88E-05	6.23E-06
2011	5.11E-05	1.73E-05	5.69E-06
2012	4.76E-05	1.66E-05	5.43E-06
2013	4.46E-05	1.57E-05	5.08E-06
2014	4.14E-05	1.47E-05	4.62E-06
2015	3.92E-05	1.43E-05	4.45E-06
2016	3.67E-05	1.35E-05	4.11E-06
2017	3.45E-05	1.27E-05	3.67E-06
2018	3.36E-05	1.24E-05	3.54E-06

TABLE 3-86: SUMMARY OF $ADD_{Expected}$ FOR FEMALE RACCOON USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	3.83E-08	4.02E-06	2.16E-05	4.29E-05	6.85E-05
Stillwater (168)	6.80E-08	5.39E-07	3.78E-05	1.12E-04	1.50E-04
Federal Dam (154)	4.75E-08	3.30E-07	9.00E-06	1.01E-05	1.95E-05
Lower River					
143.5	3.68E-08	3.83E-07	1.25E-06	3.11E-06	4.78E-06
137.2	3.68E-08	7.68E-07	2.47E-06	5.48E-06	8.76E-06
122.4	1.68E-08	2.93E-07	1.37E-06	3.47E-06	5.15E-06
113.8	1.68E-08	3.11E-07	1.40E-06	3.64E-06	5.37E-06
100	1.68E-08	1.34E-07	6.45E-07	1.44E-06	2.24E-06
88.9	1.11E-08	2.65E-07	3.24E-07	2.82E-06	3.42E-06
58.7	1.11E-08	2.91E-07	9.97E-07	9.09E-07	2.21E-06
47.3	1.11E-08	2.59E-07	1.13E-06	5.55E-06	6.95E-06
25.8	1.11E-08	1.95E-07	3.35E-07	2.09E-06	2.63E-06

TABLE 3-87: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE RACCOON USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water 95% UCL	Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Average Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	1.21E-07	6.14E-06	3.77E-05	6.27E-05	1.07E-04
Stillwater (168)	2.16E-07	9.94E-07	1.77E-04	1.96E-04	3.74E-04
Federal Dam (154)	1.02E-07	4.73E-07	1.53E-05	1.69E-05	3.28E-05
Lower River					
143.5	4.01E-07	4.53E-07	3.08E-06	3.40E-06	7.33E-06
137.2	4.01E-07	1.63E-06	1.00E-05	1.11E-05	2.31E-05
122.4	2.16E-07	4.60E-07	3.43E-06	3.86E-06	7.97E-06
113.8	2.16E-07	3.22E-07	5.44E-06	6.02E-06	1.20E-05
100	2.16E-07	2.27E-07	4.41E-06	3.11E-05	3.59E-05
88.9	4.93E-08	3.48E-07	5.75E-07	8.24E-06	9.22E-06
58.7	4.93E-08	3.28E-07	9.12E-06	1.01E-05	1.96E-05
47.3	4.93E-08	3.41E-07	8.31E-06	2.17E-05	3.04E-05
25.8	4.93E-08	2.34E-07	5.68E-07	5.64E-06	6.49E-06

TABLE 3-88: SUMMARY OF $ADD_{Expected}$ FOR FEMALE RACCOON ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	1.27E-04	4.27E-05	1.89E-05
1994	1.22E-04	4.03E-05	1.74E-05
1995	1.14E-04	3.88E-05	1.68E-05
1996	1.04E-04	3.47E-05	1.41E-05
1997	9.57E-05	3.16E-05	1.23E-05
1998	8.64E-05	2.83E-05	1.06E-05
1999	7.88E-05	2.59E-05	9.36E-06
2000	7.22E-05	2.38E-05	8.18E-06
2001	6.83E-05	2.33E-05	7.65E-06
2002	6.45E-05	2.24E-05	7.31E-06
2003	6.00E-05	2.13E-05	6.90E-06
2004	5.50E-05	1.97E-05	6.32E-06
2005	5.09E-05	1.78E-05	5.59E-06
2006	4.88E-05	1.71E-05	5.29E-06
2007	4.58E-05	1.59E-05	4.77E-06
2008	4.28E-05	1.49E-05	4.38E-06
2009	4.07E-05	1.42E-05	4.21E-06
2010	3.79E-05	1.36E-05	4.05E-06
2011	3.36E-05	1.23E-05	3.66E-06
2012	3.10E-05	1.16E-05	3.44E-06
2013	2.93E-05	1.13E-05	3.32E-06
2014	2.70E-05	1.04E-05	2.96E-06
2015	2.54E-05	9.99E-06	2.81E-06
2016	2.42E-05	9.71E-06	2.73E-06
2017	2.23E-05	8.93E-06	2.34E-06
2018	2.11E-05	8.46E-06	2.18E-06

TABLE 3-89: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE RACCOON ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	1.44E-04	4.41E-05	2.00E-05
1994	1.33E-04	4.16E-05	1.84E-05
1995	1.25E-04	4.00E-05	1.77E-05
1996	1.14E-04	3.59E-05	1.50E-05
1997	1.05E-04	3.26E-05	1.30E-05
1998	9.45E-05	2.93E-05	1.13E-05
1999	8.62E-05	2.67E-05	9.88E-06
2000	7.90E-05	2.46E-05	8.68E-06
2001	7.48E-05	2.40E-05	8.09E-06
2002	7.06E-05	2.31E-05	7.73E-06
2003	6.56E-05	2.20E-05	7.30E-06
2004	6.01E-05	2.04E-05	6.69E-06
2005	5.57E-05	1.84E-05	5.93E-06
2006	5.35E-05	1.77E-05	5.58E-06
2007	5.01E-05	1.64E-05	5.05E-06
2008	4.68E-05	1.54E-05	4.63E-06
2009	4.45E-05	1.47E-05	4.70E-06
2010	4.14E-05	1.40E-05	4.28E-06
2011	3.67E-05	1.27E-05	3.88E-06
2012	3.39E-05	1.20E-05	3.63E-06
2013	3.21E-05	1.16E-05	3.50E-06
2014	2.96E-05	1.08E-05	3.14E-06
2015	2.79E-05	1.03E-05	2.97E-06
2016	2.65E-05	1.00E-05	2.88E-06
2017	2.44E-05	9.22E-06	2.48E-06
2018	2.32E-05	8.73E-06	2.30E-06

TABLE 3-90: SUMMARY OF $ADD_{Expected}$ FOR FEMALE MINK USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water Expected	Forage Fish Expected	Benthic Invertebrate Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	4.71E-08	4.69E-05	9.89E-06	6.57E-06	6.34E-05
Stillwater (168)	8.37E-08	6.28E-06	1.73E-05	1.72E-05	4.08E-05
Federal Dam (154)	5.85E-08	3.84E-06	4.13E-06	1.54E-06	9.57E-06
Lower River					
143.5	4.53E-08	4.46E-06	5.75E-07	4.76E-07	5.55E-06
137.2	4.53E-08	8.95E-06	1.13E-06	8.40E-07	1.10E-05
122.4	2:07E-08	3.41E-06	6.26E-07	5.32E-07	4.59E-06
113.8	2.07E-08	3.62E-06	6.44E-07	5.58E-07	4.84E-06
100	2.07E-08	1.56E-06	2.96E-07	2.20E-07	2.09E-06
88.9	1.37E-08	3.09E-06	1.48E-07	4.32E-07	3.68E-06
58.7	1.37E-08	3.40E-06	4.57E-07	1.39E-07	4.01E-06
47.3	1.37E-08	3.02E-06	5.19E-07	8.50E-07	4.40E-06
25.8	1.37E-08	2.27E-06	1.54E-07	3.20E-07	2.76E-06

TABLE 3-91: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE MINK USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water 95% UCL	Forage Fish 95% UCL	Benthic Invertebrate 95% UCL	Sediment 95% UCL	Total Upper Bound Daily $Dose_{95\%UCL}$ (mg/Kg/day)
Upper River					
Thompson Island Pool (189)	1.49E-07	7.15E-05	1.73E-05	9.61E-06	9.86E-05
Stillwater (168)	2.66E-07	1.16E-05	8.11E-05	2.99E-05	1.23E-04
Federal Dam (154)	1.26E-07	5.52E-06	7.01E-06	2.59E-06	1.52E-05
Lower River					
143.5	4.93E-07	5.28E-06	1.41E-06	5.21E-07	7.70E-06
137.2	4.93E-07	1.90E-05	4.59E-06	1.70E-06	2.58E-05
122.4	2.66E-07	5.36E-06	1.57E-06	5.91E-07	7.79E-06
113.8	2.66E-07	3.75E-06	2.50E-06	9.22E-07	7.44E-06
100	2.66E-07	2.64E-06	2.02E-06	4.76E-06	9.69E-06
88.9	6.07E-08	4.06E-06	2.64E-07	1.26E-06	5.64E-06
58.7	6.07E-08	3.82E-06	4.18E-06	1.54E-06	9.61E-06
47.3	6.07E-08	3.97E-06	3.81E-06	3.32E-06	1.12E-05
25.8	6.07E-08	2.72E-06	2.61E-07	8.64E-07	3.91E-06

TABLE 3-92: SUMMARY OF $ADD_{Expected}$ FOR FEMALE MINK ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

	Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	4.18E-05	1.67E-05	6.40E-06
1994	4.08E-05	1.58E-05	6.05E-06
1995	3.99E-05	1.54E-05	5.99E-06
1996	3.45E-05	1.25E-05	4.76E-06
1997	3.10E-05	1.22E-05	4.24E-06
1998	2.76E-05	9.76E-06	3.60E-06
1999	2.54E-05	9.21E-06	3.22E-06
2000	2.32E-05	8.21E-06	2.94E-06
2001	2.21E-05	8.51E-06	2.71E-06
2002	2.07E-05	7.89E-06	2.55E-06
2003	1.92E-05	7.48E-06	2.47E-06
2004	1.76E-05	6.96E-06	2.21E-06
2005	1.65E-05	6.22E-06	2.02E-06
2006	1.58E-05	6.12E-06	1.89E-06
2007	1.47E-05	5.53E-06	1.77E-06
2008	1.38E-05	5.09E-06	1.56E-06
2009	1.32E-05	5.12E-06	1.60E-06
2010	1.21E-05	4.76E-06	1.53E-06
2011	1.08E-05	4.19E-06	1.38E-06
2012	1.01E-05	4.33E-06	1.41E-06
2013	9.46E-06	4.01E-06	1.27E-06
2014	8.76E-06	3.80E-06	1.17E-06
2015	8.25E-06	3.58E-06	1.13E-06
2016	7.82E-06	3.54E-06	1.12E-06
2017	7.25E-06	3.09E-06	9.09E-07
2018	6.97E-06	3.07E-06	9.06E-07

TABLE 3-93: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE MINK ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	4.89E-05	1.77E-05	7.04E-06
1994	4.56E-05	1.67E-05	6.65E-06
1995	4.45E-05	1.62E-05	6.54E-06
1996	3.86E-05	1.33E-05	5.24E-06
1997	3.48E-05	1.28E-05	4.63E-06
1998	3.11E-05	1.04E-05	3.97E-06
1999	2.85E-05	9.77E-06	3.53E-06
2000	2.61E-05	8.75E-06	3.22E-06
2001	2.49E-05	9.02E-06	2.98E-06
2002	2.33E-05	8.39E-06	2.81E-06
2003	2.16E-05	7.95E-06	2.71E-06
2004	1.98E-05	7.39E-06	2.43E-06
2005	1.85E-05	6.62E-06	2.21E-06
2006	1.77E-05	6.50E-06	2.07E-06
2007	1.65E-05	5.89E-06	1.93E-06
2008	1.55E-05	5.43E-06	1.71E-06
2009	1.48E-05	5.43E-06	1.79E-06
2010	1.36E-05	5.07E-06	1.67E-06
2011	1.21E-05	4.48E-06	1.51E-06
2012	1.13E-05	4.59E-06	1.53E-06
2013	1.06E-05	4.26E-06	1.38E-06
2014	9.85E-06	4.04E-06	1.28E-06
2015	9.29E-06	3.81E-06	1.23E-06
2016	8.79E-06	3.75E-06	1.21E-06
2017	8.15E-06	3.29E-06	9.92E-07
2018	7.85E-06	3.26E-06	9.85E-07

TABLE 3-94: SUMMARY OF $ADD_{Expected}$ FOR FEMALE OTTER USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water Expected	Piscivorous Fish Expected	Sediment Expected	Total Average Daily $Dose_{Expected}$ (mg/Kg/day)
Upper River				
Thompson's Island Pool (189)	3.78E-08	4.98E-04	4.46E-06	5.03E-04
Stillwater (168)	6.71E-08	8.86E-05	1.16E-05	1.00E-04
Federal Dam (154)	4.69E-08	6.43E-05	1.05E-06	6.54E-05
Lower River				
143.5	3.63E-08	6.43E-05	3.23E-07	6.46E-05
137.2	3.63E-08	2.42E-04	5.70E-07	2.43E-04
122.4	1.66E-08	5.65E-05	3.61E-07	5.69E-05
113.8	1.66E-08	5.11E-05	3.78E-07	5.15E-05
100	1.66E-08	5.87E-05	1.50E-07	5.88E-05
88.9	1.10E-08	3.78E-05	2.93E-07	3.81E-05
58.7	1.10E-08	4.39E-05	9.45E-08	4.40E-05
47.3	1.10E-08	5.03E-05	5.77E-07	5.08E-05
25.8	1.10E-08	3.55E-05	2.17E-07	3.57E-05

TABLE 3-95: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE OTTER USING 1993 DATA ON A TEQ BASIS

Location	Drinking Water 95% UCL	Piscivorous Fish 95% UCL	Sediment 95% UCL	Total Average Daily Dosage$_{95\%UCL}$ (mg/Kg/day)
Upper River				
Thompson's Island Pool (189)	1.20E-07	9.65E-04	6.52E-06	9.71E-04
Stillwater (168)	2.13E-07	1.14E-04	2.03E-05	1.35E-04
Federal Dam (154)	1.01E-07	1.15E-04	1.76E-06	1.17E-04
Lower River				
143.5	3.95E-07	1.15E-04	3.53E-07	1.16E-04
137.2	3.95E-07	5.77E-04	1.15E-06	5.78E-04
122.4	2.13E-07	7.76E-05	4.01E-07	7.83E-05
113.8	2.13E-07	7.14E-05	6.25E-07	7.23E-05
100	2.13E-07	1.81E-04	3.23E-06	1.85E-04
88.9	4.87E-08	7.19E-05	8.57E-07	7.28E-05
58.7	4.87E-08	6.51E-05	1.05E-06	6.61E-05
47.3	4.87E-08	1.35E-04	2.25E-06	1.38E-04
25.8	4.87E-08	7.05E-05	5.86E-07	7.12E-05

TABLE 3-96: SUMMARY OF $ADD_{Expected}$ FOR FEMALE OTTER ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

	Total Average Dietary Dose (mg/Kg/day)		
Year	189	168	154
1993	2.87E-04	2.12E-04	1.04E-04
1994	1.78E-04	1.47E-04	7.42E-05
1995	1.95E-04	1.62E-04	8.00E-05
1996	1.78E-04	1.31E-04	7.02E-05
1997	1.40E-04	1.15E-04	6.05E-05
1998	1.17E-04	1.03E-04	5.09E-05
1999	1.02E-04	8.44E-05	3.89E-05
2000	9.52E-05	7.96E-05	3.70E-05
2001	8.90E-05	7.67E-05	3.55E-05
2002	8.76E-05	8.15E-05	3.77E-05
2003	7.68E-05	6.87E-05	3.22E-05
2004	7.18E-05	6.69E-05	3.32E-05
2005	6.39E-05	5.13E-05	2.51E-05
2006	6.28E-05	5.58E-05	2.64E-05
2007	5.79E-05	4.67E-05	2.05E-05
2008	5.47E-05	4.22E-05	1.98E-05
2009	5.51E-05	4.54E-05	2.13E-05
2010	4.86E-05	4.15E-05	1.78E-05
2011	4.26E-05	3.54E-05	1.73E-05
2012	4.21E-05	3.58E-05	1.68E-05
2013	4.04E-05	3.72E-05	1.62E-05
2014	3.68E-05	3.54E-05	1.48E-05
2015	3.37E-05	3.11E-05	1.37E-05
2016	3.43E-05	3.48E-05	1.47E-05
2017	2.96E-05	2.65E-05	1.21E-05
2018	2.87E-05	2.54E-05	1.10E-05

TABLE 3-97: SUMMARY OF $ADD_{95\%UCL}$ FOR FEMALE OTTER ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	Total 95% UCL Dietary Dose (mg/Kg/day)		
	189	168	154
1993	3.58E-04	2.58E-04	1.30E-04
1994	2.37E-04	1.76E-04	9.10E-05
1995	2.58E-04	1.95E-04	9.70E-05
1996	2.53E-04	1.59E-04	8.82E-05
1997	1.98E-04	1.38E-04	7.55E-05
1998	1.64E-04	1.25E-04	6.23E-05
1999	1.49E-04	1.04E-04	4.88E-05
2000	1.39E-04	9.69E-05	4.55E-05
2001	1.29E-04	9.37E-05	4.40E-05
2002	1.27E-04	9.95E-05	4.71E-05
2003	1.12E-04	8.44E-05	4.03E-05
2004	1.04E-04	8.16E-05	4.14E-05
2005	9.44E-05	6.24E-05	3.13E-05
2006	9.12E-05	6.80E-05	3.23E-05
2007	8.57E-05	5.65E-05	2.51E-05
2008	8.16E-05	5.17E-05	2.50E-05
2009	7.92E-05	5.53E-05	2.68E-05
2010	6.97E-05	5.06E-05	2.21E-05
2011	6.34E-05	4.33E-05	2.19E-05
2012	6.11E-05	4.39E-05	2.11E-05
2013	5.88E-05	4.55E-05	2.05E-05
2014	5.25E-05	4.32E-05	1.83E-05
2015	4.87E-05	3.77E-05	1.72E-05
2016	4.89E-05	4.24E-05	1.82E-05
2017	4.40E-05	3.24E-05	1.58E-05
2018	4.21E-05	3.11E-05	1.40E-05

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TABLE 4-1
COMMON EFFECTS OF PCB EXPOSURE IN ANIMALS

Hepatotoxicity
Hepatomegaly; bile duct hyperplasia, proliferation of smooth ER
Focal necrosis; fatty degeneration
Induction of microsomal enzymes; implications for hormone imbalances, pancreas and reproductive effects
Depletion of fat soluble vitamins (predominantly vitamin A)
Porphyria

Immunotoxicity
Atrophy of lymphoid tissues
Reduction in circulating leukocytes and lymphocytes
Suppressed antibody responses
Enhanced susceptibility to viruses
Suppression of natural killer cells

Neurotoxicity
Impaired behavioral responses
Alterations in catecholamine levels
Depressed spontaneous motor activity
Developmental deficits
Numbness in extremities

Reproduction
Increased abortion; low birth weights
Decreased survival and mating success
Increased length of estrus
Embryo and fetal mortality
Gross teratogenic effects
Biochemical, neurological, and functional changes following *in utero* exposure (mammals)
Decreased libido, decreased sperm numbers and motility

Gastrointestinal
Gastric hyperplasia
Ulceration and necrosis

Respiratory
Chronic bronchitis
Decreased vital capacity

Dermal Toxicity
Chloracne
Hyperplasia and hyperkeratosis of epithelium
Edema

Mutagenic Effects
Commercial mixtures are weakly mutagenic

Carcinogenic Effects
Preneoplastic changes
Neoplastic changes
Promotion considered main contribution
Attenuation of other carcinogens under certain conditions

Source: Hansen, L. G., 1987. Environmental Toxicology of Polychlorinated Biphenyls in Environmental Toxin Series 1. eds. Safe, S. and Hutzinger, O., p. 32.

TABLE 4-2
WORLD-HEALTH ORGANIZATION FOR TOXIC EQUIVALENCY FACTORS (TEFs) FOR HUMANS, MAMMALS, FISH, AND BIRDS

Congener	Toxic Equivalency Factor		
	Humans/Mammals	Fish	Birds
Non-*ortho* PCBs			
3,4,4',5-TetraCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TetraCB (77)	0.0001	0.0001	0.05
3,3',4,4',5-PentaCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HexaCB (169)	0.01	0.00005	0.001
Mono-*ortho* PCBs			
2,3,3',4,4'-PentaCB (105)	0.0001	<0.000005	0.0001
2,3,4,4',5-PentaCB (114)	0.0005	<0.000005	0.0001
2,3',4,4',5-PentaCB (118)	0.0001	<0.000005	0.00001
2',3,4,4',5-PentaCB (123)	0.0001	<0.000005	0.00001
2,3,3',4,4',5-HexaCB (156)	0.0005	<0.000005	0.0001
2,3,3',4,4',5'-HexaCB (157)	0.0005	<0.000005	0.0001
2,3',4,4',5,5'-HexaCB (167)	0.00001	<0.000005	0.00001
2,3,3',4,4',5,5'-HeptaCB (189)	0.0001	<0.000005	0.00001

Notes: CB = chlorinated biphenyls
Reference: van den Berg, et al. (1998). Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife. Environmental Health Perspectives, 106:12, 775-791.

TABLE 4-3
SELECTED SEDIMENT SCREENING GUIDELINES: PCBs

	Total PCBs	Aroclor 1254	Aroclor 1248	Aroclor 1016	Aroclor 1260
Hudson River Sediment Effect Concentrations ***(mg/kg, or ppm)***					
(MacDonald Env. Sci., 1999)					
(Estuarine, freshwater, and saltwater)					
Threshold Effect Concentration	0.04				
Mid-range Effect Concentration	0.4				
Extreme Effect Concentration	1.7				
NYSDEC (1998) (Freshwater) ***(mg/kg organic carbon)***					
Benthic Aquatic Life Acute Toxicity	2760.8				
Benthic Aquatic Life Chronic Toxicity	19.3				
Wildife Bioaccumulation	1.4				
NYSDEC (1998) (Saltwater) ***(mg/kg organic carbon)***					
Benthic Aquatic Life Acute Toxicity	13803.3				
Benthic Aquatic Life Chronic Toxicity	41.4				
Wildlife Bioaccumulation	1.4				
Ontario Ministry of the Environment Sediment Guidelines (Freshwater)					
(Persaud et al., 1993)					
No Effect Level ***(mg/kg)***	0.01				
Lowest Effect Level ***(mg/kg)***	0.07	0.06	0.03	0.007	0.005
Severe Effect Level ***(mg/kg organic carbon)***	530	34	150	53	24
Long et al. (1995) Sediment Guidelines ***(ug/kg)***					
(Marine and Estuarine)					
Effects-Range-Low	22.7				
Effects-Range-Median	180				
Ingersoll et al. (1996) Sediment Guidelines ***(ug/kg, or ppb)***					
(Freshwater)					
(Derived from 28-day Hyalella azteca *data)*					
Effects-Range-Low	50				
Effects-Range-Median	730				
Threshold Effect Level	32				
Probable Effect Level	240				
No Effect Concentration	190				
Washington State Dep't of Ecology 1997 Sediment Guidelines				**Aroclor 1242**	
(Freshwater) ***(ug/kg, or ppb)*** [1]					
Apparent Effects Threshold (Microtox)	21	7.3			
Apparent Effects Threshold (*Hyalella azteca*)	820	350		100	
Probable Apparent Effects Threshold (Microtox)	21	7.3	21		
Probable Apparent Effects Threshold (*Hyalella azteca*)	450	240		100	
Lowest Apparent Effects Threshold (between Microtox and *H. azteca*)	21	7.3	21		
Florida Department of Environmental Protection ***(ug/kg, or ppb)***					
(MacDonald, D.D., et al., 1996) (Marine and Estuarine)					
Threshold Effect Level	21.6				
Probable Effect Level	189				
Jones et al. (1997) ***(ug/kg, or ppb)***					
EqP-derived; recommended TOC adjustment					
Secondary Chronic Value		810	1000		450000
Smith et al. (1996) ***(ug/kg, or ppb)***					
Threshold Effect Level	34.1				
Probable Effect Level	277				

Note: All values are dry weight unless noted.
Please note that for Washington state values, the Aroclor 1016 column becomes Aroclor 1242. This applies only to this one set of values.
[1] Some values also available in mg/kg organic carbon

TABLE 4-4
TOXICITY ENDPOINTS FOR BENTHIC INVERTEBRATES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs, AROCLORS, AND DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	PCB TYPE	EXPOSURE DURATION	EFFECT LEVEL	EFFECT CONC, WHOLE BODY CONC. (mg/kg wet wt)	EFFECT ENDPOINT	REFERENCE
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1248	2 months	LD_{50}	552	Mortality	Nebeker and Puglisi (1974)
Amphipod (*Hyalella azteca*)	Water	PCB 52	> or = 10 weeks	LD_{100}	180	Mortality	Borgmann et al. (1990)
Amphipod (*Hyalella azteca*)	Water	Aroclor 1242	> or = 10 weeks	LD_{100}	100	Mortality	Borgmann et al. (1990)
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1242	2 months	LD_{50}	316	Mortality	Nebeker and Puglisi (1974)
Cladoceran (*Daphnia magna*)	Model ecosystem	2,3,7,8-TCDD	33 days	EL (no effect)	1570	Mortality	Isensee and Jones (1975)
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1248	2 months	LOAEL	552	Reproduction reduced by at least 50%	Nebeker and Puglisi (1974)
Snail (*Physa* spp.)	Water	2,3,7,8-TCDD	33 days	EL (no effect)	502	Mortality	Isensee and Jones (1975) Isensee (1978)
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1242	2 months	EL (effect)	316	No reproduction	Nebeker and Puglisi (1974)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 153	35 days	LOAEL	126	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 153	35 days	LOAEL	126	Weight loss	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 15	35 days	LOAEL	119	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 15	35 days	LOAEL	119	Weight loss	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 47	35 days	LOAEL	113	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 47	35 days	LOAEL	113	Weight loss	Fisher et al. (1998)
Grass shrimp (*Palaemonetes pugio*)	Water	Aroclor 1254	7 days	LOAEL	65	Mortality (60%)	Nimmo et al. (1974)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 1	35 days	LOAEL	64	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 1	35 days	LOAEL	64	Weight loss	Fisher et al. (1998)
Grass shrimp (*Palaemonetes pugio*)	Water	Aroclor 1254	16 days	LOAEL	27	Mortality (45%)	Nimmo et al. (1974)
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1248	2 months	NOAEL	127	Reproduction	Nebeker and Puglisi (1974)
Amphipod (*Gammarus pseudolimnaeus*)	Water	Aroclor 1242	2 months	NOAEL	76	Reproduction	Nebeker and Puglisi (1974)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 153	35 days	NOAEL	65	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 153	35 days	NOAEL	65	Weight loss	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 15	35 days	NOAEL	63.1	Mortality	Fisher et al. (1998)

TABLE 4-4
TOXICITY ENDPOINTS FOR BENTHIC INVERTEBRATES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs, AROCLORS, AND DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	PCB TYPE	EXPOSURE DURATION	EFFECT LEVEL	EFFECT CONC, WHOLE BODY CONC. (mg/kg wet wt)	EFFECT ENDPOINT	REFERENCE
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 15	35 days	NOAEL	63.1	Weight loss	Fisher et al. (1998)
Amphipod (*Hyalella azteca*)	Water	PCB 52	> or = 10 weeks	NOAEL	54	Mortality	Borgmann et al. (1990)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 47	35 days	NOAEL	49.3	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 47	35 days	NOAEL	49.3	Weight loss	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 1	35 days	NOAEL	33.2	Mortality	Fisher et al. (1998)
Oligochaete (*Lumbriculus variegatus*)	Algae (Food)	PCB 1	35 days	NOAEL	33.2	Weight loss	Fisher et al. (1998)
Amphipod (*Hyalella azteca*)	Water	Aroclor 1242	> or = 10 weeks	NOAEL	30	Mortality	Borgmann et al. (1990)
Grass shrimp (*Palaemonetes pugio*)	Water	Aroclor 1254	16 days	NOAEL	18	Mortality	Nimmo et al. (1974)
Grass shrimp (*Palaemonetes pugio*)	Water	Aroclor 1255	7 days	NOAEL	5.4	Mortality	Nimmo et al. (1974)

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TABLE 4-5
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	PCB TYPE	EXPOSURE DURATION	EFFECT LEVEL	EFFECT CONCENTRATION WHOLE BODY CONCENTRATION mg/kg wet wt.	EFFECT ENDPOINT	REFERENCE
Laboratory studies							
Lake trout (*Salvelinus namaycush*)	Water	PCB-153	15 days	LD100	7.6	Fry mortality	Broyles and Noveck, 1979
Chinook salmon (Oncorhnchus tshawytscha)	Water	PCB-153	15 days	LD100	3.6	Fry mortality	Broyles and Noveck, 1979
Adult Fathead Minnow (*Pimephales promelas*)	Water	Aroclor 1254	9 months	LOAEL	999	Adult mortality	Nebeker et al., 1974
Adult Fathead Minnow (*Pimephales promelas*)	Water	Aroclor 1254	9 months	LOAEL	429	Spawning	Nebeker et al., 1974
Adult Minnow (*Phoxinus phoxinus*)	Diet	Clophen A50	40 days; studied for 300 days	LOAEL	170	Egg hatchability	Bengtsson, B., 1980
Brook trout fry (*Salvelinus fontinalis*)	Water	Aroclor 1254	118 days	LOAEL	125	Fry mortality	Mauck et al., 1978
Brook trout fry (*Salvelinus fontinalis*)	Water	Aroclor 1254	21 days	EL-effect	32.8 in muscle	Egg hatchabilty	Freeman and Idler, 1974
Brook trout fry (*Salvelinus fontinalis*)	Water	Aroclor 1254	21 days	EL-effect	77.9 in eggs	Egg hatchability	Freeman and Idler, 1974
Junvenile Spot (*Leiostomus xanthurus*)	Water	Aroclor 1254	20 days	LOAEL	46	Adult mortality	Hansen et al., 1971
Adult pinfish (*Lagodon rhomboides*)	Water	Aroclor 1016	42 days	LOAEL	42	Adult mortality	Hansen et al., 1974
Killifish (*Fundulus heteroclitus*)	Single intraperitoneal injection into adults	PCB mixture	Single injection, 40 d of observation	LOAEL	19 (nominal dose)	Adult female mortality	Black et al., 1998a
Lake trout fry (*Salmo gairdneri*)	Water	Aroclor 1254	48 days	EL-effect	4.5	Fry mortality	Mac and Seelye, 1981
Killifish (*Fundulus heteroclitus*)	Single intraperitoneal injection into adults	PCB mixture	Single injection, 40 days of observation	LOAEL	3.8 (nominal dose)	Egg production and food consumption	Black et al., 1998a
Adult Fathead Minnow (*Pimephales promelas*)	Water	Aroclor 1242	9 months	NOAEL	436	Adult mortality	Nebeker et al., 1974
Adult Fathead Minnow (*Pimephales promelas*)	Water	Aroclor 1254	9 months	NOAEL	429	Egg hatchability	Nebeker et al., 1974
Adult pinfish (*Lagodon rhomboides*)	Water	Aroclor 1016	42 days	NOAEL	170	Adult mortality	Hansen et al., 1974
Adult Fathead Minnow (*Pimephales promelas*)	Water	Aroclor 1254	9 months	NOAEL	105	Spawning	Nebeker et al., 1974
Brook trout fry (*Salvelinus fontinalis*)	Water	Aroclor 1254	118 days	NOAEL	71	Fry mortality	Mauck et al., 1978
Juvenile Spot (*Leiostomus xanthurus*)	Water	Aroclor 1254	Lab Stu	NOAEL	27	Adult mortality	Hansen et al., 1971
Adult Minnow (*Phoxinus phoxinus*)	Diet	Clophen A50	40 days; studied for 300 days	NOAEL	15	Egg hatchability	Bengtsson, B., 1980

TABLE 4-5
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

Killifish (*Fundulus heteroclitus*)	Single intraperitoneal injection into adults	PCB mixture	Single injection, 40 days of observation	NOAEL	3.8 (nominal dose)	Adult female mortality	Black et al., 1998a
Killifish (*Fundulus heteroclitus*)	Single intraperitoneal injection into adults	PCB mixture	Single injection, 40 days of observation	NOAEL	0.76 (nominal dose)	Egg production and food consumption	Black et al., 1998a

TABLE 4-6
TOXICITY ENDPOINTS FOR FISH - FIELD STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

SPECIES	FIELD COMPONENT	CONTAMINANT TYPE	EFFECT LEVEL	EFFECT CONCENTRATION mg/kg wet wt (or as noted below)	EFFECT ENDPOINT	REFERENCE
Field studies						
Arctic charr (*Salvelinus alpinus*)	Adult fish and eggs collected from Lake Geneva	PCBs DDT	EL-effect	10 to 78 mg/kg lipid in eggs	Embryomortality	Monod, 1985
Winter flounder (*Pseudopleuronectes americanus*)	Adult and eggs collected from New Bedford Harbor	PCBs	EL-effect	39.6 mg/kg dry wt in eggs	Growth rate of larvae	Black et al., 1988b
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	PCBs	LOAEL	29.2 mg/kg dry wt in liver	Embryo and larval survival	Black et al., 1998b
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	PCBs	LOAEL	20.8 mg/kg dry wt in liver	Adult female mortality	Black et al., 1998b
English sole (*Parophrys vetulus*)	Fish collected from Puget Sound	PCBs, PAHs	EL-effect	Approx. 10 mg/kg in liver	Increased fecundity	Johnson et al., 1997
Striped bass (*Morone saxatilis*)	Eggs from hatcheries. Larvae fed naturally contaminated food.	PCBs, HCB, pesticides	EL-effect	0.1 to 10 in eggs	Larval mortality	Westin et al., 1985
Chinook salmon (*Oncorhynchus tshawytscha*)	Adult fish and eggs collected from Lake Michigan	PCBs, pesticides	EL-effect	2.8 to 9.9 A-1254 in eggs	Hathcing success	Giesy et al., 1986
Chinook salmon (*Oncorhynchus tshawytscha*)	Adult fish and eggs collected from Lake Michigan	PCBs	El-effect	2.75 to 5.75 in eggs	Hatching success	Ankley et al., 1981
Rainbow trout (*Salmo gairdneri*)	Adult fish and eggs hatchery	PCBs, DDT	EL-effect	2.7 in eggs	Embryomortality	Hogan and Braun, 1975
English sole (*Parophrys vetulus*)	Adults and eggs collected from Puget Sound	PCBs	LOAEL	2.56 in liver	Prodcution of normal larvie	Casillas et al., 1991
Lake trout (*Salvelinus namaycush*)	Adult fish and eggs collected from Great Lakes	PCBs	EL-effect	0.25 to 7.77 in eggs	Egg mortality and percent of normal fry hatching	Mac et al., 1993
Chinook salmon (*Oncorhynchus tshawytscha*)	Adult fish and eggs collected from Lake Michigan	PCBs, pesticides	EL-effect	0.322 to 2.6 A-1260 in eggs	Hathcing success	Giesy et al., 1986
Starry flounder (*Platichthys stellatus*)	Adult fish and eggs collected from area of San Francisco Bay	PCBs, HCB, Pthalates	EL-effect	about 50 t0 200 in eggs	Hathcing success	Spies and Rice, 1988
Redbreast sunfish (*Lepomis auritus*)	Adult fish collected from East Tennessee stream	PCBs, PAHs, metals, chlorine	EL-effect	0.95	Fecundity, clutch size, growth	Adams et al., 1989, 1990, 1992
Baltic herring (*Clupea harengus*)	Adult fish and eggs collected from Baltic Sea	PCBs, pesticides	EL-effect	> 0.120 in ovaries	Hathcing success	Hansen et el., 1985
Baltic flounder (*Platichthys flesus*)	Adult fish and eggs collected from Baltic Sea	PCBs, pesticides, metals	EL-effect	> 0.120 in ovaries	Hathcing success	von Westernhagen et al., 1981
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	PCBs	NOAEL	9.5 mg/kg dry wt in liver	Embryo and larval mortality	Black et al., 1998b
Striped bass (*Morone saxatilis*)	Eggs from Hudson River fish. Larvae fed naturally contaminated food	PCBs	EL-no effect	3.1 in post yolk sac larvae	Larval mortality	Westin et al., 1983
Winter flounder (*Pseudopleuronectes americanus*)	Adult and eggs collected from New Bedford Harbor	PCBs	EL-no effect	1.08 mg/kg dry wt in eggs	Growth rate of larvae	Black et al., 1988b
English sole (*Parophrys vetulus*)	Adults and eggs collected from Puget Sound	PCBs	NOAEL	0.09 in liver	Prodcution of normal larvie	Casillas et al., 1991

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TABLE 4-6
TOXICITY ENDPOINTS FOR FISH - FIELD STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

Redbreast sunfish (*Lepomis auritus*)	Fish from an East Tennessee stream	PCBs, PAHs, metals, chlorine	EL-no effect	0.5	Fecundity, clutch size, growth	Adams et al., 1989, 1990, 1992
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	PCBs	NOAEL	0.461 mg/kg dry wt in liver	Adult female mortality	Black et al., 1998b
Arctic charr (*Salvelinus alpinus*)	Adult fish and eggs collected from Lake Geneva	PCBs DDT	EL- no effect	0.1 to 0.31 in eggs	Embryomortality	Monod, 1985

TABLE 4-7
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww)	LIPID CONTENT OF EGG (g lipid/gww egg)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Laboratory studies[a]										
Fathead minnow (*Pimephales promelas*)	Water	LD50	Embryo	2,3,7,8-TCDD	25.7	0.024	1	1071	Early life stage mortality	Olivieri and Cooper, 1997 [b]
Zebrafish (*Danio danio*)	Water	LD50	Egg	2,3,7,8-TCDD	2.61	0.017	1	154	Early life stage mortality	Elonen et al., 1998
Zebrafish (Danio danio)	Water	LD50	Egg	2,3,7,8-TCDD	2.5	0.017	1	147	Early life stage mortality	Henry et al., 1997
White sucker (*Catastomus commersoni*)	Water	LD50	Egg	2,3,7,8-TCDD	1.89	0.025	1	76	Early life stage mortality	Elonen et al., 1998
Northern Pike (*Esox lucius*)	Water	LD50	Egg	2,3,7,8-TCDD	2.46	0.042	1	59	Early life stage mortality	Elonen et al., 1998
Medaka (*Oryzias latipes*)	Water	LD50	Egg	2,3,7,8-TCDD	1.11	0.029	1	38	Early life stage mortality	Elonen et al., 1998
Fathead minnow (*Pimephales promelas*)	Water	LD50	Egg	2,3,7,8-TCDD	0.539	0.024	1	22	Early life stage mortality	Elonen et al., 1998
Lake herring (*Coregonus artedii*)	Water	LD50	Egg	2,3,7,8-TCDD	0.902	0.066	1	14	Early life stage mortality	Elonen et al., 1998
Channel catfish (*Ictalurus punctatus*)	Water	LD50	Egg	2,3,7,8-TCDD	0.644	0.048	1	13	Early life stage mortality	Elonen et al., 1998
Rainbow Trout (*Salmo gairderi*) - Erwin strain	Water	LD50	Egg	2,3,7,8-TCDD	0.439	0.087	1	5.0	Early life stage mortality	Walker et al., 1992
Rainbow Trout (*Salmo gairderi*) - Erwin strain	Injection	LD50	Egg	2,3,7,8-TCDD	0.421	0.087	1	4.8	Early life stage mortality	Walker et al., 1992
Brook Trout (Salvenius fontinalis)	Water	LD100	Egg	2,3,7,8-TCDD	0.324	0.068	1	4.8	Early life stage mortality	Walker and Peterson, 1994
Rainbow Trout (*Salmo gairderi*) - Erwin strain	Egg injection	LD50	Egg	2,3,7,8-TCDD	0.409	0.087	1	4.7	Early life stage mortality	Zabel & Peterson, 1996
Rainbow Trout (*Salmo gairderi*)	Egg injection	LD50	Egg	2,3,7,8-TCDD	0.374	0.087	1	4.3	Early life stage mortality	Walker and Peterson, 1991
Rainbow Trout (*Salmo gairderi*)	Egg injection	LD50	Egg	PCB 126	74	0.087	0.005	4.3	Early life stage mortality	Walker and Peterson, 1991
Brook Trout (*Salvenius fontinalis*)	Water	LD50	Egg	2,3,7,8-TCDD	0.200	0.068	1	2.9	Early life stage mortality	Walker and Peterson, 1994
(*Salmo gairdneri*) Erwin strain	Egg injection	LD50	Egg	2,3,7,8-TCDD	0.242	0.087	1	2.8	Early life stage mortality	Zabel & Peterson, 1996
Lake trout (*Salvenius namaycush*)	Water	LD50	Egg	PCB 126	29	0.08	0.005	1.8	Early life stage mortality	Zabel et al., 1995
Fathead minnow (Pimephales promelas)	Water	LD50	Embryo	2,3,7,8-TCDD	0.026	0.024	1	1.1	Early life stage mortality	Olivieri and Cooper, 1997
Lake trout (*Salvenius namaycush*)	Water	LD50	Egg	2,3,7,8-TCDD	0.085	0.08	1	1.1	Early life stage mortality	Zabel et al., 1995
Lake trout (*Salvenius namaycush*)	Water	LD50	Egg	2,3,7,8-TCDD	0.065	0.08	1	0.8	Early life stage mortality	Walker et al., 1992
Lake trout (*Salvenius namaycush*)	Injection	LD50	Egg	2,3,7,8-TCDD	0.047	0.08	1	0.6	Early life stage mortality	Walker et al., 1992
Fathead minnow (Pimephales promelas)	Water	LD100	Larvae	2,3,7,8-TCDD	163	Not reported for larvae	1		Early life stage mortality	Olivieri and Cooper, 1997

TABLE 4-7
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww)	LIPID CONTENT OF EGG (g lipid/gww egg)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Fathead minnow (Pimephales promelas)	Water	LD50	Larvae	2,3,7,8-TCDD	70.9	Not reported for larvae	1		Early life stage mortality	Olivieri and Cooper, 1997

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TABLE 4-7
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww)	LIPID CONTENT OF EGG (g lipid/gww egg)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Zebrafish (*Danio danio*)	Water	LOAEL	Egg	2,3,7,8-TCDD	2	0.017	1	118	Early life stage mortality	Elonen et al., 1998
Fathead minnow (*Pimephales promelas*)	Water	LOAEL	Embryo	2,3,7,8-TCDD	2.46	0.024	1	103	Early life stage mortality	Olivieri and Cooper, 1997
White sucker (*Catastomus commersoni*)	Water	LOAEL	Egg	2,3,7,8-TCDD	1.22	0.025	1	49	Early life stage mortality	Elonen et al., 1998
Northern Pike (*Esox lucius*)	Water	LOAEL	Egg	2,3,7,8-TCDD	1.8	0.042	1	43	Early life stage mortality	Elonen et al., 1998
Medaka (*Oryzias latipes*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.949	0.029	1	33	Early life stage mortality	Elonen et al., 1998
Fathead minnow (*Pimephales promelas*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.435	0.024	1	18	Early life stage mortality	Elonen et al., 1998
Channel catfish (*Ictalurus punctatus*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.855	0.048	1	18	Early life stage mortality	Elonen et al., 1998
Lake herring (*Coregonus artedii*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.27	0.066	1	4.1	Early life stage mortality	Elonen et al., 1998
Rainbow Trout (*Salmo gairderi*)	Injection	LOAEL	Egg	2,3,7,8-TCDD	0.291	0.087	1	3.3	Early life stage mortality	Walker et al., 1992
Rainbow Trout (*Salmo gairderi*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.279	0.087	1	3.2	Early life stage mortality	Walker et al., 1992
Brook Trout (*Salvenius fontinalis*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.185	0.068	1	2.7	Early life stage mortality	Walker and Peterson, 1994
Lake trout (*Salvelinus namaycush*)	Injection	LOAEL	Egg	2,3,7,8-TCDD	0.058	0.08	1	0.7	Early life stage mortality	Walker et al., 1992
Lake trout (*Salvelinus namaycush*)	Injection	LOAEL	Egg	2,3,7,8-TCDD	0.055	0.08	1	0.7		Walker et al., 1994
Lake trout (*Salvelinus namaycush*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.055	0.08	1	0.7	Early life stage mortality	Walker et al., 1992
Lake trout (*Salvelinus namaycush*)	Maternal transfer	LOAEL	Egg	2,3,7,8-TCDD	0.05	0.08	1	0.6		Walker et al., 1994
Lake trout (*Salvelinus namaycush*)	Water	LOAEL	Egg	2,3,7,8-TCDD	0.04	0.08	1	0.5		Walker et al., 1994
Fathead minnow (*Pimephales promelas*)	Water	LOAEL	Larvae	2,3,7,8-TCDD	20	Not reported for larvae	1		Early life stage mortality	Olivieri and Cooper, 1997
White sucker (*Catastomus commersoni*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.848	0.025	1	34	Early life stage mortality	Elonen et al., 1998
Northern Pike (*Esox lucius*)	Water	NOAEL	Egg	2,3,7,8-TCDD	1.19	0.042	1	28	Early life stage mortality	Elonen et al., 1998
Zebrafish (*Danio danio*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.424	0.017	1	25	Early life stage mortality	Elonen et al., 1998
Medaka (*Oryzias latipes*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.455	0.029	1	16	Early life stage mortality	Elonen et al., 1998
Fathead minnow (*Pimephales promelas*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.235	0.024	1	9.8	Early life stage mortality	Elonen et al., 1998
Channel catfish (*Ictalurus punctatus*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.385	0.048	1	8.0	Early life stage mortality	Elonen et al., 1998
Fathead minnow (*Pimephales promelas*)	Water	NOAEL	Embryo	2,3,7,8-TCDD	0.13	0.024	1	5.4	Early life stage mortality	Olivieri and Cooper, 1997

TABLE 4-7
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww)	LIPID CONTENT OF EGG (g lipid/gww egg)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Lake herring (*Coregonus artedii*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.175	0.066	1	2.7	Early life stage mortality	Elonen et al., 1998
Rainbow Trout (*Salmo gairderi*)	Injection	NOAEL	Egg	2,3,7,8-TCDD	0.291	0.087	1	3.3	Early life stage mortality	Walker et al., 1992
Brook Trout (*Salvenius fontinalis*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.135	0.068	1	2.0	Early life stage mortality	Walker and Peterson, 1994

TABLE 4-7
TOXICITY ENDPOINTS FOR FISH - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww)	LIPID CONTENT OF EGG (g lipid/gww egg)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Lake trout (*Salvelinus namaycush*)	Injection	NOAEL	Egg	2,3,7,8-TCDD	0.044	0.08	1	0.55	Early life stage mortality	Walker et al., 1992
Lake trout (*Salvelinus namaycush*)	Injection	NOAEL	Egg	2,3,7,8-TCDD	0.044	0.08	1	0.55		Walker et all., 1994
Lake trout (*Salvelinus namaycush*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.034	0.08	1	0.43	Early life stage mortality	Walker et al., 1992
Lake trout (*Salvelinus namaycush*)	Water	NOAEL	Egg	2,3,7,8-TCDD	0.034	0.08	1	0.43		Walker et all., 1994
Lake trout (*Salvelinus namaycush*)	Maternal transfer	NOAEL	Egg	2,3,7,8-TCDD	0.023	0.08	1	0.29		Walker et all., 1994
Fathead minnow (*Pimephales promelas*)	Water	NOAEL	Larvae	2,3,7,8-TCDD	3.59	Not reported for larvae	1		Early life stage mortality	Olivieri and Cooper, 1997

Notes:

[a] No relevant field studies were found.

[b] Fathead minnow embryo is assumed to have same lipid content as reported for eggs.

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TABLE 4-8
TOXICITY ENDPOINTS FOR FISH - FIELD STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EFFECT LEVEL	TISSUE	CONTAMINANT TYPE	EFFECT CONC. (ug/kg ww, unless noted differently below)	LIPID CONTENT OF EGG (g lipid/gww egg)	EFFECT CONC. (ug/kg lipid)	TEF	EFFECT CONC. DIOXIN EQUIVALENTS (ug TEQ/kg lipid)	EFFECT ENDPOINT	REFERENCE
Rainbow Trout - Arlee strain (*Salmo gairdneri*)	Egg injection of extract from field-collected fish	LD50	Eggs	TEQs	0.514	0.087	5.9	1	5.9	Embryomortality	Wright and Tillitt, 1999
Rainbow Trout - Erwin strain (*Salmo gairdneri*)	Egg injection of extract from field-collected fish	LD50	Eggs	TEQs	0.206	0.087	2.4	1	2.4	Embryomortality	Wright and Tillitt, 1999
Rainbow Trout - Lake Superior (*Salmo gairdneri*)	Egg injection of extract from field-collected fish	LD50	Eggs	TEQs	1.43	0.087	16.4	1	16.4	Embryomortality	Wright and Tillitt, 1999
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	LOAEL	Liver	TEQs	1.56 ug/kg dry et	Not available	Not available	1	Not available	Embryo and larval survival	Black et al., 1998
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	LOAEL	Liver	TEQs	0.543 ug/kg dry wt	Not available	Not available	1	Not available	Adult female mortality	Black et al., 1998
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	NOAEL	Liver	TEQs	0.132 ug/kg dry wt	Not available	Not available	1	Not available	Embryo and larval survival	Black et al., 1998
Lake trout (*Salvelinus namaycush*)	Fish collected from Lake Ontario	EL-no effect	Eggs	TEQs	0.011	0.08	0.1	1	0.1	Early life stage mortality	Guiney et al., 1996
Killifish (*Fundulus heteroclitus*)	Fish collected from New Bedford Harbor	NOAEL	Liver	TEQs	0.00572 ug/kg dry wt	Not available	Not available	1	Not available	Adult female mortality	Black et al., 1998

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TABLE 4-9
TOXICITY ENDPOINTS FOR AVIANS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies								
Mallard Duck (*Anas platrhynchos*)		5 day	LD50	Aroclor 1254	853	8122	Mortality	Hill et al., 1975
Japanese Quail (*Coturnix coturnix*)		5 day	LD50	Aroclor 1254	759	6737	Mortality	Hill et al., 1975
Bobwhite Quail (*Colinus virginianus*)		5 day	LD50	Aroclor 1254	141	1516	Mortality	Hill et al., 1975
Brown-headed Cowbird (*Molothrus ater*)	Diet	7 days	EL-effect	Aroclor 1254	333	1500	Mortality	Stickel et al., 1984
Red-winged Blackbird (*Agelaius phoeniceus*)	Diet	6 days	EL-effect	Aroclor 1254	321	1500	Mortality	Stickel et al., 1984
Japanese Quail (*Coturnix coturnix*)	Oral by syringe	7 days	LOAEL	Aroclor 1260	100	888	Weight loss	Vos et al., 1971
Mallard Duck (*Anas platrhynchos*)	Diet	12 weeks	EL-effect	Aroclor1242	16	150	Decreased weight gain in hens, eggshell thinning	Haseltine and Prouty, 1980
Domestic Chicken (*Gallus domesticus*)	Drinking water	6 weeks	EL-effect	Aroclor 1254	3.5	50	Hatching success	Tumasonis et al., 1973
Ring-Necked Pheasant (*Phasianus colchicus*)	Diet, in gelatin capsules	Once per week for 17 weeks	LOAEL	Aroclor 1254	2.9	50	Egg production	Dahlgren et al., 1972
Ring-Necked Pheasant (*Phasianus colchicus*)	Diet	Not available	LOAEL	Aroclor 1254	2.9	50	Female fertility	Roberts et al., 1978
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor 1242	1.4	20	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor 1248	1.4	20	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor 1254	1.4	20	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor1242	1.4	20	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor 1254	1.4	20	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	LOAEL	Aroclor1248	1.4	20	Hatching success	Cecil et al., 1974
Ringed Turtle Dove (*Streptopelia risoria*)	Diet	3 months	EL-effect	Aroclor 1254	1.1	10	Hatching success	Peakall et al, 1972
Ringed Turtle Dove (*Streptopelia risoria*)	Diet		LOAEL	Aroclor 1254	1.1	10	Hatching success	Peakall and Peakall, 1973
Domestic Chicken (*Gallus domesticus*)	Diet	6 weeks	LOAEL	Aroclor 1242	0.7	10	Hatching success	Britton and Huston, 1973
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	LOAEL	Aroclor 1242	0.7	10	Hatching success	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	LOAEL	Aroclor 1248	0.7	10	Hatching success	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	LOAEL	Aroclor 1248	0.7	10	Hatching success	Scott, 1977
Domestic Chicken (*Gallus domesticus*)	Diet		LOAEL	Aroclor 1254	0.3	5	Fertility and egg production	Platonow and Reinhart, 1973

TABLE 4-9
TOXICITY ENDPOINTS FOR AVIANS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies								
European Starling (*Sternus vulgaris*)	Diet	4 days	EL-effect	Aroclor 1254	Not available	1,500	Mortality	Stickel et al., 1984
Common Grackle (*Quiscalus quiscula*)	Diet	8 days	EL-effect	Aroclor 1254	Not available	1,500	Mortality	Stickel et al., 1984
Mallard Duck (*Anas platrhynchos*)	Diet	12 weeks	EL-no effect	Aroclor1242	16	150	Reproduction success, hatching success, survival and growth of chicks	Haseltine and Prouty, 1980
Japanese Quail (*Coturnix coturnix*)	Diet	14 weeks	EL-no effect	Aroclor 1254	5.6	50	Mortality and growth rates of adults	Chang and Stokstad, 1975
Mallard Duck (*Anas platyrhynchos*)	Diet	Approx. 1 month	EL-no effect	Aroclor 1254	2.6	25	Reproduction success	Custer and Heinz, 1980
Japanese Quail (*Coturnix coturnix*)	Diet	Not reported	NOAEL	Aroclor1248	2.3	20	Hatching success	Scott, 1977
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	NOAEL	Aroclor 1016	1.4	20	Egg production	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	NOAEL	Aroclor 1254	1.4	20	Egg production	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	EL-no effect	Aroclor1221	1.4	20	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	EL-no effect	Aroclor1232	1.4	20	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	EL-no effect	Aroclor1268	1.4	20	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	EL-no effect	Aroclor 5442	1.4	20	Hatching success	Cecil et al., 1974
Ring-Necked Pheasant (*Phasianus colchicus*)	Diet, in gelatin capsules	Once per week for 17 weeks	NOAEL	Aroclor 1254	0.7	12.5	Egg production	Dahlgren et al., 1972
Screech Owl (*Otus asio*)	Diet	> 8 weeks	EL-no effect	Aroclor1248	0.4	3	Egg prdoduction, hatching success, fledging success	McLane and Hughes, 1980
Domestic Chicken (*Gallus domesticus*)	Diet	6 weeks	NOAEL	Aroclor1242	0.3	5	Hatching success	Britton and Huston, 1973
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	NOAEL	Aroclor 1242	0.3	5	Hatching success	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	NOAEL	Aroclor1248	0.3	5	Hatching success	Lillie et al., 1975
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor 1242	0.1	2	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor 1248	0.1	2	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor 1254	0.1	2	Egg production, hatching success, chick growth	Lillie et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor1242	0.1	2	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor1248	0.1	2	Hatching success	Cecil et al., 1974
Domestic Chicken (*Gallus domesticus*)	Diet	9 weeks	NOAEL	Aroclor 1254	0.1	2	Hatching success	Cecil et al., 1974

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TABLE 4-9
TOXICITY ENDPOINTS FOR AVIANS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies								
Domestic Chicken (*Gallus domesticus*)	Diet	8 weeks	NOAEL	Aroclor1248	0.1	1	Hatching success	Scott, 1977

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TABLE 4-10
TOXICITY ENDPOINTS FOR AVIANS - FIELD STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	FIELD COMPONENT	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Field studies							
Tree Swallow (*Tachycineta bicolor*)	Populations in Fox River and Green Bay, Lake Michigan, studied	NOAEL	PCBs, DDE	0.55	up to 0.61	Clutch and egg success	Custer et al., 1998
Tree Swallow (*Tachycineta bicolor*)	Populations along Hudson River studied	NOAEL	PCBs	16.1	up to 17.9	Growth, mortality, reproduction	US EPA Phase 2 Database (1998)

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TABLE 4-11
TOXICITY ENDPOINTS FOR AVIANS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE DIOXIN EQUIVALENTS (ug/kg/day)	EFFECT ENDPOINT	REFERENCE
Laboratory studies[a]							
Ringed turtle dove (*Streptopelia risoria*)	Oral	Singe dose	LD_{50}	2,3,7,8-TCDD	> 810	Mortality	Hudson et al., 1984
Mallard (*Anas platrhyncos*)	Oral	Single dose		2,3,7,8-TCDD	> 108	Mortality	Hudson et al., 1984
Chicken (*Gallus domesticus*)	Oral	21 days	LD_{100}	2,3,7,8-TCDD	25 - 50	Mortality	Greig et al., 1973
Ring-necked pheasant (*Phasianus colchicus*)	Intraperitoneal	Single dose	LD_{75}	2,3,7,8-TCDD	25	Mortality	Nosek et al., 1992
Northern bobwhite quail (*Colinus virginianus*)	Oral	Single dose	LD_{50}	2,3,7,8-TCDD	15	Mortality	Hudson et al., 1984
Chicken (*Gallus domesticus*)	Oral	21 days	LOAEL	2,3,7,8-TCDD	1.0	Mortality	Schwetz et al., 1973
Ring-necked pheasant (*Phasianus colchicus*)	Intraperitoneal	10 weeks	LOAEL	2,3,7,8-TCDD	0.14	Fertility, embryo mortality	Nosek et al., 1992
Chicken (*Gallus domesticus*)	Oral	21 days	NOAEL	2,3,7,8-TCDD	0.1	Mortality	Schwetz et al., 1973
Ring-necked pheasant (*Phasianus colchicus*)	Intraperitoneal	10 weeks	NOAEL	2,3,7,8-TCDD	0.014	Fertility, embryo mortality	Nosek et al., 1992

Notes:
[a] No relevant field studies were found.
Note units of ug/kg/day.

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TABLE 4-12
TOXICITY ENDPOINTS FOR AVIANS - FIELD STUDIES
EFFECTIVE DIETARY DOSES OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	FIELD COMPONENT	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE DIOXIN EQUIVALENTS (ug/kg/day)	EFFECTIVE FOOD CONC. (ug/kg)	EFFECT ENDPOINT	REFERENCE
Field studies							
Tree Swallow (*Tachycineta bicolor*)	Populations along Hudson River studied	EL-no effect	TEQs	4.9	up to 5.41	Growth, mortality, reproduction	US EPA Phase 2 Database, 1998
Tree Swallow (*Tachycineta bicolor*)	Populations in Fox River and Green Bay, Lake Michigan, studied	EL-no effect	TEQs, DDE	0.08	up to 0.091	Clutch and egg success	Custer et al., 1998

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TABLE 4-13
TOXICITY ENDPOINTS FOR AVIAN EGGS - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE EGG CONC. (mg/kg egg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies							
Chicken (*Gallus domesticus*)	Drinking water	6 weeks	EL-effect	Aroclor 1254	> 10-15 ppm in yolk	Deformities	Tumasonis et al., 1973
Chicken (*Gallus domesticus*)	Egg injection		LOAEL	Aroclor 1260	10	Growth rate of chicks	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		LOAEL	Aroclor 1254	6.7	Growth and mortality of embryos	Gould et al., 1997
Chicken (*Gallus domesticus*)	Egg injection		LOAEL	Aroclor 1242	5	Hatching success	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		LOAEL	Aroclor 1254	5	Hatching success	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		LOAEL	Aroclor 1242	5	Growth rate of chicks	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)			LOAEL		5	Egg production and hatching success	Platanow and Reinhart, 1973
Chicken (*Gallus domesticus*)	Diet	6 weeks	LOAEL	Aroclor 1242	3.7	Hatching success	Britton and Huston, 1973
Chicken (*Gallus domesticus*)	Diet	4 weeks	LOAEL	Aroclor 1248	2.21	Hatching success	Scott, 1977
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1260	10	Hatching success	Carlson and Duby, 1973
Screech owl (*Otus asio*)	Diet of hens	> 8 weeks	NOAEL	Aroclor 1248	7.1	Egg production, hatching success, and fledging success	McLane and Hughes, 1980
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1260	5	Growth rate of chicks	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1242	2.5	Hatching success	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1254	2.5	Hatching success	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1242	2.5	Growth rate of chicks	Carlson and Duby, 1973
Chicken (*Gallus domesticus*)	Diet	6 weeks	NOAEL	Aroclor 1242	1.7	Hatching success	Britton and Huston, 1973
Chicken (*Gallus domesticus*)	Egg injection		NOAEL	Aroclor 1254	0.67	Growth and mortality of embryos	Gould et al., 1997
Chicken (*Gallus domesticus*)	Diet	4 weeks	NOAEL	Aroclor 1248	0.33	Hatching success	Scott, 1977

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TABLE 4-14
TOXICITY ENDPOINTS FOR AVIAN EGGS - FIELD STUDIES
EFFECTIVE CONCENTRATIONS OF TOTAL PCBs AND AROCLORS

SPECIES	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE EGG CONC. (mg/kg egg)	EFFECT ENDPOINT	REFERENCE
Field studies					
Bald eagle (*Haliaeetus leucocephalus*)	EL--Effect level	PCBs, Pesticides	20-54	Reproductive success	Clark et al., 1988
Double-crested cormorant (*Phalocrocorax auritus*)	EL-Effect level	PCBs, Pesticides, Hg	23.8	Hatching success and fledging success	Weseloh et al., 1983
Caspian tern (*Hydropogne caspia*)	EL-Effect level	PCBs, Pesticides	4.2 - 18	Increased rate of embryo deformities	Yamashita et al., 1993
Forster's tern (*Sterna forsteri*)	LOAEL	PCBs, Pesticides, Dioxins, Furans	22.2	Hatching success	Kubiak et al., 1989
Common tern (*Sterna hirundo*)	LOAEL	PCBs, Pesticides, Hg	7	Hatching success	Becker et al., 1993
Common tern (*Sterna hirundo*)	LOAEL	PCBs, Pesticides, Hg	9.8	Hatching success	Hoffman et al., 1993
Bald eagle (*Haliaeetus leucocephalus*)	LOAEL	PCBs, Pesticides, Hg	3 - 5.6	10 % reduction in reproductive success	Wiemeyer et al., 1984, 1993
Bald eagle (*Haliaeetus leucocephalus*)	EL- No Effect	PCBs, TEQs, Pesticides	33.2 - 64 in yolk sac	Hatching success	Elliott et al., 1996
Tree swallow (*Tachycineta bicolor*)	NOAEL	PCBs	26.7	Reproductive output	Secord and McCarty, 1997, McCarty and Secord, 1999, U.S. EPA Phase 2 Database Release 4.1b, 1998
Common tern (*Sterna hirundo*)	NOAEL	PCBs, Pesticides, Hg	6.7	Hatching success	Hoffman et al., 1993
Common tern (*Sterna hirundo*)	NOAEL	PCBs, Pesticides, Hg	5.2	Hatching success	Becker et al., 1993
Forster's tern (Sterna forsteri)	NOAEL	PCBs, Pesticides, Dioxins, Furans	4.5	Hatching success	Kubiak et al., 1989
Tree swallow (*Tachycineta bicolor*)	NOAEL	PCBs, DDE	3.24 in eggs and pippers	Clutch success, egg success	Custer et al., 1998
Bald eagle (*Haliaeetus leucocephalus*)	NOAEL	PCBs, Pesticides, Hg	< 3	Reproductive success	Wiemeyer et al., 1984, 1993

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TABLE 4-15
TOXICITY ENDPOINTS FOR AVIAN EGGS - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE EGG CONC. (ug/kg egg)	TEF	EFFECTIVE EGG CONC. DIOXIN EQUIVALENTS (ug TEQ/kg egg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies									
American kestrel (*Falco sparverius*)	Egg injection	18 days	LD50	PCB 77	316	0.05	16	Embryo mortality	Hoffman et al., 1998
Double-crested cormorant (*Phalacrocorax auritus*)	Egg injection	21 days	LD50	PCB 126	158	0.1	16	Embryo mortality	Powell et al., 1997
Common tern (*Sterna hirundo*)	Egg injection	18 days	LD50	PCB 126	104	0.1	10	Embryo mortality	Hoffman et al., 1998
American kestrel (*Falco sparverius*)	Egg injection	20 days	LD50	PCB 126	65	0.1	7	Embryo mortality	Hoffman et al., 1998
Ring-necked pheasant (*Phasianus colchicus*)	Egg injection	28 days	LD50	2,3,7,8-TCDD	1.35	1	1	Embryo mortality	Nosek et al., 1993
Chicken (*Gallus domesticus*)	Egg injection	18 days	LD50	PCB 105	5592	0.0001	1	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus domesticus*)	Egg injection	18 days	LD50	PCB 77	8.8	0.05	0.4	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus domesticus*)	Egg injection	24 days	LD50	PCB 126	2.3	0.1	0.2	Embryo mortality	Powell et al., 1996a
Chicken (*Gallus domesticus*)	Egg injection	24 days	LD50	2,3,7,8-TCDD	0.15	1	0.2	Embryo mortality	Powell et al., 1996a
Chicken (*Gallus gallus*)	Egg injection	20 days	LD50	PCB 77	2.6	0.05	0.1	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus gallus*)	Egg injection	18 days	LD50	PCB 126	0.4	0.1	0.04	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus domesticus*)	Egg injection	18 days	LD50	PCB 126	0.6	0.1	0.1	Embryo mortality	Powell et al., 1996b
Double-crested cormorant (*Phalacrocorax auritus*)	Egg injection	21 days	LOAEL	PCB 126	800	0.1	80	Embryo mortality	Powell et al., 1997
American kestrel (*Falco sparverius*)	Egg injection	20 days	LOAEL	PCB 126	233	0.1	23	Embryo mortality	Hoffman et al., 1998
American kestrel (*Falco sparverius*)	Egg injection	20 days	LOAEL	PCB 77	100	0.05	5	Embryo mortality	Hoffman et al., 1998
Common tern (*Sterna hirundo*)	Egg injection	18 days	LOAEL	PCB 126	44	0.1	4	Embryo mortality	Hoffman et al., 1998
Double-crested cormorant (*Phalacrocorax auritus*)	Egg injection	21 days	LOAEL	2,3,7,8-TCDD	4	1	4	Embryo mortality	Powell et al., 1997
Ring-necked pheasant (*Phasianus colchicus*)	Egg injection	21 days	LOAEL	2,3,7,8-TCDD	1	1	1.0	Embryo mortality	Nosek et al., 1993
Chicken (*Gallus domesticus*)	Egg injection	18 days	LOAEL	PCB 105	8100	0.0001	1	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus domesticus*)	Egg injection	18 days	LOAEL	PCB 77	9	0.05	0.5	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus gallus*)	Egg injection	18 days	LOAEL	PCB 77	6	0.05	0.3	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus domesticus*)	Egg injection	24 days	LOAEL	2,3,7,8-TCDD	0.16	1	0.2	Embryo mortality	Powell et al., 1996a
Pidgeon (*Columba livia*)	Egg injection	Embryonic Day 3 through hatch	EL-Effect	2,3,7,8-TCDD	1	1	1.0	Hatchability	Janz and Bellward, 1996
Chicken (*Gallus domesticus*)	Egg injection	18 days	LOAEL	PCB 126	0.9	0.1	0.09	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus gallus*)	Egg injection	18 days	LOAEL	PCB 126	0.5	0.1	0.05	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus domesticus*)	Egg injection	24 days	LOAEL	PCB 126	0.2	0.1	0.02	Embryo mortality	Powell et al., 1996a
Double-crested cormorant (*Phalacrocorax auritus*)	Egg injection	21 days	NOAEL	PCB 126	400	0.1	40	Embryo mortality	Powell et al., 1997

TABLE 4-15
TOXICITY ENDPOINTS FOR AVIAN EGGS - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE EGG CONC. (ug/kg egg)	TEF	EFFECTIVE EGG CONC. DIOXIN EQUIVALENTS (ug TEQ/kg egg)	EFFECT ENDPOINT	REFERENCE
Great Blue Heron (*Ardea herodias*)	Egg injection	Embryonic Day 9 through hatch	EL-No effect	2,3,7,8-TCDD	2	1	2	Hatchability	Janz and Bellward, 1996
American kestrel (*Falco sparverius*)	Egg injection	20 days	NOAEL	PCB 126	23	0.1	2	Embryo mortality	Hoffman et al., 1998
Double-crested cormorant (*Phalacrocorax auritus*)	Egg injection	21 days	NOAEL	2,3,7,8-TCDD	1	1	1	Embryo mortality	Powell et al., 1997

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TABLE 4-15
TOXICITY ENDPOINTS FOR AVIAN EGGS - LABORATORY STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE EGG CONC. (ug/kg egg)	TEF	EFFECTIVE EGG CONC. DIOXIN EQUIVALENTS (ug TEQ/kg egg)	EFFECT ENDPOINT	REFERENCE
Chicken (*Gallus domesticus*)	Egg injection	18 days	NOAEL	PCB 105	2700	0.0001	0.3	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus domesticus*)	Egg injection	18 days	NOAEL	PCB 77	3	0.05	0.2	Embryo mortality	Powell et al., 1996b
Ring-necked pheasant (*Phasianus colchicus*)	Egg injection	28 days	NOAEL	2,3,7,8-TCDD	0.1	1	0.1	Embryo mortality	Nosek et al., 1993
Chicken (*Gallus domesticus*)	Egg injection	24 days	NOAEL	2,3,7,8-TCDD	0.08	1	0.1	Embryo mortality	Powell et al., 1996a
Chicken (*Gallus gallus*)	Egg injection	18 days	NOAEL	PCB 77	1.2	0.05	0.1	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus gallus*)	Egg injection	Embryonic Day 4 through hatch	EL-No effect	2,3,7,8-TCDD	0.1	1	0.1	Hatchability	Janz and Bellward, 1996
Chicken (*Gallus gallus*)	Egg injection	18 days	NOAEL	PCB 126	0.3	0.1	0.03	Embryo mortality	Hoffman et al., 1998
Chicken (*Gallus domesticus*)	Egg injection	18 days	NOAEL	PCB 126	0.3	0.1	0.03	Embryo mortality	Powell et al., 1996b
Chicken (*Gallus domesticus*)	Egg injection	24 days	NOAEL	PCB 126	0.1	0.1	0.01	Embryo mortality	Powell et al., 1996a

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TABLE 4-16
TOXICITY ENDPOINTS FOR AVIAN EGGS - FIELD STUDIES
EFFECTIVE CONCENTRATIONS OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE EGG CONC. DIOXIN EQUIVALENTS (ug TEQ/kg egg)	EFFECT ENDPOINT	REFERENCE
Field studies					
Osprey (*Pandion haliaetus*)	EL-Effect level	TCDD	29 - 162	Growth rate of chicks	Woodford, et al., 1998
Bald eagle (*Haliaeetus leucocephalus*)	EL-Effect level	TEQs, DDE	0.51-1.2	Reproductive success	Clark et al., 1998
Great blue heron (*Ardea herodias*)	LOAEL	TEQs	0.5	Growth rate	Sanderson et al., 1994
Great blue heron (*Ardea herodias*)	EL-Effect level	TEQs, pesticides	0.5	Growth rate	Hart et al., 1991
Cormorant (*Phalacrocorax auritus*)	EL-effect level	TEQ	0.035 - 0.344	Egg mortality	Tillitt et al., 1992
Great blue heron (*Ardea herodias*)	EL-Effect level	TEQs, pesticides	0.23	Reproductive success	Elliott et al., 1989
Forster's tern (*Sterna forsteri*)	EL-Effect	TEQs, pesticides	2.20	Hatching success, growth rate of chicks	Kubiak et al., 1989
Forster's tern (*Sterna forsteri*)	EL-Effect level	TEQ	0.21	Hatching success	Tillitt et al., 1993
Wood duck (*Aix sponsa*)	LOAEL	TEQs, pesticides	0.02	Nest success, hatching success, duckling production	White and Seginak, 1994; White and Hoffman, 1995
Tree swallow (*Tachycineta bicolor*)	NOAEL	TEQs	13	Reproductive success	US EPA Phase 2 Database (1998)
Tree swallow (*Tachycineta bicolor*)	EL-No effect	TEQs	0.589 in pippers	Reproductive success	Custer et al., 1998
Great blue heron (*Ardea herodias*)	NOAEL	TEQs	0.3	Reduced body weight	Sanderson et al., 1994
Great blue heron (*Ardea herodias*)	NOAEL	TEQs	0.24	Growth rate	Hart et al., 1991
Forster's tern (*Sterna forsteri*)	EL-no effect	TEQs, pesticides	0.2	Hatchabilty, growth rate of chicks	Kubiak et al., 1989
Great blue heron (*Ardea herodias*)	EL-No effect	TEQs, pesticides	0.079	Reproductive success	Elliott et al., 1989
Osprey (*Pandion haliaetus*)	EL-no effect	TCDD, TEQs	ND - 23.8	Growth rate of chicks	Woodford et al., 1998
Osprey (*Pandion haliaetus*)	EL-no effect	TEQs	0.136	Embryo survival	Woodford et al., 1998
Foster's tern (*Sterna forsteri*)	EL-no effect	TEQs	0.023	Hatching success	Tillitt et al., 1993
Wood duck (*Aix sponsa*)	NOAEL	TEQs, pesticides	0.005	Nest success, hatching success, duckling production	White and Seginak, 1994; White and Hoffman, 1995

TABLE 4-17
TOXICITY ENDPOINTS FOR OTHER MAMMALS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	FOOD INGESTION RATE (kg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies[a]									
Osborne-Mendel Rat	Oral-gavage	2.5 wk, 2 d per week	LD_{50}	Aroclor 1254	1530	0.099		Mortality	Garthoff et al., 1981 (ATSDR)
Osborne-Mendel Rat	Oral-gavage	2.5 wk, 2 d per week	LD_{50}	Aroclor 1254	1530	0.099		Mortality	Garthoff et al., 1981 (ATSDR)
Wistar Rat	Diet	From mating to weaning of pups	LD_{50}	Aroclor 1254	22	0	269	2 day postnatal mortality of offspring	Overmann et al., 1987
Juvenile Male Rat	Single intraperitoneal injection	Observed after 14 days	LOAEL	Aroclor 1248	2000			Growth rate of juveniles	Harris et al., 1993
Juvenile Male Rat	Single intraperitoneal injection	Observed after 14 days	LOAEL	Aroclor 1232	2000			Growth rate of juveniles	Harris et al., 1993
Sherman Rat	Diet	8 months	LOAEL	Aroclor 1260	72.4	0.08		Mortality	Kimbrough et al., 1972 (ATSDR)
Raccoon (*Procyon lotor*)	DIet	8 days	EL-effect	Arochor 1254	50			Decreased weight gain	Montz et al., 1982
Osborne-Mendel Rat	Diet	During pregnancy and lactation	LOAEL	Not reported	49.471	0.080	500	Reduced litter size	Collins & Capen, 1980
Balb/c Mouse	Oral	6 months	LOAEL	Aroclor 1254	48.75	0.18		Mortality	Koller et al., 1977 (ATSDR)
Adult Female Rat	Oral	Day 1,3,5,7 and 9 of lactation	LOAEL	Aroclor 1254	32	0.08		Reduced growth rate of offspring	Sager & Girard, 1994
Wistar Rat	Oral-gavage	1 month	LOAEL	Aroclor 1254	30	0.08		Decreased litter size, survival of weanlings	Brezner et al., 1984 (ATSDR)
White-footed Mouse (*Peromyscus leucopus*)	Diet	12 weeks	EL-effect	Aroclor 1254	17		10	Reduced growth rate reproduction in second generation	Linzey, 1988 (Golub)
Wistar Rat	Diet	42 days	LOAEL	Aroclor 1254	13.5	0.08		Neonatal death	Overmann, 1987 (ATSDR)
Mouse	Diet	108 days	LOAEL	Aroclor 1254	12.5	0.18		Decreased conception	Welsch, 1975 (ATSDR)
Rabbit	Oral-gavage	28 days	LOAEL	Aroclor 1254	12.5	0.034		Fetal death	Villeneuve et al., 1971 (ATSDR)
Pig	Diet	91 days	LOAEL	Aroclor 1242	9.2			Decreased weight gain	Hansen et al., 1976 (ATSDR)
New Zealand White Rabbit	Diet	> 4 weeks	LOAEL	Aroclor 1248	8.9	0.0	250	Reduced growth rate in offspring	Thomas and Hinsdill, 1980 (Golub)
Osborne-Mendel Rat	Diet	During pregnancy and lactation	LOAEL	Not reported	4.947	0.080	50	Reduced growth rate of offspring	Collins & Capen, 1980
Rhesus Monkey (*Macaca mulatta*)	Diet	2 months	LOAEL	Aroclor 1248	4.3	0.2		Decreased conception	Allen et al., 1974a (ATSDR)
Rhesus Monkey (*Macaca mulatta*)	Diet	2 months	LOAEL	Aroclor 1248	4.3	0.2		Abortion	Allen et al., 1974a (ATSDR)
Fischer Rat	Diet	105 weeks	LOAEL	Aroclor 1254	2.5	0.08		Decreased survival	NCI, 1978 (ATSDR)
Guinea Pig	Oral-gavage	Gestational day 18-60	LOAEL	Clophen A50	2.5			Fetal death	Lundkvist, 1990 (ATSDR)
Sherman Rat	Diet	Multigenerational	LOAEL	Aroclor 1254	1.5	0.08	20	Decreased litter size	Linder et al., 1974
Wistar Rat	Diet	52 weeks	LOAEL	Aroclor 1254	1	0.08		Decreased growth rate	Phillips et al., 1972 (ATSDR)
Oldfield Mouse (*Peromyscus polionotus*)	Diet	12 months	EL-effect	Aroclor 1254	0.68	0.01	5	Decreased offspring born per mated pair, birth weight, % survival of offspring to weaning	McCoy et al., 1995
Rhesus Monkey (*Macaca mulatta*)	Diet	38 weeks	LOAEL	Aroclor 1254	0.2	0.2		No conception, abortion	Arnold et al., 1990 (ATSDR)

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TABLE 4-17
TOXICITY ENDPOINTS FOR OTHER MAMMALS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	FOOD INGESTION RATE (kg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Rhesus Monkey (*Macaca mulatta*)	Diet	7 months	LOAEL	Aroclor 1248	0.2	0.2		Decreased conception	Barsotti et al., 1976 (ATSDR)
Wistar Rat	Diet	From mating to weaning of pups	LOAEL	Aroclor 1254	0.2	0.08	2.5	Reduced growth rate in offspring	Overmann et al., 1987
Rhesus Monkey (*Macaca mulatta*)	Diet	2 months	LOAEL	Aroclor 1242	0.12	0.2		No weight gain	Becker et al., 1979 (ATSDR)
Rhesus Monkey (*Macaca mulatta*)	Diet	1.5 years	LOAEL	Aroclor 1248	0.12	0.2	5	Reduced birth weight	Allen and Barsotti, 1976 (Golub)
Rhesus Monkey (*Macaca mulatta*)	Diet	18 months	LOAEL	Aroclor 1248	0.1	0.2		Infant mortality	Allen et al., 1980 (ATSDR)
Cynomolgus Monkey	Diet	238 days	LOAEL	Aroclor 1254	0.1			100% fetal death	Truelove et al., 1982 (ATSDR)
Rhesus Monkey (*Macaca mulatta*)	Diet	18.2	LOAEL	Aroclor 1248	0.08	0.2		Decreased birth weight	Levin et al., 1988 (ATSDR)
Rhesus Monkey (*Macaca mulatta*)	Diet	> 8 months	LOAEL	Aroclor 1016	0.04	0.2	1	Reduced birth weight	Barsotti and Van Miller, 1984 (Golub)
Swine	Diet	Throughout gestation	EL-effect	Aroclor 1242	Not available		20	Decreased litter size	Hansen et al., 1975 (Golub)
Juvenile Male Rat	Single intraperitoneal injection	Observed after 14 days	NOAEL	Aroclor 1248	480			Growth rate of juveniles	Harris et al., 1993
Juvenile Male Rat	Single intraperitoneal injection	Observed after 14 days	NOAEL	Aroclor 1232	480			Growth rate of juveniles	Harris et al., 1993
Wistar Rat	Diet	52 weeks	NOAEL	Aroclor 1254	10	0.08		Decreased growth rate	Phillips et al., 1972 (ATSDR)
Rabbit	Oral-gavage	28 days	NOAEL	Aroclor 1254	10	0.034		Fetal death	Villeneuve et al., 1971 (ATSDR)
Adult Female Rat	Oral	Day 1,3,5,7 and 9 of lactation	NOAEL	Aroclor 1254	8	0.099		Growth rate of offspring	Sager & Girard, 1994
New Zealand White Rabbit	Diet	> 4 weeks	NOAEL	Aroclor 1248	3.6	0.034	100	Reduced growth rate in offspring	Thomas and Hinsdill, 1980 (Golub)
Sherman Rat	Diet	Multigenerational	NOAEL	Aroclor 1254	0.32	0.08	5	Decreased litter size	Linder et al., 1974
Osborne-Mendel Rat	Diet	During pregnancy and lactation	NOAEL	Aroclor 1254	0.059	0.08	50	Reduced litter size	Collins & Capen, 1980
Rhesus Monkey (*Macaca mulatta*)	Diet	> 8 months	NOAEL	Aroclor 1016	0.01	0.2	0.25	Reduced birth weight	Barsotti and Van Miller, 1984 (Golub)
Wistar Rat	Diet	From mating to weaning of pups	NOAEL	Aroclor 1254	0.0016	0.08	0.02	Reduced growth rate in offspring	Overmann et al., 1987

Notes:

[a]No relevant field studies were found.

Dose to rhesus monkey calculated using food ingestion rate of 0.2 kg/day and body weight of 5 kg (Sample et al., 1996)

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TABLE 4-18
TOXICITY ENDPOINTS FOR OTHER MAMMALS - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE DIOXIN EQUIVALENTS (ug TEQ/kg/day)*	EFFECT ENDPOINT	REFERENCE
Laboratory studies							
Hamster	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	1,160 - 5,050	Mortality	Kociba and Schwetz, 1982
Mouse	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	114 -284	Mortality	Kociba and Schwetz, 1982
Dog	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	about 100 - 200	Mortality	Kociba and Schwetz, 1982
Rabbit	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	115	Mortality	Schwetz et al., 1973
Rhesus monkey (*Macaca mulatta*)	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	approx. 70	Mortality	Kociba and Schwetz, 1982
Rat	Oral	Single dose	LD$_{50}$	2,3,7,8-TCDD	22 - 45	Mortality	Schwetz et al., 1973
Guinea pig	Oral	Single dose	LD$_{52}$	2,3,7,8-TCDD	0.6 - 2.1	Mortality	Schwetz et al., 1973
Rat		Gestation days 6 to 15	LOAEL	2,3,7,8-TCDD	0.25	Litter size, pup weight	Khera and Ruddick, 1973
Rat		2 years	LOAEL	2,3,7,8-TCDD	0.1	Female mortality	Kociba et al., 1978
Rat		3 generations	LOAEL	2,3,7,8-TCDD	0.01	Reproductive capacity	Murray et al.,1979
Rhesus monkey (*Macaca mulatta*)		7 months	LOAEL	2,3,7,8-TCDD	0.0021	Number of births	Allen et al., 1979
Rhesus monkey (*Macaca mulatta*)		7 - 48 months, maternal	LOAEL	2,3,7,8-TCDD	0.00059	Reproductive	Bowman et al., 1989b
Rat		Gestation days 6 to 15	NOAEL	2,3,7,8-TCDD	0.125	Litter size, pup weight	Khera and Ruddick, 1973
Rat		2 years	NOAEL	2,3,7,8-TCDD	0.01	Female mortality	Kociba et al., 1978
Rat		3 generations	NOAEL	2,3,7,8-TCDD	0.001	Reproductive capacity	Murray et al. 1979
Rhesus monkey (*Macaca mulatta*)		7 to 48 months, maternal	NOAEL	2,3,7,8-TCDD	0.00012	Reproductive	Bowman et al., 1989

TABLE 4-19
TOXICITY ENDPOINTS FOR MINK - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	EXPOSURE MEDIA	EXPOSURE DURATION	EFFECT LEVEL	PCB TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Laboratory studies								
Mink (*Mustela vision*)	Diet	4 weeks	LD50	Aroclor 1254	11.5	84	Adult mortality	Hornshaw (1984), *as cited in* Aulerich et al. (1986)
Mink (*Mustela vision*)	Diet	4 weeks	LD50	Aroclor 1254	10.8	79	Adult mortality	Aulerich et al. (1986)
Mink (*Mustela vision*)	Diet	4 weeks	LD50	Aroclor 1254	6.4	47	Adult mortality	Hornshaw et al. (1986)
Mink (*Mustela vision*)	Diet	4 weeks	LD50	Aroclor 1254 (weathered)	6.4	47	Adult mortality	Aulerich et al. (1986)
Mink (*Mustela vision*)	Diet	9 months	LD50	Aroclor 1254	0.9	6.6	Mortality	Ringer et al. (1981)
Mink (*Mustela vision*)	Diet	8 months	EL-effect	Aroclor 1016	2.7	20	Reduced birth weight and growth rate of kits	Bleavins et al., 1980
Mink (*Mustela vision*)	Diet	8 months	EL-effect	Aroclor 1016	2.7	20	Adult mortality	Bleavins et al., 1980
Mink (*Mustela vision*)	Diet	4 weeks	LOAEL	Aroclor 1254	1.4	10	Reduced weight gain in juveniles	Hornshaw et al. (1986)
Mink (*Mustela vision*)	Diet	8 months	LOAEL	Aroclor 1242	1.4	10	Adult mortality	Bleavins et al., 1980
Mink (*Mustela vision*)	Diet	3 months	EL-effect	Clophen A-50	2	Not reported	Decreased number of kits born alive	Kihlstom et al., 1992
Mink (*Mustela vision*)	Diet	3 months	EL-effect	Aroclor 1254	2	Not reported	Decreased number of kits born alive	Kihlstom et al., 1992
Mink (*Mustela vision*)	Diet	8 months	LOAEL	Aroclor 1242	0.7	5	Reduced reproduction	Bleavins et al., 1980
Mink (*Mustela vision*)	Diet	4 months	LOAEL	Aroclor 1254	0.7	5	Decreased number of kits born alive	Aulerich and Ringer (1977)
Mink (*Mustela vision*)	Diet	105 days	LOAEL	Aroclor 1254 (weathered)	0.5	3.57	Adult mortality	Platonow & Karstad (1973)
Mink (*Mustela vision*)	Diet	66 days	LOAEL	Not reported	0.5	3.3	Decreased number of kits born alive	Jensen et al. (1977)
Mink (*Mustela vision*)	Diet	4 months	EL-effect	Aroclor 1254	0.3	2.5	Decreased number of kits born alive	Aulerich et al. (1985)
Mink (*Mustela vision*)	Diet	6 months	EL-effect	Aroclor 1254	0.1	1	Reduced growth rates of kits	Wren et al., 1987
Mink (*Mustela vision*)	Diet	160 days	LOAEL	Aroclor 1254 (weathered)	0.09	0.64	Reduced number of kits born alive	Platanow & Karstad (1973)
Mink (*Mustela vision*)	Diet	8 months	NOAEL	Aroclor 1242	0.9	5	Adult mortality	Bleavins et al., 1980
Mink (*Mustela vision*)	Diet	4 months	NOAEL	Aroclor 1254	0.1	1	Decreased number of kits born alive	Aulerich & Ringer (1977)

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TABLE 4-20

TOXICITY ENDPOINTS FOR MINK - FIELD STUDIES

EFFECTIVE DIETARY DOSES OF TOTAL PCBs AND AROCLORS

SPECIES	FIELD COMPONENT	STUDY DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE FOOD CONC. (mg/kg)	EFFECT ENDPOINT	REFERENCE
Field studies								
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Mink were fed prior to and throughout the reproductive period	LOAEL	PCBs, TEQs, others	0.13	N/A	Reproductive success, growth/survival of offspring	Heaton et al. (1995)
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Mink fed prior to breeding and over two generations	LOAEL	PCBs, pesticides	0.08	0.5	Kit survival	Restum et al., 1998
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Mink fed prior to breeding and over two generations	LOAEL	PCBs, pesticides	0.04	0.25	Reduced growth rate of kits	Restum et al., 1998
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Mink fed prior to breeding and over two generations	LOAEL	PCBs, pesticides	0.04	0.25	Kit survival	Restum et al., 1998
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Mink were fed prior to and throughout the reproductive period	NOAEL	PCBs, TEQs, others	0.004	N/A	Reproductive success, growth/survival of offspring	Heaton et al. (1995)

TABLE 4-21
TOXICITY ENDPOINTS FOR MINK - LABORATORY STUDIES
EFFECTIVE DIETARY DOSES OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	FIELD COMPONENT	STUDY DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE (mg/kg/day)	EFFECTIVE DOSE DIOXIN EQUIVALENTS (ug TEQ/kg/day)	EFFECT ENDPOINT	REFERENCE
Laboratory studies								
Mink kits (*Mustela vison*)	Intraperitoneal	12 days	LD_{53}	2,3,7,8-TCDD	< 0.01	< 0.01	Mortality	Aulerich et al., 1988
Mink males (*Mustela vison*)	Oral	Single dose	LD_{51}	2,3,7,8-TCDD	4.2	4.2	Mortality	Hochstein et al., 1988

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TABLE 4-22
TOXICITY ENDPOINTS FOR MINK - FIELD STUDIES
EFFECTIVE DIETARY DOSES OF DIOXIN TOXIC EQUIVALENTS (TEQs)

SPECIES	FIELD COMPONENT	STUDY DURATION	EFFECT LEVEL	CONTAMINANT TYPE	EFFECTIVE DOSE DIOXIN EQUIVALENTS (ug TEQ/kg/day)	EFFECT ENDPOINT	REFERENCE
Field studies							
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	LOAEL	TEQs, pesticides	0.0036	Growth rate of kits	Heaton et al. (1995)
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	LOAEL	TEQs (chemically derived)	0.00224	Growth and survival rate of kits	Tillitt et al., 1996
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	LOAEL	TEQs (bioassay derived)	0.00027	Growth and survival rate of kits	Tillitt et al., 1996
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	NOAEL	TEQs (bioassay derived)	0.00344	Growth and survival rate of kits	Tillitt et al., 1996
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	NOAEL	TEQs, pesticides	0.00025	Growth rate of kits	Heaton et al. (1995)
Mink (*Mustela vision*)	Fed contaminated carp from Saginaw Bay, MI	Fed prior to and throughout breeding period	NOAEL	TEQs (chemically derived)	0.00008	Growth and survival rate of kits	Tillitt et al., 1996

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TABLE 4-23
TAXONOMY OF STUDIED ORGANISMS

Phylum	*Class*	*Subclass*	*Order*	*Family*	*Genus*	*Species*	*Common name*
Chordata	Mammalia		Carnivora	Mustelidae	*Lutra*	*canadensis*	River Otter
Chordata	Mammalia		Carnivora	Mustelidae	*Mustela*	*vision*	Mink
Chordata	Mammalia		Carnivora	Procyonidae	*Procyon*	*lotor*	Raccoon
Chordata	Mammalia		Chiroptera	Vespertilionidae	*Myotis*	*lucifugus*	Little Brown Bat
Chordata	Mammalia		Lagomorphus	Leporidae	*[Sylvilagus]*	*[transitionalis]*	Rabbit [Eastern Cottontail]
Chordata	Mammalia		Rodentia	Muridae	*[Peromyscus]*	*[polionotus]*	Mouse [Oldfield Mouse]
Chordata	Mammalia		Rodentia	Muridae	*[Rattus]*	*[rattus]*	Rat
							Birds
Chordata	Aves		Anseriformes	Anatidae	*Aix*	*sponsa*	Wood Duck
Chordata	Aves		Anseriformes	Anatidae	*Anas*	*platyrhynchos*	Mallard Duck
Chordata	Aves		Charadriiformes	Laridae	*Hydropogne*	*caspia*	Caspian tern
Chordata	Aves		Charadriiformes	Laridae	*Sterna*	*hirundo*	Common tern
Chordata	Aves		Charadriiformes	Laridae	*Sterna*	*forsteri*	Forster's tern
Chordata	Aves		Ciconiiformes	Ardeidae	*Ardea*	*herodias*	Great Blue Heron
Chordata	Aves		Coraciiformes	Alcedinidae	*Ceryle*	*alcyon*	Kingfisher
Chordata	Aves		Falconiiformes	Accipitridae	*Haliaeetus*	*leucocephalus*	Bald Eagle
Chordata	Aves		Falconiiformes	Falconidae	*Falco*	*sparvenius*	American Kestrel
Chordata	Aves		Falconiiformes	Pandionidae	*Pandion*	*haliaeetus*	Osprey
Chordata	Aves		Galliformes	Phasianidae	*Colinus*	*virginianus*	Northern Bobwhite
Chordata	Aves		Galliformes	Phasianidae	*Coturnix*	*coturnix*	Japanese Quail
Chordata	Aves		Galliformes	Phasianidae	*Gallus*	*domesticus*	Domestic Chicken
Chordata	Aves		Galliformes	Phasianidae	*Phasianus*	*colchicus*	Ring-Necked Pheasant
Chordata	Aves		Passeriformes	Hirundinidae	*Tachycineta*	*bicolor*	Tree Swallow
Chordata	Aves		Passeriformes	Icteridae	*Agelaius*	*phoeniceus*	Red-Winged Blackbird
Chordata	Aves		Passeriformes	Icteridae	*Molothrus*	*ater*	Brown-Headed Cowbird
Chordata	Aves		Passeriformes	Icteridae	*Quiscalus*	*quiscula*	Common Grackle
Chordata	Aves		Passeriformes	Sturnidae	*Sturnus*	*vulgaris*	European Starling
Chordata	Aves		Pelecaniformes	Phalacrocoracidae	*Phalacrocorax*	*auritus*	Double-Crested Cormorant
Chordata	Aves		Strigiformes	Strigidae	*Otus*	*asio*	Screech Owl
							Fish
Chordata	Pisces	Actinopterygii	Acipenseriformes	Acipenseridae	*Acipenser*	*brevirostrum*	Shortnose Sturgeon
Chordata	Pisces	Actinopterygii	Beloniformes	Adrianichthydiae	*Oryzias*	*latipes*	Medaka
Chordata	Pisces	Actinopterygii	Clupeiformes	Clupeidae	*Clupea*	*harengus*	Baltic Herring
Chordata	Pisces	Actinopterygii	Cypriniformes	Catostomidae	*Catastomus*	*commersoni*	White sucker
Chordata	Pisces	Actinopterygii	Cypriniformes	Cyprinidae	*Danio*	*danio*	Zebrafish
Chordata	Pisces	Actinopterygii	Cypriniformes	Cyprinidae	*Notropis*	*hudsonius*	Spottail Shiner
Chordata	Pisces	Actinopterygii	Cypriniformes	Cyprinidae	*Phoxinus*	*phoxinus*	Minnow
Chordata	Pisces	Actinopterygii	Cypriniformes	Cyprinidae	*Pimephalus*	*promelas*	Fathead Minnow
Chordata	Pisces	Actinopterygii	Cypriniformes	Cyprinodontidae	*Fundulus*	*heteroclitus*	Killifish
Chordata	Pisces	Actinopterygii	Perciformes	Centrarchidae	*Lepomis*	*gibbosus*	Pumpkinseed
Chordata	Pisces	Actinopterygii	Perciformes	Centrarchidae	*Lepomis*	*auritus*	Redbreast Sunfish
Chordata	Pisces	Actinopterygii	Perciformes	Centrarchidae	*Micropterus*	*salmoides*	Largemouth Bass
Chordata	Pisces	Actinopterygii	Perciformes	Moronidae	*Morone*	*americana*	White Perch
Chordata	Pisces	Actinopterygii	Perciformes	Moronidae	*Morone*	*saxatilis*	Striped Bass
Chordata	Pisces	Actinopterygii	Perciformes	Percidae	*Perca*	*flavescens*	Yellow Perch
Chordata	Pisces	Actinopterygii	Perciformes	Sciaenidae	*Leiostomus*	*xanthurus*	Spot

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TABLE 4-23
TAXONOMY OF STUDIED ORGANISMS

Phylum	*Class*	*Subclass*	*Order*	*Family*	*Genus*	*Species*	*Common name*
Chordata	Pisces	Actinopterygii	Perciformes	Sparidae	*Lagodon*	*rhomboides*	Pinfish
Chordata	Pisces	Actinopterygii	Pleuronectiformes	Pleuronectidae	*Parophrys*	*vetulus*	English Sole
Chordata	Pisces	Actinopterygii	Pleuronectiformes	Pleuronectidae	*Platichthys*	*flesus*	Baltic Flounder
Chordata	Pisces	Actinopterygii	Pleuronectiformes	Pleuronectidae	*Platichthys*	*stellatus*	Starry Flounder
Chordata	Pisces	Actinopterygii	Pleuronectiformes	Pleuronectidae	*Pseudopleuronectes*	*americanus*	Winter Flounder
Chordata	Pisces	Actinopterygii	Salmoniformes	Esocidae	*Esox*	*lucius*	Northern Pike
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Coregonus*	*artedii*	Lake Herring
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Oncorhynchus*	*tshawytscha*	Chinook Salmon
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Salmo*	*gairdneri*	Rainbow Trout
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Salvelinus*	*alpinus*	Arctic Charr
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Salvelinus*	*fontinalis*	Brook Trout
Chordata	Pisces	Actinopterygii	Salmoniformes	Salmonidae	*Salvelinus*	*namaycush*	Lake Trout
Chordata	Pisces	Actinopterygii	Siluriformes	Ictaluridae	*Ictalurus*	*nebulosus*	Brown Bullhead
Chordata	Pisces	Actinopterygii	Siluriformes	Ictaluridae	*Ictalurus*	*punctatus*	Channel Catfish

TABLE 4-24
STANDARD ANIMAL BODY WEIGHTS AND FOOD INTAKE RATES

Animal	*Body Weight (kg)*	*Food Ing. Rate (g/d)*	*Food Ingestion Rate (kg/d)*	*Food factor (kg/kg body wt/d)*
MAMMALS				
Mink	1		0.137	0.137
Mouse	0.03		0.0055	0.180
	0.028			
Mean Mouse	0.029			
Mouse, Oldfield	0.014	1.9	0.0019	
Rabbit	3.8		0.135	0.034
Rhesus Monkey	5		0.2	0.040
Rat	0.35		0.028	0.080
	0.435			
	0.303			
	0.273		0.0375	0.137
	0.365			
	0.26			
Mean Rat	0.331		0.03275	0.099
BIRDS				
Blackbird, Red-Winged	0.064		0.0137	0.214
Chicken, Domestic--adult	1.6		0.11	0.069
	1.5		0.106	0.071
Mean Chicken, Domestic--adult	1.55		0.108	0.070
Chickens, Domestic--chick	0.121		0.0126	0.104
	0.534		0.044	0.082
Mean Chicken, Domestic--chick	0.3275		0.0283	0.086
Cowbird, Brown-headed	0.049		0.01087	0.222
Dove, Ringed	0.155		0.017	0.110
Duck, Mallard--adult	1		0.1	0.100
	1.153		0.11	0.095
	1.15	115	0.115	0.100
	1		0.128	0.128
	1.17		0.121	0.103
Mean Duck, Mallard--adult	1.0946		0.1148	0.105
Duck, Mallard--duckling	0.782	78.2	0.0782	0.100
Kestrel, American	0.13		0.01	0.077
Owl, Screech	0.181	25	0.025	0.138
Pheasant, Ring-necked	1		0.0582	0.058
Quail, Japanese	0.15		0.0169	0.113
Quail, Japanese--3 months	0.072			

Note: All values are from Toxicological Benchmarks for Wildlife:1996 Revision (USEPA, 1996) unless otherwise noted.

TABLE 4-25
TOXICITY REFERENCE VALUES FOR FISH
DIETARY DOSES AND EGG CONCENTRATIONS OF TOTAL PCBs AND DIOXIN TOXIC EQUIVALENTS (TEQs)

TRVs		Pumpkinseed (*Lepomis gibbosus*)	Spottail Shiner (*Notropis hudsonius*)	Brown Bullhead (*Ictalurus nebulosus*)	Yellow Perch (*Perca flavescens*)	White Perch (*Morone americana*)	Largemouth Bass (*Micropterus salmoides*)	Striped Bass (*Morone saxatilus*)	Shortnose Sturgeon (*Acipenser brevirostrum*)	References
Tissue Concentration										
Lab-based TRVs for PCBs (mg/kg wet wt.)	LOAEL	17	***170***	***17***	***17***	17	17	17	***17***	Bengtsson (1980)
	NOAEL	1.5	***15***	***1.5***	***1.5***	1.5	1.5	1.5	***1.5***	
Field-based TRVs for PCBs (mg/kg wet wt.)	LOAEL	NA	NA	NA	NA	NA	NA	NA	NA	White perch and striped bass: Westin et al. (1983)
	NOAEL	***0.5***	NA	NA	NA	***3.1***	***0.5***	***3.1***	NA	Pumpkinseed and Largemouth bass: Adams et al. (1989, 1990, 1992)
Egg Concentration										
Lab-based TRV for TEQs (ug/kg lipid) from salmonids	LOAEL	***0.6***	Not derived	***18***	***0.6***	***0.6***	***0.6***	***0.6***	***0.6***	Brown Bullhead: Elonen et al. (1998)
	NOAEL	***0.29***	Not derived	***8.0***	***0.29***	***0.29***	***0.29***	***0.29***	***0.29***	All others: Walker et al. (1994)
Lab-based TRV for TEQs (ug/kg lipid) from non-salmonids	LOAEL	10.3	***103***	Not derived	10.3	10.3	10.3	10.3	10.3	Oliveri and Cooper (1997)
	NOAEL	0.54	***5.4***	Not derived	0.54	0.54	0.54	0.54	0.54	
Field-based TRVs for TEQs (ug/kg lipid)	LOAEL	NA	NA	NA	NA	NA	NA	NA	NA	
	NOAEL	NA	NA	NA	NA	NA	NA	NA	NA	

Note:
[a] Pumpkinseed (*Lepomis gibbosus*) and spottail shiner (*Notropis hudsonius*)
Units vary for PCBs and TEQ.
NA = Not available
Selected TRVs are ***bolded and italicized***.

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TABLE 4-26
TOXICITY REFERENCE VALUES FOR BIRDS
DIETARY DOSES AND EGG CONCENTRATIONS OF TOTAL PCBs AND DIOXIN TOXIC EQUIVALENTS (TEQs)

TRVs		Tree Swallow (*Tachycineta bicolor*)	Mallard Duck (*Anas platyrhychos*)	Belted Kingfisher (*Ceryle alcyon*)	Great Blue Heron (*Ardea herodias*)	Bald Eagle (*Haliaeetus leucocephalus*)	References
Dietary Dose							
Lab-based TRVs for PCBs (mg/kg/day)	LOAEL	0.07	***2.6***	***0.07***	***0.07***	***0.07***	Mallard: Custer and Heinz (1980)
	NOAEL	0.01	***0.26***	***0.01***	***0.01***	***0.01***	All others: Scott (1977)
Field-based TRVs for PCBs (mg/kd/day)	LOAEL	NA	NA	NA	NA	NA	Tree Swallow: US EPA Phase 2 Database (1998)
	NOAEL	***16.1***	NA	NA	NA	NA	
Lab-based TRVs for TEQs (ug/kg/day)	LOAEL	0.014	***0.014***	***0.014***	***0.014***	***0.014***	Nosek et al. (1992)
	NOAEL	0.0014	***0.0014***	***0.0014***	***0.0014***	***0.0014***	
Field-based TRVs for TEQs (ug/kg/day)	LOAEL	NA	NA	NA	NA	NA	US EPA Phase 2 Database (1998)
	NOAEL	***4.9***	NA	NA	NA	NA	
Egg Concentration							
Lab-based TRVs for PCBs (mg/kg egg)	LOAEL	2.21	***2.21***	***2.21***	***2.21***	2.21	Scott (1977)
	NOAEL	0.33	***0.33***	***0.33***	***0.33***	0.33	
Field-based TRVs for PCBs (mg/kg egg)	LOAEL	NA	NA	NA	NA	NA	Bald Eagle: Wiemeyer (1984, 1993)
	NOAEL	***26.7***	NA	NA	NA	***3.0***	Tree Swallow: US EPA Phase 2 Database (1998)
Lab-based TRVs for TEQs (ug/kg egg)	LOAEL	0.02	0.02	***0.02***	NA	***0.02***	Great Blue Heron: Janz and Bellward (1996)
	NOAEL	0.01	0.01	***0.01***	2	***0.01***	Others: Powell et al. (1996a)
Field-based TRVs for TEQs (ug/kg egg)	LOAEL	NA	***0.02***	NA	***0.5***	NA	Mallard: White and Segniak (1994); White and Hoffman (1995)
	NOAEL	***13***	***0.005***	NA	***0.3***	NA	Great Blue Heron: Sanderson et al. (1994)
							Tree Swallow: US EPA Phase 2 Database (1998)

Note: Units vary for PCBs and TEQ.

NA = Not Available

Selected TRVs are ***bolded and italicized.***

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TABLE 4-27
TOXICITY REFERENCE VALUES FOR MAMMALS
DIETARY DOSES OF TOTAL PCBs AND DIOXIN TOXIC EQUIVALENTS (TEQs)

TRVs		Little Brown Bat (*Myotis lucifugus*)	Raccoon (*Procyon lotor*)	Mink (*Mustela vison*)	Otter (*Lutra canadensis*)	References
Lab-based TRVs for PCBs (mg/kg/day)	LOAEL	***0.15***	***0.15***	0.07	0.07	Mink and otter: Aulerich and Ringer (1977)
	NOAEL	***0.032***	***0.032***	0.01	0.01	Raccoon and bat: Linder et al. (1984)
Field-based TRVs for PCBs (mg/kg/day)	LOAEL	NA	NA	***0.13***	***0.13***	Heaton et al. (1995)
	NOAEL	NA	NA	***0.004***	***0.004***	
Lab-based TRVs for TEQs (ug/kg/day)	LOAEL	***0.001***	***0.001***	0.001	0.001	Murray et al. (1979)
	NOAEL	***0.0001***	***0.0001***	0.0001	0.0001	
Field-based TRVs for TEQs (ug/kg/day)	LOAEL	NA	NA	***0.00224***	***0.00224***	Tillitt et al. (1996)
	NOAEL	NA	NA	***0.00008***	***0.00008***	

Note: Units vary for PCBs and TEQ.

Note: TRVs for raccoon and bat are based on mulit-generational studies to which interspecies uncertainty factors are applied.

NA = Not Available

Final selected TRVs are ***bolded and italicized*.**

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TABLE 4-28: WILDLIFE SURVEY RESULTS Amphibians

Hudson River

New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
				Amphibians		
Amphibian Expert	1-Jun-99	Email	Yes	Thomas Palmer, frog consultant for Wellesley Project; Ophis@world.std.com	He doesn't know anything about PCB effects on frogs; posted message on amphibian web page	Recommended the following website: http://cciw.ca/green-lane/herptox/
NYSDEC - Amphibian and Reptile Atlas Project	3-Jun-99	Email	No	herps@gw.dec.state.ny.us; http://www.dec.state.ny.us/website/dfwmr/wildlife/herp/index.html		
NYS Department of Environmental Conservation - Endangered Species Unit	8-Jun-99	WWW	No	www.dec.state.ny.us/website/dfwmr/wildlife/endspec/enspamphib.html	Brief summaries, listed by species, for NY state.	*Eurycea longicauda* (Longtail Salamander): nocturnal salamander which occupies shallow rocky streams and moist forested areas. Found in Cattaraugus County and mid Hudson Valley. Very few in NY. Status: Special Concern.
NYS Department of Environmental Conservation	8-Jun-99	WWW	No	www.dec.state.ny.us/website/dfwmr/wildlife/herp/atproj.html	10 year survey documenting geographic distribution of herpetofauna in NY state.	Common frogs and toads abundant, snapping turtles abundant, some box turtles present.
NYSDEC	16-Jun-99	Call	Yes	Mark Brown (518) 623-3671	Familiar with the area regarding mammals, birds, and herps. Good source. See General Info page.	Reports snapping and painted turtles, red back and two-line salamanders. Frogs: bull, spring peepers, gray tree, northern leopard, and pickeral. American toad. Garter and water snakes (none are poisonous). Currently working on a herp survey.
Ndakinna Wilderness Project	6/3/1999 6/16/99	Email Call Call	No No Yes	Jim Brushek (518) 583-9980x3, 23 Middle Grove Road, Greenfield Center, NY 12833; Received address from Saratoga County Information - Annamaria Dalton (annamaria@spa.net)	Professional Tracker	Common amphibians present in strong numbers. Box, snapper, and painted turtles. Some snakes which he could not identify.

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TABLE 5-1
BENTHIC INVERTEBRATES COLLECTED AT TI POOL STATIONS

Taxa in Rank Order	Common Name	Mean % of Total Ind. Collected
Caecidotea racovitzai	Isopod (sowbug)	34.6
Chironomidae[1]	Midges	~30.2
Oligochaeta	Aquatic worms	14.3
Gammarus fasciatus	Amphipod	10.3
Pisidium sp.	Pill Clam	5.0
Canthocamptes sp.	Harpacticoid copepod	1.5
Nematoda	Nematods (worms)	1.1
Phylocentropus sp.	Caddis fly larvae	<1.0
Dubiraphia sp.	Beetle larvae	<1.0
Menetus sp.	Caddis fly larvae	<1.0
Valvata sp.	Snail	<1.0
Sialis sp.	Alderfly larvae	<1.0
Oecetis sp.	Caddisfly larvae	<1.0
Probezzia sp.	Biting midges	<1.0
Enallagma sp.	Damselfly nymph	<1.0
Chydoridae	Water fleas (Cladoceran)	<1.0
Acariformes	Mites	<1.0
Amnicola sp.	Snail	<1.0
Mystacides sp.	Caddisfly larvae	<1.0
Diaphanosoma sp.	Water fleas (Cladoceran)	<1.0
Ceratopogonidae	Biting midges	<1.0
Helobdella fusca	Leech	<1.0
Arthropoda	Arthropods	<1.0
Eukiefferiella sp.	Biting Midges	<1.0

TABLE 5-1
BENTHIC INVERTEBRATES COLLECTED AT TI POOL STATIONS

Taxa in Rank Order	**Common Name**	**Mean % of Total Ind. Collected**
Turbellaria	Flatworms	<1.0
Dugesia tigrina	Flatworm	<1.0
Bithynia tentaculata	Snail	<1.0
Trichoptera	Caddisfly larvae	<1.0
Chydorus sp.	Water fleas (Cladoceran)	<1.0
Caenis sp.	Mayfly nymph	<1.0
Physa sp.	Snail	<1.0
Helobdella sp.	Leech	<1.0
Mesocyclops sp.	Cyclopoid copepods	<1.0
Orthotrichia sp.	Caddis fly larvae	<1.0
Aeschnidae	Dragonfly nymph	<1.0
Hexagenia sp.	Mayfly nymph	<1.0
Hirudinea	Leeches	<1.0
Neureclipsis sp.	Caddisfly larvae	<1.0
Culicoides sp.	Mosquito larvae	<1.0
Corixidae	Water boatman	<1.0
Neoperla sp.	Stonefly nymph	<1.0
Caenidae	Mayfly nymph	<1.0
Donacia sp.	Beetle	<1.0
Hemiptera	True bugs	<1.0
Molanna sp.	Caddisfly larvae	<1.0
Copepoda	Copepods	<1.0
Insecta	Insects	<1.0
Baetidae	Mayfly nymph	<1.0
Macronychus sp.	Riffle beetle	<1.0
Tipulidae	Cranefly larvae	<1.0

TABLE 5-1
BENTHIC INVERTEBRATES COLLECTED AT TI POOL STATIONS

Taxa in Rank Order	Common Name	Mean % of Total Ind. Collected
Cymatia sp.	Water boatman	<1.0
Notonecta sp.	Water boatman	<1.0
Talitridae	Amphipod	<1.0
Baetis sp.	Mayfly nymph	<1.0
Dromogomphus sp.	Dragonfly nymph	<1.0
Oxyethira sp.	Caddis fly larvae	<1.0
Diptera	Flies and midges	<1.0
Atherix sp.	Snipe fly	<1.0
Tabanidae	Horsefly larvae	<1.0
Elliptio sp.	Eastern elliptio mussel	<1.0

Notes: Taxa are listed in order of absolute abundance.
Mean Percent of individuals is based on the mean of Stations 3 to 7.
[1] Chironomidae were primarily composed of Chironominae, *Proclaudius* sp., *Tanytarsus* sp., *Dicrotendipes* sp., *Polypedilum* sp., *Clinotanypus* sp., *Tribelos jucundus*, and Tanypodinae.

TABLE 5 -2
RELATIVE ABUNDANCE OF FIVE DOMINANT TAXANOMIC GROUPS AT TI POOL STATIONS

Group/Taxa	Station 3 Abundance		Station 4 Abundance		Station 5 Abundance		Station 6 Abundance		Station 7 Abundance	
	ind/m^2	Percent	ind/m^2	Percent	ind/m^2	Percent	ind/m^2	Percent	ind/m^2	Percent
Total Dominant Isopoda	**653**	**5.6%**	**3245**	**24.6%**	**14256**	**50.9%**	**2347**	**15.2%**	**7286**	**60.9%**
Caecidotea racovitzai										
Total Dominant Chironomids	**3775**	**32.3%**	**3959**	**30.1%**	**7619**	**27.2%**	**3277**	**21.3%**	**1561**	**13.0%**
Unidentified Chironomidae	1398	12.0%	122	0.9%	2232	8.0%	293	1.9%	398	3.3%
Unidentified Chironominae	510	4.4%	1490	11.3%	374	1.3%	1378	8.9%	41	0.3%
Procladius sp.	479	4.1%	204	1.5%	1474	5.3%	128	0.8%	296	2.5%
Tanytarsus sp.	255	2.2%	0	0.0%	1409	5.0%	26	0.2%	0	0.0%
Dicrotendipes sp.	479	4.1%	337	2.6%	560	2.0%	38	0.2%	204	1.7%
Polypedilum sp.	82	0.7%	102	0.8%	396	1.4%	281	1.8%	224	1.9%
Clinotanypus sp.	51	0.4%	133	1.0%	200	0.7%	332	2.2%	194	1.6%
Tribelos jucundus	0	0.0%	867	6.6%	0	0.0%	0	0.0%	0	0.0%
Unidentified Tanypodinae	112	1.0%	571	4.3%	131	0.5%	38	0.2%	0	0.0%
Tribelos sp.	214	1.8%	51	0.4%	194	0.7%	128	0.8%	204	1.7%
Chironomus sp.	41	0.3%	41	0.3%	650	2.3%	0	0.0%	0	0.0%
Cricotopus trifascia	102	0.9%	41	0.3%	0	0.0%	306	2.0%	0	0.0%
Unidentified Orthocladiinae	51	0.4%	0	0.0%	0	0.0%	332	2.2%	0	0.0%
Total Dominant Oligochaeta	**2918**	**25.0%**	**2245**	**17.0%**	**2681**	**9.6%**	**3584**	**23.3%**	**71**	**0.6%**
Unidentified Oligochaeta										
Total Dominant Amphipoda	**1030**	**8.8%**	**1102**	**8.4%**	**682**	**2.4%**	**3176**	**20.6%**	**2296**	**19.2%**
Gammarus fasciatus										
Total Dominant Pelecypoda	**1245**	**10.6%**	**1581**	**12.0%**	**49**	**0.2%**	**1097**	**7.1%**	**0**	**0.0%**
Pisidium sp.										
Subtotals	**9621**	**82.3%**	**12132**	**92.1%**	**25287**	**90.4%**	**13482**	**87.5%**	**11214**	**93.7%**
Total Abundance (all taxa)	**11691**		**13172**		**27983**		**15407**		**11968**	

Table 5-3

Summary of Infauna and Total Benthos Indices - TI Pool

Station	Simpson Diversity D_s		Simpson Dominance I		Eveness Distribution		Species Richness		Abundance No. Ind./Sq M	
	Infauna	Total Benthos	Infauna	Total Benthos	Infauna	Total Benthos	Infauna	Total Benthos	Infauna	Total Benthos
3	0.84	0.87	0.16	0.13	0.88	0.90	25	27	10,008	11,691
4	0.79	0.83	0.21	0.17	0.84	0.87	19	21	8,825	13,172
5	0.81	0.69	0.19	0.31	0.87	0.73	17	19	13,044	27,983
6	0.78	0.84	0.22	0.16	0.82	0.88	22	24	9,884	15,407
7	0.84	0.57	0.16	0.43	0.95	0.61	12	14	2,387	11,968
TI Pool Grand Mean	0.81	0.76	0.19	0.24	0.87	0.80	19	21	8,830	16,044

Notes: Total benthos equals the sum of infaunal and epibenthic macroinvertebrates

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TABLE 5-4
RELATIVE PERCENT ABUNDANCE OF MACROINVERTEBRATES -- LOWER HUDSON RIVER

Station 12		Station 14		Station 15		Station 17		Station 18	
Species/Group	**%**	**Species/Group**	**%**	**Species/Group**	**%**	**Species/Group**	**%**	**Species/Group**	**%**
Oligochaeta	42.4%	Chironominae Indet.	36.1%	Oligochaeta	22.0%	*Hobsonia florida*	36.1%	Oligochaeta	18.4%
Chironominae Indet.	12.9%	*Dicrotendipes sp.*	10.5%	Chydoridae	17.3%	Oligochaeta	32.8%	*Cyathura polita*	16.5%
Chironomidae Indet.	10.3%	*Procladius sp.*	10.2%	*Coelotanypus sp.*	14.0%	*Gammarus fasciatus*	11.3%	*Hobsonia florida*	14.2%
Procladius sp.	8.0%	*Polypedilum sp.*	9.0%	Nematoda	7.3%	*Clinotanypus sp.*	6.3%	*Hydrobia minuta*	11.5%
Polypedilum sp.	7.1%	*Clinotanypus sp.*	6.4%	*Clinotanypus sp.*	6.0%	Nemotoda	3.3%	Isopoda	10.8%
Pisidium sp.	2.9%	Oligochaeta	4.1%	*Polypedilum sp.*	5.3%	*Cyathura polita*	2.0%	*Clinotanypus sp.*	10.0%
Tribelos sp.	2.9%	*Gammarus fasciatus*	2.6%	Acariformes	4.0%	*Coelotanypus sp.*	2.0%	*Gammarus fasciatus*	9.7%
Cryptotendipes sp.	2.9%	*Pisidium sp.*	2.3%	*Dicrotendipes sp.*	4.0%	*Procladius sp.*	1.7%	Ostracoda	4.5%
Tanytarsus sp.	2.3%	Chironomidae Indet.	2.3%	*Cladotanytarsus sp.*	3.3%	Pelecypoda	1.3%	*Neanthes succinea*	1.3%
Chironomus sp.	1.9%	*Amnicola limosa*	1.9%	*Amnicola sp.*	3.3%	*Neanthes succinea*	1.0%	Pelecypoda	1.3%
Gammarus fasciatus	1.0%	*Cladotanytarsus sp.*	1.5%	*Synorthocladius sp.*	2.7%	Bryozoa	0.7%	*Procladius sp.*	1.0%
Acariformes	0.6%	*Orthotrichia sp.*	1.1%	*Pisidium sp.*	2.7%	*Balanus improvisus*	0.7%	*Rhithropanopeus harrisii*	0.5%
Tanypodinae Indet.	0.6%	Nematoda	1.1%	*Tribelos sp.*	2.0%	Isopoda	0.3%	*Coelotanypus sp.*	0.3%
Clinotanypus sp.	0.6%	Gastropoda	1.1%	Cyclopoida	1.3%	Orthocladiinae	0.3%		
Coleoptera	0.3%	*Cricotopus bicinctus*	1.1%	*Gammarus fasciatus*	1.3%	*Dicrotendipes sp.*	0.3%		
Bithynia tentaculata	0.3%	*Tanytarsus sp.*	1.1%	Hydroptilidae	1.3%				
Valvata sp.	0.3%	*Triaenodes sp.*	0.8%	*Cyathura polita*	0.7%				
Nematoda	0.3%	Orthocladiinae Indet.	0.8%	*Hydroptila sp.*	0.7%				
Cyathura polita	0.3%	*Chironomus sp.*	0.8%	*Chironomus sp.*	0.7%				
Ostracoda	0.3%	Acariformes	0.4%						
Leptoceridae	0.3%	*Dugesia tigrina*	0.4%						
Ceratopognidae	0.3%	*Diaphanosoma sp.*	0.4%						
Hemiptera	0.3%	*Hydroptila sp.*	0.4%						
Nilothauma sp.	0.3%	*Probezzia sp.*	0.4%						
Cryptochironomus sp.	0.3%	*Bithynia tentaculata*	0.4%						
		Tanypodinae Indet.	0.4%						
		Synorthocladius sp.	0.4%						
		Tribelos sp.	0.4%						
		Djalmabatista sp.	0.4%						
		Labrundinia sp.	0.4%						
		Coelotanypus sp.	0.4%						
		Synorthocladius sp.	0.4%						
		Cryptotendipes sp.	0.4%						

Table 5-5

Summary of Diversity Indices and Abundance Data - Lower Hudson River

Station	D_s	I	D_{max}	E_s	Species Richness	Abundance ind/m^2	Biomass mg/m^2
Station 12 Stockport Flats	0.70	0.30	0.92	0.76	14	5,289	63
Station 14 Tivoli Bays	0.82	0.18	0.95	0.86	16	4,524	126
Station 15 Esopus Meadows	0.86	0.14	0.93	0.93	11	2,551	65
Station 17 Iona Island	0.71	0.29	0.90	0.79	9	5,136	365
Station 18 Piermont Pier	0.84	0.16	0.90	0.93	9	6,480	291
Grand Mean	0.79	0.21	0.92	0.85	12	4,796	182

TABLE 5-6
SELECTED SEDIMENT SCREENING GUIDELINES: PCBs

	Total PCBs	Aroclor 1254	Aroclor 1248	Aroclor 1016	Aroclor 1260	Aroclor 1242
Sediment Guidelines/Effect Levels						
Hudson River Sediment Effect Concentrations						
(NOAA, 1999) - mg/kg (ppm)						
Threshold Effect Concentration	0.04					
Mid-range Effect Concentration	0.4					
Extreme Effect Concentration	1.7					
NYSDEC (1998) Freshwater (µg/g OC)						
Benthic Aquatic Life Acute Toxicity	2760.8					
Benthic Aquatic Life Chronic Toxicity	19.3					
Wildlife Bioaccumulation	1.4					
Ontario Ministry of the Environment						
Freshwater Guidelines (Persaud et al., 1993)						
No Effect Level (µg/g)	0.01					
Lowest Effect Level (µg/g)	0.07	0.06	0.03	0.007	0.005	
Severe Effect Level (µg/g OC)	530	34	150	53	24	
Long et al. (1995) Marine & Estuaries- ppb						
Effects-Range-Low	22.7					
Effects-Range-Median	180					
Ingersoll et al. (1996) Freshwater Guidelines						
based on *Hyallela azteca* - ppb						
Effects-Range-Low	50					
Effects-Range-Median	730					
Threshold Effect Level	32					
Probable Effect Level	240					
No Effect Concentration	190					
Washington State (1997) Freshwater - ppb						
Probable Apparent Effects Threshold - Microtox	21	7.3	21			
PAET - *Hyalella azteca*	450	240				100
Apparent Effects Threshold - Microtox	21	7.3				
AET - *Hyalella azteca*	820	350				100
Apparent Effects Threshold - Microtox mg/kg OC	2.6	0.73				
AET - *Hyalella azteca* mg/kg OC		18				
Jones et al. (1997) ppb; Eq-P-derived assuming 1% OC						
Recommended TOC adjustment						
Secondary Chronic Values		810	1000		4500000	

Notes: All values are provided in dry weight unless noted
Mean PCB conc.Upper Hudson benthic stations: 9.292 - 29.320 ppm
Mean PCB conc.Lower Hudson benthic stations: 0.367 - 1.313 ppm

TABLE 5-7: FEDERAL AND STATE PCB WATER QUALITY CRITERIA

	Total PCB Water Quality Criteria (µg/L)	Upper Hudson 1993 (µg/L)	
USEPA/NYSDEC - Benthic Aquatic Life		Average	Maximum
Acute Toxicity - Freshwater	2		
Acute Toxicity - Saltwater	10		
Chronic Toxicity - Freshwater	0.014	0.071	0.226
Chronic Toxicity - Saltwater	0.03		
NYSDEC - Wildlife Bioaccumulation			
Freshwater	0.001	0.071	0.226
Saltwater	0.001		
NYSDEC Surface Water Standards			
Wildlife Criterion	0.00012	0.071	0.226

Sources: NYSDEC June, 1998 and March 1998; USEPA, 1991

TABLE 5-8: RATIO OF OBSERVED SEDIMENT CONCENTRATIONS TO GUIDELINES

Location	TEC 0.04 mg/kg dry weight Average Sediment	TEC 0.04 mg/kg dry weight 95% UCL Sediment	MEC 0.4 mg/kg dry weight Average Sediment	MEC 0.4 mg/kg dry weight 95% UCL Sediment	EEC 1.7 mg/kg dry weight Average Sediment	EEC 1.7 mg/kg dry weight 95% UCL Sediment	NYSDEC Benthic Chronic 19.3 mg/kg OC Average Sediment	NYSDEC Benthic Chronic 19.3 mg/kg OC 95% UCL Sediment	NYSDEC Wildlife 1.4 mg/kg OC Average Sediment	NYSDEC Wildlife 1.4 mg/kg OC 95% UCL Sediment
Upper River										
Thompson Island Pool (189)	**297**	**435**	**30**	**43**	**7.0**	**10.2**	**12**	**16**	**169**	**215**
Stillwater (168)	**776**	**1354**	**78**	**135**	**18**	**32**	**43**	**74**	**587**	**1025**
Federal Dam (154)	**70**	**117**	**7.0**	**12**	**1.6**	**2.8**	**9.2**	**15**	**127**	**213**
Lower River										
143.5	**22**	**24**	**2.2**	**2.4**	0.5	0.6	**1.4**	**1.4**	**20**	**20**
137.2	**38**	**77**	**3.8**	**7.7**	0.9	**1.8**	**2.8**	**5.7**	**39**	**79**
122.4	**24**	**27**	**2.4**	**2.7**	0.6	0.6	**2.4**	**2.6**	**33**	**36**
113.8	**25**	**42**	**2.5**	**4.2**	0.6	**1.0**	**1.6**	**2.6**	**22**	**37**
100	**10**	**215**	**1.0**	**22**	0.2	**5.1**	0.9	**17**	**12**	**241**
88.9	**20**	**57**	**2.0**	**5.7**	0.5	**1.3**	**1.1**	**3.3**	**16**	**45**
58.7	**6.3**	**70**	0.6	**7.0**	0.1	**1.6**	**1.1**	**9.6**	**16**	**133**
47.3	**38**	**150**	**3.8**	**15**	0.9	**3.5**	**2.3**	**8.8**	**32**	**121**
25.8	**14**	**39**	**1.4**	**3.9**	0.3	0.9	**1.5**	**3.9**	**20**	**54**

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TABLE 5-8: RATIO OF OBSERVED SEDIMENT CONCENTRATIONS TO GUIDELINES

Location	Persaud LEL 0.007 mg/kg dry weight Average Sediment	Persaud LEL 0.007 mg/kg dry weight 95% UCL Sediment	Persaud SEL 53 mg/kg OC Average Sediment	Persaud SEL 53 mg/kg OC 95% UCL Sediment	Washington State PAET 1242 100 ppb Average Sediment	Washington State PAET 1242 100 ppb 95% UCL Sediment	Washington State PAET Microtox Average Sediment	Washington State PAET Microtox 95% UCL Sediment	Washington State AET Microtox OC Average Sediment	Washington State AET Microtox OC 95% UCL Sediment
Upper River										
Thompson Island Pool (189)	1697	2483	4.5	5.7	119	174	566	828	91	116
Stillwater (168)	4433	7739	16	27	310	542	1478	2580	316	552
Federal Dam (154)	399	669	3.4	5.6	28	47	133	223	69	115
Lower River										
143.5	123	135	0.5	0.5	8.6	9.4	41	45	11	11
137.2	217	438	1.0	2.1	15	31	72	146	21	43
122.4	138	153	0.9	0.9	10	11	46	51	18	19
113.8	144	238	0.6	1.0	10	17	48	79	12	20
100	57	1230	0.3	6.4	4.0	86	19	410	6.7	130
88.9	112	326	0.4	1.2	7.8	23	37	109	8.5	24
58.7	36	399	0.4	3.5	2.5	28	12	133	8.4	71
47.3	220	857	0.8	3.2	15	60	73	286	17	65
25.8	83	223	0.5	1.4	5.8	16	28	74	11	29

TABLE 5-9: RATIO OF HUDTOX PREDICTED SEDIMENT CONCENTRATIONS TO SEDIMENT GUIDELINES

	Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results		
Year	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc
	TEC: 0.04 mg/kg dry weight						MEC: 0.4 mg/kg dry weight						EEC: 1.7 mg/kg dry weight					
1993	720	232	103	760	233	104	72	23	10.3	76	23	10.4	17	5.5	2.4	18	5.5	2.4
1994	667	218	95	704	219	95	67	22	9.5	70	22	9.5	16	5.1	2.2	17	5.1	2.2
1995	628	212	93	662	212	93	63	21	9.3	66	21	9.3	15	5.0	2.2	16	5.0	2.2
1996	570	190	78	601	191	78	57	19	7.8	60	19	7.8	13	4.5	1.8	14	4.5	1.8
1997	527	172	68	555	173	68	53	17	6.8	56	17	6.8	12	4.1	1.6	13	4.1	1.6
1998	475	155	58	501	156	59	48	15	5.8	50	16	5.9	11	3.6	1.4	12	3.7	1.4
1999	433	141	51	457	142	52	43	14	5.1	46	14	5.2	10	3.3	1.2	11	3.3	1.2
2000	396	129	45	417	130	45	40	13	4.5	42	13	4.5	9.3	3.0	1.0	9.8	3.1	1.1
2001	374	127	42	395	127	42	37	13	4.2	39	13	4.2	8.8	3.0	1.0	9.3	3.0	1.0
2002	354	122	40	373	122	40	35	12	4.0	37	12	4.0	8.3	2.9	0.9	8.8	2.9	0.9
2003	330	116	38	348	117	38	33	12	3.8	35	12	3.8	7.8	2.7	0.9	8.2	2.7	0.9
2004	302	108	35	318	109	35	30	11	3.5	32	11	3.5	7.1	2.5	0.8	7.5	2.6	0.8
2005	278	97	30	293	97	31	28	9.7	3.0	29	9.7	3.1	6.5	2.3	0.7	6.9	2.3	0.7
2006	268	94	29	282	94	29	27	9.4	2.9	28	9.4	2.9	6.3	2.2	0.7	6.6	2.2	0.7
2007	251	87	26	265	87	26	25	8.7	2.6	27	8.7	2.6	5.9	2.0	0.6	6.2	2.1	0.6
2008	234	81	24	247	82	24	23	8.1	2.4	25	8.2	2.4	5.5	1.9	0.6	5.8	1.9	0.6
2009	223	78	23	235	78	25	22	7.8	2.3	23	7.8	2.5	5.2	1.8	0.5	5.5	1.8	0.6
2010	209	74	22	220	75	22	21	7.4	2.2	22	7.5	2.2	4.9	1.7	0.5	5.2	1.8	0.5
2011	185	67	20	194	67	20	18	6.7	2.0	19	6.7	2.0	4.3	1.6	0.5	4.6	1.6	0.5
2012	170	63	19	179	63	19	17	6.3	1.9	18	6.3	1.9	4.0	1.5	0.4	4.2	1.5	0.4
2013	161	62	18	170	62	18	16	6.2	1.8	17	6.2	1.8	3.8	1.5	0.4	4.0	1.5	0.4
2014	148	57	16	157	57	16	15	5.7	1.6	16	5.7	1.6	3.5	1.3	0.4	3.7	1.3	0.4
2015	139	54	15	147	54	15	14	5.4	1.5	15	5.4	1.5	3.3	1.3	0.4	3.5	1.3	0.4
2016	133	53	15	141	53	15	13	5.3	1.5	14	5.3	1.5	3.1	1.2	0.4	3.3	1.2	0.4
2017	122	49	13	129	49	13	12	4.9	1.3	13	4.9	1.3	2.9	1.1	0.3	3.0	1.1	0.3
2018	115	46	12	121	46	12	11	4.6	1.2	12	4.6	1.2	2.7	1.1	0.3	2.9	1.1	0.3

301730

TABLE 5-9: RATIO OF HUDTOX PREDICTED SEDIMENT CONCENTRATIONS TO SEDIMENT GUIDELINES

	NYSDEC Benthic Chronic 19.3 mg/Kg OC						NYSDEC Wildlife 1.4 mg/Kg OC						Persaud LEL 0.007 mg/Kg dry weight					
	Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results		
Year	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc
1993	74	47	26	84	48	26	1026	651	361	1157	655	365	4116	1326	589	4343	1333	594
1994	69	45	24	78	45	24	951	615	336	1074	616	337	3812	1248	542	4023	1251	543
1995	65	43	24	73	43	24	898	598	326	1012	598	327	3588	1211	529	3784	1212	530
1996	59	39	19	67	39	20	818	537	268	921	540	271	3258	1087	444	3435	1092	447
1997	55	35	17	62	35	17	757	487	240	852	489	241	3009	985	387	3172	988	388
1998	50	32	12	56	32	12	684	437	166	770	440	168	2716	884	333	2863	890	337
1999	45	29	11	51	29	11	624	400	147	703	400	147	2477	808	294	2611	810	294
2000	41	27	9.2	47	27	9.3	571	366	127	643	368	128	2262	739	255	2385	742	257
2001	39	26	8.6	44	26	8.6	540	360	119	608	360	119	2139	723	238	2256	724	238
2002	37	25	8.3	42	25	8.3	511	347	114	576	348	114	2024	697	228	2134	698	228
2003	35	24	7.8	39	24	7.8	477	332	108	537	333	108	1884	665	215	1986	666	216
2004	32	22	7.2	36	22	7.2	438	308	99	494	310	100	1726	618	198	1820	621	199
2005	29	20	6.3	33	20	6.3	404	275	87	456	276	87	1590	554	174	1676	556	175
2006	28	19	6.0	32	19	6.0	389	265	83	439	265	83	1530	535	165	1614	535	166
2007	27	18	5.4	30	18	5.4	367	245	74	413	246	75	1437	496	149	1515	498	150
2008	25	17	4.9	28	17	4.9	342	228	68	385	229	68	1338	465	136	1410	466	137
2009	24	16	4.7	27	16	4.7	326	217	65	367	217	65	1275	443	130	1343	443	141
2010	22	15	4.6	25	15	4.6	306	208	63	343	208	63	1193	425	126	1257	426	127
2011	20	14	4.1	22	14	4.1	270	186	57	304	187	57	1055	383	114	1111	385	114
2012	18	13	3.8	20	13	3.8	248	175	53	280	175	53	970	361	106	1024	361	106
2013	17	12	3.8	19	12	3.8	234	170	52	265	171	52	919	353	104	970	353	104
2014	16	11	3.3	18	11	3.4	215	155	46	244	156	46	847	324	92	895	325	93
2015	15	11	3.1	17	11	3.2	202	148	43	230	149	43	796	310	87	841	311	87
2016	14	10	3.1	16	10	3.1	192	144	43	219	145	43	759	303	85	803	303	85
2017	13	10	2.6	15	10	2.6	176	131	36	201	132	36	695	278	72	736	279	73
2018	12	8.9	2.4	14	8.9	2.4	166	122	33	189	123	33	655	261	67	693	261	67

TABLE 5-9: RATIO OF HUDTOX PREDICTED SEDIMENT CONCENTRATIONS TO SEDIMENT GUIDELINES

	Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results			Average PCB Results			Tri+ 95% UCL Results		
Year	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc	189 Total Sed Conc	168 Total Sed Conc	154 Total Sed Conc
	Persaud SEL 53 mg/Kg OC						Washington State PAET 1242 0.1 mg/Kg dry weight						Washington PAET Microtox 0.021 mg/Kg dry weight					
1993	27	17	10	31	17	10	288	93	41	304	93	42	1372	442	196	1448	444	198
1994	25	16	8.9	28	16	8.9	267	87	38	282	88	38	1271	416	181	1341	417	181
1995	24	16	8.6	27	16	8.6	251	85	37	265	85	37	1196	404	176	1261	404	177
1996	22	14	7.1	24	14	7.2	228	76	31	240	76	31	1086	362	148	1145	364	149
1997	20	13	6.3	23	13	6.4	211	69	27	222	69	27	1003	328	129	1057	329	129
1998	18	12	4.4	20	12	4.4	190	62	23	200	62	24	905	295	111	954	297	112
1999	16	11	3.9	19	11	3.9	173	57	21	183	57	21	826	269	98	870	270	98
2000	15	10	3.4	17	10	3.4	158	52	18	167	52	18	754	246	85	795	247	86
2001	14	10	3.1	16	10	3.1	150	51	17	158	51	17	713	241	79	752	241	79
2002	14	9.2	3.0	15	9.2	3.0	142	49	16	149	49	16	675	232	76	711	233	76
2003	13	8.8	2.8	14	8.8	2.9	132	47	15	139	47	15	628	222	72	662	222	72
2004	12	8.1	2.6	13	8.2	2.6	121	43	14	127	43	14	575	206	66	607	207	66
2005	11	7.3	2.3	12	7.3	2.3	111	39	12	117	39	12	530	185	58	559	185	58
2006	10	7.0	2.2	12	7.0	2.2	107	37	12	113	37	12	510	178	55	538	178	55
2007	10	6.5	2.0	11	6.5	2.0	101	35	10	106	35	10	479	165	50	505	166	50
2008	9.0	6.0	1.8	10	6.1	1.8	94	33	10	99	33	10	446	155	45	470	155	46
2009	8.6	5.7	1.7	10	5.7	1.7	89	31	9.1	94	31	10	425	148	43	448	148	47
2010	8.1	5.5	1.7	9.1	5.5	1.7	84	30	8.8	88	30	8.9	398	142	42	419	142	42
2011	7.1	4.9	1.5	8.0	4.9	1.5	74	27	8.0	78	27	8.0	352	128	38	370	128	38
2012	6.5	4.6	1.4	7.4	4.6	1.4	68	25	7.4	72	25	7.4	323	120	35	341	120	35
2013	6.2	4.5	1.4	7.0	4.5	1.4	64	25	7.3	68	25	7.3	306	118	35	323	118	35
2014	5.7	4.1	1.2	6.4	4.1	1.2	59	23	6.4	63	23	6.5	282	108	31	298	108	31
2015	5.3	3.9	1.1	6.1	3.9	1.1	56	22	6.1	59	22	6.1	265	103	29	280	104	29
2016	5.1	3.8	1.1	5.8	3.8	1.1	53	21	6.0	56	21	6.0	253	101	28	268	101	28
2017	4.6	3.5	1.0	5.3	3.5	1.0	49	19	5.1	52	20	5.1	232	93	24	245	93	24
2018	4.4	3.2	0.9	5.0	3.2	0.9	46	18	4.7	49	18	4.7	218	87	22	231	87	22

301732

TABLE 5-10: RATIO OF MEASURED WHOLE WATER CONCENTRATIONS TO BENCHMARKS

Hudson River	USEPA/NYSDEC - Benthic Aquatic Life 0.014 µg/L freshwater and 0.03 saltwater		NYSDEC - Wildlife Bioaccumulation 0.001 µg/L		USEPA Wildlife Criterion 1.2E-04 µg/L	
Location	Average Conc. in Water	95% UCL Conc. In Water	Average Conc. in Water	95% UCL Conc. In Water	Average Conc. in Water	95% UCL Conc. In Water
Upper River						
Thompson Island Pool (189)	**5.3**	**17**	**74**	**233**	**613**	**1942**
Stillwater (168)	**9.3**	**30**	**131**	**415**	**1090**	**3458**
Federal Dam (154)	**6.5**	**14**	**91**	**196**	**762**	**1634**
Lower River						
143.5	**5.1**	**55**	**71**	**770**	**589**	**6420**
137.2	**5.1**	**55**	**71**	**770**	**589**	**6420**
122.4	**2.3**	**30**	**32**	**415**	**270**	**3460**
113.8	**2.3**	**30**	**32**	**415**	**270**	**3460**
100	**2.3**	**30**	**32**	**415**	**270**	**3460**
88.9	**1.5**	**6.8**	**21**	**95**	**178**	**790**
58.7	0.7	**3.2**	**21**	**95**	**178**	**790**
47.3	0.7	**3.2**	**21**	**95**	**178**	**790**
25.8	0.7	**3.2**	**21**	**95**	**178**	**790**

Notes:
Source: TAMS/Gradient Database Release 4.1b

301733

TABLE 5-11: RATIO OF HUDTOX PREDICTED WHOLE WATER CONCENTRATIONS TO CRITERIA AND BENCHMARKS

	Tri+ Average PCB Results			Tri+ 95% UCL Results			Tri+ Average PCB Results			Tri+ 95% UCL Results			Tri+ Average PCB Results			Tri+ 95% UCL Results		
Year	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc	189 Whole Water Conc	168 Whole Water Conc	154 Whole Water Conc
	USEPA/NYSDEC - Benthic Aquatic Life 0.014 ug/L						NYSDEC - Wildlife Bioaccumulation 0.001 ug/L						USEPA Wildlife Criterion 1.2E-04 ug/l					
1993	3.5	5.2	3.5	3.5	5.3	0.8	49	73	49	49	75	11	41	61	41	41	62	9
1994	3.0	4.0	2.7	3.0	4.2	0.6	41	57	38	42	59	8	35	47	32	35	49	7
1995	4.7	6.9	4.3	4.7	7.1	1.0	66	96	60	66	99	14	55	80	50	55	82	12
1996	1.9	2.8	1.8	1.9	3.2	0.5	26	40	26	26	44	7	22	33	21	22	37	6
1997	2.0	3.5	2.3	2.0	3.5	0.7	28	48	32	28	49	9	23	40	27	23	41	8
1998	2.1	3.5	1.9	2.1	3.6	2.0	29	50	27	29	50	27	24	41	22	24	42	23
1999	1.7	3.1	1.8	1.7	3.2	1.9	24	43	25	24	44	27	20	36	21	20	37	22
2000	1.4	2.6	1.6	1.5	2.7	1.7	20	36	22	21	38	24	17	30	18	17	31	20
2001	1.8	3.0	1.8	1.9	3.1	1.9	26	42	26	27	43	26	22	35	21	22	36	22
2002	1.5	2.8	1.6	1.6	2.9	1.7	22	39	22	22	41	24	18	33	19	18	34	20
2003	1.2	2.2	1.3	1.2	2.3	1.5	17	31	19	17	32	21	14	26	16	14	27	17
2004	1.1	2.1	1.4	1.1	2.2	1.6	16	29	19	16	31	22	13	24	16	13	26	18
2005	1.4	2.5	1.5	1.4	2.5	1.6	19	34	22	19	35	23	16	29	18	16	29	19
2006	1.4	2.5	1.5	1.4	2.5	1.6	19	34	22	19	35	23	16	29	18	16	29	19
2007	0.7	1.3	0.7	0.7	1.4	0.8	10	19	10	10	19	11	8.5	15	8.5	8.6	16	9.2
2008	1.0	1.7	1.1	1.0	1.8	1.2	14	24	15	14	26	17	11	20	13	12	21	14
2009	1.2	2.0	1.1	1.2	2.1	1.3	16	28	16	17	29	18	14	23	13	14	24	15
2010	0.7	1.3	0.7	0.7	1.3	0.8	10	18	10	10	19	11	8.0	15	8.5	8.1	16	9.4
2011	0.7	1.3	0.8	0.7	1.4	0.9	9.4	18	11	10	20	13	7.8	15	9.2	8.0	16	11
2012	0.9	1.7	1.0	0.9	1.7	1.1	12	23	14	12	24	15	10	19	12	10	20	12
2013	0.6	1.2	0.6	0.6	1.2	0.7	8.8	16	8.7	8.9	17	9.5	7.3	14	7.3	7.5	14	7.9
2014	0.5	1.3	0.8	0.5	1.4	0.8	7.4	19	11	8	19	11	6.2	16	8.9	6.3	16	9.3
2015	0.5	1.0	0.6	0.5	1.0	0.6	7.2	14	7.9	7.3	14	8.5	6.0	11	6.6	6.1	12	7.1
2016	0.9	1.7	1.0	0.9	1.7	1.0	12	24	14	12	24	14	10	20	11	10	20	12
2017	0.4	0.8	0.4	0.4	0.8	0.5	5.5	11	6.2	5.6	12	7.0	4.6	9.0	5.2	4.7	10	5.8
2018	0.5	1.0	0.6	0.5	1.0	0.7	6.6	14	8.8	6.8	14	9.5	5.5	12	7.3	5.6	12	7.9

301734

TABLE 5-12: RATIO OF MEASURED FORAGE FISH CONCENTRATIONS TO TOXICITY BENCHMARKS

	Pumpkinseed field-based NOAEL		Spottail shiner lab-based NOAEL		Spottail shiner lab-based LOAEL	
Location	Average Forage Fish Conc mg/Kg	95% UCL Forage Fish Conc mg/Kg	Average Forage Fish Conc mg/Kg	95% UCL Forage Fish Conc mg/Kg	Average Forage Fish Conc mg/Kg	95% UCL Forage Fish Conc mg/Kg
Upper River						
Thompson Island Pool (189)	**42**	**85**	**1.4**	**2.8**	0.1	0.3
Stillwater (168)	**14**	**20**	0.5	0.7	0.04	0.06
Federal Dam (154)	**3.3**	**4.8**	0.1	0.2	0.01	0.01
Lower River						
143.5	**3.9**	**4.6**	0.1	0.2	0.01	0.01
137.2	**7.8**	**17**	0.3	0.6	0.02	0.05
122.4	**3.0**	**4.8**	0.1	0.2	0.01	0.01
113.8	**3.1**	**3.2**	0.1	0.1	0.009	0.01
100	**1.4**	**2.3**	0.05	0.08	0.004	0.007
88.9	**2.7**	**3.7**	0.09	0.1	0.008	0.01
58.7	**2.9**	**3.3**	0.1	0.1	0.009	0.01
47.3	**2.6**	**3.5**	0.09	0.1	0.008	0.01
25.8	**2.0**	**2.4**	0.07	0.08	0.006	0.007

Source: TAMS/Gradient Database Release 4.1b

301735

TABLE 5-13: RATIO OF PREDICTED PUMPKINSEED CONCENTRATIONS TO FIELD-BASED NOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	7.8	20	43	7.4	21	49	3.7	11	26
1994	6.4	16	31	6.0	16	35	3.0	7.9	18
1995	7.0	17	37	6.9	19	45	3.3	9.8	24
1996	4.9	12	30	4.6	12	26	2.2	6.0	16
1997	4.2	10	22	4.0	10	23	2.1	5.8	14
1998	3.6	8.5	18	3.7	9.5	21	1.8	4.9	12
1999	2.6	6.2	15	2.8	6.9	15	1.2	3.2	7.7
2000	2.6	6.4	14	2.7	6.6	14	1.1	3.0	7.0
2001	2.5	5.9	14	2.9	7.5	16	1.3	3.6	8.5
2002	2.4	5.9	13	2.7	6.7	13	1.2	3.1	7.0
2003	2.0	4.9	11	2.2	5.6	12	1.0	2.7	6.8
2004	2.0	4.8	11	2.2	5.3	11	1.1	2.9	7.1
2005	1.7	4.0	9.9	1.9	4.5	9.3	0.9	2.3	5.4
2006	1.7	4.1	9.6	1.9	4.9	11	0.8	2.5	6.0
2007	1.6	3.8	8.6	1.7	4.2	8.1	0.7	1.9	4.4
2008	1.4	3.4	8.5	1.5	3.5	6.6	0.6	1.6	4.1
2009	1.5	3.7	8.2	1.7	4.3	9.7	0.7	2.1	5.3
2010	1.5	3.5	7.5	1.6	3.9	7.9	0.6	1.8	4.4
2011	1.2	2.9	6.4	1.3	3.1	6.3	0.5	1.5	3.8
2012	1.2	2.9	6.3	1.5	3.7	8.1	0.6	1.7	4.3
2013	1.2	2.9	6.3	1.4	3.5	7.2	0.5	1.5	3.6
2014	1.0	2.4	5.6	1.3	3.2	6.7	0.5	1.3	3.4
2015	1.0	2.4	5.2	1.2	2.9	6.1	0.5	1.3	3.1
2016	0.9	2.4	5.3	1.2	3.3	7.8	0.5	1.6	4.3
2017	0.8	2.1	4.5	1.0	2.4	5.0	0.4	1.1	3.2
2018	0.8	1.9	4.4	0.9	2.1	4.3	0.3	0.9	2.3

TABLE 5-14: RATIO OF PREDICTED SPOTTAIL SHINER CONCENTRATIONS TO LABORATORY-DERIVED NOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.3	0.7	**1.4**	0.3	0.7	**1.4**	0.1	0.4	0.7
1994	0.3	0.6	**1.3**	0.2	0.6	**1.0**	0.1	0.3	0.5
1995	0.3	0.6	**1.4**	0.2	0.6	**1.2**	0.1	0.3	0.7
1996	0.2	0.5	**1.2**	0.2	0.4	0.7	0.08	0.2	0.5
1997	0.2	0.4	0.9	0.2	0.4	0.7	0.08	0.2	0.4
1998	0.1	0.3	0.8	0.1	0.3	0.6	0.06	0.2	0.3
1999	0.1	0.3	0.7	0.1	0.2	0.5	0.05	0.1	0.2
2000	0.1	0.3	0.7	0.1	0.2	0.4	0.04	0.1	0.2
2001	0.1	0.2	0.7	0.1	0.2	0.4	0.05	0.1	0.2
2002	0.1	0.2	0.6	0.1	0.2	0.4	0.04	0.1	0.2
2003	0.08	0.2	0.6	0.09	0.2	0.4	0.04	0.09	0.2
2004	0.08	0.2	0.5	0.08	0.2	0.3	0.04	0.09	0.2
2005	0.07	0.2	0.5	0.07	0.2	0.3	0.03	0.07	0.1
2006	0.07	0.2	0.5	0.07	0.2	0.3	0.03	0.07	0.2
2007	0.06	0.2	0.4	0.06	0.1	0.3	0.02	0.06	0.1
2008	0.06	0.1	0.4	0.06	0.1	0.2	0.02	0.05	0.1
2009	0.06	0.1	0.4	0.06	0.1	0.3	0.03	0.06	0.1
2010	0.06	0.1	0.3	0.06	0.1	0.3	0.02	0.06	0.1
2011	0.05	0.1	0.3	0.05	0.1	0.2	0.02	0.05	0.1
2012	0.05	0.1	0.3	0.06	0.1	0.2	0.02	0.06	0.1
2013	0.05	0.1	0.3	0.05	0.1	0.2	0.02	0.05	0.1
2014	0.04	0.1	0.3	0.05	0.1	0.2	0.02	0.04	0.1
2015	0.04	0.1	0.2	0.05	0.1	0.2	0.02	0.04	0.08
2016	0.04	0.09	0.2	0.04	0.1	0.2	0.02	0.05	0.12
2017	0.03	0.08	0.2	0.04	0.08	0.1	0.01	0.03	0.08
2018	0.03	0.08	0.2	0.04	0.08	0.1	0.01	0.03	0.07

TABLE 5-15: RATIO OF PREDICTED SPOTTAIL SHINER CONCENTRATIONS TO LABORATORY-DERIVED LOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.026	0.058	0.123	0.024	0.061	0.120	0.012	0.031	0.064
1994	0.024	0.054	0.111	0.021	0.049	0.089	0.010	0.023	0.044
1995	0.025	0.056	0.121	0.022	0.055	0.108	0.011	0.028	0.058
1996	0.018	0.041	0.108	0.015	0.036	0.064	0.007	0.018	0.041
1997	0.015	0.035	0.082	0.015	0.031	0.058	0.007	0.017	0.034
1998	0.012	0.029	0.073	0.012	0.028	0.053	0.006	0.013	0.029
1999	0.009	0.023	0.064	0.010	0.022	0.040	0.004	0.010	0.020
2000	0.009	0.023	0.059	0.008	0.020	0.036	0.003	0.008	0.017
2001	0.009	0.021	0.057	0.010	0.022	0.040	0.004	0.010	0.021
2002	0.009	0.021	0.054	0.009	0.021	0.037	0.004	0.009	0.018
2003	0.007	0.018	0.049	0.008	0.017	0.032	0.003	0.008	0.018
2004	0.007	0.018	0.047	0.007	0.017	0.030	0.003	0.008	0.018
2005	0.006	0.015	0.042	0.006	0.014	0.025	0.003	0.006	0.013
2006	0.006	0.015	0.042	0.006	0.014	0.026	0.003	0.006	0.014
2007	0.006	0.014	0.037	0.006	0.013	0.023	0.002	0.005	0.011
2008	0.005	0.013	0.036	0.005	0.011	0.020	0.002	0.005	0.010
2009	0.005	0.013	0.034	0.006	0.013	0.023	0.002	0.006	0.013
2010	0.005	0.012	0.030	0.005	0.013	0.023	0.002	0.005	0.011
2011	0.004	0.011	0.027	0.004	0.009	0.017	0.002	0.004	0.009
2012	0.004	0.010	0.027	0.005	0.012	0.022	0.002	0.005	0.011
2013	0.004	0.010	0.026	0.004	0.011	0.019	0.002	0.004	0.008
2014	0.004	0.009	0.022	0.004	0.010	0.018	0.002	0.004	0.009
2015	0.004	0.008	0.021	0.004	0.009	0.016	0.002	0.004	0.007
2016	0.003	0.008	0.022	0.004	0.009	0.018	0.002	0.004	0.011
2017	0.003	0.007	0.019	0.003	0.007	0.013	0.001	0.003	0.007
2018	0.003	0.007	0.020	0.003	0.007	0.013	0.001	0.003	0.006

TABLE 5-16: RATIO OF PREDICTED PUMPKINSEED CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.8	**2.2**	**5.8**	0.8	**2.3**	**6.1**	0.004	0.007	0.018
1994	0.6	**1.7**	**4.4**	0.6	**1.8**	**4.5**	0.003	0.007	0.016
1995	0.7	**1.9**	**5.0**	0.7	**2.1**	**5.6**	0.003	0.007	0.017
1996	0.5	**1.3**	**4.0**	0.5	**1.3**	**3.2**	0.002	0.005	0.012
1997	0.4	**1.1**	**2.9**	0.4	**1.1**	**2.9**	0.003	0.005	0.012
1998	0.4	**1.0**	**2.5**	0.4	**1.1**	**2.7**	0.002	0.004	0.010
1999	0.3	0.7	**2.1**	0.3	0.8	**1.9**	0.002	0.004	0.009
2000	0.3	0.7	**2.1**	0.3	0.7	**1.8**	0.002	0.004	0.008
2001	0.3	0.7	**1.9**	0.3	0.8	**2.1**	0.002	0.004	0.008
2002	0.3	0.7	**1.8**	0.3	0.7	**1.8**	0.002	0.003	0.007
2003	0.2	0.5	**1.6**	0.2	0.6	**1.5**	0.002	0.003	0.007
2004	0.2	0.5	**1.5**	0.2	0.6	**1.5**	0.001	0.003	0.006
2005	0.2	0.5	**1.4**	0.2	0.5	**1.2**	0.001	0.003	0.006
2006	0.2	0.5	**1.4**	0.2	0.5	**1.4**	0.001	0.002	0.005
2007	0.2	0.4	**1.2**	0.2	0.5	**1.1**	0.002	0.003	0.005
2008	0.1	0.4	**1.1**	0.2	0.4	0.9	0.001	0.002	0.004
2009	0.2	0.4	**1.1**	0.2	0.5	**1.2**	0.001	0.002	0.004
2010	0.2	0.4	**1.0**	0.2	0.4	**1.0**	0.001	0.002	0.005
2011	0.1	0.3	0.9	0.1	0.3	0.8	0.001	0.002	0.004
2012	0.1	0.3	0.9	0.1	0.4	**1.0**	0.001	0.002	0.004
2013	0.1	0.3	0.9	0.2	0.4	0.9	0.001	0.002	0.004
2014	0.1	0.3	0.8	0.1	0.4	0.9	0.001	0.002	0.004
2015	0.1	0.3	0.7	0.1	0.3	0.8	0.001	0.002	0.003
2016	0.1	0.3	0.7	0.1	0.4	1.0	0.001	0.002	0.004
2017	0.1	0.2	0.6	0.1	0.3	0.6	0.001	0.002	0.003
2018	0.1	0.2	0.6	0.1	0.2	0.6	0.001	0.001	0.003

TABLE 5-17: RATIO OF PREDICTED PUMPKINSEED CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.4	**1.05**	**2.8**	0.4	**1.1**	**3.0**	0.002	0.004	0.009
1994	0.3	0.8	**2.1**	0.3	0.9	**2.2**	0.002	0.003	0.008
1995	0.3	0.9	**2.4**	0.3	**1.0**	**2.7**	0.002	0.003	0.008
1996	0.2	0.6	**1.9**	0.2	0.6	**1.6**	0.001	0.002	0.006
1997	0.2	0.5	**1.4**	0.2	0.6	**1.4**	0.001	0.002	0.006
1998	0.2	0.5	**1.2**	0.2	0.5	**1.3**	0.001	0.002	0.005
1999	0.1	0.3	**1.0**	0.1	0.4	0.9	0.001	0.002	0.004
2000	0.1	0.4	**1.0**	0.1	0.4	0.9	0.001	0.002	0.004
2001	0.1	0.3	0.9	0.1	0.4	**1.0**	0.001	0.002	0.004
2002	0.1	0.3	0.9	0.1	0.4	0.9	0.001	0.001	0.003
2003	0.1	0.3	0.8	0.11	0.3	0.7	0.001	0.002	0.003
2004	0.1	0.3	0.7	0.11	0.3	0.7	0.001	0.001	0.003
2005	0.09	0.2	0.7	0.10	0.2	0.6	0.001	0.001	0.003
2006	0.09	0.2	0.7	0.10	0.3	0.7	0.001	0.001	0.003
2007	0.08	0.2	0.6	0.09	0.2	0.5	0.001	0.001	0.003
2008	0.07	0.2	0.5	0.08	0.2	0.4	0.001	0.001	0.002
2009	0.08	0.2	0.5	0.08	0.2	0.6	0.001	0.001	0.002
2010	0.07	0.2	0.5	0.08	0.2	0.5	0.001	0.001	0.002
2011	0.06	0.2	0.4	0.07	0.2	0.4	0.001	0.001	0.002
2012	0.06	0.2	0.4	0.07	0.2	0.5	0.001	0.001	0.002
2013	0.06	0.2	0.4	0.07	0.2	0.5	0.001	0.001	0.002
2014	0.05	0.1	0.4	0.06	0.2	0.4	0.001	0.001	0.002
2015	0.05	0.1	0.3	0.06	0.2	0.4	0.001	0.001	0.002
2016	0.05	0.1	0.3	0.06	0.2	0.5	0.001	0.001	0.002
2017	0.04	0.1	0.3	0.05	0.1	0.3	0.000	0.001	0.001
2018	0.04	0.1	0.3	0.05	0.1	0.3	0.000	0.001	0.001

TABLE 5-18: RATIO OF PREDICTED SPOTTAIL SHINER CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.092	0.233	0.690	0.088	0.248	0.655	0.005	0.012	0.029
1994	0.081	0.215	0.615	0.076	0.198	0.497	0.005	0.011	0.026
1995	0.089	0.228	0.680	0.079	0.221	0.583	0.005	0.011	0.027
1996	0.060	0.168	0.599	0.055	0.142	0.363	0.004	0.008	0.021
1997	0.053	0.144	0.455	0.050	0.128	0.338	0.004	0.008	0.019
1998	0.045	0.118	0.382	0.044	0.113	0.294	0.003	0.006	0.016
1999	0.032	0.096	0.337	0.035	0.088	0.231	0.003	0.006	0.014
2000	0.033	0.094	0.320	0.032	0.081	0.201	0.003	0.006	0.014
2001	0.031	0.088	0.304	0.035	0.088	0.226	0.003	0.005	0.012
2002	0.031	0.086	0.281	0.034	0.083	0.206	0.002	0.005	0.011
2003	0.026	0.073	0.255	0.028	0.070	0.184	0.002	0.005	0.011
2004	0.026	0.071	0.240	0.028	0.067	0.168	0.002	0.004	0.010
2005	0.022	0.062	0.218	0.022	0.054	0.142	0.002	0.004	0.009
2006	0.022	0.061	0.216	0.024	0.058	0.148	0.002	0.004	0.009
2007	0.020	0.056	0.186	0.021	0.052	0.128	0.002	0.004	0.009
2008	0.019	0.053	0.189	0.019	0.045	0.112	0.002	0.003	0.007
2009	0.019	0.052	0.181	0.020	0.050	0.136	0.002	0.003	0.008
2010	0.018	0.049	0.164	0.020	0.050	0.129	0.002	0.004	0.008
2011	0.015	0.043	0.150	0.015	0.038	0.096	0.002	0.003	0.007
2012	0.015	0.042	0.143	0.018	0.046	0.124	0.002	0.004	0.008
2013	0.015	0.040	0.134	0.017	0.042	0.106	0.002	0.003	0.007
2014	0.013	0.036	0.124	0.015	0.039	0.104	0.002	0.003	0.006
2015	0.012	0.034	0.113	0.015	0.037	0.093	0.001	0.003	0.006
2016	0.012	0.032	0.110	0.014	0.037	0.096	0.002	0.003	0.007
2017	0.011	0.030	0.098	0.012	0.029	0.073	0.001	0.002	0.005
2018	0.010	0.028	0.099	0.011	0.029	0.076	0.001	0.002	0.004

TABLE 5-19: RATIO OF PREDICTED SPOTTAIL SHINER CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.005	0.012	0.036	0.005	0.013	0.034	0.0003	0.0006	0.0015
1994	0.004	0.011	0.032	0.004	0.010	0.026	0.0002	0.0006	0.0014
1995	0.005	0.012	0.036	0.004	0.012	0.031	0.0003	0.0006	0.0014
1996	0.003	0.009	0.031	0.003	0.007	0.019	0.0002	0.0004	0.0011
1997	0.003	0.008	0.024	0.003	0.007	0.018	0.0002	0.0004	0.0010
1998	0.002	0.006	0.020	0.002	0.006	0.015	0.0002	0.0003	0.0008
1999	0.002	0.005	0.018	0.002	0.005	0.012	0.0001	0.0003	0.0007
2000	0.002	0.005	0.017	0.002	0.004	0.011	0.0002	0.0003	0.0007
2001	0.002	0.005	0.016	0.002	0.005	0.012	0.0001	0.0003	0.0007
2002	0.002	0.004	0.015	0.002	0.004	0.011	0.0001	0.0003	0.0006
2003	0.001	0.004	0.013	0.001	0.004	0.010	0.0001	0.0003	0.0006
2004	0.001	0.004	0.013	0.001	0.004	0.009	0.0001	0.0002	0.0005
2005	0.001	0.003	0.011	0.001	0.003	0.007	0.0001	0.0002	0.0005
2006	0.001	0.003	0.011	0.001	0.003	0.008	0.0001	0.0002	0.0004
2007	0.001	0.003	0.010	0.001	0.003	0.007	0.0001	0.0002	0.0005
2008	0.001	0.003	0.010	0.001	0.002	0.006	0.0001	0.0002	0.0004
2009	0.001	0.003	0.010	0.001	0.003	0.007	0.0001	0.0002	0.0004
2010	0.001	0.003	0.009	0.001	0.003	0.007	0.0001	0.0002	0.0004
2011	0.001	0.002	0.008	0.001	0.002	0.005	0.0001	0.0002	0.0004
2012	0.001	0.002	0.007	0.001	0.002	0.006	0.0001	0.0002	0.0004
2013	0.001	0.002	0.007	0.001	0.002	0.006	0.0001	0.0002	0.0003
2014	0.001	0.002	0.007	0.001	0.002	0.005	0.0001	0.0002	0.0003
2015	0.001	0.002	0.006	0.001	0.002	0.005	0.0001	0.0002	0.0003
2016	0.001	0.002	0.006	0.001	0.002	0.005	0.0001	0.0002	0.0003
2017	0.001	0.002	0.005	0.001	0.002	0.004	0.0001	0.0001	0.0003
2018	0.001	0.001	0.005	0.001	0.002	0.004	0.0001	0.0001	0.0002

TABLE 5-20: RATIO OF PREDICTED BROWN BULLHEAD CONCENTRATIONS TO LABORATORY-DERIVED NOAEL FOR TRI+ PCBS

Year	Thompson Island Pool 25th (mg/kg wet weight)	Thompson Island Pool Median (mg/kg wet weight)	Thompson Island Pool 95th Percentile (mg/kg wet weight)	River Mile 168 25th (mg/kg wet weight)	River Mile 168 Median (mg/kg wet weight)	River Mile 168 95th Percentile (mg/kg wet weight)	River Mile 154 25th (mg/kg wet weight)	River Mile 154 Median (mg/kg wet weight)	River Mile 154 95th Percentile (mg/kg wet weight)
1993	**6.5**	**17**	**55**	**4.6**	**10**	**22**	**2.1**	**4.6**	**10**
1994	**5.2**	**15**	**51**	**3.8**	**8.8**	**21**	**1.8**	**4.0**	**9.0**
1995	**5.4**	**15**	**49**	**4.1**	**9.3**	**21**	**1.9**	**4.3**	**9.0**
1996	**4.7**	**14**	**48**	**3.3**	**7.7**	**18**	**1.5**	**3.4**	**7.8**
1997	**4.0**	**12**	**41**	**3.1**	**7.1**	**17**	**1.4**	**3.0**	**6.6**
1998	**3.6**	**11**	**37**	**2.6**	**6.2**	**15**	**1.1**	**2.5**	**5.8**
1999	**3.1**	**9.7**	**34**	**2.3**	**5.5**	**14**	0.9	**2.1**	**5.0**
2000	**3.0**	**9.0**	**31**	**2.3**	**5.2**	**13**	0.9	**1.9**	**4.5**
2001	**2.9**	**8.5**	**30**	**2.1**	**5.1**	**13**	0.8	**1.9**	**4.3**
2002	**2.7**	**7.9**	**29**	**2.2**	**5.0**	**12**	0.8	**1.8**	**4.0**
2003	**2.5**	**7.5**	**26**	**1.9**	**4.5**	**11**	0.7	**1.6**	**3.8**
2004	**2.3**	**7.0**	**23**	**1.8**	**4.3**	**10**	0.7	**1.6**	**3.5**
2005	**2.1**	**6.4**	**21**	**1.5**	**3.8**	**9.3**	0.6	**1.3**	**3.0**
2006	**2.0**	**6.1**	**22**	**1.6**	**3.8**	**9.2**	0.6	**1.3**	**2.9**
2007	**1.9**	**5.7**	**20**	**1.4**	**3.4**	**8.3**	0.5	**1.1**	**2.5**
2008	**1.8**	**5.3**	**18**	**1.3**	**3.2**	**7.9**	0.5	**1.1**	**2.5**
2009	**1.7**	**5.1**	**17**	**1.3**	**3.1**	**7.6**	0.5	**1.0**	**2.4**
2010	**1.5**	**4.6**	**16**	**1.2**	**2.9**	**7.0**	0.4	0.9	**2.1**
2011	**1.4**	**4.2**	**14**	**1.1**	**2.6**	**6.4**	0.4	0.9	**1.9**
2012	**1.3**	**4.0**	**13**	**1.1**	**2.6**	**6.3**	0.4	0.9	**1.9**
2013	**1.2**	**3.7**	**13**	**1.0**	**2.4**	**5.9**	0.3	0.8	**1.8**
2014	**1.1**	**3.4**	**12**	1.0	**2.3**	**5.6**	0.3	0.7	**1.7**
2015	**1.1**	**3.2**	**11**	0.9	**2.2**	**5.4**	0.3	0.7	**1.5**
2016	**1.1**	**3.1**	**10**	0.9	**2.2**	**5.2**	0.3	0.7	**1.5**
2017	0.9	**2.8**	**10**	0.8	**1.9**	**4.7**	0.3	0.6	**1.3**
2018	0.9	**2.8**	**10**	0.8	**1.9**	**4.7**	0.2	0.6	**1.3**

TABLE 5-21: RATIO OF PREDICTED BROWN BULLHEAD CONCENTRATIONS TO LABORATORY-DERIVED LOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.6	**1.5**	**4.8**	0.4	0.9	**2.0**	0.2	0.4	0.9
1994	0.5	**1.3**	**4.5**	0.3	0.8	**1.8**	0.2	0.4	0.8
1995	0.5	**1.3**	**4.3**	0.4	0.8	**1.8**	0.2	0.4	0.8
1996	0.4	**1.2**	**4.3**	0.3	0.7	**1.6**	0.1	0.3	0.7
1997	0.4	**1.1**	**3.6**	0.3	0.6	**1.5**	0.1	0.3	0.6
1998	0.3	**1.0**	**3.3**	0.2	0.5	**1.3**	0.1	0.2	0.5
1999	0.3	0.9	**3.0**	0.2	0.5	**1.2**	0.08	0.2	0.4
2000	0.3	0.8	**2.8**	0.2	0.5	**1.1**	0.08	0.2	0.4
2001	0.3	0.7	**2.6**	0.2	0.5	**1.1**	0.07	0.2	0.4
2002	0.2	0.7	**2.5**	0.2	0.4	**1.0**	0.07	0.2	0.4
2003	0.2	0.7	**2.3**	0.2	0.4	**1.0**	0.06	0.1	0.3
2004	0.2	0.6	**2.1**	0.2	0.4	0.9	0.06	0.1	0.3
2005	0.2	0.6	**1.9**	0.1	0.3	0.8	0.05	0.1	0.3
2006	0.2	0.5	**1.9**	0.1	0.3	0.8	0.05	0.1	0.3
2007	0.2	0.5	**1.7**	0.1	0.3	0.7	0.04	0.1	0.2
2008	0.2	0.5	**1.6**	0.1	0.3	0.7	0.04	0.09	0.2
2009	0.2	0.5	**1.5**	0.1	0.3	0.7	0.04	0.09	0.2
2010	0.1	0.4	**1.4**	0.1	0.3	0.6	0.04	0.08	0.2
2011	0.1	0.4	**1.3**	0.09	0.2	0.6	0.03	0.08	0.2
2012	0.1	0.4	**1.2**	0.10	0.2	0.6	0.03	0.08	0.2
2013	0.1	0.3	**1.2**	0.09	0.2	0.5	0.03	0.07	0.2
2014	0.1	0.3	**1.0**	0.09	0.2	0.5	0.03	0.07	0.1
2015	0.09	0.3	**1.0**	0.08	0.2	0.5	0.03	0.06	0.1
2016	0.09	0.3	0.9	0.08	0.2	0.5	0.03	0.06	0.1
2017	0.08	0.2	0.9	0.07	0.2	0.4	0.02	0.05	0.1
2018	0.08	0.2	0.8	0.07	0.2	0.4	0.02	0.05	0.1

TABLE 5-22: RATIO OF PREDICTED BROWN BULLHEAD CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.05	0.19	0.9	0.04	0.11	0.39	0.01	0.03	0.13
1994	0.04	0.17	0.7	0.03	0.10	0.35	0.01	0.03	0.12
1995	0.05	0.17	0.8	0.03	0.10	0.36	0.01	0.03	0.12
1996	0.04	0.15	0.7	0.03	0.09	0.31	0.01	0.02	0.10
1997	0.03	0.14	0.6	0.03	0.08	0.28	0.01	0.02	0.09
1998	0.03	0.12	0.6	0.02	0.07	0.25	0.004	0.02	0.08
1999	0.03	0.11	0.5	0.02	0.06	0.23	0.004	0.02	0.07
2000	0.03	0.10	0.5	0.02	0.06	0.22	0.004	0.01	0.06
2001	0.02	0.10	0.4	0.02	0.06	0.21	0.003	0.01	0.05
2002	0.02	0.09	0.4	0.02	0.06	0.20	0.003	0.01	0.05
2003	0.02	0.09	0.4	0.02	0.05	0.19	0.003	0.01	0.05
2004	0.02	0.08	0.4	0.01	0.05	0.17	0.003	0.01	0.04
2005	0.02	0.07	0.3	0.01	0.04	0.16	0.003	0.01	0.04
2006	0.02	0.07	0.3	0.01	0.04	0.15	0.002	0.01	0.04
2007	0.02	0.07	0.3	0.01	0.04	0.14	0.002	0.01	0.03
2008	0.01	0.06	0.3	0.01	0.04	0.13	0.002	0.01	0.03
2009	0.01	0.06	0.3	0.01	0.03	0.13	0.002	0.01	0.03
2010	0.01	0.05	0.2	0.01	0.03	0.12	0.002	0.01	0.03
2011	0.01	0.05	0.2	0.01	0.03	0.11	0.002	0.01	0.03
2012	0.01	0.05	0.2	0.01	0.03	0.10	0.002	0.01	0.02
2013	0.01	0.04	0.2	0.01	0.03	0.10	0.002	0.01	0.02
2014	0.01	0.04	0.2	0.01	0.03	0.09	0.001	0.01	0.02
2015	0.01	0.04	0.2	0.01	0.02	0.09	0.001	0.00	0.02
2016	0.01	0.04	0.2	0.01	0.02	0.09	0.001	0.00	0.02
2017	0.01	0.03	0.1	0.01	0.02	0.08	0.001	0.00	0.02
2018	0.01	0.03	0.1	0.01	0.02	0.08	0.001	0.00	0.02

TABLE 5-23: RATIO OF PREDICTED BROWN BULLHEAD CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.024	0.086	0.381	0.017	0.049	0.172	0.004	0.014	0.060
1994	0.019	0.076	0.333	0.014	0.043	0.155	0.003	0.013	0.054
1995	0.020	0.077	0.338	0.016	0.045	0.161	0.003	0.012	0.053
1996	0.018	0.069	0.319	0.012	0.038	0.138	0.003	0.010	0.045
1997	0.015	0.062	0.263	0.011	0.035	0.125	0.002	0.009	0.039
1998	0.014	0.055	0.246	0.010	0.031	0.113	0.002	0.008	0.034
1999	0.012	0.050	0.221	0.008	0.028	0.101	0.002	0.007	0.029
2000	0.011	0.046	0.203	0.008	0.026	0.096	0.002	0.006	0.026
2001	0.010	0.045	0.194	0.008	0.025	0.092	0.001	0.006	0.024
2002	0.010	0.041	0.189	0.008	0.025	0.087	0.001	0.005	0.023
2003	0.009	0.038	0.173	0.007	0.023	0.083	0.001	0.005	0.022
2004	0.008	0.035	0.161	0.007	0.022	0.077	0.001	0.005	0.020
2005	0.008	0.033	0.146	0.005	0.019	0.069	0.001	0.004	0.018
2006	0.008	0.031	0.145	0.006	0.019	0.068	0.001	0.004	0.017
2007	0.007	0.029	0.127	0.005	0.017	0.062	0.001	0.004	0.015
2008	0.007	0.028	0.126	0.005	0.016	0.059	0.001	0.003	0.014
2009	0.006	0.026	0.117	0.005	0.015	0.057	0.001	0.003	0.013
2010	0.006	0.024	0.105	0.004	0.014	0.052	0.001	0.003	0.013
2011	0.005	0.021	0.098	0.004	0.013	0.048	0.001	0.003	0.012
2012	0.005	0.020	0.089	0.004	0.013	0.046	0.001	0.003	0.011
2013	0.005	0.019	0.085	0.004	0.012	0.043	0.001	0.003	0.010
2014	0.004	0.017	0.076	0.004	0.012	0.041	0.001	0.002	0.009
2015	0.004	0.017	0.075	0.003	0.011	0.039	0.001	0.002	0.009
2016	0.004	0.016	0.070	0.003	0.011	0.038	0.001	0.002	0.009
2017	0.003	0.014	0.063	0.003	0.009	0.035	0.001	0.002	0.008
2018	0.003	0.014	0.064	0.003	0.010	0.034	0.000	0.002	0.007

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TABLE 5-24: RATIO OF OBSERVED LARGEMOUTH BASS AND BROWN BULLHEAD CONCENTRATIONS TO TOXICITY BENCHMARKS USING NYSDEC DATASET

	RATIO OF WET WEIGHT CONCENTRATION TO NOAEL														
	Largemouth Bass 113			Largemouth Bass 168			Brown Bullhead 168			Largemouth Bass 189			Brown Bullhead 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	22	*	69	34	43	76	8.5	13	17	189	366	692	17	33	28
1994	31	72	104	27	55	64	5.7	13	18	90	136	193	18	23	69
1995	16	21	60	26	36	57	6.0	7.7	13	112	187	256	13	17	18
1996	19	32	53							56	75	114	11	*	13

	RATIO OF WET WEIGHT CONCENTRATION TO LOAEL														
	Largemouth Bass 113			Largemouth Bass 168			Brown Bullhead 168			Largemouth Bass 189			Brown Bullhead 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	NA	*	NA	NA	NA	NA	0.7	1.2	1.5	NA	NA	NA	1.5	2.9	2.5
1994	NA	NA	NA	NA	NA	NA	0.5	1.2	1.6	NA	NA	NA	1.5	2.0	6.1
1995	NA	NA	NA	NA	NA	NA	0.5	0.7	1.1	NA	NA	NA	1.2	1.5	1.6
1996	NA	NA	NA							NA	NA	NA	0.9	*	1.1

	RATIO OF LIPID NORMALIZED CONCENTRATIONS: TEQ BASIS TO NOAEL														
	Largemouth Bass 113			Largemouth Bass 168			Brown Bullhead 168			Largemouth Bass 189			Brown Bullhead 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	2.4	5.1	4.2	9.5	11	15	0.2	*	0.3	42	64	94	0.6	1.1	1.2
1994	2.8	4.2	8.2	9.0	17	21	0.1	0.2	0.5	23	29	48	0.5	0.7	2.1
1995	2.7	3.3	4.3	10.5	12	18	0.1	0.1	0.3	20	31	34	0.2	0.3	0.4
1996	2.2	3.0	4.5							15	19	27	0.2	*	0.3

	RATIO OF LIPID NORMALIZED CONCENTRATIONS: TEQ BASIS TO LOAEL														
	Largemouth Bass 113			Largemouth Bass 168			Brown Bullhead 168			Largemouth Bass 189			Brown Bullhead 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	1.2	2.5	2.0	4.6	5.4	7.2	0.1	*	0.1	20	31	45	0.3	0.5	0.5
1994	1.4	2.1	4.0	4.4	8.1	10.1	0.1	0.1	0.2	11	14	23	0.2	0.3	0.9
1995	1.3	1.6	2.1	5.1	6.0	8.9	0.0	0.1	0.1	9.8	15	17	0.1	0.1	0.2
1996	1.1	1.5	2.2							7.1	9.0	13	0.1	*	0.1

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TABLE 5-25: RATIO OF OBSERVED WHITE PERCH AND YELLOW PERCH CONCENTRATIONS TO TOXICITY BENCHMARKS USING NYSDEC DATASET

<<<<<<<<<<<<<<< ---------- RATIO OF WET WEIGHT CONCENTRATION TO NOAEL ---------- >>>>>>>>>>>

	White Perch 113			White Perch 152			Yellow Perch 113			Yellow Perch 168			Yellow Perch 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	0.8	*	**1.8**	0.8	*	**1.2**	0.7	*	**2.2**	**7.0**	*	**14**	**24**	**44**	**88**
1994	0.3	*	0.7	**1.6**	*	**2.8**	0.3	*	0.5						
1995															
1996	**1.6**	*	**2.9**	0.9	*	**2.6**									

<<<<<<<<<<<<<<< ---------- RATIO OF WET WEIGHT CONCENTRATION TO LOAEL ---------- >>>>>>>>>>>

	White Perch 113			White Perch 152			Yellow Perch 113			Yellow Perch 168			Yellow Perch 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	NA	NA	NA	NA	NA	NA	0.1	*	0.2	0.6	*	**1.2**	**2.1**	**3.9**	**7.7**
1994	NA	NA	NA	NA	NA	NA	0.03	*	0.05						
1995															
1996	NA	NA	NA	NA	NA										

<<<<<<<<<<<<<<< ----------RATIO OF LIPID NORMALIZED CONCENTRATIONS: TEQ BASIS TO NOAEL ---------- >>>>>>>>>>>

	White Perch 113			White Perch 152			Yellow Perch 113			Yellow Perch 168			Yellow Perch 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	**2.3**	**3.3**	**4.1**	**2.0**	**2.3**	**3.0**	**2.0**	**2.5**	**8.0**	**9.0**	*	**13**	**51**	**75**	**255**
1994	**2.1**	**3.0**	**3.6**	**5.8**	**7.1**	**12**	**1.0**	**1.3**	**1.4**						
1995															
1996	**2.8**	**7.3**	**6.5**												

<<<<<<<<<<<<< ---------- RATIO OF LIPID NORMALIZED CONCENTRATIONS: TEQ BASIS TO LOAEL---------- >>>>>>>>>>

	White Perch 113			White Perch 152			Yellow Perch 113			Yellow Perch 168			Yellow Perch 189		
	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum	Average	95% UCL	Maximum
1993	**1.1**	**1.6**	**2.0**	**1.0**	**1.1**	**1.5**	**1.0**	**1.2**	**3.9**	**4.4**	*	**6.5**	**25**	**36**	**123**
1994	**1.0**	**1.5**	**1.8**	**2.8**	**3.4**	**5.9**	0.5	0.6	0.7						
1995															
1996	**1.4**	**3.5**	**3.2**												

TABLE 5-26: RATIO OF PREDICTED WHITE PERCH CONCENTRATIONS TO FIELD-BASED NOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	**2.2**	**5.1**	**14.2**	**1.7**	**3.5**	**6.5**	0.8	**1.6**	**3.1**
1994	**1.6**	**4.1**	**13.1**	**1.4**	**2.9**	**5.6**	0.6	**1.4**	**2.6**
1995	**1.8**	**4.4**	**12.7**	**1.5**	**3.2**	**6.2**	0.7	**1.5**	**2.9**
1996	**1.4**	**3.7**	**12.8**	**1.1**	**2.4**	**4.9**	0.5	**1.1**	**2.2**
1997	**1.2**	**3.3**	**10.4**	**1.0**	**2.3**	**4.6**	0.5	**1.0**	**2.1**
1998	**1.1**	**2.8**	**9.3**	0.9	**2.0**	**4.0**	0.4	0.9	**1.6**
1999	0.9	**2.5**	**8.7**	0.8	**1.7**	**3.7**	0.3	0.7	**1.4**
2000	0.9	**2.4**	**7.8**	0.8	**1.7**	**3.4**	0.3	0.7	**1.3**
2001	0.8	**2.3**	**7.4**	0.7	**1.6**	**3.3**	0.3	0.6	**1.2**
2002	0.8	**2.1**	**7.1**	0.7	**1.6**	**3.2**	0.3	0.6	**1.2**
2003	0.7	**1.9**	**6.7**	0.6	**1.4**	**2.9**	0.2	0.5	**1.1**
2004	0.7	**1.8**	**6.0**	0.6	**1.4**	**2.8**	0.3	0.5	**1.1**
2005	0.6	**1.7**	**5.4**	0.5	**1.1**	**2.4**	0.2	0.4	0.9
2006	0.6	**1.6**	**5.6**	0.5	**1.1**	**2.5**	0.2	0.4	0.8
2007	0.5	**1.5**	**4.9**	0.5	**1.0**	**2.2**	0.2	0.4	0.7
2008	0.5	**1.4**	**4.6**	0.4	**1.0**	**2.1**	0.2	0.3	0.7
2009	0.5	**1.4**	**4.3**	0.4	0.9	**2.0**	0.2	0.4	0.7
2010	0.4	**1.2**	**4.0**	0.4	0.9	**1.9**	0.2	0.3	0.6
2011	0.4	**1.1**	**3.6**	0.4	0.8	**1.6**	0.1	0.3	0.6
2012	0.4	**1.1**	**3.4**	0.4	0.8	**1.7**	0.1	0.3	0.6
2013	0.4	**1.0**	**3.2**	0.3	0.8	**1.6**	0.1	0.3	0.5
2014	0.3	0.9	**2.9**	0.3	0.7	**1.5**	0.1	0.3	0.5
2015	0.3	0.8	**2.7**	0.3	0.7	**1.4**	0.1	0.2	0.5
2016	0.3	0.8	**2.7**	0.3	0.7	**1.5**	0.1	0.2	0.5
2017	0.3	0.7	**2.5**	0.3	0.6	**1.2**	0.1	0.2	0.4
2018	0.3	0.7	**2.4**	0.3	0.6	**1.3**	0.1	0.2	0.4

TABLE 5-27: RATIO OF PREDICTED YELLOW PERCH CONCENTRATIONS TO LABORATORY-DERIVED NOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	3.4	8.7	18	2.7	7.4	17	1.3	3.7	9.0
1994	2.5	6.0	13	2.3	5.7	12	1.1	2.8	6.3
1995	2.7	6.8	14	2.5	6.7	15	1.2	3.4	8.0
1996	2.0	5.0	13	1.8	4.4	9.2	0.8	2.2	5.5
1997	1.8	4.3	10	1.6	4.0	8.4	0.8	2.1	4.8
1998	1.6	3.6	8.8	1.5	3.8	7.9	0.7	1.8	4.3
1999	1.2	2.9	7.5	1.1	2.8	5.8	0.5	1.3	2.9
2000	1.2	2.8	6.9	1.1	2.7	5.2	0.5	1.2	2.7
2001	1.0	2.6	6.6	1.1	2.8	5.7	0.5	1.3	2.9
2002	1.1	2.5	6.3	1.1	2.7	5.3	0.5	1.2	2.7
2003	0.9	2.2	5.6	0.9	2.3	4.6	0.4	1.0	2.4
2004	0.8	2.1	5.2	0.9	2.2	4.4	0.4	1.1	2.6
2005	0.7	1.9	4.7	0.8	1.8	3.6	0.3	0.9	2.0
2006	0.8	1.8	4.8	0.8	2.0	4.2	0.3	1.0	2.3
2007	0.7	1.6	4.2	0.7	1.7	3.3	0.3	0.7	1.7
2008	0.6	1.5	4.1	0.6	1.4	2.7	0.2	0.6	1.5
2009	0.7	1.6	4.0	0.7	1.7	3.4	0.3	0.7	1.8
2010	0.6	1.4	3.6	0.6	1.5	3.0	0.3	0.7	1.6
2011	0.5	1.3	3.2	0.5	1.3	2.4	0.2	0.6	1.4
2012	0.5	1.2	3.0	0.6	1.4	2.8	0.2	0.6	1.5
2013	0.5	1.2	2.9	0.5	1.4	2.7	0.2	0.6	1.4
2014	0.4	1.1	2.8	0.5	1.3	2.5	0.2	0.5	1.2
2015	0.4	1.0	2.5	0.5	1.2	2.3	0.2	0.5	1.1
2016	0.4	1.0	2.5	0.5	1.3	2.8	0.2	0.6	1.4
2017	0.3	0.8	2.2	0.4	1.0	1.9	0.1	0.4	1.1
2018	0.3	0.8	2.2	0.4	0.8	1.6	0.1	0.3	0.8

TABLE 5-28: RATIO OF PREDICTED YELLOW PERCH CONCENTRATIONS TO LABORATORY-DERIVED LOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.3	0.8	**1.6**	0.2	0.6	**1.5**	0.1	0.3	0.8
1994	0.2	0.5	**1.1**	0.2	0.5	**1.1**	0.1	0.3	0.6
1995	0.2	0.6	**1.3**	0.2	0.6	**1.3**	0.1	0.3	0.7
1996	0.2	0.4	**1.2**	0.2	0.4	0.8	0.07	0.2	0.5
1997	0.2	0.4	0.9	0.1	0.4	0.7	0.07	0.2	0.4
1998	0.1	0.3	0.8	0.1	0.3	0.7	0.06	0.2	0.4
1999	0.1	0.3	0.7	0.1	0.2	0.5	0.04	0.1	0.3
2000	0.1	0.2	0.6	0.1	0.2	0.5	0.04	0.1	0.2
2001	0.09	0.2	0.6	0.1	0.2	0.5	0.04	0.1	0.3
2002	0.09	0.2	0.6	0.1	0.2	0.5	0.04	0.1	0.2
2003	0.08	0.2	0.5	0.08	0.2	0.4	0.03	0.1	0.2
2004	0.07	0.2	0.5	0.08	0.2	0.4	0.04	0.1	0.2
2005	0.07	0.2	0.4	0.07	0.2	0.3	0.03	0.08	0.2
2006	0.07	0.2	0.4	0.07	0.2	0.4	0.03	0.09	0.2
2007	0.06	0.1	0.4	0.06	0.1	0.3	0.02	0.06	0.1
2008	0.05	0.1	0.4	0.05	0.1	0.2	0.02	0.06	0.1
2009	0.06	0.1	0.4	0.06	0.1	0.3	0.02	0.07	0.2
2010	0.05	0.1	0.3	0.06	0.1	0.3	0.02	0.06	0.1
2011	0.05	0.1	0.3	0.05	0.1	0.2	0.02	0.05	0.1
2012	0.04	0.1	0.3	0.05	0.1	0.2	0.02	0.06	0.1
2013	0.04	0.1	0.3	0.05	0.1	0.2	0.02	0.05	0.1
2014	0.04	0.1	0.2	0.04	0.1	0.2	0.02	0.05	0.1
2015	0.04	0.09	0.2	0.04	0.1	0.2	0.02	0.04	0.1
2016	0.04	0.09	0.2	0.05	0.12	0.2	0.02	0.05	0.1
2017	0.03	0.07	0.2	0.03	0.08	0.2	0.01	0.04	0.1
2018	0.03	0.07	0.2	0.03	0.07	0.1	0.01	0.03	0.07

TABLE 5-29: RATIO OF PREDICTED WHITE PERCH CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.7	**2.5**	**9.6**	0.5	**1.6**	**5.2**	0.1	0.46	**1.9**
1994	0.5	**2.1**	**8.5**	0.4	**1.4**	**4.5**	0.1	0.43	**1.7**
1995	0.6	**2.1**	**8.4**	0.5	**1.5**	**4.8**	0.11	0.41	**1.7**
1996	0.5	**1.9**	**8.2**	0.3	**1.1**	**3.7**	0.09	0.34	**1.4**
1997	0.4	**1.6**	**6.8**	0.3	**1.1**	**3.6**	0.08	0.31	**1.2**
1998	0.4	**1.4**	**6.2**	0.3	0.9	**3.2**	0.07	0.26	**1.0**
1999	0.3	**1.3**	**5.6**	0.2	0.8	**2.8**	0.06	0.23	0.9
2000	0.3	**1.2**	**5.1**	0.2	0.8	**2.6**	0.06	0.21	0.8
2001	0.3	**1.1**	**4.9**	0.2	0.8	**2.5**	0.05	0.19	0.8
2002	0.3	**1.1**	**4.7**	0.2	0.8	**2.5**	0.05	0.18	0.7
2003	0.2	**1.0**	**4.2**	0.2	0.7	**2.3**	0.05	0.18	0.7
2004	0.2	0.9	**4.0**	0.2	0.6	**2.1**	0.04	0.16	0.6
2005	0.2	0.8	**3.6**	0.2	0.5	**1.8**	0.04	0.14	0.6
2006	0.2	0.8	**3.6**	0.2	0.6	**1.9**	0.04	0.13	0.5
2007	0.2	0.7	**3.4**	0.1	0.5	**1.6**	0.04	0.13	0.5
2008	0.2	0.7	**3.1**	0.1	0.5	**1.6**	0.03	0.11	0.4
2009	0.2	0.7	**2.9**	0.1	0.4	**1.6**	0.03	0.11	0.4
2010	0.1	0.6	**2.7**	0.1	0.4	**1.4**	0.03	0.11	0.4
2011	0.1	0.5	**2.4**	0.11	0.4	**1.3**	0.03	0.10	0.4
2012	0.1	0.5	**2.3**	0.11	0.4	**1.3**	0.03	0.10	0.4
2013	0.1	0.5	**2.1**	0.11	0.4	**1.2**	0.03	0.09	0.3
2014	0.1	0.4	**1.9**	0.10	0.3	**1.1**	0.02	0.08	0.3
2015	0.10	0.4	**1.8**	0.10	0.3	**1.1**	0.02	0.08	0.3
2016	0.10	0.4	**1.8**	0.10	0.3	**1.1**	0.02	0.08	0.3
2017	0.09	0.4	**1.7**	0.08	0.3	0.9	0.02	0.06	0.2
2018	0.09	0.4	**1.6**	0.08	0.3	0.9	0.02	0.06	0.2

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TABLE 5-30: RATIO OF PREDICTED WHITE PERCH CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.3	**1.2**	**4.6**	0.2	0.8	**2.5**	0.06	0.22	0.90
1994	0.3	**1.0**	**4.1**	0.2	0.7	**2.2**	0.06	0.21	0.82
1995	0.3	**1.0**	**4.1**	0.2	0.7	**2.3**	0.05	0.20	0.80
1996	0.2	0.9	**3.9**	0.2	0.6	**1.8**	0.04	0.16	0.67
1997	0.2	0.8	**3.3**	0.2	0.5	**1.7**	0.04	0.15	0.59
1998	0.2	0.7	**3.0**	0.1	0.5	**1.5**	0.03	0.12	0.50
1999	0.2	0.6	**2.7**	0.1	0.4	**1.4**	0.03	0.11	0.45
2000	0.1	0.6	**2.5**	0.1	0.4	**1.3**	0.03	0.10	0.39
2001	0.1	0.6	**2.4**	0.1	0.4	**1.2**	0.03	0.09	0.37
2002	0.1	0.5	**2.3**	0.1	0.4	**1.2**	0.02	0.09	0.35
2003	0.1	0.5	**2.0**	0.1	0.3	**1.1**	0.02	0.08	0.33
2004	0.1	0.4	**1.9**	0.1	0.3	**1.0**	0.02	0.08	0.30
2005	0.09	0.4	**1.7**	0.1	0.3	0.9	0.02	0.07	0.27
2006	0.09	0.4	**1.7**	0.1	0.3	0.9	0.02	0.06	0.25
2007	0.09	0.4	**1.6**	0.1	0.2	0.8	0.02	0.06	0.23
2008	0.08	0.3	**1.5**	0.1	0.2	0.8	0.01	0.05	0.21
2009	0.08	0.3	**1.4**	0.1	0.2	0.8	0.01	0.05	0.20
2010	0.07	0.3	**1.3**	0.1	0.2	0.7	0.02	0.05	0.20
2011	0.06	0.3	**1.1**	0.1	0.2	0.6	0.01	0.05	0.18
2012	0.06	0.3	**1.1**	0.1	0.2	0.6	0.01	0.05	0.17
2013	0.06	0.2	**1.0**	0.1	0.2	0.6	0.01	0.04	0.16
2014	0.05	0.2	0.9	0.1	0.2	0.6	0.01	0.04	0.15
2015	0.05	0.2	0.9	0.0	0.2	0.5	0.01	0.04	0.14
2016	0.05	0.2	0.9	0.0	0.2	0.5	0.01	0.04	0.13
2017	0.04	0.2	0.8	0.0	0.1	0.4	0.01	0.03	0.12
2018	0.04	0.2	0.8	0.0	0.1	0.5	0.01	0.03	0.11

TABLE 5-31: RATIO OF PREDICTED YELLOW PERCH CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	**1.0**	**2.7**	**7.5**	0.8	**2.4**	**6.5**	0.4	**1.4**	**4.8**
1994	0.7	**1.9**	**5.2**	0.6	**1.8**	**4.8**	0.4	**1.3**	**4.5**
1995	0.8	**2.1**	**5.6**	0.7	**2.1**	**5.9**	0.4	**1.3**	**4.3**
1996	0.6	**1.6**	**5.1**	0.5	**1.4**	**3.6**	0.3	**1.1**	**3.5**
1997	0.5	**1.4**	**3.9**	0.5	**1.3**	**3.3**	0.3	0.9	**3.1**
1998	0.4	**1.2**	**3.3**	0.4	**1.2**	**3.1**	0.3	0.8	**2.7**
1999	0.3	0.9	**2.9**	0.3	0.9	**2.3**	0.2	0.7	**2.3**
2000	0.3	0.9	**2.7**	0.3	0.8	**2.1**	0.2	0.7	**2.1**
2001	0.3	0.8	**2.4**	0.3	0.9	**2.3**	0.2	0.6	**2.0**
2002	0.3	0.8	**2.4**	0.3	0.8	**2.1**	0.2	0.6	**1.9**
2003	0.3	0.7	**2.1**	0.3	0.7	**1.8**	0.2	0.5	**1.8**
2004	0.2	0.7	**2.1**	0.3	0.7	**1.8**	0.2	0.5	**1.6**
2005	0.2	0.6	**1.8**	0.2	0.6	**1.5**	0.1	0.4	**1.5**
2006	0.2	0.6	**1.8**	0.2	0.6	**1.7**	0.1	0.4	**1.4**
2007	0.2	0.5	**1.6**	0.2	0.5	**1.3**	0.1	0.4	**1.3**
2008	0.2	0.5	**1.5**	0.2	0.4	**1.1**	0.1	0.3	**1.1**
2009	0.2	0.5	**1.5**	0.2	0.5	**1.3**	0.1	0.3	**1.1**
2010	0.2	0.5	**1.3**	0.2	0.5	**1.2**	0.1	0.3	**1.1**
2011	0.1	0.4	**1.2**	0.2	0.4	**1.0**	0.1	0.3	**1.0**
2012	0.1	0.4	**1.2**	0.2	0.4	**1.1**	0.1	0.3	**1.0**
2013	0.1	0.4	**1.1**	0.2	0.4	**1.1**	0.1	0.3	0.9
2014	0.1	0.3	**1.0**	0.1	0.4	**1.0**	0.1	0.3	0.8
2015	0.1	0.3	0.9	0.1	0.4	0.9	0.1	0.3	0.8
2016	0.1	0.3	0.9	0.1	0.4	**1.1**	0.1	0.3	0.7
2017	0.1	0.3	0.8	0.1	0.3	0.8	0.1	0.2	0.6
2018	0.09	0.3	0.8	0.1	0.3	0.6	0.1	0.2	0.6

TABLE 5-32: RATIO OF PREDICTED YELLOW PERCH CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.5	**1.3**	**3.6**	0.4	**1.1**	**3.2**	0.2	0.7	**2.3**
1994	0.3	0.9	**2.5**	0.3	0.9	**2.3**	0.2	0.6	**2.2**
1995	0.4	1.0	**2.7**	0.4	1.0	**2.9**	0.2	0.6	**2.1**
1996	0.3	0.8	**2.5**	0.2	0.7	**1.8**	0.2	0.5	**1.7**
1997	0.2	0.7	**1.9**	0.2	0.6	**1.6**	0.1	0.5	**1.5**
1998	0.2	0.6	**1.6**	0.2	0.6	**1.5**	0.1	0.4	**1.3**
1999	0.2	0.4	**1.4**	0.2	0.4	**1.1**	0.1	0.3	**1.1**
2000	0.1	0.4	**1.3**	0.1	0.4	**1.0**	0.1	0.3	**1.0**
2001	0.1	0.4	**1.2**	0.2	0.4	**1.1**	0.1	0.3	**1.0**
2002	0.1	0.4	**1.1**	0.2	0.4	**1.0**	0.09	0.3	0.9
2003	0.1	0.3	**1.0**	0.1	0.4	0.9	0.09	0.3	0.9
2004	0.1	0.3	**1.0**	0.1	0.3	0.9	0.08	0.2	0.8
2005	0.1	0.3	0.9	0.1	0.3	0.7	0.07	0.2	0.7
2006	0.1	0.3	0.9	0.1	0.3	0.8	0.07	0.2	0.7
2007	0.09	0.3	0.8	0.09	0.3	0.6	0.07	0.2	0.6
2008	0.08	0.2	0.7	0.08	0.2	0.5	0.06	0.2	0.6
2009	0.09	0.2	0.7	0.09	0.3	0.6	0.06	0.2	0.6
2010	0.08	0.2	0.7	0.09	0.2	0.6	0.06	0.2	0.5
2011	0.07	0.2	0.6	0.07	0.2	0.5	0.06	0.2	0.5
2012	0.07	0.2	0.6	0.08	0.2	0.5	0.06	0.2	0.5
2013	0.07	0.2	0.5	0.08	0.2	0.5	0.05	0.1	0.4
2014	0.06	0.2	0.5	0.07	0.2	0.5	0.05	0.1	0.4
2015	0.06	0.2	0.5	0.07	0.2	0.4	0.05	0.1	0.4
2016	0.06	0.2	0.5	0.07	0.2	0.5	0.05	0.1	0.4
2017	0.05	0.1	0.4	0.05	0.15	0.4	0.04	0.1	0.3
2018	0.04	0.1	0.4	0.05	0.13	0.3	0.03	0.09	0.3

TABLE 5-33: RATIO OF PREDICTED LARGEMOUTH BASS CONCENTRATIONS TO FIELD-BASED NOAEL FOR TRI+ PCBS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	**42**	**88**	**163**	**34**	**68**	**118**	**16**	**33**	**60**
1994	**24**	**50**	**117**	**24**	**47**	**80**	**11**	**23**	**41**
1995	**26**	**56**	**129**	**27**	**52**	**89**	**13**	**26**	**44**
1996	**22**	**48**	**132**	**20**	**42**	**71**	**10**	**22**	**41**
1997	**16**	**37**	**98**	**19**	**37**	**62**	**9**	**19**	**35**
1998	**14**	**31**	**84**	**16**	**33**	**56**	**8.0**	**16**	**29**
1999	**11**	**26**	**75**	**13**	**26**	**47**	**5.7**	**12**	**23**
2000	**11**	**25**	**70**	**12**	**25**	**44**	**5.7**	**12**	**21**
2001	**10**	**23**	**64**	**12**	**24**	**43**	**5.4**	**11**	**20**
2002	**10**	**23**	**64**	**13**	**26**	**44**	**5.5**	**12**	**21**
2003	**8.6**	**20**	**57**	**10**	**22**	**38**	**4.7**	**10**	**18**
2004	**8.1**	**19**	**52**	**10**	**21**	**36**	**4.9**	**10**	**19**
2005	**7.0**	**16**	**48**	**8.0**	**16**	**28**	**3.7**	**7.8**	**14**
2006	**7.3**	**16**	**48**	**8.8**	**18**	**32**	**4.2**	**8.4**	**15**
2007	**6.4**	**15**	**44**	**7.5**	**15**	**26**	**3.2**	**6.5**	**12**
2008	**5.8**	**14**	**41**	**6.6**	**13**	**24**	**2.9**	**6.1**	**12**
2009	**6.2**	**14**	**39**	**7.2**	**14**	**26**	**3.2**	**6.6**	**13**
2010	**5.7**	**13**	**36**	**6.4**	**13**	**23**	**2.8**	**5.6**	**10**
2011	**4.5**	**11**	**32**	**5.5**	**11**	**20**	**2.5**	**5.3**	**10**
2012	**4.6**	**11**	**30**	**5.5**	**11**	**20**	**2.5**	**5.2**	**10**
2013	**4.5**	**10**	**29**	**5.6**	**12**	**20**	**2.4**	**5.0**	**9.6**
2014	**4.2**	**9.7**	**26**	**5.5**	**11**	**20**	**2.3**	**4.7**	**8.5**
2015	**3.8**	**8.8**	**24**	**4.9**	**10**	**17**	**2.0**	**4.3**	**7.8**
2016	**4.0**	**9.1**	**25**	**5.5**	**11**	**19**	**2.3**	**4.7**	**8.4**
2017	**3.2**	**7.5**	**22**	**4.1**	**8.3**	**15**	**1.6**	**3.6**	**7.5**
2018	**3.3**	**7.4**	**22**	**3.9**	**8.0**	**14**	**1.6**	**3.4**	**6.7**

TABLE 5-34: RATIO OF PREDICTED LARGEMOUTH BASS CONCENTRATIONS TO LABORATORY-DERIVED NOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	**1.8**	**6.0**	**25.2**	**1.5**	**4.6**	**19.5**	0.4	**1.1**	**3.3**
1994	**1.1**	**3.6**	**16.5**	**1.0**	**3.2**	**13.6**	0.4	**1.0**	**3.1**
1995	**1.2**	**4.0**	**17.9**	**1.2**	**3.6**	**14.8**	0.4	**1.0**	**3.1**
1996	**1.0**	**3.4**	**18.7**	0.9	**2.8**	**11.9**	0.3	0.8	**2.5**
1997	0.8	**2.6**	**13.3**	0.8	**2.5**	**10.3**	0.3	0.7	**2.2**
1998	0.6	**2.3**	**11.7**	0.7	**2.2**	**9.3**	0.2	0.6	**1.9**
1999	0.5	**1.9**	**9.8**	0.6	**1.8**	**7.5**	0.2	0.5	**1.7**
2000	0.5	**1.8**	**8.9**	0.5	**1.7**	**7.2**	0.2	0.5	**1.6**
2001	0.5	**1.7**	**9.0**	0.5	**1.7**	**6.9**	0.2	0.5	**1.5**
2002	0.5	**1.6**	**8.3**	0.6	**1.8**	**7.2**	0.2	0.4	**1.3**
2003	0.4	**1.4**	**7.5**	0.5	**1.5**	**6.0**	0.2	0.4	**1.4**
2004	0.4	**1.3**	**7.0**	0.5	**1.4**	**5.9**	0.2	0.4	**1.2**
2005	0.3	**1.2**	**6.3**	0.4	**1.1**	**4.6**	0.1	0.4	**1.1**
2006	0.3	**1.2**	**6.1**	0.4	**1.2**	**5.1**	0.1	0.3	**1.0**
2007	0.3	**1.1**	**5.5**	0.3	**1.0**	**4.3**	0.1	0.3	**1.0**
2008	0.3	**1.0**	**5.4**	0.3	0.9	**3.8**	0.1	0.3	0.9
2009	0.3	**1.0**	**5.3**	0.3	**1.0**	**4.0**	0.1	0.3	0.9
2010	0.3	0.9	**4.7**	0.3	0.9	**3.8**	0.1	0.3	0.9
2011	0.2	0.8	**4.1**	0.2	0.8	**3.3**	0.1	0.3	0.9
2012	0.2	0.8	**4.0**	0.2	0.8	**3.3**	0.1	0.3	0.9
2013	0.2	0.7	**3.8**	0.3	0.8	**3.3**	0.1	0.3	0.8
2014	0.2	0.7	**3.5**	0.2	0.8	**3.1**	0.1	0.3	0.7
2015	0.2	0.6	**3.4**	0.2	0.7	**2.8**	0.1	0.2	0.7
2016	0.2	0.7	**3.2**	0.2	0.7	**3.1**	0.1	0.3	0.7
2017	0.2	0.5	**2.8**	0.2	0.6	**2.5**	0.1	0.2	0.6
2018	0.2	0.5	**2.7**	0.2	0.5	**2.3**	0.1	0.2	0.5

TABLE 5-35: RATIO OF PREDICTED LARGEMOUTH BASS CONCENTRATIONS TO LABORATORY-DERIVED LOAEL ON A TEQ BASIS

	Thompson Island Pool			River Mile 168			River Mile 154		
Year	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)	25th (mg/kg wet weight)	Median (mg/kg wet weight)	95th Percentile (mg/kg wet weight)
1993	0.9	**2.9**	**12.2**	0.7	**2.2**	**9.4**	0.2	0.5	**1.6**
1994	0.5	**1.7**	**8.0**	0.5	**1.6**	**6.6**	0.2	0.5	**1.5**
1995	0.6	**1.9**	**8.7**	0.6	**1.7**	**7.1**	0.2	0.5	**1.5**
1996	0.5	**1.6**	**9.0**	0.4	**1.4**	**5.7**	0.14	0.4	**1.2**
1997	0.4	**1.3**	**6.4**	0.4	**1.2**	**5.0**	0.14	0.3	**1.1**
1998	0.3	**1.1**	**5.7**	0.3	**1.1**	**4.5**	0.11	0.3	0.9
1999	0.3	0.9	**4.8**	0.3	0.9	**3.6**	0.10	0.2	0.8
2000	0.2	0.9	**4.3**	0.3	0.8	**3.5**	0.10	0.3	0.8
2001	0.2	0.8	**4.3**	0.3	0.8	**3.4**	0.09	0.2	0.7
2002	0.2	0.8	**4.0**	0.3	0.9	**3.5**	0.08	0.2	0.7
2003	0.2	0.7	**3.6**	0.2	0.7	**2.9**	0.09	0.2	0.7
2004	0.2	0.6	**3.4**	0.2	0.7	**2.8**	0.08	0.2	0.6
2005	0.2	0.6	**3.0**	0.2	0.5	**2.2**	0.07	0.2	0.5
2006	0.2	0.6	**2.9**	0.2	0.6	**2.5**	0.07	0.2	0.5
2007	0.15	0.5	**2.6**	0.2	0.5	**2.1**	0.07	0.2	0.5
2008	0.14	0.5	**2.6**	0.1	0.4	**1.9**	0.06	0.14	0.4
2009	0.14	0.5	**2.6**	0.2	0.5	**1.9**	0.05	0.13	0.4
2010	0.13	0.4	**2.3**	0.14	0.4	**1.8**	0.06	0.15	0.4
2011	0.10	0.4	**2.0**	0.12	0.4	**1.6**	0.06	0.14	0.4
2012	0.10	0.4	**1.9**	0.12	0.4	**1.6**	0.06	0.15	0.4
2013	0.10	0.4	**1.8**	0.12	0.4	**1.6**	0.06	0.14	0.4
2014	0.09	0.3	**1.7**	0.12	0.4	**1.5**	0.05	0.12	0.4
2015	0.09	0.3	**1.6**	0.10	0.3	**1.3**	0.05	0.12	0.3
2016	0.09	0.3	**1.5**	0.12	0.4	**1.5**	0.05	0.13	0.4
2017	0.08	0.3	**1.4**	0.09	0.3	**1.2**	0.04	0.10	0.3
2018	0.07	0.3	**1.3**	0.09	0.3	**1.1**	0.04	0.08	0.2

TABLE 5-36
COMPARISON OF MEASURED STRIPED BASS CONCENTRATIONS
TO TOXICITY REFERENCE VALUES

		<<--- Tri+ in Tissue -->>		<< -- TEQ in Eggs: Lipid Normalized -->>			
		Field-Based NOAEL		LOAEL		NOAEL	
River Mile	Year	Average	95%UCL	Average	95% UCL	Average	95% UCL
12	1993	0.4	0.7	0.2	0.4	0.5	0.7
27	1993	0.8	**1.3**	0.4	0.6	0.9	**1.3**
33	1993	**1.4**	**2.7**	0.5	0.9	**1.0**	**1.8**
40	1993	0.5	0.7	0.3	0.4	0.6	0.8
74	1993	**1.0**	**1.6**	0.7	**1.2**	**1.4**	**2.5**
112	1993	**1.2**	**1.8**	**1.1**	**1.9**	**2.3**	**3.9**
152	1993	**4.0**	**5.7**	**2.8**	**4.9**	**5.8**	**10.0**
26	1994	0.5	0.8	0.3	0.5	0.7	**1.0**
37	1994	0.6	**1.0**	0.4	0.8	0.9	**1.6**
40	1994	0.6	0.9	0.4	0.5	0.8	**1.1**
74	1994	0.8	**1.4**	0.5	0.7	0.9	**1.4**
112	1994	**1.0**	**2.7**	**1.2**	**4.3**	**2.5**	**9.0**
152	1994	**2.1**	**3.2**	**2.3**	**3.1**	**4.8**	**6.4**
27	1995	0.6	0.9	0.5	0.8	**1.0**	**1.7**
36	1995	0.4	0.5	0.2	0.3	0.5	0.7
59	1995	0.7	0.9	**1.5**	**2.3**	**3.1**	**4.7**
76	1995	0.6	0.7	0.3	0.3	0.6	0.7
113	1995	0.5	0.9	0.3	0.5	0.7	**1.1**
152	1995	**2.1**	**2.7**	**1.6**	**2.1**	**3.3**	**4.4**
12	1996	0.4	0.6	0.3	0.5	0.7	**1.0**
29	1996	0.6	0.9	0.4	0.5	0.8	**1.1**
40	1996	0.5	0.7	0.4	0.7	0.9	**1.3**
74	1996	0.6	0.8	0.4	0.6	0.9	**1.3**
112	1996	0.6	**1.0**	0.8	**1.7**	**1.6**	**3.5**
152	1996	**1.6**	**3.6**	**2.0**	**4.8**	**4.1**	**10.0**

Bold values indicate exceedances

TABLE 5-37: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE TREE SWALLOW FOR TRI+ CONGENERS

Location	<<<< ----- Dietary Dose ---- >>>> LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	<<<< ---- Egg Concentration ---- >>>> LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	NA	NA	0.7	**1.2**	NA	NA	1.0	**1.7**
Stillwater (168)	NA	NA	**1.2**	**5.5**	NA	NA	**1.7**	**7.8**
Federal Dam (154)	NA	NA	0.3	0.5	NA	NA	0.4	0.7
Lower River								
143.5	NA	NA	0.04	0.1	NA	NA	0.1	0.1
137.2	NA	NA	0.08	0.3	NA	NA	0.1	0.4
122.4	NA	NA	0.04	0.1	NA	NA	0.1	0.2
113.8	NA	NA	0.04	0.2	NA	NA	0.1	0.2
100	NA	NA	0.02	0.1	NA	NA	0.03	0.2
88.9	NA	NA	0.01	0.02	NA	NA	0.01	0.03
58.7	NA	NA	0.03	0.3	NA	NA	0.04	0.4
47.3	NA	NA	0.04	0.3	NA	NA	0.05	0.4
25.8	NA	NA	0.01	0.0	NA	NA	0.01	0.03

Bold value indicates exceedances

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TABLE 5-38: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE TREE SWALLOWS BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	NA	NA	0.8	**1.2**	NA	NA	0.4	0.7	NA	NA	0.2	0.2
1994	NA	NA	0.7	**1.1**	NA	NA	0.4	0.7	NA	NA	0.2	0.2
1995	NA	NA	0.7	**1.0**	NA	NA	0.4	0.6	NA	NA	0.2	0.2
1996	NA	NA	0.6	0.9	NA	NA	0.3	0.6	NA	NA	0.1	0.2
1997	NA	NA	0.6	0.8	NA	NA	0.3	0.5	NA	NA	0.1	0.1
1998	NA	NA	0.5	0.8	NA	NA	0.3	0.5	NA	NA	0.1	0.1
1999	NA	NA	0.5	0.7	NA	NA	0.3	0.4	NA	NA	0.1	0.1
2000	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
2001	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
2002	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
2003	NA	NA	0.4	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2004	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2005	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2006	NA	NA	0.3	0.4	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2007	NA	NA	0.3	0.4	NA	NA	0.2	0.3	NA	NA	0.05	0.1
2008	NA	NA	0.3	0.4	NA	NA	0.2	0.2	NA	NA	0.04	0.05
2009	NA	NA	0.2	0.4	NA	NA	0.1	0.2	NA	NA	0.04	0.05
2010	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2011	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2012	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2013	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.03	0.04
2014	NA	NA	0.2	0.2	NA	NA	0.1	0.2	NA	NA	0.03	0.03
2015	NA	NA	0.2	0.2	NA	NA	0.1	0.2	NA	NA	0.03	0.03
2016	NA	NA	0.1	0.2	NA	NA	0.1	0.2	NA	NA	0.03	0.03
2017	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.03
2018	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.03

Bold value indicates exceedances

TABLE 5-39 : RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE TREE SWALLOWS BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	NA	NA	**1.1**	**1.6**	NA	NA	0.6	**1.0**	NA	NA	0.3	0.3
1994	NA	NA	**1.0**	**1.5**	NA	NA	0.6	0.9	NA	NA	0.3	0.3
1995	NA	NA	**1.0**	**1.4**	NA	NA	0.6	0.9	NA	NA	0.2	0.3
1996	NA	NA	0.9	**1.3**	NA	NA	0.5	0.8	NA	NA	0.2	0.2
1997	NA	NA	0.8	**1.2**	NA	NA	0.4	0.7	NA	NA	0.2	0.2
1998	NA	NA	0.7	**1.1**	NA	NA	0.4	0.6	NA	NA	0.2	0.2
1999	NA	NA	0.7	**1.0**	NA	NA	0.4	0.6	NA	NA	0.1	0.1
2000	NA	NA	0.6	0.9	NA	NA	0.3	0.5	NA	NA	0.1	0.1
2001	NA	NA	0.6	0.8	NA	NA	0.3	0.5	NA	NA	0.1	0.1
2002	NA	NA	0.5	0.8	NA	NA	0.3	0.5	NA	NA	0.1	0.1
2003	NA	NA	0.5	0.7	NA	NA	0.3	0.5	NA	NA	0.1	0.1
2004	NA	NA	0.5	0.7	NA	NA	0.3	0.4	NA	NA	0.1	0.1
2005	NA	NA	0.4	0.6	NA	NA	0.3	0.4	NA	NA	0.1	0.1
2006	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
2007	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
2008	NA	NA	0.4	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2009	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2010	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2011	NA	NA	0.3	0.4	NA	NA	0.2	0.3	NA	NA	0.1	0.1
2012	NA	NA	0.3	0.4	NA	NA	0.2	0.3	NA	NA	0.05	0.1
2013	NA	NA	0.2	0.4	NA	NA	0.2	0.3	NA	NA	0.05	0.1
2014	NA	NA	0.2	0.3	NA	NA	0.2	0.2	NA	NA	0.04	0.05
2015	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2016	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2017	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.03	0.04
2018	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.03	0.04

Bold value indicates exceedances

TABLE 5-40: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE TREE SWALLOW ON TEQ BASIS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	NA	NA	0.1	0.2	NA	NA	0.4	0.6
Stillwater (168)	NA	NA	0.2	**1.0**	NA	NA	0.6	**3.0**
Federal Dam (154)	NA	NA	0.05	0.08	NA	NA	0.2	0.3
Lower River								
143.5	NA	NA	0.01	0.02	NA	NA	0.02	0.05
137.2	NA	NA	0.01	0.06	NA	NA	0.04	0.17
122.4	NA	NA	0.01	0.02	NA	NA	0.02	0.06
113.8	NA	NA	0.01	0.03	NA	NA	0.02	0.09
100	NA	NA	0.00	0.02	NA	NA	0.01	0.07
88.9	NA	NA	0.00	0.00	NA	NA	0.01	0.01
58.7	NA	NA	0.01	0.05	NA	NA	0.02	0.15
47.3	NA	NA	0.01	0.05	NA	NA	0.02	0.14
25.8	NA	NA	0.00	0.00	NA	NA	0.01	0.01

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TABLE 5-41: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE TREE SWALLOW USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	NA	NA	0.138	0.202	NA	NA	0.077	0.121	NA	NA	0.034	0.036
1994	NA	NA	0.130	0.192	NA	NA	0.073	0.116	NA	NA	0.032	0.034
1995	NA	NA	0.121	0.175	NA	NA	0.069	0.108	NA	NA	0.029	0.031
1996	NA	NA	0.109	0.160	NA	NA	0.061	0.097	NA	NA	0.025	0.027
1997	NA	NA	0.100	0.146	NA	NA	0.056	0.089	NA	NA	0.021	0.023
1998	NA	NA	0.092	0.132	NA	NA	0.050	0.080	NA	NA	0.019	0.020
1999	NA	NA	0.083	0.123	NA	NA	0.046	0.073	NA	NA	0.016	0.018
2000	NA	NA	0.077	0.110	NA	NA	0.043	0.068	NA	NA	0.015	0.016
2001	NA	NA	0.072	0.105	NA	NA	0.042	0.067	NA	NA	0.014	0.015
2002	NA	NA	0.068	0.100	NA	NA	0.040	0.064	NA	NA	0.013	0.014
2003	NA	NA	0.063	0.092	NA	NA	0.038	0.060	NA	NA	0.012	0.013
2004	NA	NA	0.059	0.085	NA	NA	0.035	0.055	NA	NA	0.011	0.012
2005	NA	NA	0.054	0.079	NA	NA	0.032	0.051	NA	NA	0.010	0.011
2006	NA	NA	0.052	0.076	NA	NA	0.031	0.049	NA	NA	0.009	0.010
2007	NA	NA	0.048	0.070	NA	NA	0.029	0.045	NA	NA	0.009	0.009
2008	NA	NA	0.046	0.066	NA	NA	0.027	0.043	NA	NA	0.008	0.009
2009	NA	NA	0.043	0.062	NA	NA	0.026	0.041	NA	NA	0.008	0.008
2010	NA	NA	0.039	0.058	NA	NA	0.024	0.038	NA	NA	0.007	0.008
2011	NA	NA	0.036	0.052	NA	NA	0.022	0.035	NA	NA	0.007	0.007
2012	NA	NA	0.033	0.048	NA	NA	0.021	0.033	NA	NA	0.006	0.007
2013	NA	NA	0.031	0.046	NA	NA	0.020	0.032	NA	NA	0.006	0.006
2014	NA	NA	0.029	0.042	NA	NA	0.019	0.030	NA	NA	0.005	0.006
2015	NA	NA	0.027	0.040	NA	NA	0.018	0.029	NA	NA	0.005	0.006
2016	NA	NA	0.025	0.037	NA	NA	0.017	0.027	NA	NA	0.005	0.005
2017	NA	NA	0.024	0.035	NA	NA	0.016	0.026	NA	NA	0.004	0.005
2018	NA	NA	0.023	0.035	NA	NA	0.016	0.025	NA	NA	0.004	0.004

TABLE 5-42: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS BASED ON FISHRAND FOR FEMALE TREE SWALLOW USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
1994	NA	NA	0.4	0.6	NA	NA	0.2	0.4	NA	NA	0.1	0.1
1995	NA	NA	0.4	0.5	NA	NA	0.2	0.3	NA	NA	0.09	0.1
1996	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.08	0.08
1997	NA	NA	0.3	0.5	NA	NA	0.2	0.3	NA	NA	0.07	0.07
1998	NA	NA	0.3	0.4	NA	NA	0.2	0.2	NA	NA	0.06	0.06
1999	NA	NA	0.3	0.4	NA	NA	0.1	0.2	NA	NA	0.05	0.05
2000	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.05	0.05
2001	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.05
2002	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2003	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.04	0.04
2004	NA	NA	0.2	0.3	NA	NA	0.1	0.2	NA	NA	0.03	0.04
2005	NA	NA	0.2	0.2	NA	NA	0.1	0.2	NA	NA	0.03	0.03
2006	NA	NA	0.2	0.2	NA	NA	0.1	0.1	NA	NA	0.03	0.03
2007	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.03	0.03
2008	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.03
2009	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.03
2010	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2011	NA	NA	0.1	0.2	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2012	NA	NA	0.1	0.1	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2013	NA	NA	0.095	0.1	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2014	NA	NA	0.088	0.1	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2015	NA	NA	0.083	0.1	NA	NA	0.1	0.1	NA	NA	0.02	0.02
2016	NA	NA	0.078	0.1	NA	NA	0.1	0.1	NA	NA	0.01	0.02
2017	NA	NA	0.072	0.1	NA	NA	0.05	0.1	NA	NA	0.01	0.01
2018	NA	NA	0.072	0.1	NA	NA	0.05	0.1	NA	NA	0.01	0.01

TABLE 5-43: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE MALLARD FOR TRI+ CONGENERS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	0.8	**1.4**	**8.1**	**14**	**19**	**30**	**129**	**202**
Stillwater (168)	**1.5**	**2.7**	**15**	**27**	**36**	**62**	**240**	**417**
Federal Dam (154)	0.4	0.8	**4.2**	**7.6**	**8.5**	**15**	**57**	**99**
Lower River								
143.5	0.1	0.2	1.0	**2.3**	**1.2**	**2.1**	**8**	**14**
137.2	0.1	0.3	**1.4**	**3.1**	**2.3**	**4.1**	**16**	**27**
122.4	0.1	0.6	0.7	**5.6**	**1.1**	**2.7**	**7.3**	**18**
113.8	0.1	0.5	0.7	**5.1**	0.9	**1.6**	**6.3**	**11**
100	0.0	0.6	0.5	**5.9**	0.5	**3.5**	**3.5**	**24**
88.9	0.0	0.4	0.3	**4.3**	0.3	0.5	**1.7**	**3.1**
58.7	0.0	0.5	0.5	**4.6**	0.7	**1.2**	**4.5**	**7.8**
47.3	0.1	0.7	0.6	**6.8**	0.9	**6.6**	**6.1**	**44**
25.8	0.0	0.4	0.3	**4.3**	0.3	0.5	**1.8**	**3.0**

Bold values indicate exceedances

TABLE 5-44: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS FOR FEMALE MALLARD BASED ON FISHRAND RESULTS FOR THE TRI+ CONGENERS

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	0.9	**1.3**	**9.1**	**13**	0.6	0.8	**5.7**	**8.2**	0.2	0.2	**2.1**	**2.3**
1994	0.9	**1.2**	**8.7**	**12**	0.6	0.8	**5.6**	**8.1**	0.2	0.2	**2.0**	**2.2**
1995	0.8	**1.1**	**8.4**	**11**	0.5	0.8	**5.3**	**7.6**	0.2	0.2	**2.0**	**2.2**
1996	0.7	**1.0**	**6.8**	**9.7**	0.4	0.6	**4.1**	**6.2**	0.2	0.2	**1.5**	**1.7**
1997	0.6	0.9	**6.4**	**9.0**	0.4	0.6	**4.2**	**6.1**	0.1	0.2	**1.4**	**1.5**
1998	0.5	0.8	**5.5**	**7.7**	0.3	0.5	**3.2**	**4.9**	0.1	0.1	**1.2**	**1.3**
1999	0.5	0.7	**5.0**	**7.3**	0.3	0.5	**3.1**	**4.6**	0.1	0.1	**1.1**	**1.2**
2000	0.5	0.7	**4.6**	**6.5**	0.3	0.4	**2.8**	**4.2**	0.1	0.1	**1.0**	**1.0**
2001	0.4	0.6	**4.4**	**6.3**	0.3	0.4	**3.0**	**4.4**	0.1	0.1	0.9	**1.0**
2002	0.4	0.6	**4.1**	**6.0**	0.3	0.4	**2.7**	**4.1**	0.1	0.1	0.8	0.9
2003	0.4	0.5	**3.8**	**5.5**	0.3	0.4	**2.6**	**3.8**	0.1	0.1	0.8	0.9
2004	0.4	0.5	**3.5**	**5.0**	0.2	0.4	**2.5**	**3.6**	0.1	0.1	0.7	0.8
2005	0.3	0.5	**3.3**	**4.7**	0.2	0.3	**2.1**	**3.2**	0.1	0.1	0.7	0.7
2006	0.3	0.5	**3.2**	**4.5**	0.2	0.3	**2.1**	**3.2**	0.1	0.1	0.6	0.7
2007	0.3	0.4	**2.9**	**4.2**	0.2	0.3	**1.9**	**2.9**	0.1	0.1	0.6	0.6
2008	0.3	0.4	**2.8**	**3.9**	0.2	0.3	**1.7**	**2.6**	0.05	0.05	0.5	0.5
2009	0.3	0.4	**2.7**	**3.8**	0.2	0.3	**1.8**	**2.6**	0.05	0.06	0.5	0.6
2010	0.2	0.3	**2.4**	**3.5**	0.2	0.2	**1.6**	**2.4**	0.05	0.06	0.5	0.6
2011	0.2	0.3	**2.1**	**3.1**	0.1	0.2	**1.4**	**2.2**	0.05	0.05	0.5	0.5
2012	0.2	0.3	**2.1**	**2.9**	0.1	0.2	**1.5**	**2.2**	0.05	0.05	0.5	0.5
2013	0.2	0.3	**1.9**	**2.7**	0.1	0.2	**1.4**	**2.0**	0.04	0.05	0.4	0.5
2014	0.2	0.3	**1.8**	**2.5**	0.1	0.2	**1.3**	**1.9**	0.04	0.04	0.4	0.4
2015	0.2	0.2	**1.6**	**2.4**	0.1	0.2	**1.2**	**1.8**	0.04	0.04	0.4	0.4
2016	0.2	0.2	**1.6**	**2.2**	0.1	0.2	**1.2**	**1.8**	0.04	0.04	0.4	0.4
2017	0.1	0.2	**1.4**	**2.1**	0.1	0.2	**1.0**	**1.6**	0.03	0.03	0.3	0.3
2018	0.1	0.2	**1.5**	**2.1**	0.1	0.2	**1.1**	**1.7**	0.04	0.04	0.4	0.4

Bold values indicate exceedances

TABLE 5-45: RATIO OF EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE MALLARD BASED ON FISHRAND RESULTS FOR THE TRI+ CONGENERS

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**20**	**29**	**135**	**197**	**11**	**18**	**75**	**118**	**4.9**	**5.3**	**33**	**35**
1994	**19**	**28**	**126**	**187**	**11**	**17**	**71**	**113**	**4.6**	**5.0**	**31**	**33**
1995	**18**	**26**	**118**	**171**	**10**	**16**	**67**	**106**	**4.2**	**4.6**	**28**	**31**
1996	**16**	**23**	**107**	**156**	**8.9**	**14**	**60**	**94**	**3.6**	**3.9**	**24**	**26**
1997	**15**	**21**	**98**	**143**	**8.1**	**13**	**54**	**86**	**3.1**	**3.4**	**21**	**22**
1998	**13**	**19**	**90**	**128**	**7.3**	**12**	**49**	**78**	**2.7**	**2.9**	**18**	**20**
1999	**12**	**18**	**81**	**120**	**6.7**	**11**	**45**	**71**	**2.4**	**2.6**	**16**	**17**
2000	**11**	**16**	**75**	**107**	**6.3**	**10**	**42**	**67**	**2.1**	**2.3**	**14**	**15**
2001	**11**	**15**	**71**	**103**	**6.1**	**10**	**41**	**65**	**2.0**	**2.2**	**13**	**15**
2002	**10**	**15**	**66**	**98**	**5.9**	**9.3**	**39**	**62**	**1.9**	**2.1**	**13**	**14**
2003	**9.2**	**13**	**62**	**90**	**5.5**	**8.8**	**37**	**59**	**1.8**	**1.9**	**12**	**13**
2004	**8.5**	**12**	**57**	**82**	**5.1**	**8.0**	**34**	**54**	**1.6**	**1.7**	**11**	**12**
2005	**7.9**	**12**	**53**	**77**	**4.7**	**7.5**	**32**	**50**	**1.5**	**1.6**	**10**	**11**
2006	**7.6**	**11**	**51**	**74**	**4.5**	**7.1**	**30**	**47**	**1.4**	**1.5**	**9.1**	**10**
2007	**7.1**	**10**	**47**	**68**	**4.2**	**6.6**	**28**	**44**	**1.2**	**1.3**	**8.3**	**8.9**
2008	**6.7**	**10**	**45**	**64**	**3.9**	**6.2**	**26**	**42**	**1.1**	**1.2**	**7.7**	**8.3**
2009	**6.3**	**9.1**	**42**	**61**	**3.7**	**5.9**	**25**	**40**	**1.1**	**1.2**	**7.4**	**8.0**
2010	**5.7**	**8.4**	**38**	**56**	**3.5**	**5.6**	**23**	**37**	**1.0**	**1.1**	**7.0**	**7.6**
2011	**5.2**	**7.5**	**35**	**50**	**3.2**	**5.1**	**22**	**34**	**1.0**	**1.0**	**6.4**	**6.9**
2012	**4.8**	**7.0**	**32**	**47**	**3.1**	**4.9**	**21**	**33**	0.9	**1.0**	**6.1**	**6.5**
2013	**4.5**	**6.7**	**30**	**45**	**2.9**	**4.6**	**20**	**31**	0.8	0.9	**5.7**	**6.1**
2014	**4.2**	**6.2**	**28**	**41**	**2.7**	**4.4**	**18**	**29**	0.8	0.8	**5.2**	**5.6**
2015	**3.9**	**5.8**	**26**	**39**	**2.6**	**4.2**	**18**	**28**	0.7	0.8	**5.0**	**5.4**
2016	**3.7**	**5.4**	**25**	**36**	**2.5**	**4.0**	**17**	**27**	0.7	0.7	**4.6**	**4.9**
2017	**3.4**	**5.1**	**23**	**34**	**2.4**	**3.7**	**16**	**25**	0.6	0.7	**4.1**	**4.4**
2018	**3.4**	**5.1**	**23**	**34**	**2.3**	**3.6**	**15**	**24**	0.6	0.6	**4.0**	**4.3**

Bold values indicate exceedances

TABLE 5-46: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE MALLARD BASED ON 1993 DATA ON A TEQ BASIS

	<<< ---- Dietary Dose ---->>>>>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**93**	**345**	**933**	**3451**	**1055**	**1657**	**4218**	**6627**
Stillwater (168)	**156**	**397**	**1557**	**3975**	**1967**	**3424**	**7870**	**13698**
Federal Dam (154)	**135**	**280**	**1353**	**2796**	**469**	**816**	**1875**	**3264**
Lower River								
143.5	**75**	**225**	**753**	**2245**	**65**	**114**	**261**	**455**
137.2	**76**	**226**	**759**	**2258**	**129**	**224**	**515**	**896**
122.4	**45**	**684**	**450**	**6842**	**60**	**151**	**240**	**603**
113.8	**45**	**684**	**449**	**6839**	**52**	**90**	**206**	**359**
100	**45**	**686**	**446**	**6862**	**28**	**194**	**113**	**775**
88.9	**33**	**631**	**327**	**6309**	**14**	**25**	**57**	**101**
58.7	**33**	**631**	**328**	**6313**	**37**	**64**	**146**	**255**
47.3	**33**	**634**	**331**	**6342**	**50**	**365**	**199**	**1459**
25.8	**33**	**631**	**327**	**6308**	**15**	**25**	**59**	**100**

Bold values indicate exceedances

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TABLE 5-47: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS FOR FEMALE MALLARD FOR PERIOD 1993 - 2018 ON A TEQ BASIS

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	182	189	1818	1893	196	203	1964	2026	36	37	360	369
1994	204	212	2039	2116	223	230	2231	2298	37	38	373	382
1995	217	225	2174	2251	210	216	2102	2164	58	60	584	597
1996	92	97	925	972	99	103	994	1032	21	21	209	214
1997	98	102	977	1023	158	163	1584	1633	33	34	329	337
1998	32	35	322	351	57	59	567	594	23	23	229	235
1999	42	45	419	451	73	75	725	754	23	24	234	240
2000	32	35	322	348	53	55	525	549	23	23	225	231
2001	44	46	436	464	91	94	909	941	17	17	170	174
2002	37	40	371	397	66	69	664	690	13	13	125	129
2003	31	34	313	336	62	64	617	641	21	21	209	214
2004	28	30	282	303	71	73	710	735	17	18	173	177
2005	27	29	267	287	40	42	398	416	19	19	187	191
2006	32	34	324	344	57	59	570	591	14	14	135	138
2007	24	26	242	259	40	42	404	421	19	19	186	191
2008	20	22	204	220	29	30	287	301	10	10	97	99
2009	32	34	318	336	49	50	487	505	12	13	122	126
2010	23	25	235	250	38	40	381	396	16	17	165	168
2011	16	17	157	170	22	24	225	236	12	12	120	123
2012	25	26	246	260	40	41	397	412	20	21	204	209
2013	16	18	165	177	31	32	309	322	17	17	168	172
2014	18	19	176	187	29	30	287	298	18	19	183	187
2015	15	16	146	156	25	26	248	259	13	13	131	135
2016	19	20	193	203	31	33	314	326	18	19	183	187
2017	11	12	107	116	15	16	147	155	9	10	93	96
2018	19	20	187	197	37	38	366	378	22	23	221	226

Bold values indicate exceedances

TABLE 5-48: RATIO OF MODELED EGG CONCENTRATION TO BENCHMARKS FOR FEMALE MALLARD FOR PERIOD 1993 - 2018 ON A TEQ BASIS

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	1106	1618	4422	6474	612	966	2449	3865	269	289	1077	1157
1994	1038	1535	4150	6140	583	926	2331	3702	254	275	1016	1098
1995	970	1403	3880	5611	548	868	2194	3472	233	251	932	1003
1996	874	1280	3497	5120	489	773	1958	3091	197	214	789	856
1997	804	1171	3215	4684	447	709	1786	2836	172	184	687	737
1998	737	1054	2948	4215	403	638	1611	2553	150	161	599	643
1999	666	987	2665	3949	366	583	1466	2332	131	141	522	564
2000	613	882	2451	3527	346	546	1382	2186	117	126	469	504
2001	579	842	2314	3368	337	536	1349	2142	111	119	442	477
2002	541	802	2163	3208	322	512	1287	2048	105	113	419	454
2003	505	738	2019	2950	304	483	1216	1930	98	106	392	423
2004	469	677	1876	2707	279	441	1116	1764	89	95	355	381
2005	433	635	1732	2539	258	410	1034	1639	81	87	323	348
2006	416	606	1665	2424	245	389	979	1556	75	81	299	323
2007	388	560	1551	2242	230	364	918	1456	68	73	272	293
2008	369	529	1476	2114	215	341	859	1363	63	68	252	273
2009	348	498	1392	1994	206	326	824	1306	61	66	244	263
2010	315	463	1260	1850	192	306	768	1223	57	62	229	248
2011	286	414	1142	1655	177	283	709	1131	52	57	210	226
2012	266	386	1063	1546	169	268	676	1071	50	54	199	215
2013	246	367	984	1470	161	255	643	1019	47	50	186	201
2014	230	338	918	1353	151	240	603	960	43	46	171	184
2015	215	320	858	1279	146	231	582	926	41	44	163	176
2016	204	294	814	1176	138	220	553	878	38	41	150	162
2017	188	279	753	1117	129	205	518	821	33	36	134	145
2018	187	278	746	1112	126	200	505	801	33	35	130	140

Bold values indicate exceedances

301771

TABLE 5-49: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCKMARKS BASED ON 1993 DATA FOR FEMALE BELTED KINGFISHER FOR TRI+ CONGENERS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**107**	**213**	**748**	**1494**	**257**	**513**	**1720**	**3439**
Stillwater (168)	**59**	**173**	**410**	**1209**	**140**	**414**	**936**	**2771**
Federal Dam (154)	**14**	**22**	**96**	**151**	**33**	**52**	**221**	**347**
Lower River								
143.5	**9.3**	**12**	**65**	**86**	**22**	**30**	**150**	**198**
137.2	**19**	**44**	**131**	**309**	**45**	**106**	**302**	**710**
122.4	**7.5**	**13**	**52**	**91**	**18**	**31**	**120**	**209**
113.8	**7.8**	**11**	**55**	**77**	**19**	**26**	**126**	**177**
100	**3.4**	**8.4**	**24**	**59**	**8.2**	**20**	**55**	**133**
88.9	**6.1**	**8.5**	**43**	**59**	**15**	**20**	**98**	**136**
58.7	**7.1**	**14**	**50**	**97**	**17**	**33**	**115**	**223**
47.3	**6.5**	**14**	**46**	**95**	**16**	**33**	**105**	**218**
25.8	**4.5**	**5.6**	**32**	**39**	**11**	**13**	**73**	**89**

Bold values indicate exceedances

TABLE 5-50: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE GREAT BLUE HERON FOR TRI+ CONGENERS

	<<<< ---- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**47**	**95**	**327**	**667**	**284**	**580**	**1902**	**3883**
Stillwater (168)	**17**	**25**	**116**	**178**	**96**	**137**	**642**	**918**
Federal Dam (154)	**3.8**	**5.6**	**27**	**39**	**22**	**33**	**151**	**219**
Lower River								
143.5	**4.3**	**5.2**	**30**	**36**	**26**	**31**	**175**	**210**
137.2	**8.7**	**19**	**61**	**132**	**53**	**115**	**354**	**768**
122.4	**3.3**	**5.4**	**23**	**38**	**20**	**33**	**135**	**219**
113.8	**3.5**	**3.7**	**24**	**26**	**21**	**22**	**142**	**147**
100	**1.5**	**2.8**	**11**	**19**	**9**	**16**	**61**	**106**
88.9	**3.0**	**4.1**	**21**	**29**	**18**	**25**	**122**	**168**
58.7	**3.3**	**3.8**	**23**	**27**	**20**	**23**	**133**	**151**
47.3	**2.9**	**4.0**	**20**	**28**	**18**	**23**	**119**	**157**
25.8	**2.2**	**2.6**	**15**	**18**	**13**	**16**	**89**	**107**

Bold values indicate exceedances

301773

TABLE 5-51: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE EAGLE FOR TRI+ CONGENERS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**172**	**333**	**1204**	**2331**	NA	NA	**882**	**1707**
Stillwater (168)	**31**	**39**	**214**	**276**	NA	NA	**157**	**202**
Federal Dam (154)	**22**	**40**	**155**	**279**	NA	NA	**114**	**204**
Lower River								
143.5	**22**	**40**	**155**	**279**	NA	NA	**114**	**204**
137.2	**84**	**199**	**586**	**1394**	NA	NA	**429**	**1021**
122.4	**19**	**27**	**136**	**188**	NA	NA	**100**	**137**
113.8	**18**	**25**	**123**	**173**	NA	NA	**90**	**126**
100	**20**	**63**	**142**	**438**	NA	NA	**104**	**321**
88.9	**13**	**25**	**91**	**174**	NA	NA	**67**	**127**
58.7	**15**	**22**	**106**	**157**	NA	NA	**78**	**115**
47.3	**17**	**47**	**121**	**327**	NA	NA	**89**	**239**
25.8	**12**	**24**	**86**	**170**	NA	NA	**63**	**125**

Bold values indicate exceedances

301774

TABLE 5-52: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BELTED KINGFISHER BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	113	192	792	1346	56	75	392	524	28	48	193	339
1994	62	100	433	699	47	59	326	416	22	33	151	231
1995	57	90	401	631	50	67	352	471	25	42	173	297
1996	57	94	402	655	35	45	245	315	17	29	116	203
1997	45	79	312	555	31	40	217	277	15	24	107	167
1998	39	64	272	450	28	36	194	254	12	20	87	141
1999	34	59	236	414	23	29	158	204	9.4	14	66	99
2000	28	52	198	367	21	27	147	190	8.3	13	58	93
2001	27	49	192	342	22	28	154	199	9.4	15	66	107
2002	26	47	179	326	21	27	148	190	8.6	14	60	95
2003	24	44	171	307	18	23	127	164	7.7	13	54	89
2004	22	40	152	283	17	22	121	154	7.5	13	53	89
2005	21	38	145	265	15	19	102	132	6.2	10	43	70
2006	18	34	129	237	15	19	105	135	6.1	10	42	71
2007	18	33	127	232	14	18	96	124	5.1	8.6	36	60
2008	17	30	116	208	12	16	85	110	4.6	7.4	32	52
2009	16	29	111	205	13	17	90	117	5.3	9.3	37	65
2010	15	28	107	197	13	16	89	114	4.8	8.1	34	56
2011	14	25	100	174	10	13	70	92	4.0	6.9	28	48
2012	13	23	88	159	11	15	80	105	4.6	7.6	32	53
2013	12	22	84	151	11	14	75	96	3.9	6.5	28	46
2014	11	20	80	143	10	13	68	88	3.6	6.1	26	43
2015	10	18	73	129	9.4	12	66	84	3.4	5.3	24	37
2016	10	17	69	121	9.2	12	65	86	3.9	8.0	27	56
2017	9.3	17	65	122	7.6	10	53	69	2.8	5.2	20	37
2018	8.8	16	61	113	7.5	10	52	68	2.6	4.3	18	30

Bold values indicate exceedances

301775

TABLE 5-53: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BLUE HERON BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	48	84	337	589	23	30	164	211	12	16	83	110
1994	23	38	158	266	19	23	132	158	8.8	11	62	77
1995	21	34	146	239	21	27	147	190	11	14	74	97
1996	22	37	152	258	14	17	96	116	6.8	9.1	48	64
1997	16	31	111	214	12	14	84	100	6.3	7.9	44	56
1998	13	24	94	167	11	13	75	92	5.1	6.5	36	46
1999	11	22	80	153	8.4	10	59	70	3.7	4.6	26	32
2000	9.2	19	64	135	7.8	9.3	54	65	3.3	4.2	23	29
2001	9.1	18	63	125	8.4	10	59	70	3.8	5.0	27	35
2002	8.4	17	59	119	8.1	10	57	67	3.5	4.4	25	31
2003	8.1	16	57	113	6.7	7.9	47	55	3.1	4.0	22	28
2004	7.0	15	49	104	6.5	7.6	45	53	3.1	4.0	22	28
2005	6.9	14	48	98	5.2	6.2	37	43	2.5	3.2	17	22
2006	5.8	12	41	85	5.6	6.6	39	46	2.5	3.2	17	23
2007	5.9	12	41	85	5.0	6.0	35	42	2.0	2.7	14	19
2008	5.3	11	37	75	4.4	5.2	31	36	1.8	2.3	13	16
2009	5.1	11	36	75	4.9	5.8	34	41	2.2	2.9	15	20
2010	5.1	10	36	73	4.9	5.8	34	41	2.0	2.6	14	18
2011	4.9	9.2	34	64	3.6	4.3	25	30	1.6	2.1	11	15
2012	4.2	8.3	29	58	4.4	5.4	31	38	1.9	2.5	14	18
2013	4.0	7.9	28	55	4.1	4.9	29	34	1.6	2.1	11	15
2014	3.9	7.5	27	53	3.7	4.4	26	31	1.5	2.0	11	14
2015	3.5	6.7	24	47	3.6	4.2	25	29	1.4	1.7	10	12
2016	3.3	6.3	23	44	3.6	4.5	25	31	1.7	2.4	12	17
2017	3.1	6.5	22	46	2.8	3.3	19	23	1.2	1.6	8.1	11
2018	2.9	5.9	20	41	2.8	3.3	19	23	1.1	1.4	7.5	10

Bold values indicate exceedances

301776

TABLE 5-54: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BALD EAGLE BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	95	120	668	838	72	88	504	615	35	44	248	309
1994	58	78	406	547	50	60	347	417	25	31	176	216
1995	64	86	448	599	55	66	385	462	27	33	190	231
1996	58	84	408	589	44	54	309	377	24	30	167	210
1997	45	65	318	458	39	47	271	326	21	26	144	180
1998	38	54	265	378	35	42	244	296	17	21	121	148
1999	33	49	231	342	28	35	199	246	13	17	92	116
2000	31	46	216	321	27	33	188	229	13	15	88	108
2001	29	43	201	298	26	32	181	222	12	15	84	105
2002	28	42	199	293	28	34	193	236	13	16	90	112
2003	25	37	174	259	23	29	162	200	11	14	76	96
2004	23	34	163	239	23	28	158	193	11	14	79	99
2005	21	31	144	217	17	21	120	147	8.5	11	59	74
2006	20	30	142	210	19	23	131	161	9.0	11	63	77
2007	19	28	131	197	16	19	110	133	6.9	8.5	49	60
2008	18	27	124	188	14	17	99	122	6.7	8.5	47	60
2009	18	26	125	183	15	19	107	131	7.2	9.1	51	64
2010	16	23	110	160	14	17	97	120	6.0	7.5	42	52
2011	14	21	96	146	12	15	83	102	5.9	7.5	41	52
2012	14	20	96	141	12	15	84	104	5.7	7.2	40	50
2013	13	19	92	136	13	15	88	108	5.5	7.0	39	49
2014	12	17	83	121	12	15	83	102	5.0	6.2	35	44
2015	11	16	76	112	10	13	73	89	4.6	5.9	33	41
2016	11	16	78	113	12	14	82	100	5.0	6.2	35	43
2017	10	15	67	102	8.9	11	62	76	4.1	5.4	29	38
2018	9.3	14	65	97	8.5	11	60	74	3.7	4.8	26	33

Bold values indicate exceedances

TABLE 5-55: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE BELTED KINGFISHER BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**269**	**459**	**1799**	**3073**	**134**	**179**	**895**	**1199**	**66**	**116**	**441**	**777**
1994	**145**	**237**	**973**	**1585**	**111**	**142**	**742**	**950**	**51**	**79**	**343**	**530**
1995	**134**	**214**	**901**	**1430**	**120**	**161**	**802**	**1078**	**59**	**102**	**394**	**681**
1996	**135**	**222**	**905**	**1488**	**83**	**107**	**557**	**720**	**40**	**70**	**265**	**466**
1997	**105**	**188**	**700**	**1258**	**74**	**94**	**494**	**633**	**36**	**57**	**243**	**382**
1998	**91**	**152**	**608**	**1019**	**66**	**86**	**440**	**579**	**30**	**48**	**199**	**324**
1999	**79**	**140**	**527**	**938**	**54**	**69**	**359**	**464**	**22**	**34**	**150**	**226**
2000	**66**	**124**	**442**	**830**	**50**	**65**	**333**	**434**	**20**	**32**	**132**	**213**
2001	**64**	**116**	**429**	**774**	**52**	**68**	**351**	**453**	**22**	**37**	**149**	**246**
2002	**60**	**110**	**399**	**737**	**50**	**65**	**337**	**433**	**21**	**33**	**137**	**218**
2003	**57**	**104**	**381**	**695**	**43**	**56**	**289**	**373**	**18**	**31**	**123**	**205**
2004	**51**	**96**	**338**	**641**	**41**	**52**	**275**	**351**	**18**	**30**	**120**	**204**
2005	**49**	**90**	**325**	**601**	**34**	**45**	**231**	**300**	**15**	**24**	**98**	**159**
2006	**43**	**80**	**287**	**536**	**35**	**46**	**238**	**307**	**14**	**24**	**97**	**163**
2007	**42**	**79**	**283**	**526**	**32**	**42**	**217**	**282**	**12**	**21**	**82**	**137**
2008	**39**	**70**	**259**	**471**	**29**	**37**	**193**	**250**	**11**	**18**	**73**	**118**
2009	**37**	**69**	**248**	**464**	**31**	**40**	**205**	**267**	**13**	**22**	**85**	**149**
2010	**36**	**67**	**238**	**446**	**30**	**39**	**203**	**261**	**12**	**19**	**77**	**129**
2011	**33**	**59**	**224**	**393**	**24**	**31**	**159**	**209**	**10**	**16**	**64**	**110**
2012	**29**	**54**	**197**	**360**	**27**	**36**	**183**	**239**	**11**	**18**	**74**	**122**
2013	**28**	**51**	**188**	**343**	**26**	**33**	**171**	**218**	**9**	**16**	**63**	**104**
2014	**27**	**48**	**179**	**323**	**23**	**30**	**154**	**201**	**9**	**15**	**58**	**98**
2015	**24**	**44**	**163**	**292**	**22**	**29**	**150**	**191**	**8**	**13**	**54**	**85**
2016	**23**	**41**	**155**	**273**	**22**	**29**	**147**	**197**	**9**	**19**	**62**	**129**
2017	**22**	**41**	**146**	**277**	**18**	**24**	**120**	**157**	**7**	**13**	**45**	**84**
2018	**21**	**38**	**137**	**256**	**18**	**23**	**119**	**155**	**6**	**10**	**42**	**68**

Bold values indicate exceedances

TABLE 5-56: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE BLUE HERON BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**291**	**511**	**1949**	**3422**	**142**	**182**	**948**	**1220**	**71**	**95**	**479**	**637**
1994	**135**	**228**	**903**	**1524**	**114**	**136**	**761**	**912**	**53**	**67**	**357**	**447**
1995	**124**	**205**	**833**	**1370**	**127**	**164**	**850**	**1098**	**64**	**85**	**430**	**566**
1996	**130**	**222**	**872**	**1487**	**83**	**99**	**553**	**666**	**41**	**55**	**275**	**369**
1997	**94**	**183**	**630**	**1227**	**73**	**86**	**486**	**575**	**38**	**48**	**256**	**322**
1998	**80**	**143**	**534**	**958**	**64**	**79**	**432**	**530**	**31**	**40**	**206**	**265**
1999	**68**	**131**	**454**	**875**	**51**	**60**	**338**	**401**	**22**	**28**	**150**	**186**
2000	**54**	**115**	**362**	**771**	**47**	**56**	**312**	**374**	**20**	**25**	**131**	**169**
2001	**53**	**106**	**357**	**713**	**50**	**60**	**338**	**403**	**23**	**30**	**155**	**201**
2002	**49**	**101**	**331**	**678**	**49**	**57**	**326**	**385**	**21**	**27**	**142**	**180**
2003	**48**	**97**	**320**	**647**	**40**	**47**	**269**	**317**	**19**	**24**	**125**	**164**
2004	**41**	**89**	**277**	**598**	**39**	**45**	**260**	**303**	**19**	**25**	**125**	**164**
2005	**41**	**84**	**272**	**560**	**31**	**37**	**210**	**247**	**15**	**19**	**100**	**128**
2006	**34**	**73**	**229**	**486**	**33**	**39**	**224**	**264**	**15**	**20**	**100**	**131**
2007	**35**	**73**	**233**	**489**	**30**	**36**	**202**	**239**	**12**	**16**	**82**	**108**
2008	**31**	**64**	**209**	**428**	**26**	**31**	**177**	**207**	**11**	**14**	**72**	**94**
2009	**30**	**64**	**202**	**430**	**29**	**35**	**195**	**234**	**13**	**18**	**89**	**119**
2010	**30**	**63**	**200**	**419**	**29**	**35**	**197**	**233**	**12**	**16**	**80**	**105**
2011	**29**	**55**	**192**	**367**	**22**	**26**	**145**	**173**	**10**	**13**	**64**	**86**
2012	**25**	**50**	**164**	**333**	**27**	**32**	**179**	**217**	**12**	**15**	**79**	**102**
2013	**24**	**47**	**159**	**317**	**25**	**29**	**166**	**195**	**10**	**13**	**65**	**85**
2014	**23**	**45**	**152**	**302**	**22**	**27**	**148**	**178**	**9**	**12**	**61**	**80**
2015	**20**	**40**	**137**	**268**	**21**	**25**	**144**	**168**	**8**	**11**	**56**	**71**
2016	**19**	**38**	**130**	**253**	**21**	**27**	**143**	**179**	**10**	**15**	**68**	**98**
2017	**19**	**39**	**124**	**262**	**17**	**20**	**111**	**133**	**7**	**10**	**47**	**65**
2018	**17**	**35**	**114**	**236**	**17**	**20**	**111**	**131**	**6**	**8**	**43**	**56**

Bold values indicate exceedances

TABLE 5-57: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS FOR FEMALE BALD EAGLES BASED ON THE SUM OF TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	NA	NA	**489**	**614**	NA	NA	**369**	**451**	NA	NA	**182**	**226**
1994	NA	NA	**297**	**400**	NA	NA	**254**	**306**	NA	NA	**129**	**159**
1995	NA	NA	**328**	**439**	NA	NA	**282**	**339**	NA	NA	**139**	**169**
1996	NA	NA	**299**	**431**	NA	NA	**226**	**276**	NA	NA	**122**	**154**
1997	NA	NA	**233**	**336**	NA	NA	**198**	**239**	NA	NA	**105**	**132**
1998	NA	NA	**194**	**276**	NA	NA	**178**	**217**	NA	NA	**88**	**109**
1999	NA	NA	**169**	**251**	NA	NA	**146**	**180**	NA	NA	**67**	**85**
2000	NA	NA	**158**	**235**	NA	NA	**137**	**168**	NA	NA	**64**	**79**
2001	NA	NA	**148**	**218**	NA	NA	**132**	**162**	NA	NA	**62**	**77**
2002	NA	NA	**146**	**214**	NA	NA	**141**	**173**	NA	NA	**66**	**82**
2003	NA	NA	**127**	**189**	NA	NA	**118**	**146**	NA	NA	**56**	**70**
2004	NA	NA	**119**	**175**	NA	NA	**115**	**141**	NA	NA	**58**	**72**
2005	NA	NA	**106**	**159**	NA	NA	**88**	**108**	NA	NA	**44**	**54**
2006	NA	NA	**104**	**154**	NA	NA	**96**	**118**	NA	NA	**46**	**56**
2007	NA	NA	**96**	**145**	NA	NA	**80**	**98**	NA	NA	**36**	**44**
2008	NA	NA	**90**	**138**	NA	NA	**72**	**89**	NA	NA	**34**	**44**
2009	NA	NA	**92**	**134**	NA	NA	**78**	**96**	NA	NA	**37**	**47**
2010	NA	NA	**80**	**118**	NA	NA	**71**	**88**	NA	NA	**31**	**38**
2011	NA	NA	**70**	**107**	NA	NA	**61**	**75**	NA	NA	**30**	**38**
2012	NA	NA	**70**	**103**	NA	NA	**62**	**76**	NA	NA	**29**	**37**
2013	NA	NA	**67**	**99**	NA	NA	**64**	**79**	NA	NA	**28**	**36**
2014	NA	NA	**61**	**89**	NA	NA	**61**	**75**	NA	NA	**26**	**32**
2015	NA	NA	**56**	**82**	NA	NA	**54**	**65**	NA	NA	**24**	**30**
2016	NA	NA	**57**	**83**	NA	NA	**60**	**74**	NA	NA	**26**	**32**
2017	NA	NA	**49**	**75**	NA	NA	**46**	**56**	NA	NA	**21**	**28**
2018	NA	NA	**48**	**71**	NA	NA	**44**	**54**	NA	NA	**19**	**25**

Bold values indicate exceedances

TABLE 5-58: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE BELTED KINGFISHER ON TEQ BASIS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**124**	**250**	**1237**	**2498**	**4078**	**8287**	**8157**	**16574**
Stillwater (168)	**54**	**103**	**537**	**1027**	**1575**	**3049**	**3149**	**6099**
Federal Dam (154)	**12**	**17**	**116**	**174**	**370**	**552**	**741**	**1104**
Lower River								
143.5	**11**	**14**	**112**	**138**	**371**	**456**	**742**	**911**
137.2	**23**	**50**	**226**	**499**	**750**	**1657**	**1500**	**3313**
122.4	**8.8**	**14**	**88**	**144**	**289**	**475**	**578**	**951**
113.8	**9.2**	**10**	**92**	**105**	**303**	**340**	**606**	**680**
100	**4.0**	**9.3**	**40**	**93**	**131**	**248**	**263**	**497**
88.9	**7.8**	**11**	**78**	**109**	**255**	**351**	**511**	**702**
58.7	**8.4**	**12**	**84**	**117**	**282**	**372**	**565**	**744**
47.3	**7.8**	**13**	**78**	**126**	**253**	**379**	**506**	**759**
25.8	**5.7**	**7.1**	**57**	**71**	**187**	**226**	**374**	**451**

Bold values indicate exceedances

TABLE 5-59: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE GREAT BLUE HERON ON TEQ BASIS

	<<<< ---- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**62**	**125**	**616**	**1245**	**204**	**417**	**340**	**694**
Stillwater (168)	**26**	**39**	**256**	**388**	**69**	**98**	**115**	**164**
Federal Dam (154)	**5.2**	**7.7**	**52**	**77**	**16**	**23**	**27**	**39**
Lower River								
143.5	**5.6**	**6.8**	**56**	**68**	**19**	**23**	**31**	**38**
137.2	**11**	**25**	**114**	**246**	**38**	**82**	**63**	**137**
122.4	**4.4**	**7.0**	**44**	**70**	**15**	**23**	**24**	**39**
113.8	**4.6**	**4.9**	**46**	**49**	**15**	**16**	**25**	**26**
100	**2.0**	**4.9**	**20**	**49**	**7**	**11**	**11**	**19**
88.9	**4.0**	**5.6**	**40**	**56**	**13**	**18**	**22**	**30**
58.7	**4.2**	**5.2**	**42**	**52**	**14**	**16**	**24**	**27**
47.3	**4.0**	**6.0**	**40**	**60**	**13**	**17**	**21**	**28**
25.8	**2.9**	**3.6**	**29**	**36**	**10**	**11**	**16**	**19**

Bold values indicate exceedances

301782

TABLE 5-60: RATIO OF MODELED DIETARY DOSE AND EGG CONCENTRATIONS TO BENCHMARKS BASED ON 1993 DATA FOR FEMALE BALD EAGLE ON TEQ BASIS

	<<<< ----- Dietary Dose ---- >>>>				<<<< ---- Egg Concentration ---- >>>>			
Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient	LOAEL vs. Average Conc. Hazard Quotient	LOAEL vs. 95% UCL Conc Hazard Quotient	NOAEL vs. Average Conc. Hazard Quotient	NOAEL vs. 95% UCL Conc. Hazard Quotient
Upper River								
Thompson Island Pool (189)	**221**	**427**	**2208**	**4272**	**23037**	**44582**	**46075**	**89164**
Stillwater (168)	**39**	**51**	**392**	**505**	**4095**	**5274**	**8189**	**10547**
Federal Dam (154)	**28**	**51**	**285**	**511**	**2970**	**5337**	**5940**	**10674**
Lower River								
143.5	**28**	**51**	**285**	**512**	**2970**	**5337**	**5940**	**10674**
137.2	**107**	**256**	**1074**	**2555**	**11204**	**26663**	**22409**	**53327**
122.4	**25**	**34**	**250**	**344**	**2611**	**3588**	**5222**	**7177**
113.8	**23**	**32**	**226**	**317**	**2362**	**3302**	**4723**	**6605**
100	**26**	**80**	**260**	**803**	**2711**	**8377**	**5423**	**16754**
88.9	**17**	**32**	**167**	**318**	**1746**	**3322**	**3493**	**6643**
58.7	**19**	**29**	**194**	**288**	**2029**	**3007**	**4059**	**6014**
47.3	**22**	**60**	**223**	**599**	**2323**	**6254**	**4645**	**12508**
25.8	**16**	**31**	**157**	**312**	**1641**	**3260**	**3282**	**6520**

Bold values indicate exceedances

301783

TABLE 5-61: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BELTED KINGFISHER USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	147	241	1472	2412	68	87	682	865	34	60	338	602
1994	81	122	809	1224	56	67	561	669	26	41	260	405
1995	75	111	751	1111	61	78	613	779	30	53	304	529
1996	75	116	753	1158	42	50	421	503	20	36	202	359
1997	59	98	587	979	37	44	372	439	19	29	186	294
1998	51	79	509	792	33	40	332	402	15	25	151	249
1999	44	72	444	724	27	32	268	316	11	17	114	172
2000	37	64	373	643	25	29	248	294	10	16	100	163
2001	36	60	362	599	26	31	262	310	11	19	113	189
2002	34	57	338	569	25	30	253	297	10	17	104	167
2003	32	54	322	539	22	25	215	252	9.3	16	93	157
2004	29	50	285	497	21	24	206	239	9.1	16	91	157
2005	27	46	273	464	17	20	171	200	7.4	12	74	122
2006	24	41	243	414	18	21	177	209	7.4	13	74	125
2007	24	41	239	408	16	19	162	190	6.2	11	62	105
2008	22	36	218	363	14	17	143	168	5.5	9.0	55	90
2009	21	36	209	360	15	18	153	182	6.4	12	64	116
2010	20	35	202	346	15	18	153	180	5.9	10	59	99
2011	19	30	188	304	12	14	118	140	4.8	8.4	48	84
2012	17	28	166	278	14	17	137	165	5.6	9.4	56	94
2013	16	26	159	264	13	15	128	150	4.8	8.0	48	80
2014	15	25	150	249	12	14	115	137	4.4	7.5	44	75
2015	14	22	137	225	11	13	112	130	4.1	6.5	41	65
2016	13	21	131	212	11	14	111	136	4.8	10	48	101
2017	12	21	123	214	8.9	11	89	106	3.4	6.5	34	65
2018	11	19	114	195	8.8	10	88	104	3.2	5.2	32	52

Bold values indicate exceedances

301784

TABLE 5-62: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE GREAT BLUE HERON USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**66**	**112**	**661**	**1124**	**31**	**40**	**313**	**398**	**16**	**21**	**157**	**207**
1994	**33**	**53**	**330**	**527**	**25**	**30**	**253**	**301**	**12**	**15**	**119**	**146**
1995	**31**	**48**	**305**	**476**	**28**	**36**	**281**	**359**	**14**	**18**	**141**	**184**
1996	**31**	**51**	**313**	**508**	**19**	**22**	**186**	**222**	**9.1**	**12**	**91**	**121**
1997	**23**	**42**	**235**	**423**	**16**	**19**	**164**	**192**	**8.5**	**11**	**85**	**106**
1998	**20**	**34**	**201**	**335**	**15**	**18**	**146**	**177**	**6.8**	**8.7**	**68**	**87**
1999	**17**	**31**	**173**	**306**	**12**	**14**	**116**	**136**	**5.0**	**6.2**	**50**	**62**
2000	**14**	**27**	**141**	**271**	**11**	**13**	**107**	**126**	**4.4**	**5.6**	**44**	**56**
2001	**14**	**25**	**138**	**251**	**11**	**14**	**115**	**135**	**5.2**	**6.6**	**52**	**66**
2002	**13**	**24**	**129**	**239**	**11**	**13**	**111**	**129**	**4.7**	**5.9**	**47**	**59**
2003	**12**	**23**	**124**	**227**	**9.3**	**11**	**93**	**108**	**4.2**	**5.4**	**42**	**54**
2004	**11**	**21**	**108**	**210**	**8.9**	**10**	**89**	**103**	**4.1**	**5.4**	**41**	**54**
2005	**10**	**20**	**105**	**196**	**7.3**	**8.4**	**73**	**84**	**3.3**	**4.2**	**33**	**42**
2006	**9.1**	**17**	**91**	**172**	**7.7**	**9.0**	**77**	**90**	**3.3**	**4.3**	**33**	**43**
2007	**9.1**	**17**	**91**	**172**	**7.0**	**8.1**	**70**	**81**	**2.8**	**3.6**	**28**	**36**
2008	**8.2**	**15**	**82**	**151**	**6.1**	**7.1**	**61**	**71**	**2.4**	**3.1**	**24**	**31**
2009	**7.9**	**15**	**79**	**151**	**6.7**	**7.9**	**67**	**79**	**2.9**	**3.9**	**29**	**39**
2010	**7.7**	**15**	**77**	**147**	**6.7**	**7.8**	**67**	**78**	**2.7**	**3.4**	**27**	**34**
2011	**7.3**	**13**	**73**	**129**	**5.0**	**5.9**	**50**	**59**	**2.2**	**2.8**	**22**	**28**
2012	**6.3**	**12**	**63**	**117**	**6.1**	**7.3**	**61**	**73**	**2.6**	**3.3**	**26**	**33**
2013	**6.1**	**11**	**61**	**111**	**5.6**	**6.5**	**56**	**65**	**2.2**	**2.8**	**22**	**28**
2014	**5.8**	**11**	**58**	**105**	**5.0**	**6.0**	**50**	**60**	**2.0**	**2.6**	**20**	**26**
2015	**5.3**	**9.4**	**53**	**94**	**4.9**	**5.6**	**49**	**56**	**1.9**	**2.3**	**19**	**23**
2016	**5.0**	**8.9**	**50**	**89**	**4.9**	**6.0**	**49**	**60**	**2.2**	**3.2**	**22**	**32**
2017	**4.7**	**9.1**	**47**	**91**	**3.8**	**4.5**	**38**	**45**	**1.6**	**2.1**	**16**	**21**
2018	**4.4**	**8.2**	**44**	**82**	**3.8**	**4.4**	**38**	**44**	**1.4**	**1.8**	**14**	**18**

Bold values indicate exceedances

301786

TABLE 5-63: RATIO OF MODELED DIETARY DOSE TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BALD EAGLE USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	122	154	1225	1536	92	113	924	1128	45	57	455	567
1994	74	100	745	1002	64	77	635	765	32	40	322	397
1995	82	110	821	1098	71	85	705	848	35	42	348	423
1996	75	108	749	1079	57	69	567	692	31	39	306	386
1997	58	84	583	840	50	60	496	598	26	33	263	330
1998	49	69	487	692	45	54	447	543	22	27	221	272
1999	42	63	423	628	36	45	364	451	17	21	169	213
2000	40	59	395	588	34	42	344	421	16	20	161	199
2001	37	55	369	546	33	41	331	407	15	19	154	192
2002	36	54	364	536	35	43	353	432	16	21	164	206
2003	32	47	318	474	30	37	296	366	14	18	140	176
2004	30	44	298	438	29	35	289	354	14	18	145	181
2005	26	40	265	399	22	27	221	270	11	14	109	136
2006	26	39	260	385	24	29	241	295	11	14	115	141
2007	24	36	240	362	20	24	201	244	9	11	89	109
2008	23	35	227	345	18	22	181	223	9	11	86	109
2009	23	34	229	335	20	24	196	240	9	12	93	117
2010	20	29	201	294	18	22	179	219	8	10	78	96
2011	18	27	176	268	15	19	152	187	8	10	75	96
2012	18	26	175	259	15	19	154	190	7	9	73	92
2013	17	25	168	249	16	20	160	198	7	9	71	90
2014	15	22	153	222	15	19	153	187	6	8	65	80
2015	14	21	140	206	13	16	134	163	6	8	60	75
2016	14	21	143	207	15	18	150	184	6	8	64	79
2017	12	19	123	187	11	14	114	140	5	7	53	69
2018	12	18	119	178	11	13	109	135	5	6	48	61

Bold values indicate exceedances

TABLE 5-64: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BELTED KINGFISHER USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**4201**	**7327**	**8401**	**1465**	**2054**	**2670**	**4108**	**5340**	**1031**	**1920**	**2062**	**3841**
1994	**2023**	**3383**	**4046**	**677**	**1661**	**2025**	**3322**	**4050**	**778**	**1266**	**1555**	**2531**
1995	**1868**	**3044**	**3736**	**609**	**1842**	**2402**	**3684**	**4805**	**926**	**1684**	**1852**	**3367**
1996	**1935**	**3269**	**3870**	**654**	**1217**	**1494**	**2434**	**2987**	**598**	**1128**	**1196**	**2256**
1997	**1424**	**2714**	**2848**	**543**	**1072**	**1296**	**2145**	**2593**	**555**	**921**	**1110**	**1842**
1998	**1216**	**2139**	**2431**	**428**	**954**	**1191**	**1908**	**2383**	**448**	**778**	**896**	**1555**
1999	**1038**	**1958**	**2076**	**392**	**755**	**916**	**1510**	**1832**	**329**	**526**	**658**	**1053**
2000	**840**	**1727**	**1680**	**345**	**698**	**854**	**1396**	**1709**	**289**	**501**	**578**	**1002**
2001	**824**	**1601**	**1649**	**320**	**750**	**913**	**1500**	**1826**	**338**	**592**	**677**	**1183**
2002	**765**	**1523**	**1531**	**305**	**723**	**873**	**1445**	**1746**	**309**	**520**	**618**	**1040**
2003	**738**	**1449**	**1476**	**290**	**602**	**728**	**1205**	**1455**	**273**	**489**	**547**	**978**
2004	**643**	**1338**	**1286**	**268**	**580**	**692**	**1160**	**1385**	**271**	**493**	**542**	**986**
2005	**627**	**1253**	**1254**	**251**	**473**	**573**	**946**	**1146**	**218**	**377**	**437**	**755**
2006	**536**	**1096**	**1072**	**219**	**499**	**605**	**999**	**1210**	**217**	**391**	**435**	**783**
2007	**539**	**1094**	**1079**	**219**	**453**	**550**	**906**	**1099**	**180**	**327**	**361**	**654**
2008	**487**	**964**	**974**	**193**	**397**	**479**	**795**	**959**	**159**	**278**	**319**	**556**
2009	**470**	**964**	**939**	**193**	**434**	**532**	**869**	**1065**	**192**	**364**	**385**	**727**
2010	**461**	**936**	**922**	**187**	**436**	**527**	**872**	**1054**	**175**	**312**	**350**	**623**
2011	**439**	**821**	**879**	**164**	**327**	**400**	**655**	**800**	**141**	**264**	**283**	**527**
2012	**379**	**747**	**759**	**149**	**396**	**490**	**791**	**980**	**171**	**298**	**342**	**596**
2013	**367**	**712**	**733**	**142**	**367**	**441**	**735**	**883**	**142**	**251**	**285**	**503**
2014	**349**	**675**	**699**	**135**	**329**	**403**	**658**	**807**	**132**	**237**	**264**	**473**
2015	**315**	**603**	**630**	**121**	**319**	**382**	**639**	**764**	**123**	**202**	**246**	**404**
2016	**300**	**567**	**600**	**113**	**317**	**404**	**633**	**808**	**146**	**323**	**292**	**647**
2017	**285**	**584**	**569**	**117**	**249**	**306**	**499**	**613**	**102**	**204**	**203**	**409**
2018	**263**	**529**	**526**	**106**	**248**	**302**	**496**	**603**	**94**	**163**	**188**	**327**

Bold values indicate exceedances

TABLE 5-65: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS BASED ON FISHRAND FOR FEMALE GREAT BLUE HERON USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**209**	**367**	**349**	**612**	**102**	**131**	**170**	**218**	**51**	**68**	**86**	**114**
1994	**97**	**163**	**161**	**272**	**82**	**98**	**136**	**163**	**38**	**48**	**64**	**80**
1995	**89**	**147**	**149**	**245**	**91**	**118**	**152**	**196**	**46**	**61**	**77**	**101**
1996	**94**	**160**	**156**	**266**	**59**	**71**	**99**	**119**	**29**	**40**	**49**	**66**
1997	**68**	**132**	**113**	**219**	**52**	**62**	**87**	**103**	**27**	**35**	**46**	**58**
1998	**57**	**103**	**96**	**171**	**46**	**57**	**77**	**95**	**22**	**28**	**37**	**47**
1999	**49**	**94**	**81**	**156**	**36**	**43**	**61**	**72**	**16**	**20**	**27**	**33**
2000	**39**	**83**	**65**	**138**	**34**	**40**	**56**	**67**	**14**	**18**	**23**	**30**
2001	**38**	**76**	**64**	**127**	**36**	**43**	**60**	**72**	**17**	**22**	**28**	**36**
2002	**36**	**73**	**59**	**121**	**35**	**41**	**58**	**69**	**15**	**19**	**25**	**32**
2003	**34**	**69**	**57**	**116**	**29**	**34**	**48**	**57**	**13**	**18**	**22**	**29**
2004	**30**	**64**	**50**	**107**	**28**	**32**	**47**	**54**	**13**	**18**	**22**	**29**
2005	**29**	**60**	**49**	**100**	**23**	**27**	**38**	**44**	**11**	**14**	**18**	**23**
2006	**25**	**52**	**41**	**87**	**24**	**28**	**40**	**47**	**11**	**14**	**18**	**23**
2007	**25**	**52**	**42**	**87**	**22**	**26**	**36**	**43**	**9**	**12**	**15**	**19**
2008	**22**	**46**	**37**	**77**	**19**	**22**	**32**	**37**	**8**	**10**	**13**	**17**
2009	**22**	**46**	**36**	**77**	**21**	**25**	**35**	**42**	**10**	**13**	**16**	**21**
2010	**21**	**45**	**36**	**75**	**21**	**25**	**35**	**42**	**9**	**11**	**14**	**19**
2011	**21**	**39**	**34**	**66**	**16**	**19**	**26**	**31**	**7**	**9**	**12**	**15**
2012	**18**	**36**	**29**	**60**	**19**	**23**	**32**	**39**	**8**	**11**	**14**	**18**
2013	**17**	**34**	**29**	**57**	**18**	**21**	**30**	**35**	**7**	**9**	**12**	**15**
2014	**16**	**32**	**27**	**54**	**16**	**19**	**27**	**32**	**7**	**9**	**11**	**14**
2015	**15**	**29**	**24**	**48**	**15**	**18**	**26**	**30**	**6**	**8**	**10**	**13**
2016	**14**	**27**	**23**	**45**	**15**	**19**	**26**	**32**	**7**	**11**	**12**	**18**
2017	**13**	**28**	**22**	**47**	**12**	**14**	**20**	**24**	**5**	**7**	**8**	**12**
2018	**12**	**25**	**20**	**42**	**12**	**14**	**20**	**23**	**5**	**6**	**8**	**10**

Bold values indicate exceedances

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TABLE 5-66: RATIO OF MODELED EGG CONCENTRATIONS TO BENCHMARKS BASED ON FISHRAND FOR FEMALE BALD EAGLE USING TEQ FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	12779	16033	25558	32065	9646	11769	19292	23538	4743	5915	9486	11829
1994	7771	10459	15543	20918	6630	7983	13261	15966	3362	4141	6724	8282
1995	8564	11457	17127	22914	7361	8845	14721	17690	3633	4417	7267	8835
1996	7811	11260	15623	22521	5916	7219	11833	14438	3189	4024	6377	8049
1997	6083	8771	12166	17542	5180	6241	10361	12483	2748	3444	5495	6888
1998	5078	7222	10156	14444	4660	5667	9319	11334	2311	2837	4623	5673
1999	4416	6550	8832	13099	3803	4703	7605	9406	1760	2220	3520	4440
2000	4127	6132	8254	12264	3590	4388	7181	8776	1678	2072	3356	4145
2001	3854	5695	7709	11389	3457	4244	6915	8488	1612	2003	3223	4006
2002	3802	5597	7604	11194	3684	4512	7367	9025	1713	2148	3427	4295
2003	3321	4947	6641	9894	3094	3821	6188	7642	1461	1838	2923	3675
2004	3109	4575	6219	9151	3014	3695	6029	7391	1508	1891	3016	3781
2005	2761	4160	5522	8319	2303	2815	4607	5629	1137	1423	2274	2845
2006	2716	4020	5432	8041	2511	3075	5023	6151	1199	1472	2397	2944
2007	2503	3777	5007	7554	2098	2550	4195	5101	929	1142	1858	2283
2008	2364	3601	4727	7203	1893	2332	3786	4664	900	1139	1800	2279
2009	2390	3497	4781	6994	2045	2500	4090	5001	969	1220	1937	2441
2010	2101	3069	4202	6139	1865	2288	3729	4577	809	1004	1619	2008
2011	1840	2797	3681	5595	1591	1953	3181	3906	786	998	1571	1995
2012	1827	2702	3655	5404	1611	1983	3221	3966	764	964	1528	1928
2013	1755	2599	3511	5197	1675	2062	3349	4124	737	934	1474	1869
2014	1597	2320	3194	4639	1596	1956	3191	3913	674	836	1348	1672
2015	1463	2147	2926	4294	1400	1706	2799	3411	622	784	1244	1568
2016	1493	2161	2985	4322	1570	1920	3140	3841	670	830	1339	1659
2017	1285	1946	2570	3893	1191	1463	2381	2926	550	724	1099	1447
2018	1246	1861	2492	3721	1142	1408	2284	2815	499	641	997	1281

Bold values indicate exceedances

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TABLE 5-67: WILDLIFE SURVEY RESULTS - Birds
Hudson River
New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
Birds						
Hudsonia	2-Jun-99	Call/Fax	YES; Spoke with on 6/2/1999	Eric Kiviat, Executive Director; (914) 758-7273 (7274) OR (914) 758-7053; FAX: (914) 758-7033; EMAIL: kiviat@bard.edu	He has no direct knowledge of the upper Hudson but provided names	WATERFOWL/MALLARD: Steve Brown - Delmar NYSDEC KINGFISHER: Breeding bird atlas - DEC now computerized on web page; Bob Anderle/Janet Carroll - NYSDEC NYSDEC - Natural Resource Damage Assessment
NYS Department of Environmental Conservation - Endangered Species Unit	3-Jun-99	Call	No	Peter Nye (518) 439-7635x9 (Eagle Specialist); www.dec.state.ny.us	Left Message - Will call back	
Manomet Center for Conservation Sciences	2-Jun-99	Email	No	John M. Hagen, Division Director (Conservation Forestry Staff); jmhagan@ime.net; www.manomet.org;	Left Message - Will call back	
Saratoga National Historic Park, Stillwater, NY	4-Jun-99	Call	No	Chris (wildlife manager) (518) 664-9821x5; also can contact Richard Beresford	Left Message - Will call back	
Federation of New York State Bird Clubs	3-Jun-99	Email	No	Valeria Freer, President (vfreer@sullivan.suny.edu); http://www.birds.cornell.edu/fnysbc		
Union College Professor Emeritus	2-Jun-1999 7-Jun-1999	Call Call	No Yes	Carl George (518) 388-6330; Bird Expert; (John Waldman - Hudson River Foundation Recommended I call)	He did not have any specific data, but recommended a number of different sources	He recommended that I contact: Bob Daniels (mammals) - NY State Museum; Walter Sabin (Hudson-Mohawk Bird Club, they do an intensive waterbird survey and publish results in the *Kingbird Journal* (518) 439-7344; Also Union College has survey information for a lake in Scotia near the Hudson for Collins Lake in Scotia (across river from Schenectady) - http://tardis.union.edu/~birds, presents 10 years of bird information - 15 air miles from Hudson; also recommended contacting Robert Yunick for regional baseline information from Audubon Christmas count and the mid-May Big Day
Manomet Center for Conservation Sciences	7-Jun-99	Email	No	Dr. Treavor Lloyd-Evans (tlloyd-evans@manomet.org) - avian expert	Avian Conservationist	
American Birding Association - Online	7-Jun-99	WWW	No	www.americanbirding.org	Good links - possibility for some bird information on Hudson	

TABLE 5-67: WILDLIFE SURVEY RESULTS - Birds
Hudson River
New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
Breeding Bird Survey - OnLine	7-Jun-99	WWW	No	www.mbr.nbs.gov/bbs/bbs.html	Regional trend analysis by species - region=NY State, some additional details may be available	
Hudson-Mohawk Bird Club	7-Jun-99	Call	No	Walter Sabin Home: (518) 439-7344	Intensive waterbird survey every year - publish results in Kingbird Journal	
Ornithologist	7-Jun-99	Need Number	No	Robert Yunick	regional baseline data from Audubon Christmas count and mid-May Big Day	
NYS Department of Environmental Conservation - Endangered Species Unit	8-Jun-99	WWW	No	www.dec.state.ny.us/website/dfwmr/wildlife/endspec/enspbird.html	Brief summaries, listed by species, for NY State.	*Ixobrychus exilis* (Least Bittern): Populations along Hudson River Valley, uncommon and rare breeder, declines due to loss of marsh habitat due to drainage, vegetational changes, pollution, insecticides. *Rallus elegans* (King Rail): Nesting was reported in northern Hudson Valley, however there are no confirmed nests in NY state currently, decline due to degradation of wetlands. *Bartramia longicauda* (Upland Sand Piper): once common around NY state including Hudson, less than 250 breeding sites to date in NY, decline due to loss of grassland habitat. All considered threatened species.
Andrle, R. F. and Carroll, J. R. (ed.) 1988. The Atlas of Breeding Birds in New York State. Cornell University Press, Ithica.	8-Jun-99				Regional trend analysis by species - region=NY State, some additional details may be available	*Tachycineta bicolor* (Tree Swallow): Common breeder throughout entire state. *Ceryle alcyon* (Belted Kingfisher): Common summer resident throughout entire state. *Ardea herodias* (Great Blue Heron): Observed in Northern Hudson Valley, possibility of breeding there. *Anas platyrhynchos* (Mallard): Common breeder in wetlands. In the 1900's, rarely if ever seen as a breeder; creation/improvement of wetlands in mid-1900's and release of captive-bred adults and ducklings in the 1950's caused populations to increase. Birds not found in Northern Hudson Valley: Eagles and Osprey.

TABLE 5-67: WILDLIFE SURVEY RESULTS - Birds
Hudson River
New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
NYSDEC	16-Jun-99	Call	Yes	Mark Brown (518) 623-3671	Familiar with the area regarding mammals, birds, and herps. Good source. See General Info page.	This area is rich in birds including water fowl. Bald Eagle is only a winter resident, migrates in the summer. Lots of Canada geese and mallard. Has not seen any Osprey nests. They only feed here and spend most of their time around the near-by lakes. Has also seen tree swallow, kingfisher, and great blue heron. Most of the water fowl and larger birds use the area for feeding but do not breed here. He hasn't seen many nests except those built by species which live in the more wooded areas. Here's a list of the other species he has seen in the area: Common Mergenser (Diving Duck), red tailed hawk, sparrow hawk, rough grouse, wild turkey, killdare, wood cock, morning dove, barn owl, bard owl, sawhat owl (occupying nest boxes built for ducks), swallows, ravens, crows, wrens, eastern blue bird, starlings.
Ndakinna Wilderness Project	6/3/1999 6/16/99	Email Call Call	No No Yes	Jim Brushek (518) 583-9980x3, 23 Middle Grove Road, Greenfield Center, NY 12833; Received address from Saratoga County Information - Annamaria Dalton (annamaria@spa.net)	Professional Tracker	Saw some bald eagles 3 or 4 weeks ago. Hasn't seen any osprey. Great Blue Heron and kingfisher in large numbers. Hasn't seen any tree swallow. Lots of mallards and Canada geese. Could not recall seeing any nests.

TABLE 5-68: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE BATS BASED ON 1993 DATA FOR THE TRI+ CONGENERS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**30**	**52**	**140**	**244**
Stillwater (168)	**52**	**244**	**245**	**1146**
Federal Dam (154)	**12**	**21**	**58**	**99**
Lower River				
143.5	**1.7**	**4.3**	**8.1**	**20**
137.2	**3.4**	**14**	**16**	**65**
122.4	**1.9**	**4.7**	**8.8**	**22**
113.8	**1.9**	**7.5**	**9.1**	**35**
100	0.9	**6.1**	**4.2**	**29**
88.9	0.4	0.8	**2.1**	**3.7**
58.7	**1.4**	**13**	**6.5**	**59**
47.3	**1.6**	**11**	**7.3**	**54**
25.8	0.5	0.8	**2.2**	**3.7**

Bold values indicate exceedances

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TABLE 5-69: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE BAT FOR TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**30**	**45**	**140**	**211**	**12**	**13**	**55**	**63**	**5.2**	**6.6**	**24**	**31**
1994	**33**	**42**	**157**	**197**	**11**	**13**	**52**	**60**	**4.9**	**6.2**	**23**	**29**
1995	**31**	**39**	**145**	**182**	**10**	**12**	**49**	**56**	**4.5**	**5.7**	**21**	**27**
1996	**28**	**36**	**133**	**167**	**9.4**	**11**	**44**	**51**	**3.8**	**4.8**	**18**	**23**
1997	**26**	**32**	**121**	**152**	**8.5**	**10**	**40**	**46**	**3.3**	**4.2**	**15**	**20**
1998	**23**	**29**	**110**	**138**	**7.7**	**8.8**	**36**	**41**	**2.9**	**3.6**	**13**	**17**
1999	**21**	**27**	**100**	**126**	**7.0**	**8.1**	**33**	**38**	**2.5**	**3.2**	**12**	**15**
2000	**20**	**25**	**93**	**117**	**6.6**	**7.6**	**31**	**36**	**2.2**	**2.9**	**11**	**13**
2001	**19**	**24**	**88**	**110**	**6.5**	**7.4**	**30**	**35**	**2.1**	**2.7**	**10**	**13**
2002	**18**	**22**	**83**	**104**	**6.2**	**7.1**	**29**	**33**	**2.0**	**2.6**	**9.5**	**12**
2003	**16**	**20**	**76**	**96**	**5.8**	**6.7**	**27**	**31**	**1.9**	**2.4**	**8.9**	**11**
2004	**15**	**19**	**70**	**88**	**5.3**	**6.1**	**25**	**29**	**1.7**	**2.2**	**8.0**	**10**
2005	**14**	**18**	**66**	**83**	**4.9**	**5.7**	**23**	**27**	**1.5**	**2.0**	**7.3**	**9.2**
2006	**13**	**17**	**63**	**79**	**4.7**	**5.4**	**22**	**25**	**1.4**	**1.8**	**6.7**	**8.6**
2007	**13**	**16**	**59**	**74**	**4.4**	**5.0**	**20**	**24**	**1.3**	**1.7**	**6.1**	**7.8**
2008	**12**	**15**	**55**	**69**	**4.1**	**4.7**	**19**	**22**	**1.2**	**1.5**	**5.7**	**7.2**
2009	**11**	**14**	**52**	**66**	**3.9**	**4.5**	**18**	**21**	**1.2**	**1.5**	**5.5**	**7.0**
2010	**10**	**13**	**48**	**60**	**3.7**	**4.2**	**17**	**20**	**1.1**	**1.4**	**5.1**	**6.5**
2011	**9.1**	**11**	**43**	**54**	**3.4**	**3.9**	**16**	**18**	**1.0**	**1.3**	**4.7**	**6.0**
2012	**8.5**	**11**	**40**	**50**	**3.2**	**3.7**	**15**	**17**	**1.0**	**1.2**	**4.5**	**5.7**
2013	**8.0**	**10**	**37**	**47**	**3.1**	**3.5**	**14**	**17**	0.9	**1.1**	**4.2**	**5.3**
2014	**7.4**	**9.3**	**35**	**44**	**2.9**	**3.3**	**14**	**16**	0.8	**1.0**	**3.8**	**4.9**
2015	**7.0**	**8.8**	**33**	**41**	**2.8**	**3.2**	**13**	**15**	0.8	**1.0**	**3.7**	**4.7**
2016	**6.6**	**8.2**	**31**	**39**	**2.6**	**3.0**	**12**	**14**	0.7	0.9	**3.4**	**4.3**
2017	**6.2**	**7.8**	**29**	**36**	**2.5**	**2.9**	**12**	**13**	0.6	0.8	**3.0**	**3.9**
2018	**6.0**	**7.5**	**28**	**35**	**2.4**	**2.8**	**11**	**13**	0.6	0.8	**2.9**	**3.7**

Bold values indicate exceedances

TABLE 5-70: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE BAT BASED ON 1993 DATA ON A TEQ BASIS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**133**	**232**	**1328**	**2323**
Stillwater (168)	**232**	**1089**	**2324**	**10885**
Federal Dam (154)	**55**	**94**	**554**	**943**
Lower River				
143.5	**8**	**20**	**78**	**197**
137.2	**15**	**62**	**153**	**624**
122.4	**8.4**	**22**	**84**	**215**
113.8	**8.7**	**34**	**87**	**339**
100	**4.0**	**28**	**40**	**276**
88.9	**2.0**	**3.6**	**20**	**36**
58.7	**6.2**	**56**	**62**	**562**
47.3	**7.0**	**51**	**70**	**512**
25.8	**2.1**	**3.6**	**21**	**36**

Bold values indicate exceedances

301795

TABLE 5-71: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE BAT ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**133**	**200**	**1328**	**2001**	**52**	**60**	**522**	**599**	**23**	**29**	**231**	**293**
1994	**149**	**187**	**1487**	**1866**	**50**	**57**	**498**	**571**	**22**	**28**	**218**	**276**
1995	**138**	**173**	**1378**	**1730**	**47**	**54**	**467**	**536**	**20**	**25**	**199**	**253**
1996	**126**	**158**	**1261**	**1582**	**42**	**48**	**420**	**483**	**17**	**22**	**170**	**215**
1997	**115**	**145**	**1153**	**1446**	**38**	**44**	**380**	**436**	**15**	**19**	**147**	**187**
1998	**104**	**131**	**1045**	**1311**	**34**	**39**	**344**	**394**	**13**	**16**	**128**	**163**
1999	**95**	**120**	**953**	**1196**	**31**	**36**	**314**	**360**	**11**	**14**	**112**	**142**
2000	**88**	**111**	**884**	**1109**	**30**	**34**	**296**	**340**	**10**	**13**	**100**	**128**
2001	**84**	**105**	**836**	**1049**	**29**	**33**	**288**	**330**	**9**	**12**	**95**	**120**
2002	**79**	**99**	**786**	**986**	**28**	**32**	**276**	**317**	**9**	**11**	**90**	**115**
2003	**73**	**91**	**726**	**911**	**26**	**30**	**260**	**298**	**8**	**11**	**84**	**107**
2004	**67**	**84**	**667**	**837**	**24**	**27**	**238**	**273**	**8**	**10**	**76**	**97**
2005	**63**	**79**	**627**	**786**	**22**	**25**	**220**	**253**	**6.9**	**8.8**	**69**	**88**
2006	**60**	**75**	**596**	**749**	**21**	**24**	**209**	**240**	**6.4**	**8.1**	**64**	**81**
2007	**56**	**70**	**558**	**700**	**19**	**22**	**195**	**224**	**5.8**	**7.4**	**58**	**74**
2008	**52**	**66**	**525**	**659**	**18**	**21**	**184**	**211**	**5.4**	**6.9**	**54**	**69**
2009	**50**	**62**	**496**	**623**	**18**	**20**	**176**	**202**	**5.2**	**6.6**	**52**	**66**
2010	**45**	**57**	**453**	**568**	**16**	**19**	**164**	**188**	**4.9**	**6.2**	**49**	**62**
2011	**41**	**51**	**407**	**511**	**15**	**17**	**151**	**173**	**4.5**	**5.7**	**45**	**57**
2012	**38**	**48**	**380**	**476**	**14**	**17**	**144**	**166**	**4.3**	**5.4**	**43**	**54**
2013	**36**	**45**	**355**	**446**	**14**	**16**	**137**	**157**	**4.0**	**5.1**	**40**	**51**
2014	**33**	**41**	**330**	**414**	**13**	**15**	**128**	**147**	**3.6**	**4.6**	**36**	**46**
2015	**31**	**39**	**312**	**392**	**12**	**14**	**124**	**143**	**3.5**	**4.4**	**35**	**44**
2016	**29**	**37**	**293**	**367**	**12**	**14**	**118**	**135**	**3.2**	**4.1**	**32**	**41**
2017	**28**	**35**	**275**	**345**	**11**	**13**	**111**	**127**	**2.9**	**3.7**	**29**	**37**
2018	**27**	**34**	**268**	**336**	**11**	**12**	**108**	**124**	**2.8**	**3.5**	**28**	**35**

Bold values indicate exceedances

TABLE 5-72: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE RACCOON BASED ON 1993 DATA FOR THE TRI+ CONGENERS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**5.8**	**10**	**27**	**47**
Stillwater (168)	**9.5**	**42**	**45**	**195**
Federal Dam (154)	**2.2**	**3.7**	**10**	**17**
Lower River				
143.5	0.4	0.8	**1.7**	**3.7**
137.2	0.7	**2.6**	**3.4**	**12**
122.4	0.4	0.9	**1.8**	**4.1**
113.8	0.4	**1.3**	**1.9**	**6.2**
100	0.2	**1.3**	0.8	**6.1**
88.9	0.1	0.3	0.6	**1.2**
58.7	0.3	**2.2**	**1.3**	**10**
47.3	0.3	**2.1**	**1.6**	**9.9**
25.8	0.1	0.2	0.6	**1.0**

Bold values indicate exceedances

301798

TABLE 5-73: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE RACCOON FOR TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**6.0**	**8.5**	**27.9**	**39.7**	**2.3**	**2.6**	**10.7**	**12.1**	**1.2**	**1.2**	**5.8**	**5.8**
1994	**6.5**	**7.9**	**30.3**	**37.0**	**2.2**	**2.5**	**10.2**	**11.5**	**1.2**	**1.2**	**5.4**	**5.4**
1995	**6.0**	**7.4**	**28.2**	**34.5**	**2.1**	**2.3**	**9.7**	**10.9**	**1.1**	**1.1**	**5.0**	**5.0**
1996	**5.5**	**6.7**	**25.7**	**31.4**	**1.8**	**2.1**	**8.6**	**9.7**	0.9	0.9	**4.2**	**4.3**
1997	**5.0**	**6.1**	**23.5**	**28.7**	**1.7**	**1.9**	**7.8**	**8.8**	0.8	0.8	**3.7**	**3.7**
1998	**4.5**	**5.5**	**21.2**	**26.0**	**1.5**	**1.7**	**7.0**	**7.9**	0.7	0.7	**3.2**	**3.2**
1999	**4.1**	**5.1**	**19.4**	**23.7**	**1.4**	**1.5**	**6.4**	**7.2**	0.6	0.6	**2.8**	**2.8**
2000	**3.8**	**4.7**	**17.9**	**21.9**	**1.3**	**1.4**	**6.0**	**6.8**	0.5	0.5	**2.5**	**2.5**
2001	**3.6**	**4.4**	**17.0**	**20.8**	**1.3**	**1.4**	**5.9**	**6.6**	0.5	0.5	**2.4**	**2.4**
2002	**3.4**	**4.2**	**15.9**	**19.5**	**1.2**	**1.3**	**5.6**	**6.3**	0.5	0.5	**2.3**	**2.3**
2003	**3.1**	**3.9**	**14.7**	**18.1**	**1.1**	**1.3**	**5.3**	**6.0**	0.5	0.5	**2.1**	**2.1**
2004	**2.9**	**3.5**	**13.5**	**16.6**	**1.0**	**1.2**	**4.9**	**5.5**	0.4	0.4	**1.9**	**1.9**
2005	**2.7**	**3.3**	**12.7**	**15.5**	**1.0**	**1.1**	**4.5**	**5.1**	0.4	0.4	**1.7**	**1.7**
2006	**2.6**	**3.2**	**12.1**	**14.8**	0.9	**1.0**	**4.3**	**4.8**	0.3	0.3	**1.6**	**1.6**
2007	**2.4**	**3.0**	**11.3**	**13.9**	0.8	**1.0**	**4.0**	**4.5**	0.3	0.3	**1.5**	**1.5**
2008	**2.3**	**2.8**	**10.6**	**13.0**	0.8	0.9	**3.7**	**4.2**	0.3	0.3	**1.4**	**1.4**
2009	**2.1**	**2.6**	**10.1**	**12.3**	0.8	0.9	**3.6**	**4.0**	0.3	0.3	**1.3**	**1.3**
2010	**2.0**	**2.4**	**9.2**	**11.3**	0.7	0.8	**3.4**	**3.8**	0.3	0.3	**1.2**	**1.2**
2011	**1.8**	**2.2**	**8.3**	**10.1**	0.7	0.7	**3.1**	**3.5**	0.2	0.2	**1.1**	**1.1**
2012	**1.6**	**2.0**	**7.7**	**9.4**	0.6	0.7	**3.0**	**3.3**	0.2	0.2	**1.1**	**1.1**
2013	**1.5**	**1.9**	**7.2**	**8.8**	0.6	0.7	**2.8**	**3.2**	0.2	0.2	**1.0**	**1.0**
2014	**1.4**	**1.8**	**6.7**	**8.2**	0.6	0.6	**2.6**	**3.0**	0.2	0.2	0.9	0.9
2015	**1.4**	**1.7**	**6.3**	**7.8**	0.5	0.6	**2.5**	**2.8**	0.2	0.2	0.9	0.9
2016	**1.3**	**1.6**	**5.9**	**7.3**	0.5	0.6	**2.4**	**2.7**	0.2	0.2	0.8	0.8
2017	**1.2**	**1.5**	**5.6**	**6.8**	0.5	0.5	**2.2**	**2.5**	0.2	0.2	0.7	0.7
2018	**1.2**	**1.4**	**5.4**	**6.6**	0.5	0.5	**2.2**	**2.5**	0.1	0.1	0.7	0.7

Bold values indicate exceedances

TABLE 5-74: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE RACCOON BASED ON 1993 DATA ON A TEQ BASIS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**69**	**107**	**685**	**1067**
Stillwater (168)	**150**	**374**	**1504**	**3736**
Federal Dam (154)	**19**	**33**	**195**	**328**
Lower River				
143.5	**4.8**	**7.3**	**48**	**73**
137.2	**8.8**	**23**	**88**	**231**
122.4	**5.1**	**8.0**	**51**	**80**
113.8	**5.4**	**12**	**54**	**120**
100	**2.2**	**36**	**22**	**359**
88.9	**3.4**	**9.2**	**34**	**92**
58.7	**2.2**	**20**	**22**	**196**
47.3	**7.0**	**30**	**70**	**304**
25.8	**2.6**	**6.5**	**26**	**65**

Bold values indicate exceedances

TABLE 5-75: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE RACCOON ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	127	144	1270	1437	43	44	427	441	19	20	189	200
1994	122	133	1218	1334	40	42	403	416	17	18	174	184
1995	114	125	1144	1252	39	40	388	400	17	18	168	177
1996	104	114	1039	1137	35	36	347	359	14	15	141	150
1997	96	105	957	1047	32	33	316	326	12	13	123	130
1998	86	95	864	945	28	29	283	293	11	11	106	113
1999	79	86	788	862	26	27	259	267	9	10	94	99
2000	72	79	722	790	24	25	238	246	8.2	8.7	82	87
2001	68	75	683	748	23	24	233	240	7.6	8.1	76	81
2002	65	71	645	706	22	23	224	231	7.3	7.7	73	77
2003	60	66	600	656	21	22	213	220	6.9	7.3	69	73
2004	55	60	550	601	20	20	197	204	6.3	6.7	63	67
2005	51	56	509	557	18	18	178	184	5.6	5.9	56	59
2006	49	53	488	535	17	18	171	177	5.3	5.6	53	56
2007	46	50	458	501	16	16	159	164	4.8	5.1	48	51
2008	43	47	428	468	15	15	149	154	4.4	4.6	44	46
2009	41	44	407	445	14	15	142	147	4.2	4.7	42	47
2010	38	41	379	414	14	14	136	140	4.1	4.3	41	43
2011	34	37	336	367	12	13	123	127	3.7	3.9	37	39
2012	31	34	310	339	12	12	116	120	3.4	3.6	34	36
2013	29	32	293	321	11	12	113	116	3.3	3.5	33	35
2014	27	30	270	296	10	11	104	108	3.0	3.1	30	31
2015	25	28	254	279	10	10	100	103	2.8	3.0	28	30
2016	24	27	242	265	10	10	97	100	2.7	2.9	27	29
2017	22	24	223	244	8.9	9.2	89	92	2.3	2.5	23	25
2018	21	23	211	232	8.5	8.7	85	87	2.2	2.3	22	23

Bold values indicate exceedances

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TABLE 5-76: RATIO OF OBSERVED MINK AND OTTER PCB CONCENTRATIONS TO BENCHMARKS

Comparison to Low Range LOAEL				
Species and Statistic	North Hudson Valley	South Hudson Valley	Hudson Valley	Other NY State
Mink liver - average	0.5	0.6		
Mink liver - minimum	0.1	0.1		
Mink liver - maximum	**1.4**	**2.8**		
Otter liver - average			**1.9**	
Otter liver - minimum			0.6	
Otter liver - maximum			**5.9**	

Comparison to Upper Range LOAEL				
Species and Statistic	North Hudson Valley	South Hudson Valley	Hudson Valley	Other NY State
Mink liver - average	0.2	0.2		
Mink liver - minimum	0.0	0.0		
Mink liver - maximum	0.5	**1.1**		
Otter liver - average			0.7	
Otter liver - minimum			0.2	
Otter liver - maximum			**2.4**	

TABLE 5-77: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE MINK BASED ON 1993 DATA FOR THE TRI+ CONGENERS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**11**	**17**	**359**	**566**
Stillwater (168)	**5.8**	**23**	**188**	**760**
Federal Dam (154)	**1.8**	**2.8**	**58**	**92**
Lower River				
143.5	**1.0**	**1.3**	**31**	**43**
137.2	**1.9**	**4.6**	**62**	**150**
122.4	0.8	**1.4**	**25**	**45**
113.8	0.8	**1.3**	**27**	**43**
100	0.4	**1.0**	**12**	**34**
88.9	0.6	0.8	**19**	**26**
58.7	0.7	**1.8**	**24**	**58**
47.3	0.7	**1.7**	**22**	**56**
25.8	0.5	0.6	**15**	**18**

Bold values indicate exceedances

TABLE 5-78: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE OTTER BASED ON 1993 DATA FOR THE TRI+ CONGENERS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**89**	**173**	**2906**	**5623**
Stillwater (168)	**16**	**21**	**520**	**671**
Federal Dam (154)	**12**	**21**	**375**	**673**
Lower River				
143.5	**12**	**21**	**375**	**673**
137.2	**43**	**103**	**1413**	**3362**
122.4	**10**	**14**	**329**	**453**
113.8	**9.2**	**13**	**298**	**417**
100	**11**	**33**	**342**	**1057**
88.9	**6.8**	**13**	**220**	**419**
58.7	**7.9**	**12**	**256**	**379**
47.3	**9.0**	**24**	**293**	**789**
25.8	**6.4**	**13**	**207**	**411**

Bold values indicate exceedances

TABLE 5-79: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE MINK FOR TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**5.6**	**7.1**	**181**	**231**	**2.4**	**2.6**	**79**	**86**	0.9	**1.0**	**29**	**34**
1994	**5.7**	**6.6**	**185**	**216**	**2.3**	**2.5**	**75**	**82**	0.9	**1.0**	**28**	**32**
1995	**5.6**	**6.5**	**182**	**212**	**2.2**	**2.4**	**72**	**79**	0.8	**1.0**	**27**	**32**
1996	**4.8**	**5.6**	**156**	**182**	**1.8**	**1.9**	**58**	**63**	0.7	0.8	**21**	**25**
1997	**4.3**	**5.0**	**139**	**163**	**1.8**	**1.9**	**57**	**62**	0.6	0.7	**19**	**22**
1998	**3.8**	**4.5**	**123**	**145**	**1.4**	**1.5**	**44**	**49**	0.5	0.6	**16**	**19**
1999	**3.5**	**4.1**	**113**	**133**	**1.3**	**1.4**	**42**	**46**	0.4	0.5	**15**	**17**
2000	**3.2**	**3.8**	**104**	**123**	**1.2**	**1.3**	**38**	**42**	0.4	0.5	**14**	**16**
2001	**3.1**	**3.6**	**100**	**117**	**1.2**	**1.3**	**40**	**43**	0.4	0.4	**12**	**15**
2002	**2.8**	**3.4**	**93**	**109**	**1.1**	**1.2**	**36**	**40**	0.4	0.4	**12**	**14**
2003	**2.6**	**3.1**	**86**	**101**	**1.1**	**1.2**	**34**	**38**	0.4	0.4	**11**	**13**
2004	**2.4**	**2.9**	**79**	**93**	**1.0**	**1.1**	**32**	**35**	0.3	0.4	**10**	**12**
2005	**2.3**	**2.7**	**74**	**87**	0.9	**1.0**	**29**	**32**	0.3	0.3	**9.3**	**11**
2006	**2.2**	**2.6**	**71**	**83**	0.9	**1.0**	**28**	**31**	0.3	0.3	**8.6**	**10**
2007	**2.0**	**2.4**	**66**	**78**	0.8	0.9	**25**	**28**	0.3	0.3	**8.2**	**9.5**
2008	**1.9**	**2.2**	**62**	**73**	0.7	0.8	**23**	**26**	0.2	0.3	**7.2**	**8.3**
2009	**1.8**	**2.1**	**59**	**69**	0.7	0.8	**24**	**26**	0.2	0.3	**7.5**	**8.6**
2010	**1.7**	**1.9**	**54**	**63**	0.7	0.7	**22**	**24**	0.2	0.3	**7.2**	**8.2**
2011	**1.5**	**1.7**	**48**	**57**	0.6	0.7	**19**	**21**	0.2	0.2	**6.5**	**7.4**
2012	**1.4**	**1.6**	**45**	**53**	0.6	0.7	**20**	**22**	0.2	0.2	**6.8**	**7.7**
2013	**1.3**	**1.5**	**42**	**50**	0.6	0.6	**18**	**20**	0.2	0.2	**5.9**	**6.8**
2014	**1.2**	**1.4**	**39**	**46**	0.5	0.6	**18**	**19**	0.2	0.2	**5.5**	**6.3**
2015	**1.1**	**1.3**	**37**	**44**	0.5	0.6	**17**	**18**	0.2	0.2	**5.4**	**6.1**
2016	**1.1**	**1.3**	**35**	**41**	0.5	0.6	**16**	**18**	0.2	0.2	**5.3**	**6.0**
2017	**1.0**	**1.2**	**33**	**38**	0.4	0.5	**14**	**16**	0.1	0.2	**4.3**	**4.9**
2018	**1.0**	**1.2**	**32**	**37**	0.4	0.5	**14**	**16**	0.1	0.2	**4.4**	**5.0**

Bold values indicate exceedances

301804

TABLE 5-80: RATIO OF MODELED DIETARY DOSE TO TOXICITY BENCHMARKS FOR FEMALE OTTER FOR TRI+ CONGENERS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	50	62	1615	2025	37	46	1217	1485	18	23	598	746
1994	30	41	983	1322	26	31	837	1008	13	16	424	523
1995	33	45	1083	1448	29	34	929	1116	14	17	459	557
1996	30	44	988	1423	23	28	747	911	12	16	402	508
1997	24	34	769	1108	20	24	654	788	11	13	347	434
1998	20	28	643	913	18	22	588	715	9.0	11	292	358
1999	17	25	559	828	15	18	480	594	6.8	8.6	222	280
2000	16	24	522	775	14	17	453	554	6.5	8.0	212	261
2001	15	22	488	720	13	16	436	536	6.3	7.8	203	253
2002	15	22	481	707	14	18	465	569	6.7	8.3	216	271
2003	13	19	420	625	12	15	391	482	5.7	7.1	184	232
2004	12	18	393	578	12	14	381	466	5.9	7.3	190	239
2005	11	16	349	526	8.9	11	291	355	4.4	5.5	143	180
2006	11	16	344	508	10	12	317	388	4.7	5.7	151	186
2007	10	15	317	477	8.1	10	265	322	3.6	4.4	117	144
2008	9.2	14	299	455	7.4	9.1	239	294	3.5	4.4	114	144
2009	9.3	14	302	442	7.9	10	258	316	3.8	4.7	122	154
2010	8.2	12	266	388	7.2	8.9	235	289	3.1	3.9	102	127
2011	7.2	11	233	354	6.2	7.6	201	247	3.1	3.9	99	126
2012	7.1	11	231	341	6.3	7.7	203	250	3.0	3.7	96	122
2013	6.8	10	222	328	6.5	8.0	211	260	2.9	3.6	93	118
2014	6.2	9.0	202	293	6.2	7.6	201	247	2.6	3.2	85	105
2015	5.7	8.4	185	271	5.4	6.6	177	215	2.4	3.0	78	99
2016	5.8	8.4	189	273	6.1	7.5	198	242	2.6	3.2	84	105
2017	5.0	7.6	163	246	4.6	5.7	150	185	2.1	2.8	69	91
2018	4.8	7.2	158	235	4.4	5.5	144	178	1.9	2.5	63	81

Bold values indicate exceedances

TABLE 5-81: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE MINK BASED ON 1993 DATA ON A TEQ BASIS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**28**	**44**	**792**	**1233**
Stillwater (168)	**18**	**55**	**510**	**1536**
Federal Dam (154)	**4.3**	**6.8**	**120**	**191**
Lower River				
143.5	**2.5**	**3.4**	**69**	**96**
137.2	**4.9**	**12**	**137**	**322**
122.4	**2.0**	**3.5**	**57**	**97**
113.8	**2.2**	**3.3**	**61**	**93**
100	0.9	**4.3**	**26**	**121**
88.9	**1.6**	**2.5**	**46**	**71**
58.7	**1.8**	**4.3**	**50**	**120**
47.3	**2.0**	**5.0**	**55**	**139**
25.8	**1.2**	**1.7**	**34**	**49**

Bold values indicate exceedances

TABLE 5-82: RATIO OF MODELED DIETARY DOSES TO BENCHMARKS FOR FEMALE OTTER BASED ON 1993 DATA ON A TEQ BASIS

Location	LOAEL vs. Average ADD Hazard Quotient	LOAEL vs. 95% UCL ADD Hazard Quotient	NOAEL vs. Average ADD Hazard Quotient	NOAEL vs. 95% UCL ADD Hazard Quotient
Upper River				
Thompson Island Pool (189)	**225**	**434**	**6286**	**12140**
Stillwater (168)	**45**	**60**	**1254**	**1683**
Federal Dam (154)	**29**	**52**	**817**	**1467**
Lower River				
143.5	**29**	**52**	**808**	**1453**
137.2	**108**	**258**	**3038**	**7230**
122.4	**25**	**35**	**711**	**978**
113.8	**23**	**32**	**644**	**904**
100	**26**	**82**	**735**	**2309**
88.9	**17**	**32**	**476**	**910**
58.7	**20**	**30**	**550**	**827**
47.3	**23**	**61**	**635**	**1720**
25.8	**16**	**32**	**447**	**890**

Bold values indicate exceedances

TABLE 5-83: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE MINK ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	**19**	**22**	**522**	**612**	**7.5**	**7.9**	**209**	**221**	**2.9**	**3.1**	**80**	**88**
1994	**18**	**20**	**510**	**569**	**7.0**	**7.5**	**197**	**209**	**2.7**	**3.0**	**76**	**83**
1995	**18**	**20**	**498**	**556**	**6.9**	**7.3**	**192**	**203**	**2.7**	**2.9**	**75**	**82**
1996	**15**	**17**	**431**	**482**	**5.6**	**5.9**	**156**	**166**	**2.1**	**2.3**	**60**	**66**
1997	**14**	**16**	**388**	**435**	**5.4**	**5.7**	**152**	**161**	**1.9**	**2.1**	**53**	**58**
1998	**12**	**14**	**345**	**388**	**4.4**	**4.7**	**122**	**130**	**1.6**	**1.8**	**45**	**50**
1999	**11**	**13**	**317**	**356**	**4.1**	**4.4**	**115**	**122**	**1.4**	**1.6**	**40**	**44**
2000	**10**	**12**	**290**	**327**	**3.7**	**3.9**	**103**	**109**	**1.3**	**1.4**	**37**	**40**
2001	**10**	**11**	**277**	**311**	**3.8**	**4.0**	**106**	**113**	**1.2**	**1.3**	**34**	**37**
2002	**9.2**	**10**	**259**	**291**	**3.5**	**3.7**	**99**	**105**	**1.1**	**1.3**	**32**	**35**
2003	**8.6**	**10**	**240**	**270**	**3.3**	**3.5**	**93**	**99**	**1.1**	**1.2**	**31**	**34**
2004	**7.9**	**8.8**	**220**	**248**	**3.1**	**3.3**	**87**	**92**	**1.0**	**1.1**	**28**	**30**
2005	**7.4**	**8.3**	**206**	**232**	**2.8**	**3.0**	**78**	**83**	0.9	**1.0**	**25**	**28**
2006	**7.0**	**7.9**	**197**	**221**	**2.7**	**2.9**	**76**	**81**	0.8	0.9	**24**	**26**
2007	**6.6**	**7.4**	**184**	**207**	**2.5**	**2.6**	**69**	**74**	0.8	0.9	**22**	**24**
2008	**6.2**	**6.9**	**173**	**194**	**2.3**	**2.4**	**64**	**68**	0.7	0.8	**19**	**21**
2009	**5.9**	**6.6**	**165**	**185**	**2.3**	**2.4**	**64**	**68**	0.7	0.8	**20**	**22**
2010	**5.4**	**6.1**	**151**	**170**	**2.1**	**2.3**	**60**	**63**	0.7	0.7	**19**	**21**
2011	**4.8**	**5.4**	**135**	**151**	**1.9**	**2.0**	**52**	**56**	0.6	0.7	**17**	**19**
2012	**4.5**	**5.0**	**126**	**141**	**1.9**	**2.1**	**54**	**57**	0.6	0.7	**18**	**19**
2013	**4.2**	**4.7**	**118**	**133**	**1.8**	**1.9**	**50**	**53**	0.6	0.6	**16**	**17**
2014	**3.9**	**4.4**	**110**	**123**	**1.7**	**1.8**	**48**	**50**	0.5	0.6	**15**	**16**
2015	**3.7**	**4.1**	**103**	**116**	**1.6**	**1.7**	**45**	**48**	0.5	0.5	**14**	**15**
2016	**3.5**	**3.9**	**98**	**110**	**1.6**	**1.7**	**44**	**47**	0.5	0.5	**14**	**15**
2017	**3.2**	**3.6**	**91**	**102**	**1.4**	**1.5**	**39**	**41**	0.4	0.4	**11**	**12**
2018	**3.1**	**3.5**	**87**	**98**	**1.4**	**1.5**	**38**	**41**	0.4	0.4	**11**	**12**

Bold values indicate exceedances

301808

TABLE 5-84: RATIO OF MODELED DIETARY DOSES TO TOXICITY BENCHMARKS FOR FEMALE OTTER ON A TEQ BASIS FOR THE PERIOD 1993 - 2018

Year	LOAEL 189 Average	LOAEL 189 95% UCL	NOAEL 189 Average	NOAEL 189 95% UCL	LOAEL 168 Average	LOAEL 168 95% UCL	NOAEL 168 Average	NOAEL 168 95% UCL	LOAEL 154 Average	LOAEL 154 95% UCL	NOAEL 154 Average	NOAEL 154 95% UCL
1993	128	160	3591	4479	95	115	2653	3227	47	58	1302	1619
1994	80	106	2227	2961	66	79	1834	2200	33	41	927	1138
1995	87	115	2434	3223	73	87	2031	2432	36	43	1000	1212
1996	79	113	2220	3158	58	71	1636	1988	31	39	877	1103
1997	62	88	1744	2476	51	61	1434	1721	27	34	756	944
1998	52	73	1463	2047	46	56	1290	1562	23	28	636	778
1999	46	66	1276	1857	38	46	1055	1299	17	22	486	610
2000	43	62	1190	1737	36	43	996	1211	17	20	462	569
2001	40	58	1113	1614	34	42	959	1172	16	20	444	550
2002	39	57	1095	1584	36	44	1019	1244	17	21	471	588
2003	34	50	960	1403	31	38	859	1055	14	18	402	504
2004	32	46	898	1297	30	36	836	1020	15	19	414	518
2005	29	42	799	1180	23	28	641	780	11	14	313	391
2006	28	41	785	1140	25	30	697	849	12	14	330	404
2007	26	38	724	1071	21	25	584	706	9.1	11	256	314
2008	24	36	683	1020	19	23	527	646	8.9	11	248	313
2009	25	35	688	990	20	25	568	691	10	12	266	335
2010	22	31	607	871	19	23	518	633	8.0	10	223	276
2011	19	28	532	793	16	19	443	541	7.7	10	216	274
2012	19	27	526	764	16	20	448	548	7.5	9.4	210	264
2013	18	26	505	735	17	20	465	569	7.2	9.1	203	256
2014	16	23	460	657	16	19	442	540	6.6	8.2	185	229
2015	15	22	422	608	14	17	389	472	6.1	7.7	171	215
2016	15	22	429	611	16	19	435	529	6.6	8.1	184	227
2017	13	20	370	551	12	14	331	405	5.4	7.1	151	198
2018	13	19	358	526	11	14	318	389	4.9	6.3	137	175

Bold values indicate exceedances

301809

TABLE 5-85: WILDLIFE SURVEY RESULTS *Mammals*
Hudson River
New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
						Mammals
Hudsonia	2-Jun-99	Call/Fax	YES; spoke with on 6/2/999	Eric Kiviat, Executive Director; (914) 758-7273 (7274) OR (914) 758-7053; FAX: (914) 758-7033; EMAIL: kiviat@bard.edu; inside.bard.edu/specialprog/arch/hudsonia.html	He has no direct knowledge of the upper Hudson but provided names	RIVER OTTER: very rare; he has only seen one on the Hudson in 30 years RACCOON: Fur bearer unit - NYSDEC; trapper prices currently very low so may not have information LITTLE BROWN BAT: Endangered species Unit - Allen Hicks (Delmar NYSDEC Endangered Species) NYSDEC - Natural Resource Damage Assessment
NYS Department of Environmental Conservation - Endangered Species Unit	3-Jun-99	Call	Yes	Al Hicks (Mammal Biologist) (518) 478-3056; www.dec.state.ny.us	Left Message - Will call back	
The New York River Otter Project	2-Jun-99	Email	No	Dennis Money, Dennis_Money@rge.com; www.nyotter.org	Left Message - Will call back	
Professional Trapper	4-Jun-99	Call	No	Jim Comstock	Left Message - Will call back	
New York State Trappers Association	4-Jun-99	Email	Yes	Jerry Leggieir (montcalm@earthlink.net)	Asked me to give him a call at night; also suggested that I call Everett Nack (518) 851-2901 - a commercial fisherman on the river	
Professional Fisherman on the Hudson				Everett Nack (518) 851-2901	Recommended by Jerry Leggieir	
NYSDEC	16-Jun-99	Call	Yes	Mark Brown (518) 623-3671	Familiar with the area regarding mammals, birds, and herps. Good source. See General Info page.	Otter, Mink, Musk Rat present. PCB contamination reduced their numbers severly but in the past 10 years, they have rebounded after clean-up work. Has also seen raccoon, short and long tail weasels, big and little brown bat, skunk, oppossum. The red fox, grey fox, and coyote especially common in the northern Hudson, and plenty of white tail deer suggesting no bears.

301810

TABLE 5-85: WILDLIFE SURVEY RESULTS Mammals

Hudson River

New York

Information Source	Date	Contact	Response	Contact Information	Data Available	Information/Findings
Ndakinna Wilderness Project	6/3/1999 6/16/99	Email Call Call	No No Yes	Jim Brushek (518) 583-9980x3, 23 Middle Grove Road, Greenfield Center, NY 12833; Received address from Saratoga County Information - Annamaria Dalton (annamaria@spa.net)	Professional Tracker	Quite a few otter. Mink numbers are large and increasing. Tons of raccoons ("road-kill count is staggering"). Some musk rat. Lots of beavers. Very recent reports of moose in the center of Saratoga, about 5 miles from Hudson. He expects moose to inhabit the Hudson very soon but he thinks they are already there. Sees fisher cats cruising the water occassionally. Frequently sees red fox, grey fox , and deer visiting the water. The coyote population is very large. Coyotes and foxes will feed on the smaller aquatic mammals. Sees the occassional black bear.

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Figures

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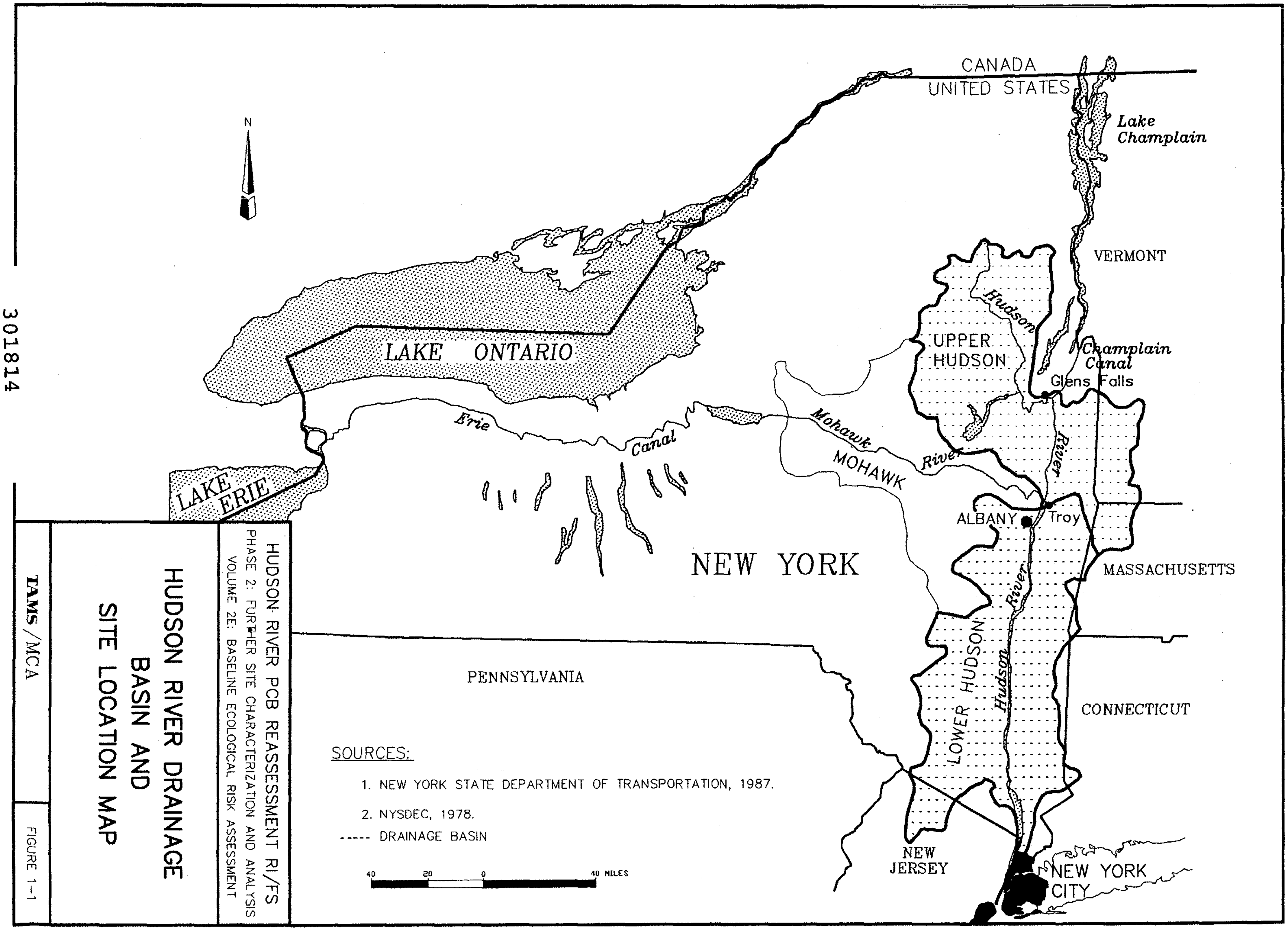


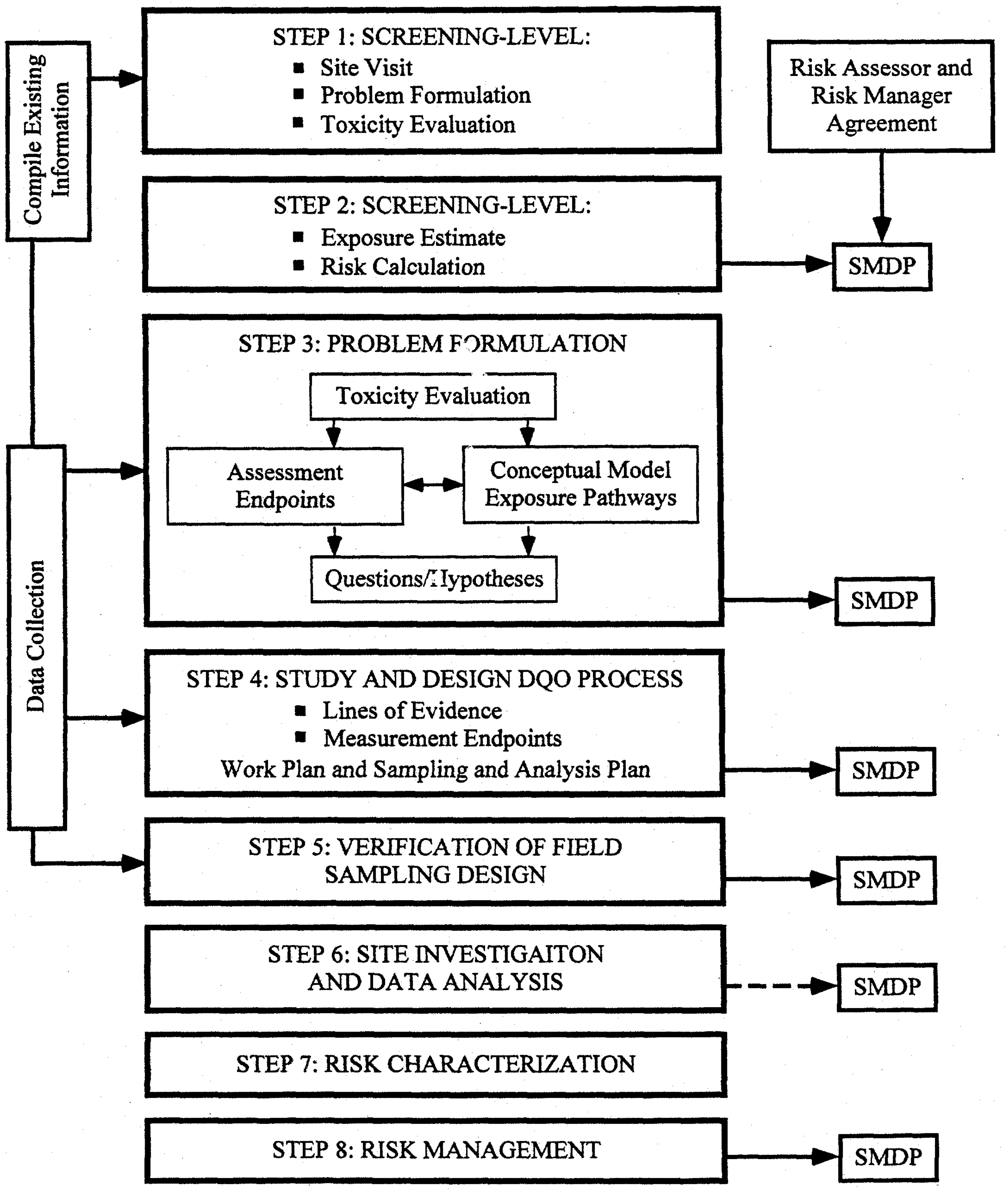
HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

HUDSON RIVER DRAINAGE BASIN AND SITE LOCATION MAP

TAMS/MCA

FIGURE 1-1

Figure 1-2
Eight-Step Ecological Risk Assessment Process for Superfund
Hudson River PCB Reassessment
Ecological Risk Assessment



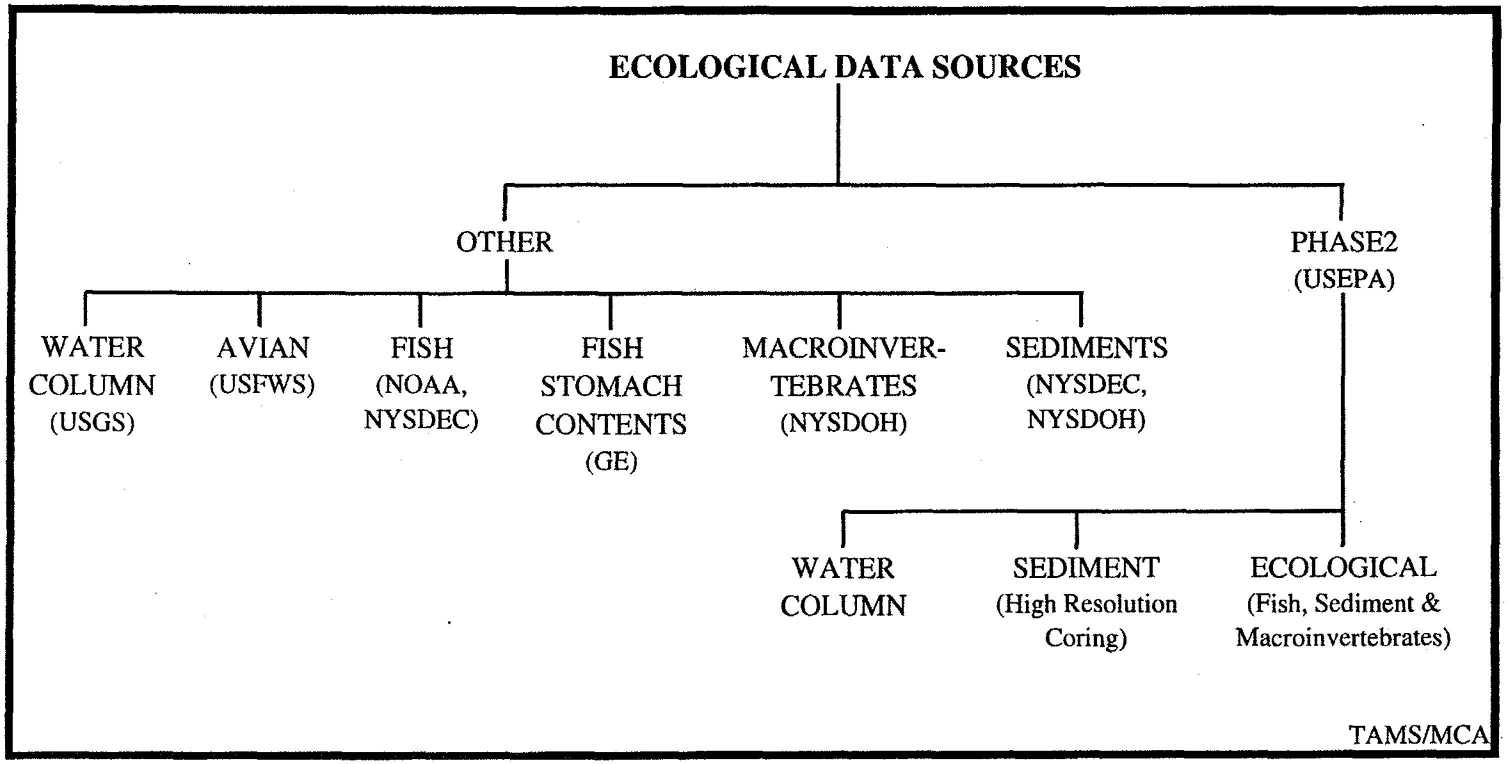
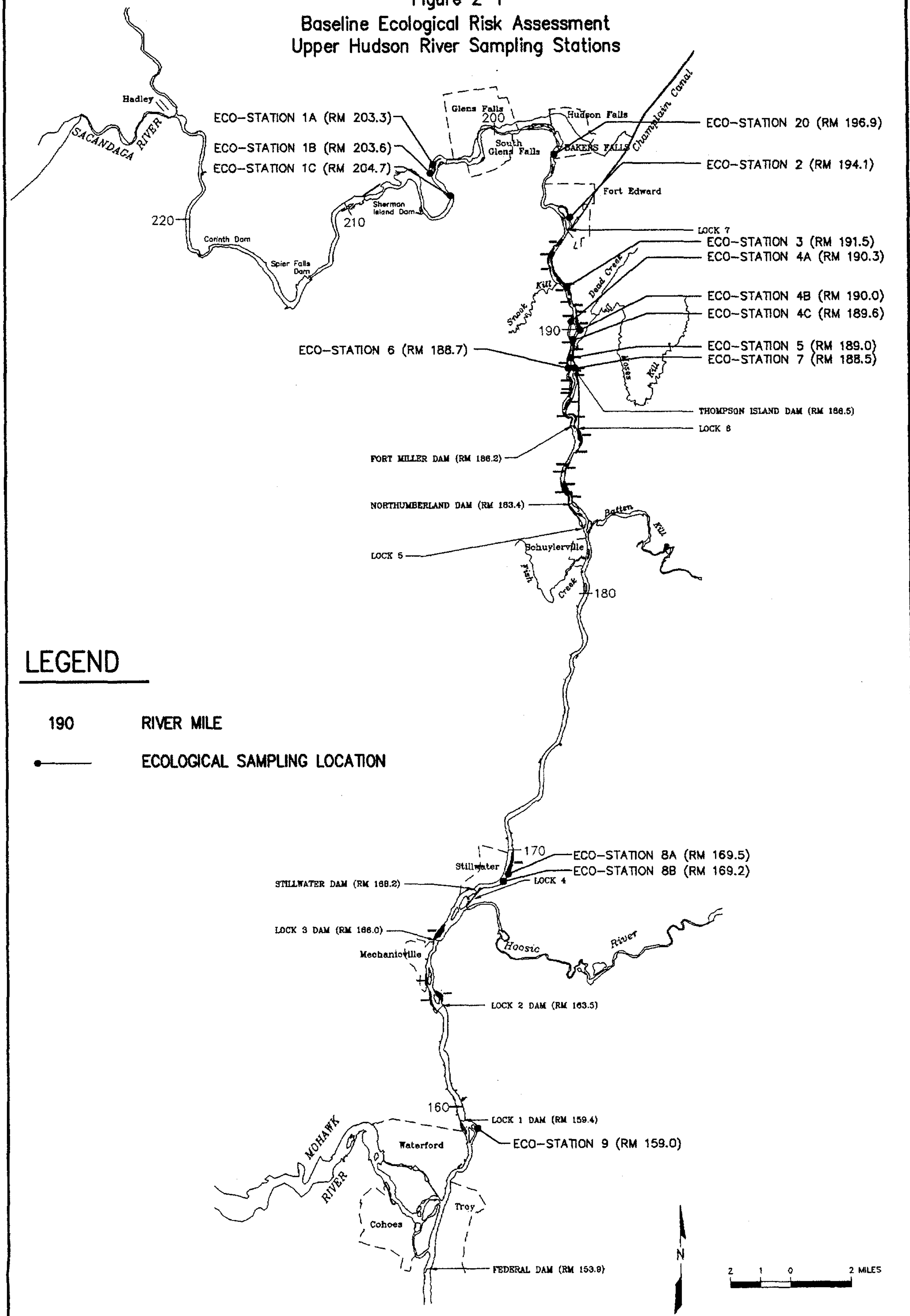


Figure 1-3
Hudson River ERA Data Sources

Figure 2-1
Baseline Ecological Risk Assessment
Upper Hudson River Sampling Stations



SOURCE: Reassessment Database

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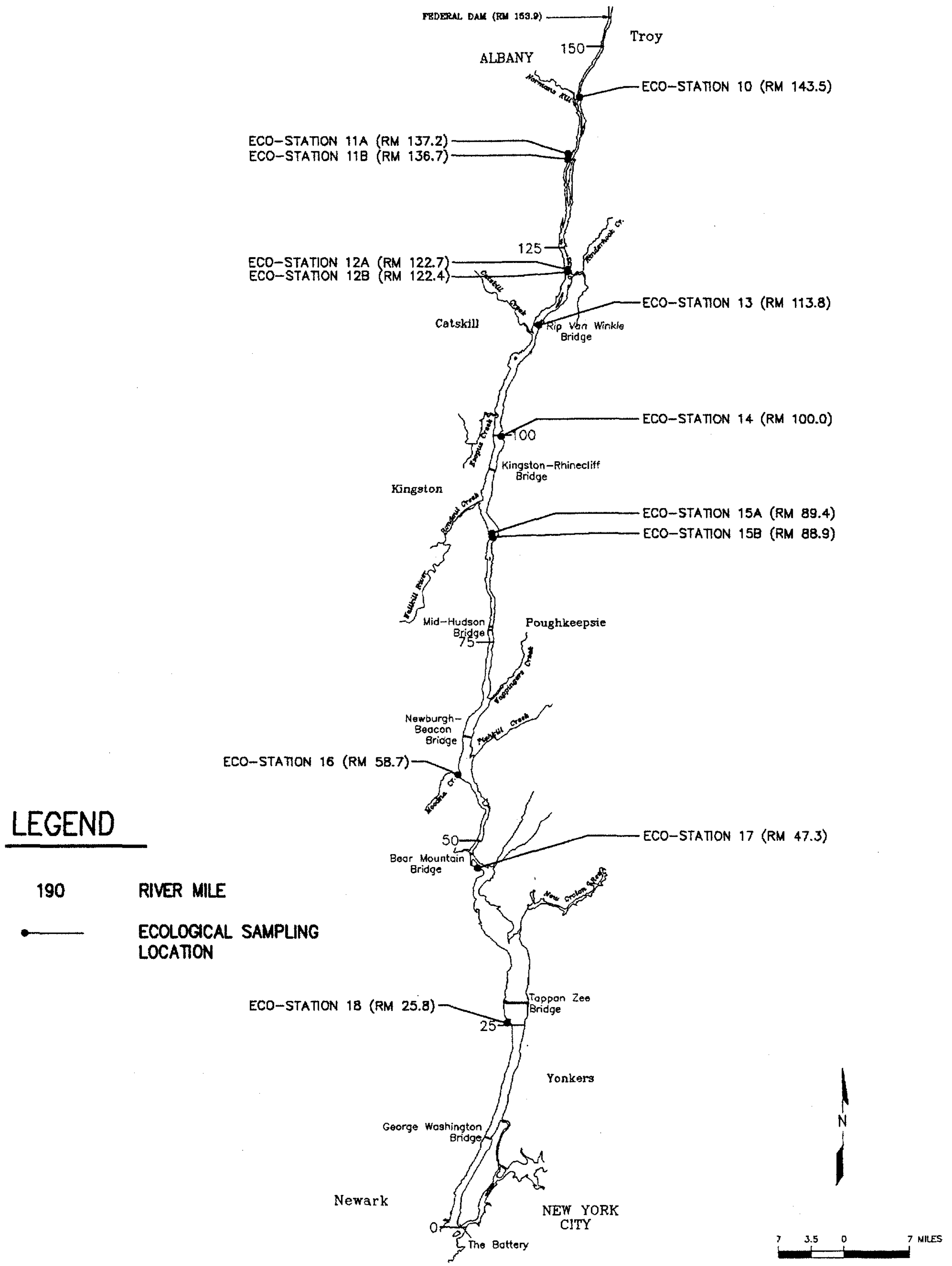
Figure 2-2
Baseline Ecological Risk Assessment
Lower Hudson River Sampling Stations



SOURCE: Reassessment Database

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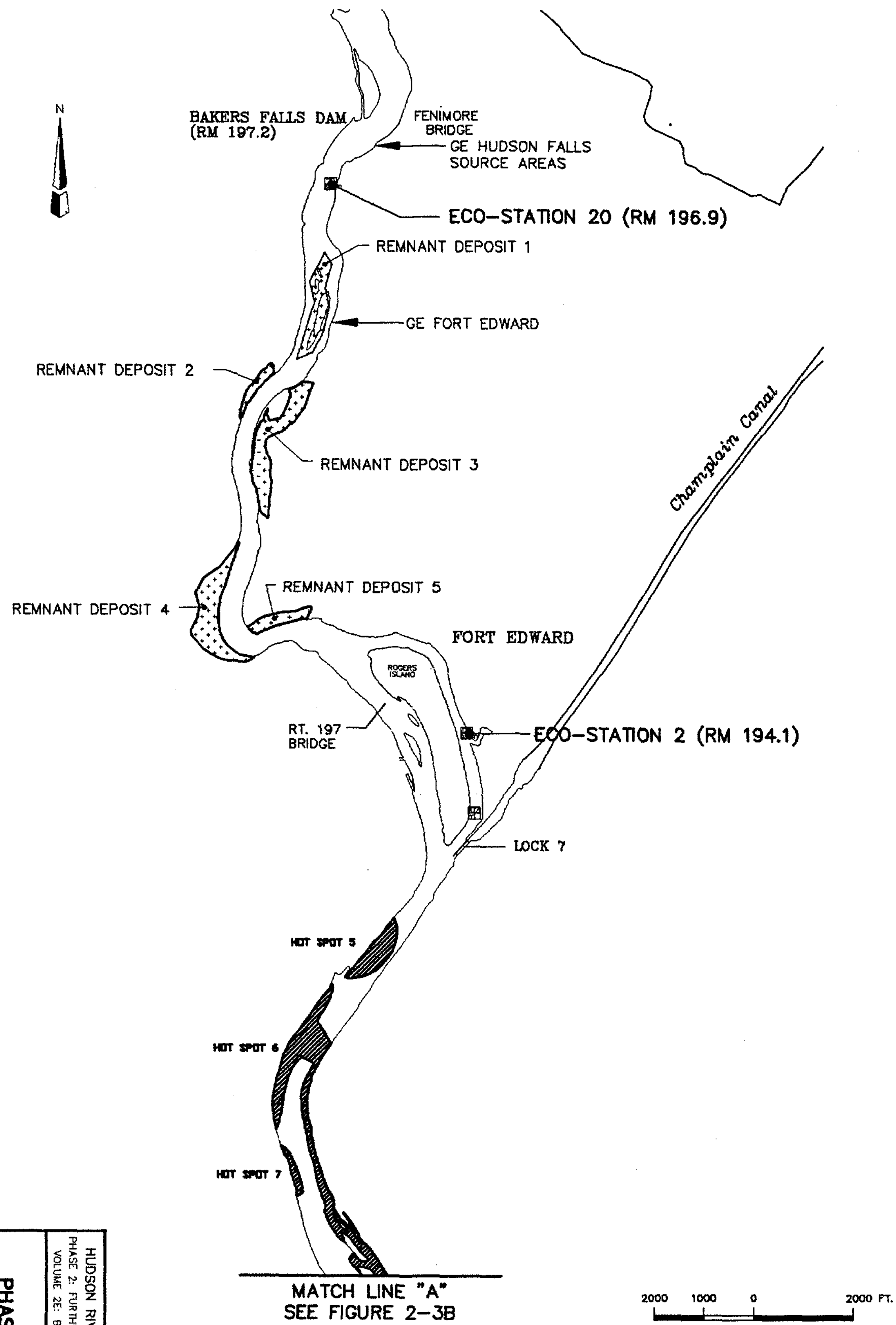

LEGEND:

●— ECOLOGICAL SAMPLING STATION

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

1. REMNANT DEPOSIT 1 AREA OBTAINED FROM NYSDEC (1993) AND AREAS 2, 3, 4, 5 OBTAINED FROM GENERAL ELECTRIC (CANONIE ENVIRONMENTAL, 1991).
2. HOT SPOTS 5 THROUGH 8 WERE DIGITIZED FROM NYSDEC'S "PCB RECLAMATION PROJECT" DRAWINGS (DECEMBER 1985) AT A SCALE OF 1" = 200'.
3. HOT SPOTS 1 THROUGH 4 (AROUND ROGERS ISLAND) ARE NOT SHOWN SINCE THEIR CONTINUED EXISTENCE IS UNCERTAIN DUE TO CHANNEL MAINTENANCE DREDGING SUBSEQUENT TO NYSDEC'S 1977/78 SAMPLING.

HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: Baseline ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

TAMS / MCA

FIGURE 2-3A

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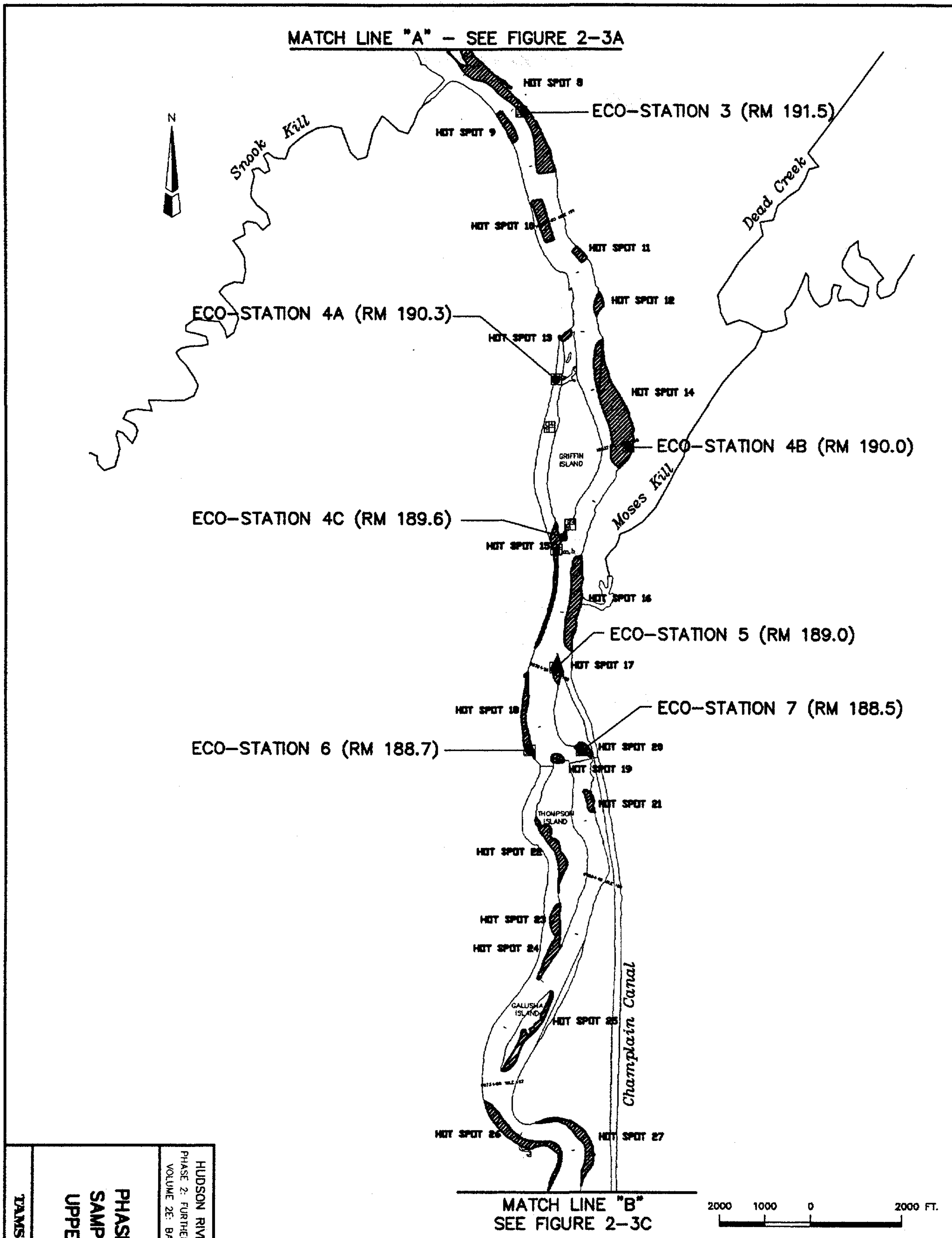


LEGEND:

●— ECOLOGICAL SAMPLING STATION

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

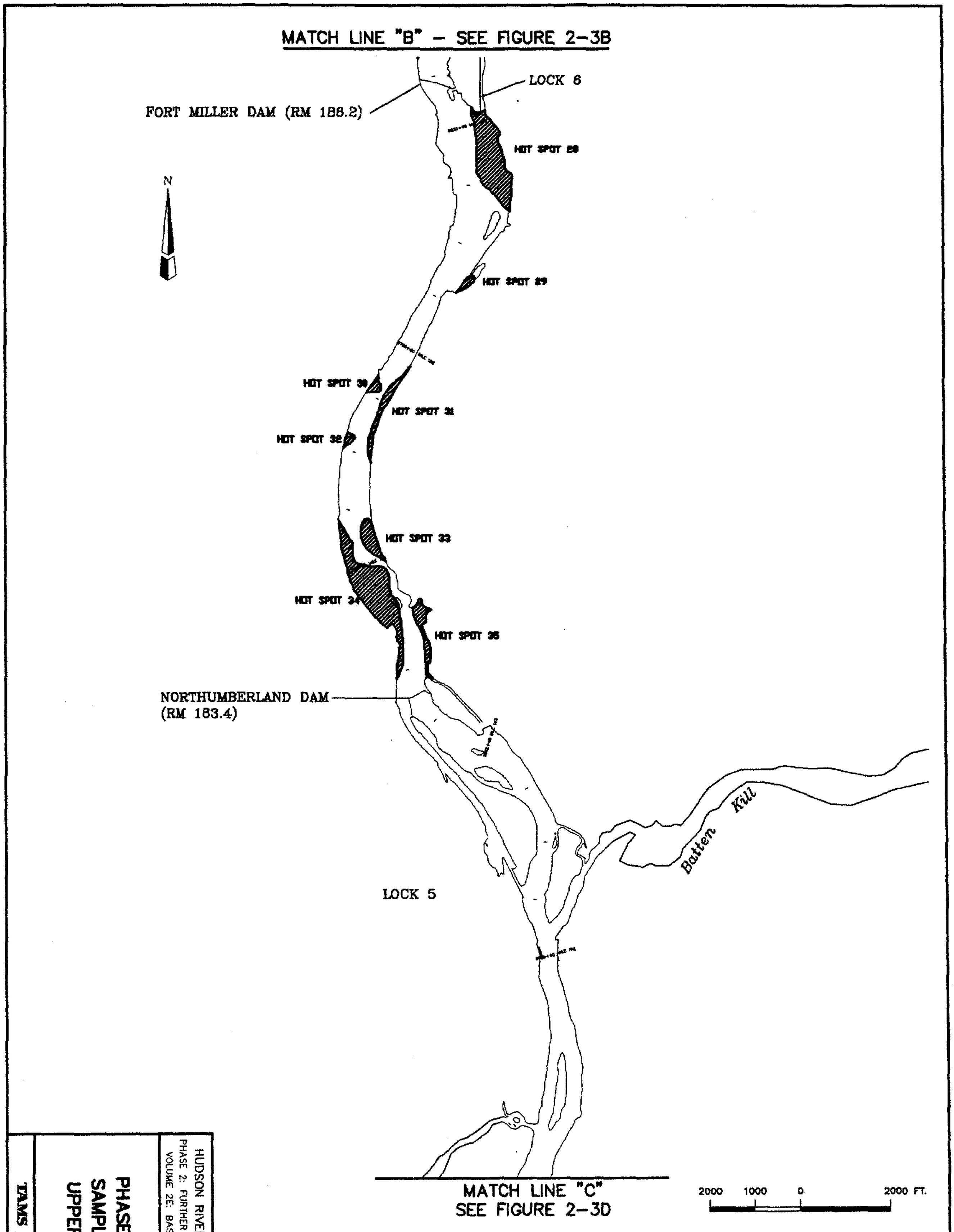
1. HOT SPOTS 8 THROUGH 20 WERE DIGITIZED FROM NYSDEC'S "PCB RECLAMATION PROJECT" DRAWINGS (DECEMBER 1985) AT A SCALE OF 1" = 200'.
2. HOT SPOTS 21 THROUGH 27 WERE DIGITIZED FROM NUS CORPORATION'S "UPPER HUDSON RIVER AREA" DRAWINGS (APRIL 1984) AT A SCALE OF 1-1/4" = 1 MILE.

HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

TAMS / MCA

FIGURE 2-3B



HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

TAMS / MCA

FIGURE 2-3C

LEGEND:

●— ECOLOGICAL SAMPLING STATION

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

1. HOT SPOTS 28 THROUGH 35 WERE DIGITIZED FROM NUS CORPORATION'S "UPPER HUDSON RIVER AREA" DRAWINGS (APRIL 1984) AT A SCALE OF 1-1/4" = 1 MILE.

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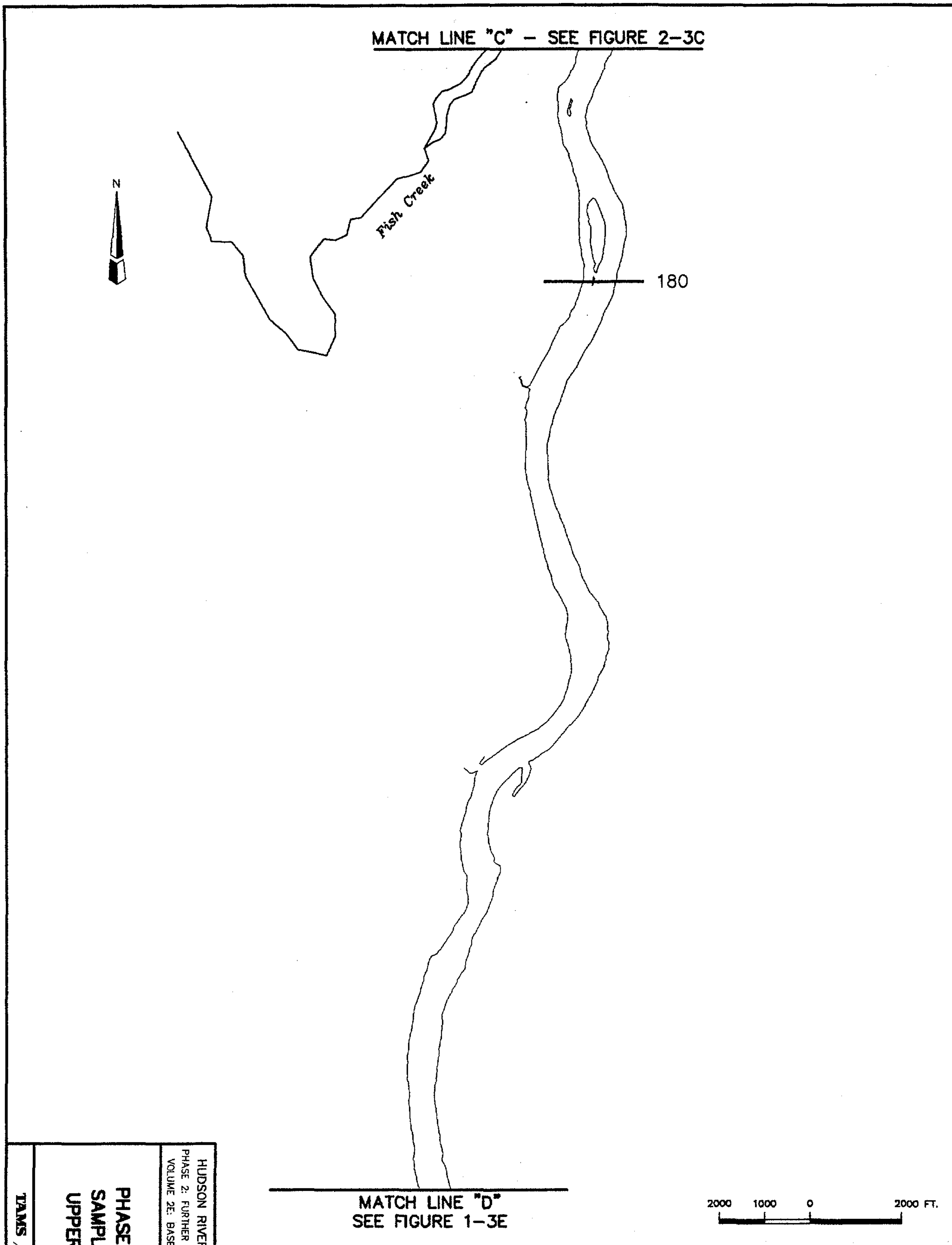

HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

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FIGURE 2-3D

LEGEND:

180 RIVER MILE (RM) UPSTREAM OF THE BATTERY

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

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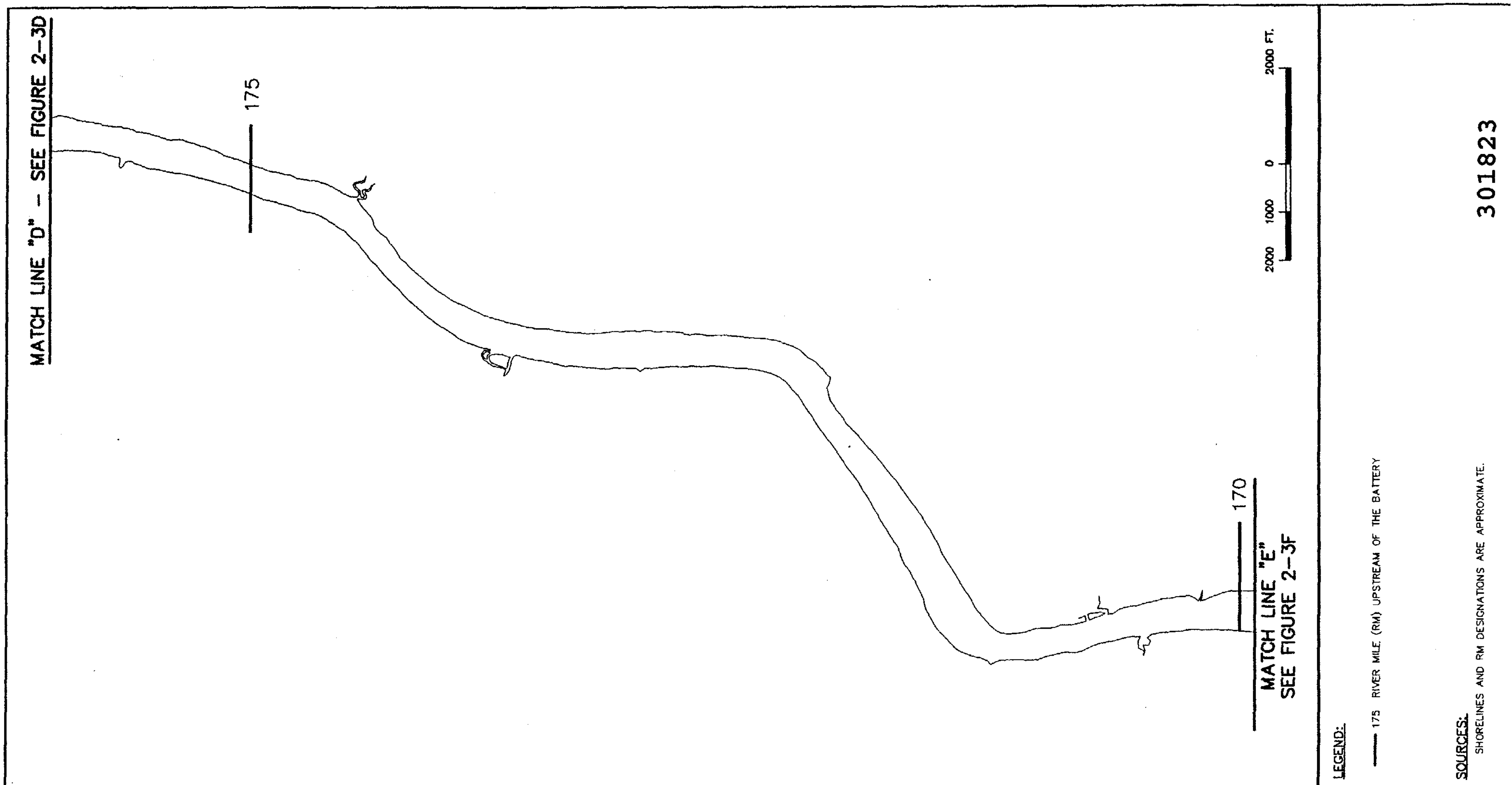

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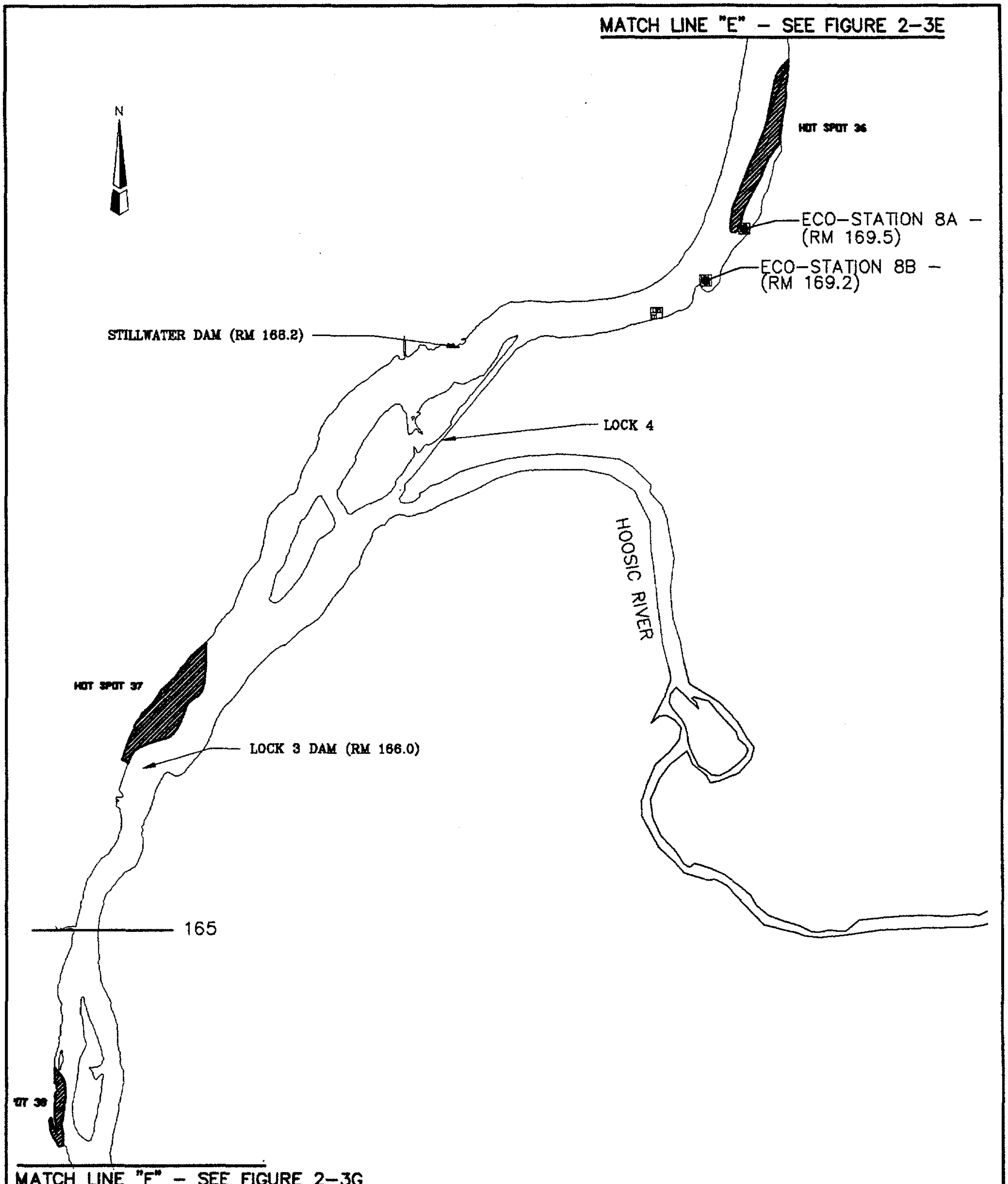
HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

TAMS / MCA

FIGURE 2-3



HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

TAMS / MCA

FIGURE 2-3F

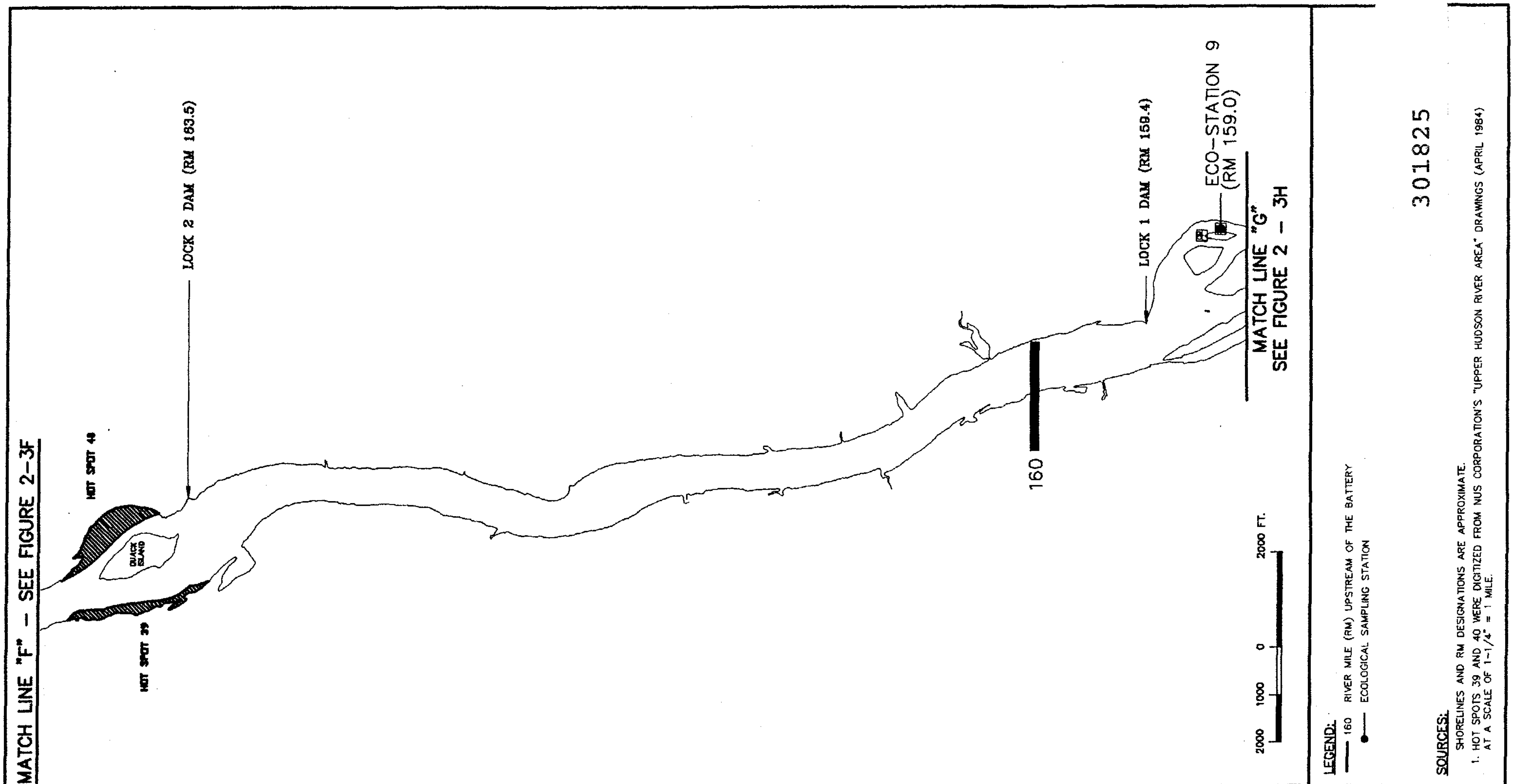
LEGEND:

- 165 RIVER MILE (RM) UPSTREAM OF THE BATTERY
- ECOLOGICAL SAMPLING STATION

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

1. HOT SPOTS 36 THROUGH 38 WERE DIGITIZED FROM NUS CORPORATION'S "UPPER HUDSON RIVER AREA" DRAWINGS (APRIL 1984) AT A SCALE OF 1-1/4" = 1 MILE.



HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL AND SAMPLING LOCATIONS– UPPER HUDSON RIVER

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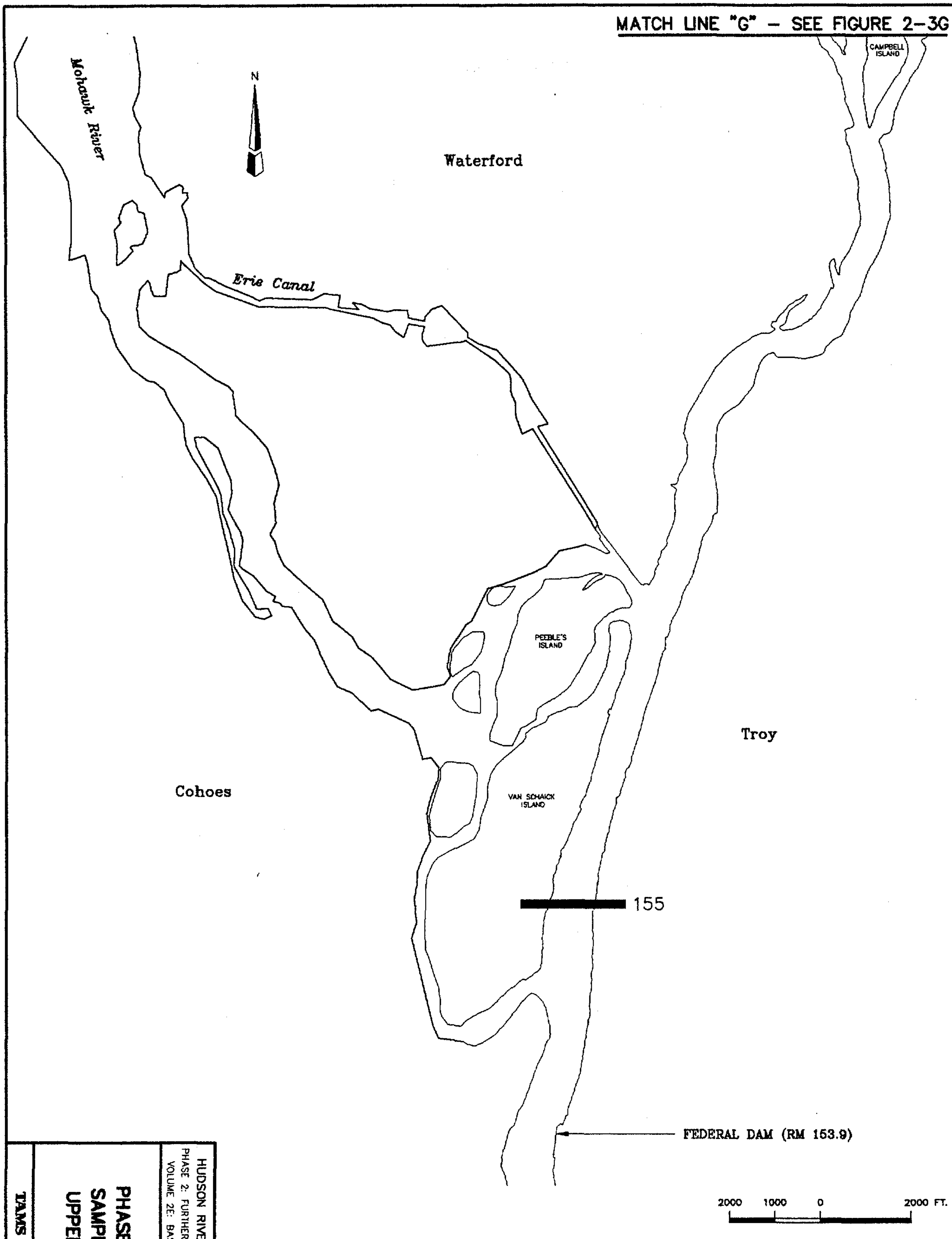
FIGURE 2-3G



HUDSON RIVER PCB REASSESSMENT RI/FS
PHASE 2: FURTHER SITE CHARACTERIZATION AND ANALYSIS
VOLUME 2E: BASELINE ECOLOGICAL RISK ASSESSMENT

PHASE 2 ECOLOGICAL SAMPLING LOCATIONS– UPPER HUDSON RIVER

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FIGURE 2 – 3H

LEGEND:

155 RIVER MILE (RM) UPSTREAM OF THE BATTERY

SOURCES:

SHORELINES AND RM DESIGNATIONS ARE APPROXIMATE.

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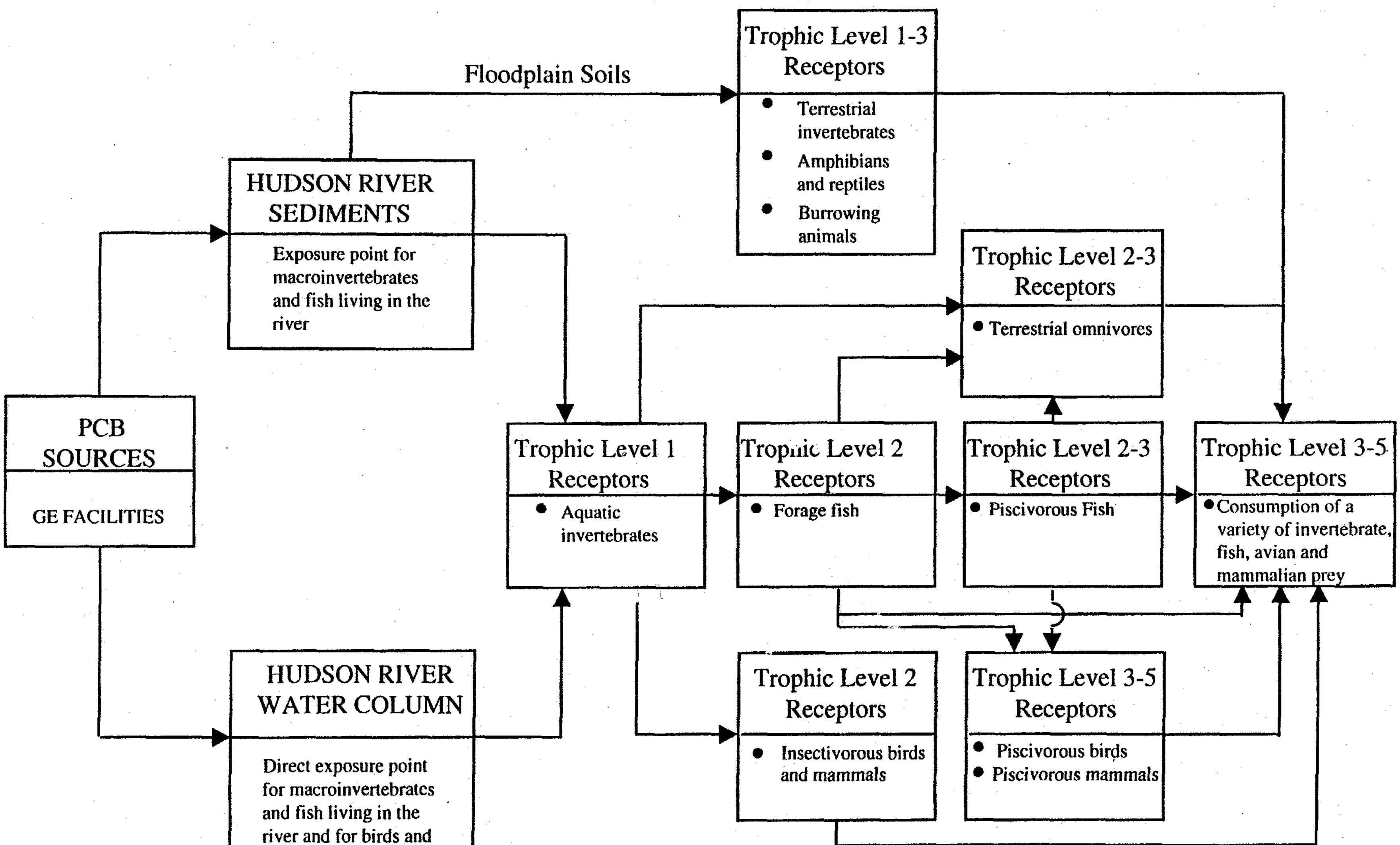
Figure 2-4
Hudson River PCB Reassessment
Conceptual Model Diagram Including Floodplain Soils



Notes:
1. All receptors may be directly exposed to river water and sediments.
2. Trophic levels are provided as a general guide to bioaccumulation potential, but vary according to species and food availability.

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FIGURE 3-1: AVERAGE WET WEIGHT PCB CONCENTRATIONS IN SELECTED FISH SPECIES BASED ON NYSDEC DATA

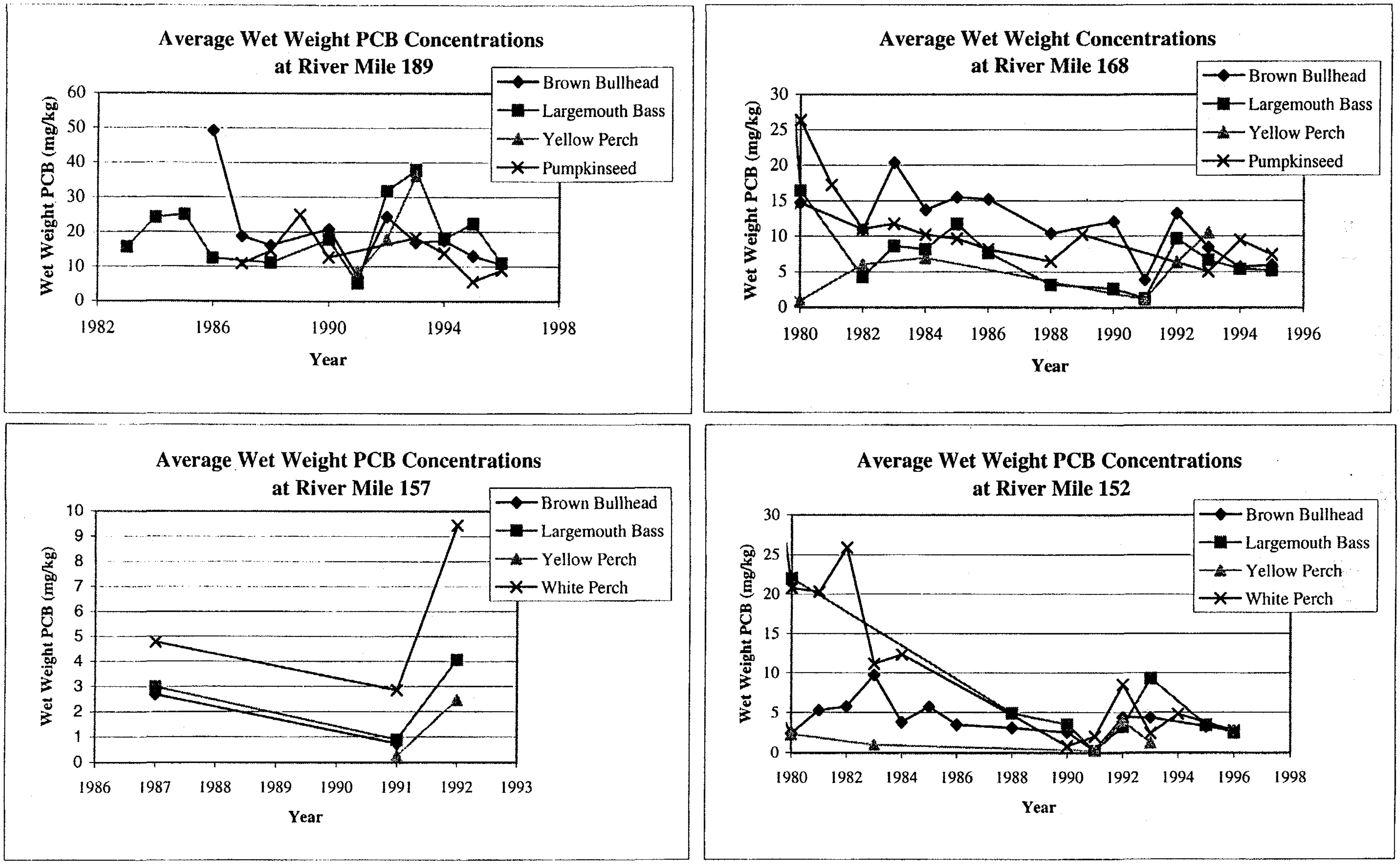
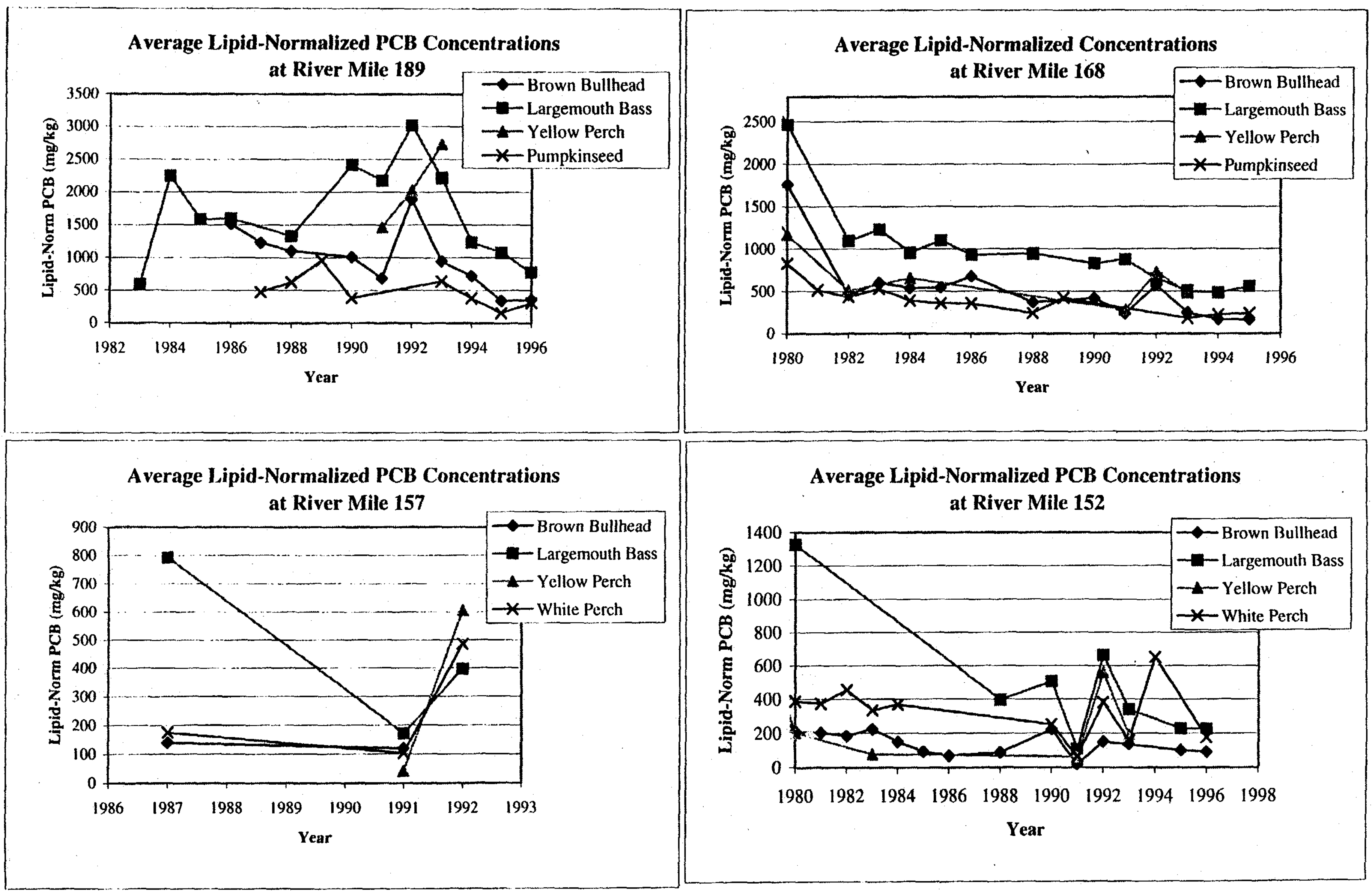


FIGURE 3-2: AVERAGE LIPID-NORMALIZED PCB CONCENTRATIONS IN SELECTED FISH SPECIES BASED ON NYSDEC DATA



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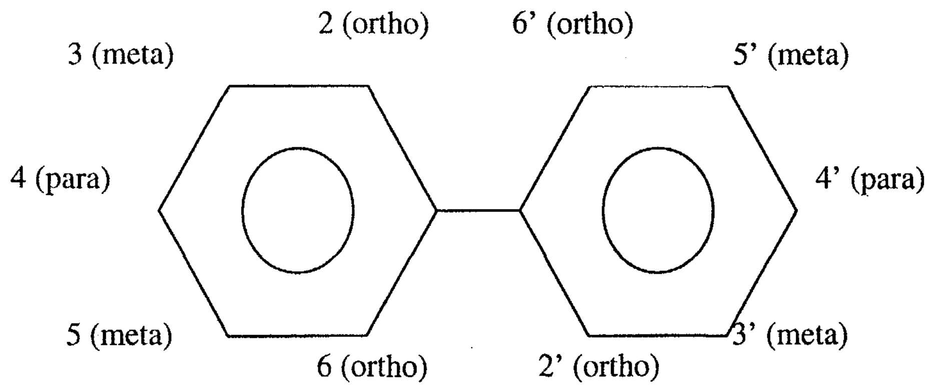

Figure 4-1: Shape of Biphenyl and Substitution Sites

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Figure 4-2

Selected Fish Aroclor and Total PCB Toxicity Endpoints

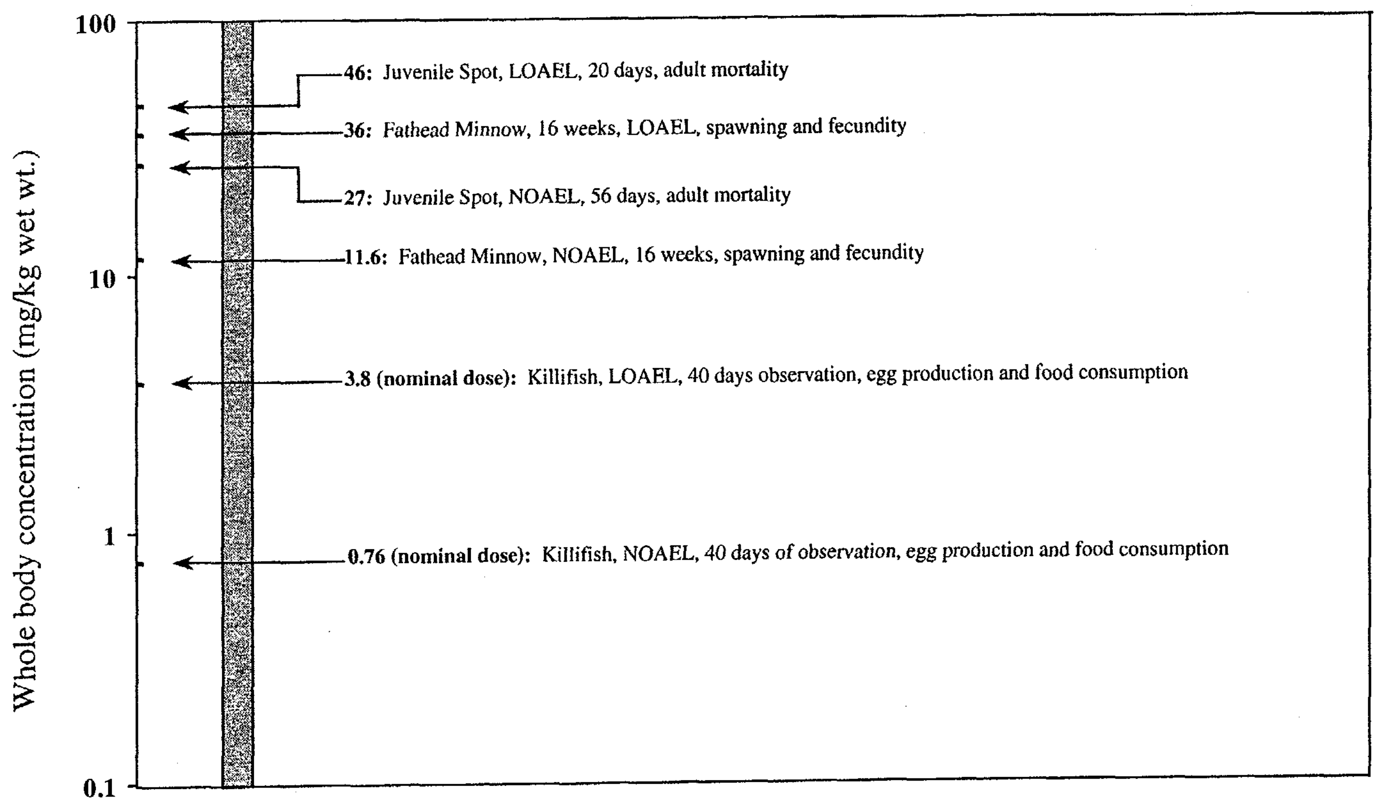

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Figure 4-3
Selected Fish Egg Dioxin Equivalent Toxicity Endpoints

Endpoint: Early Life Stage Mortality

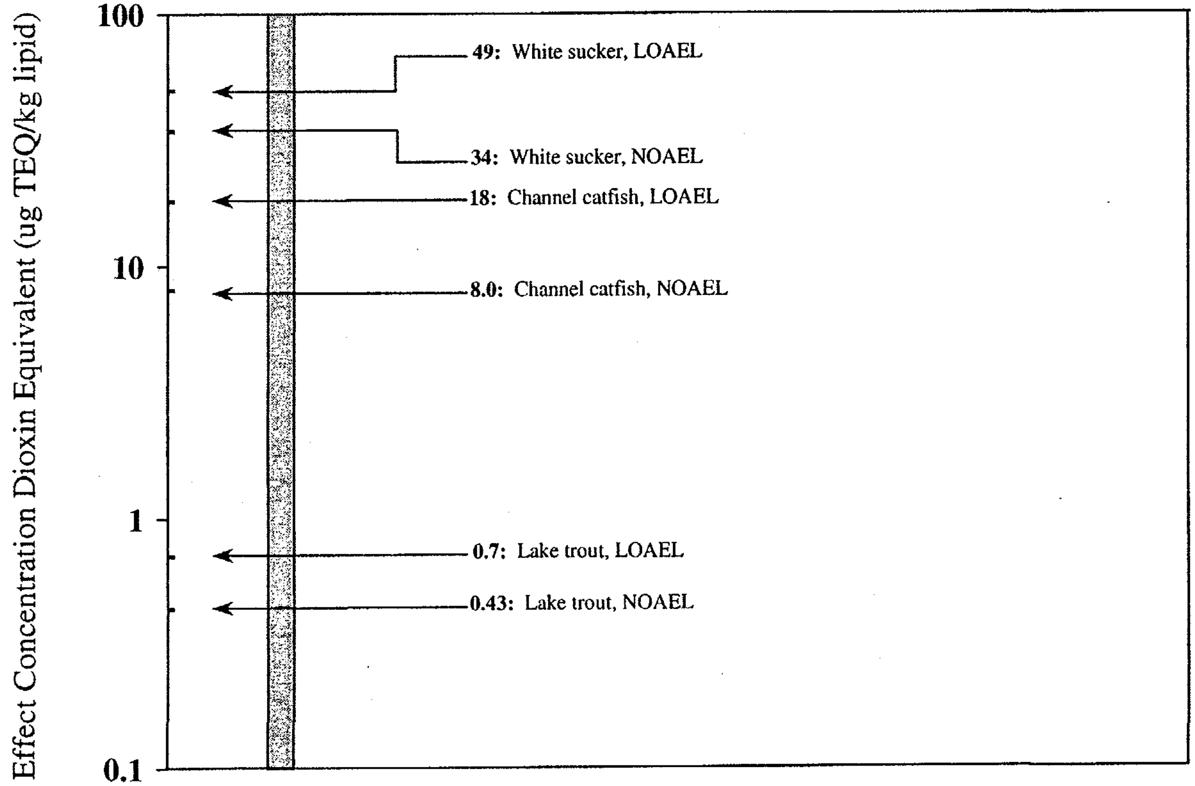

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Figure 4-4
Selected Bird Diet Aroclor and Total PCB Toxicity Endpoints

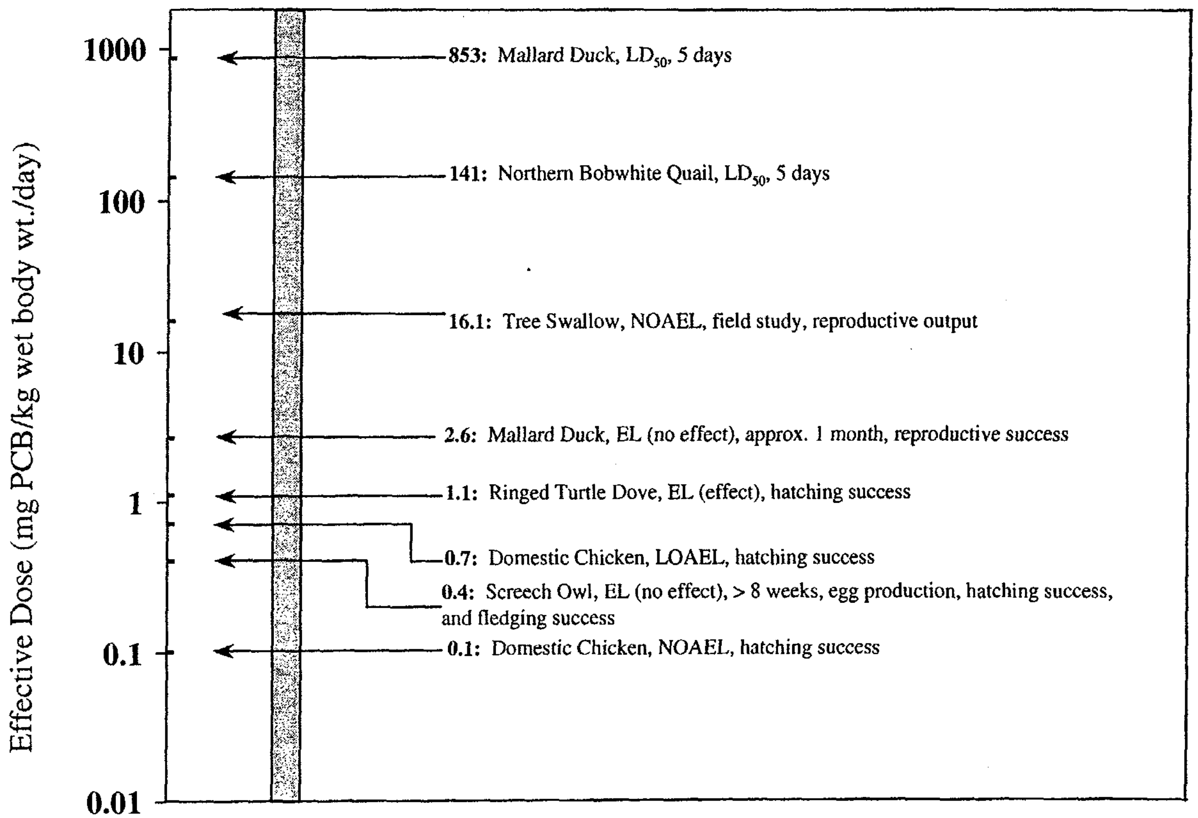

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Figure 4-5
Selected Bird Diet Dioxin Equivalent Toxicity Endpoints

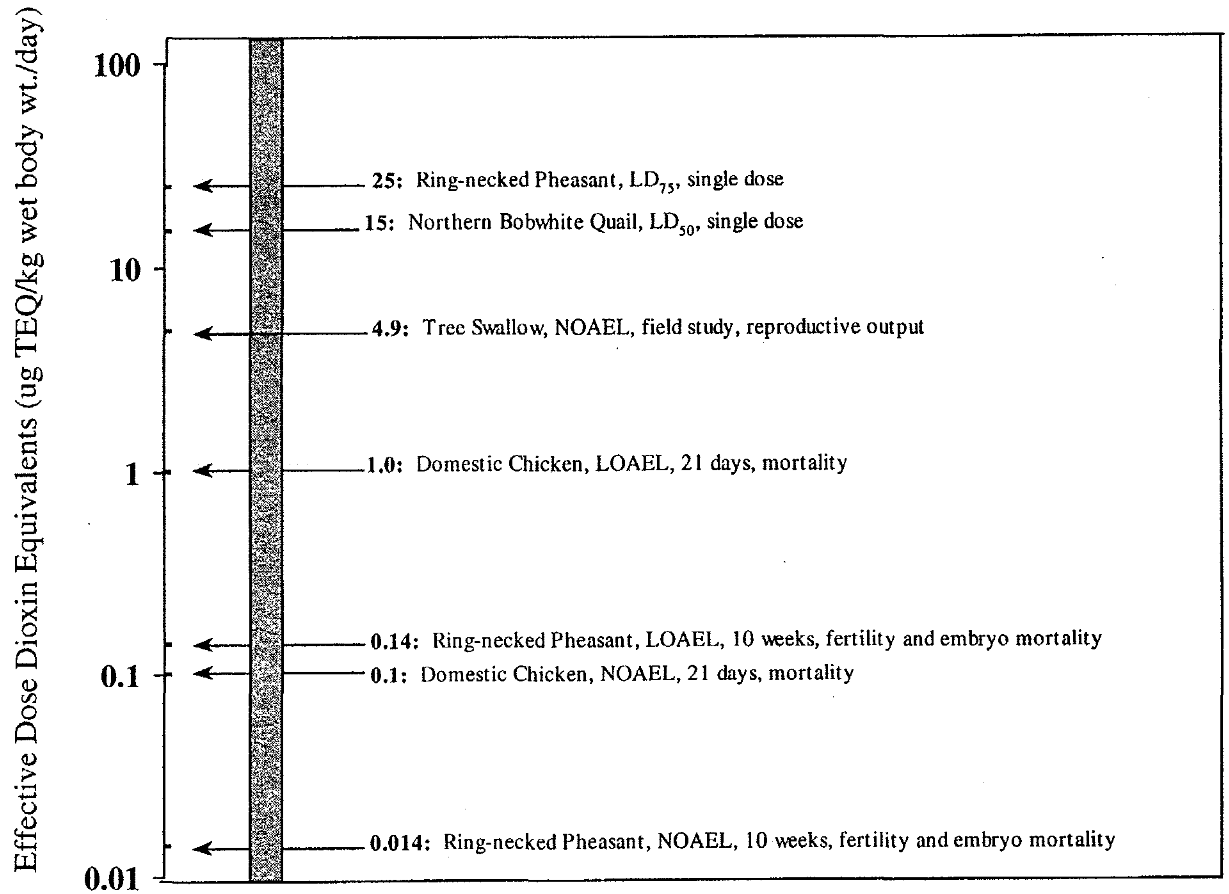

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Figure 4-6
Selected Bird Egg Aroclor and Total PCB Toxicity Endpoints

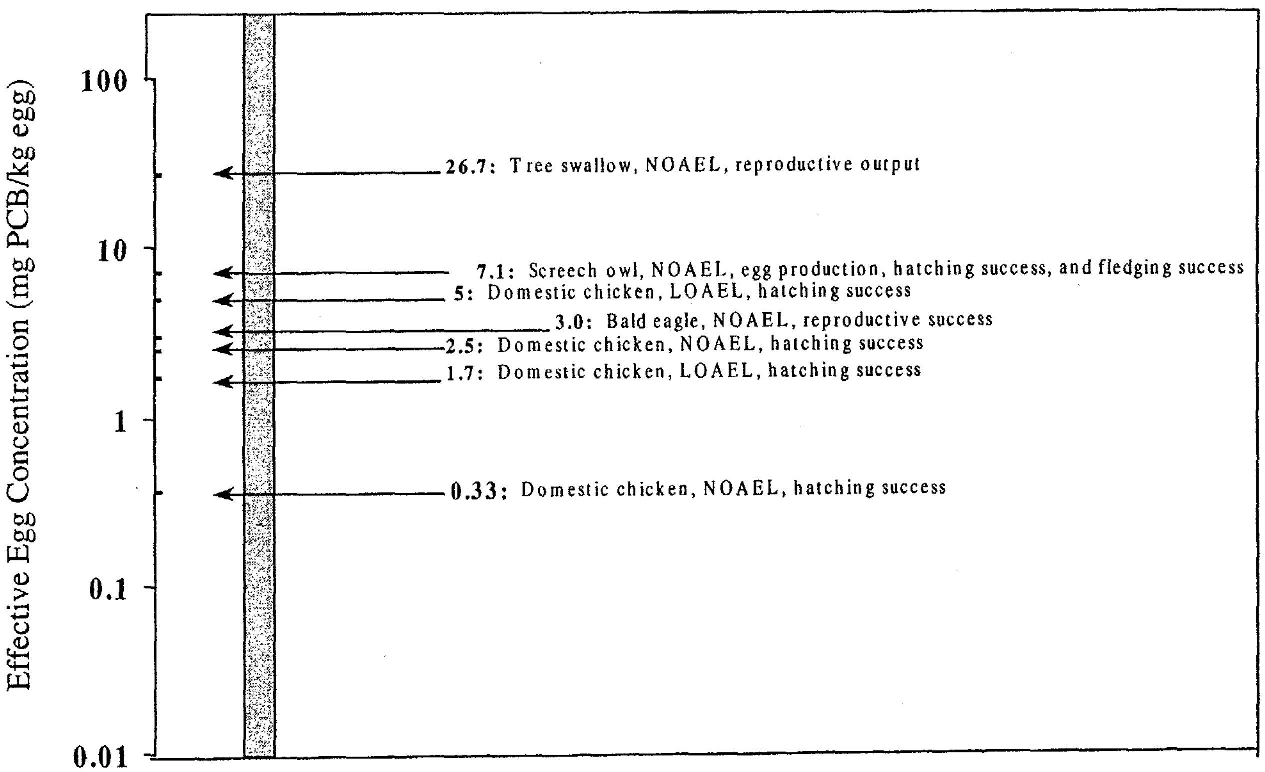

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Figure 4-7
Selected Bird Egg Dioxin Equivalent Toxicity Endpoints

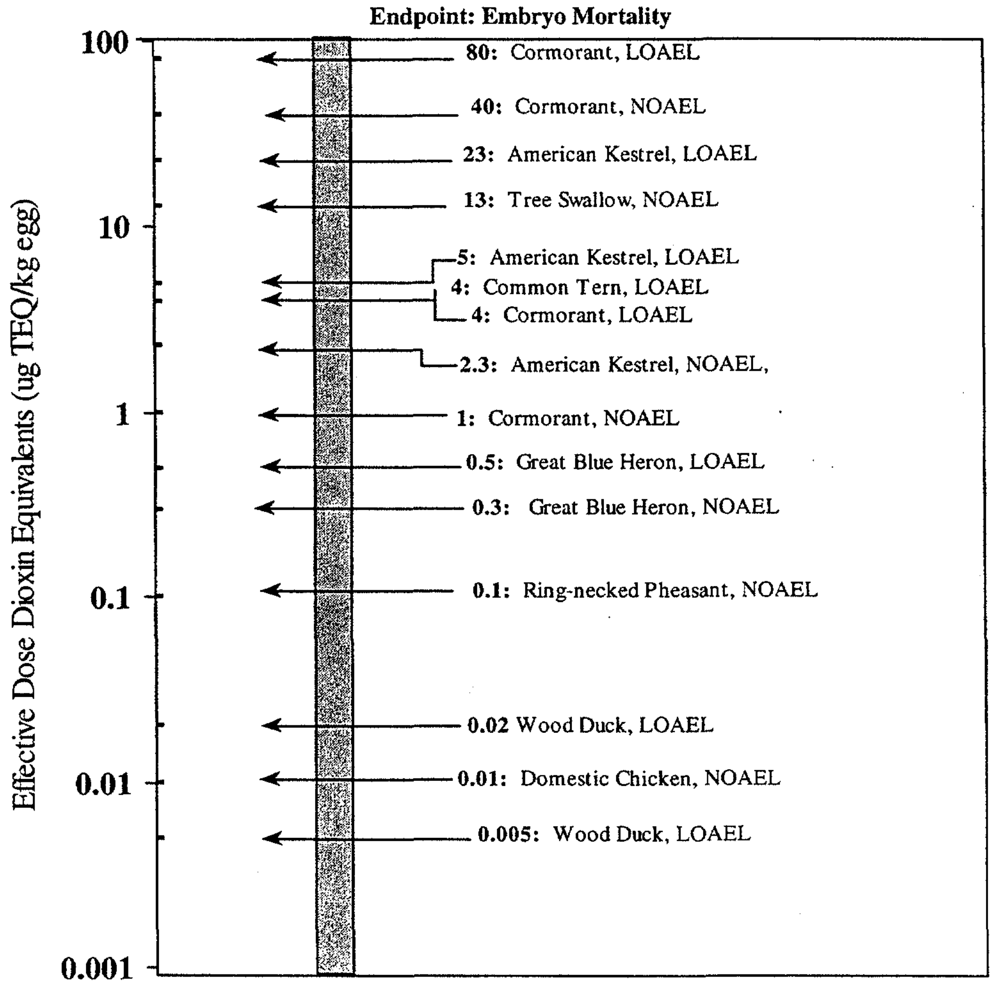

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Figure 4-8
Selected Mink Aroclor and Total PCB Toxicity Endpoints

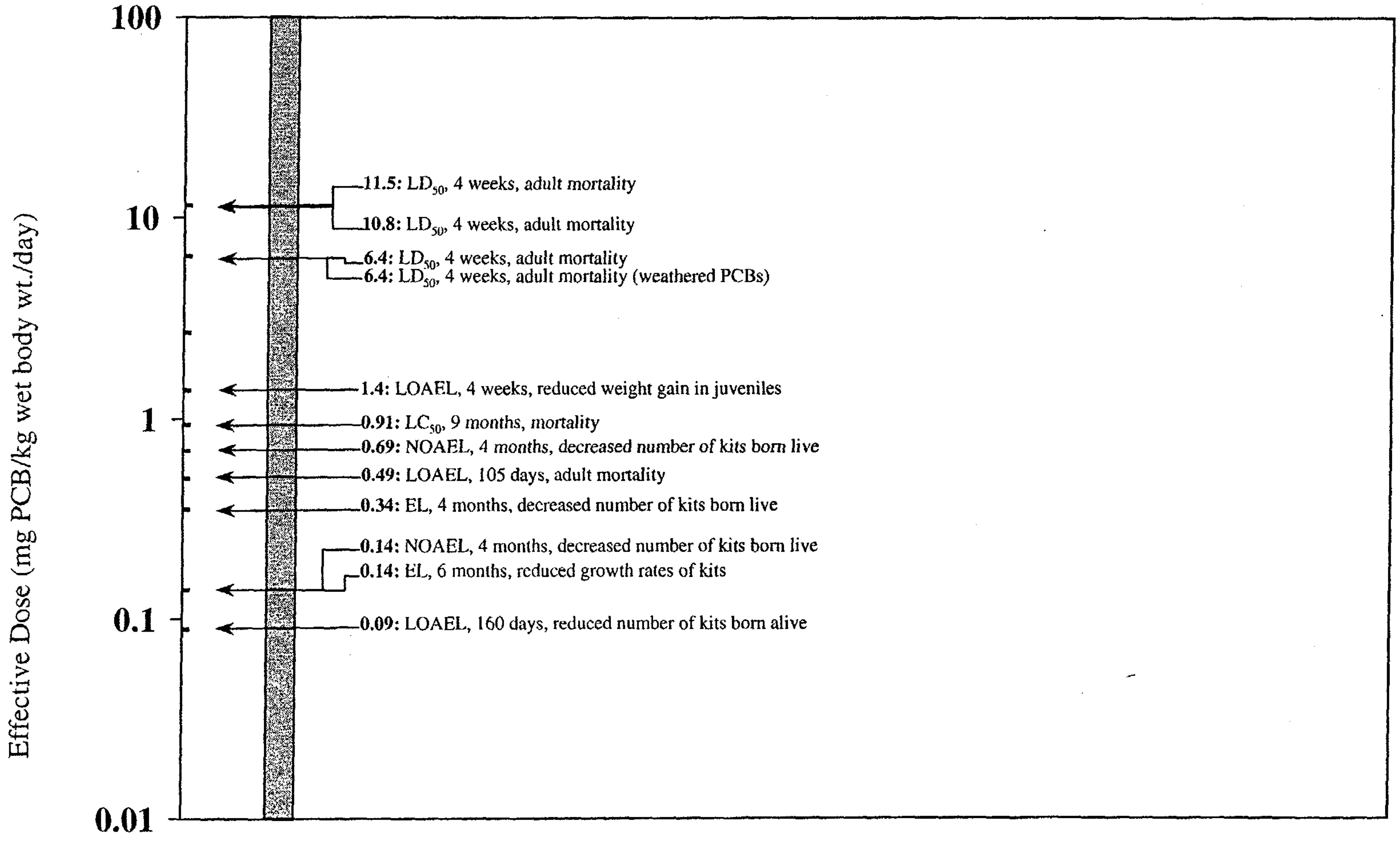

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Figure 4-9
Selected Mammal Aroclor and Total PCB Toxicity Endpoints

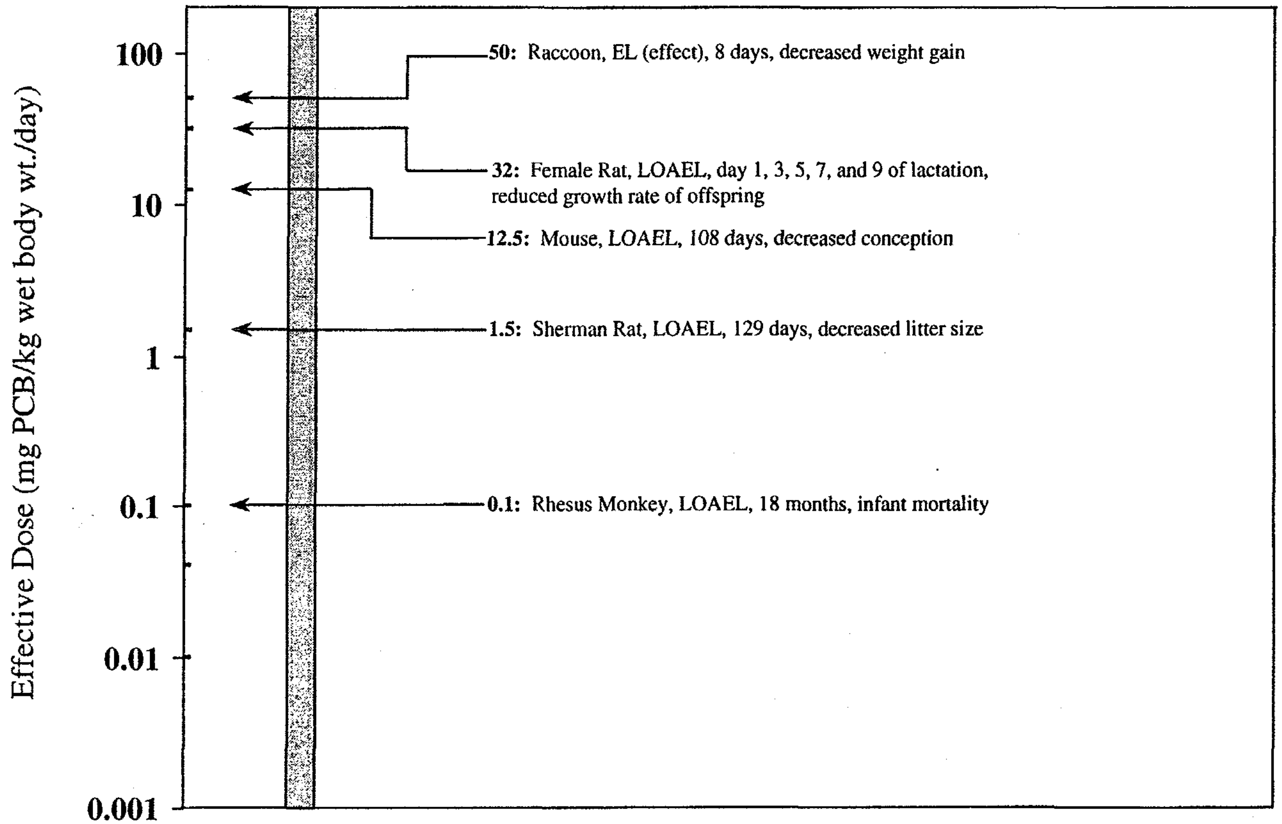

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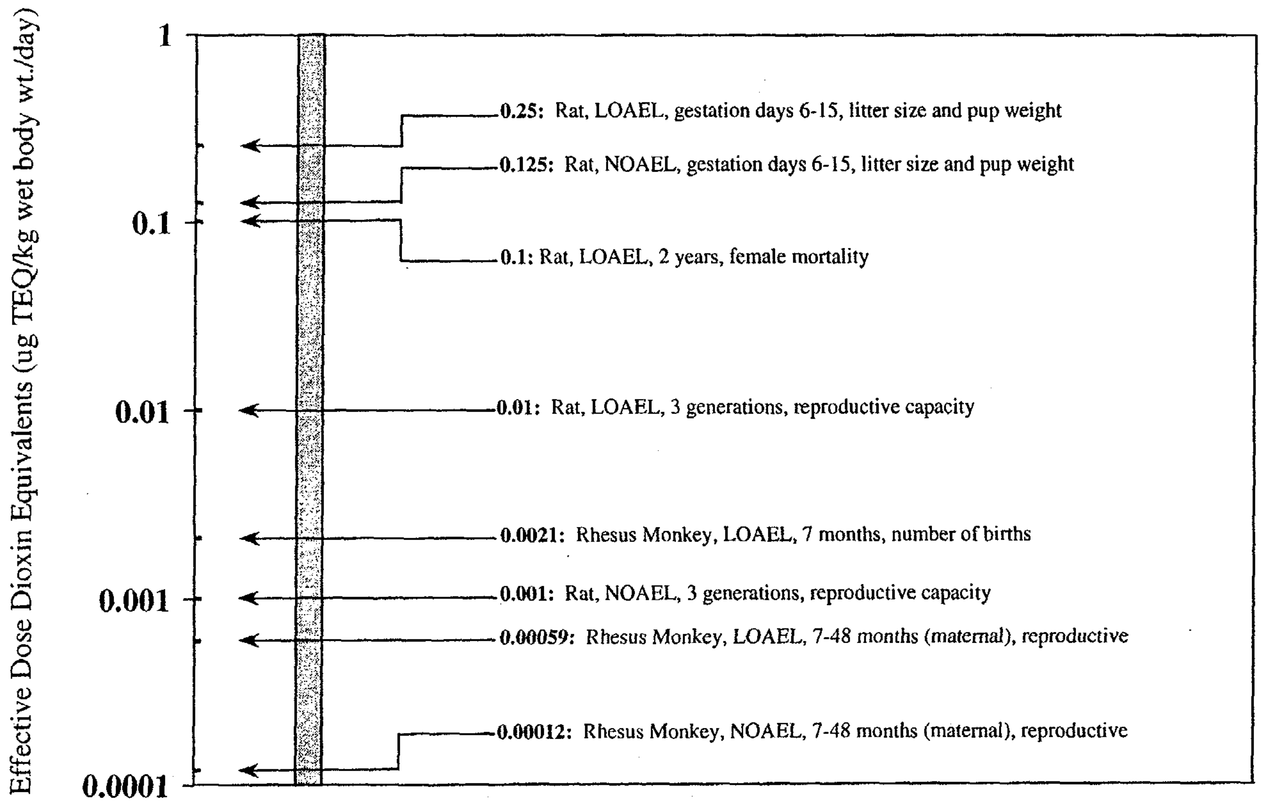
Figure 4-10
Selected Mammal Dioxin Equivalent Toxicity Endpoints



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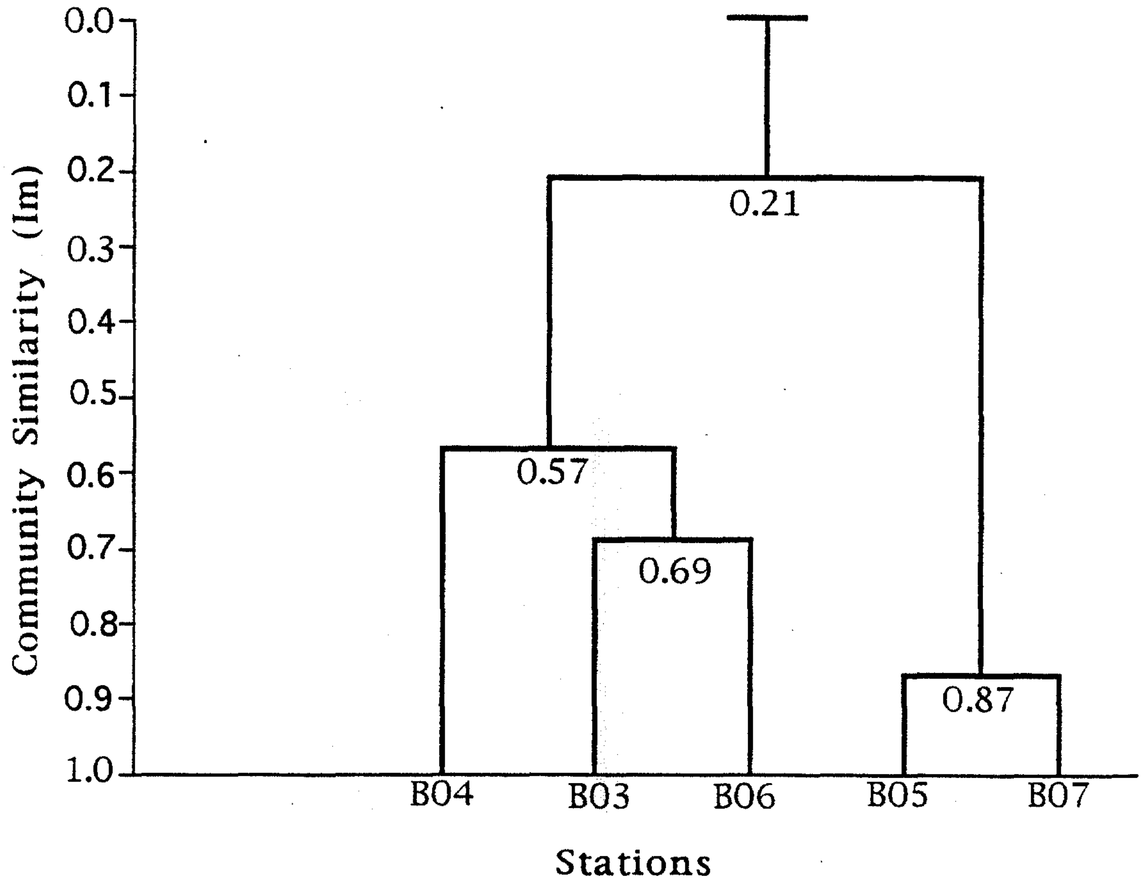

Note: The dendrogram is based on Morista's Index (I_m) of community similarity and the computed fusion value of each junction is given.

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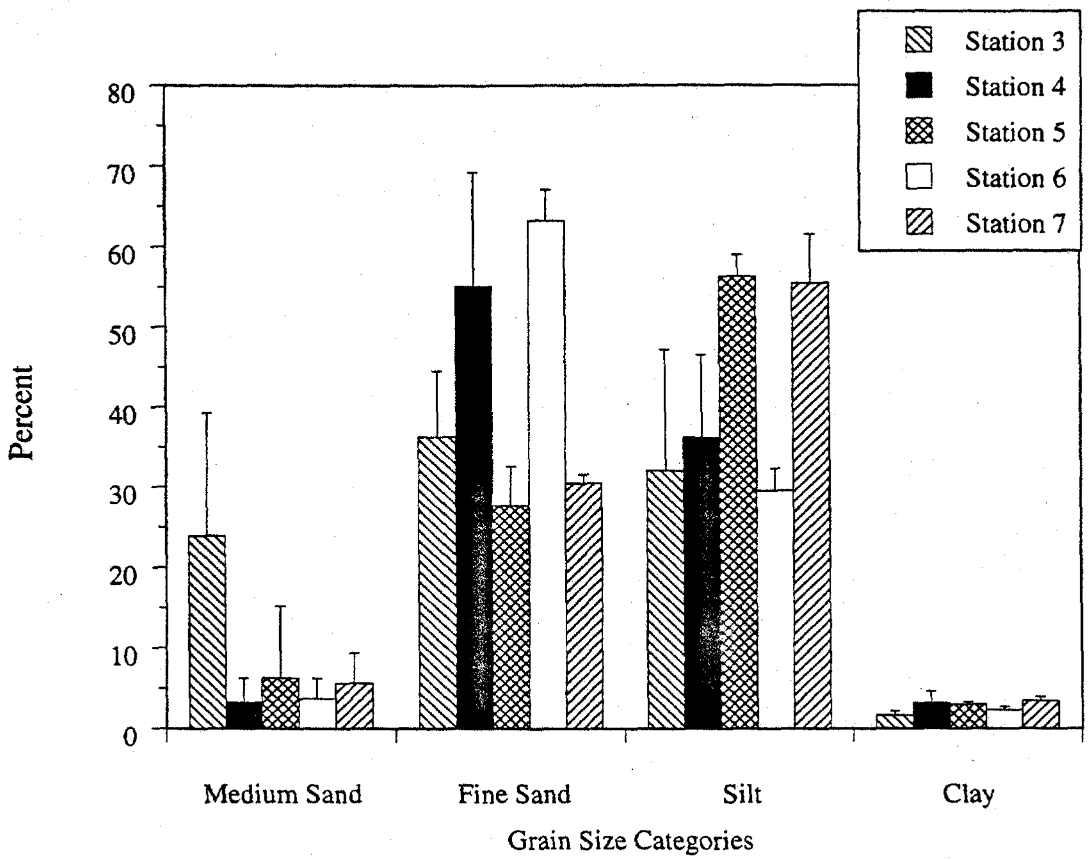
Figure 5-1
Complete Linkage Clustering - TI Pool



Note: Error bars represent one standard deviation.

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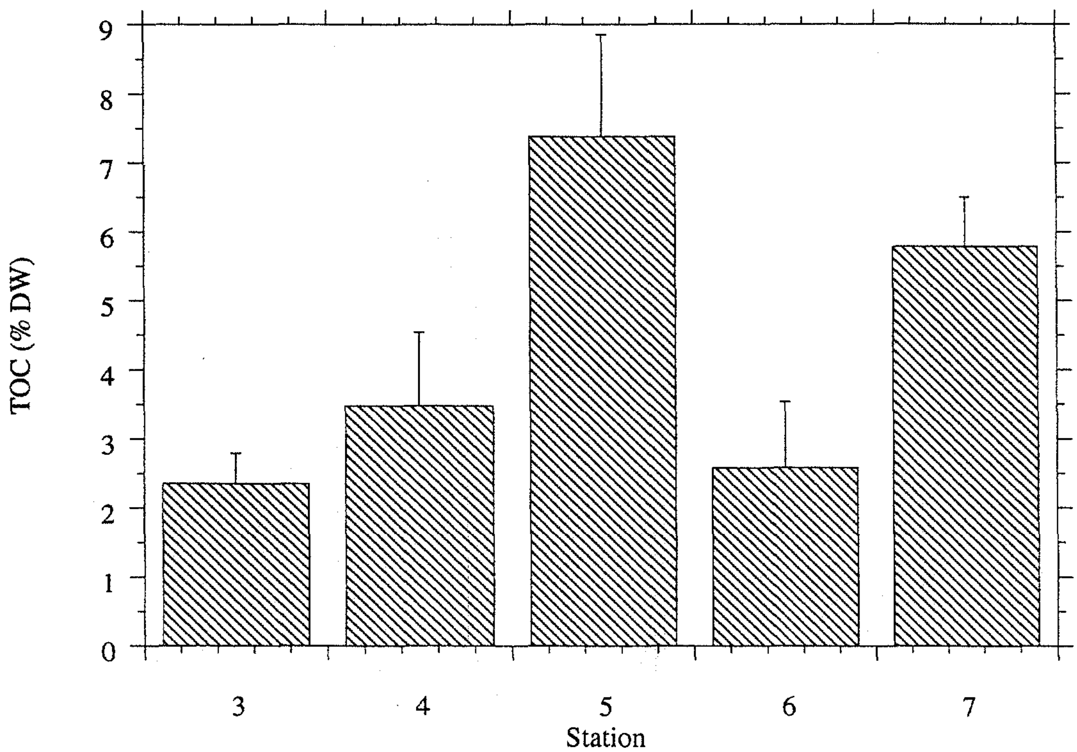
Figure 5-2
Relative Percent Grain Size Classes - TI Pool



Note: Error bars represent one standard deviation.

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Figure 5-3
Mean Sediment TOC - TI Pool

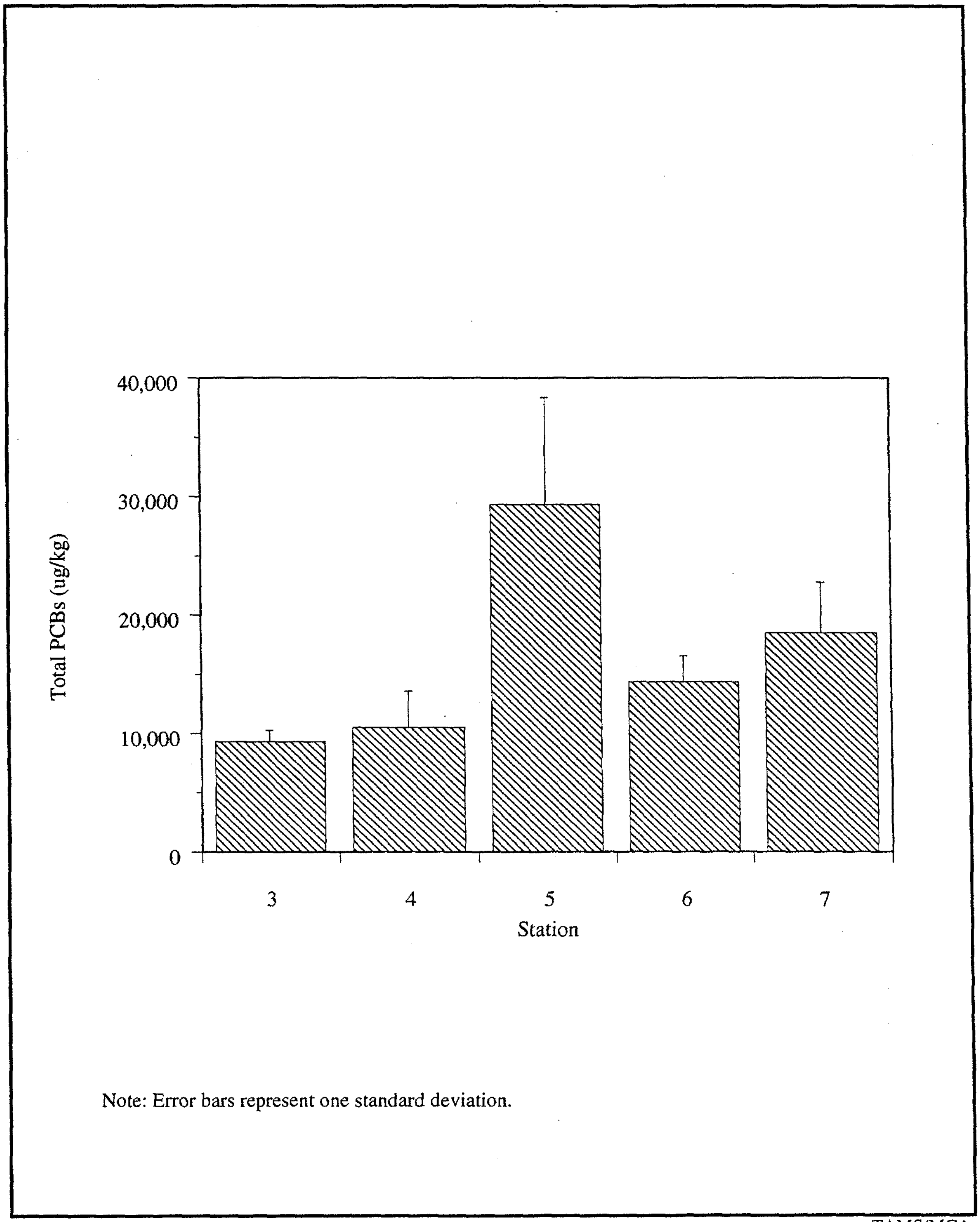

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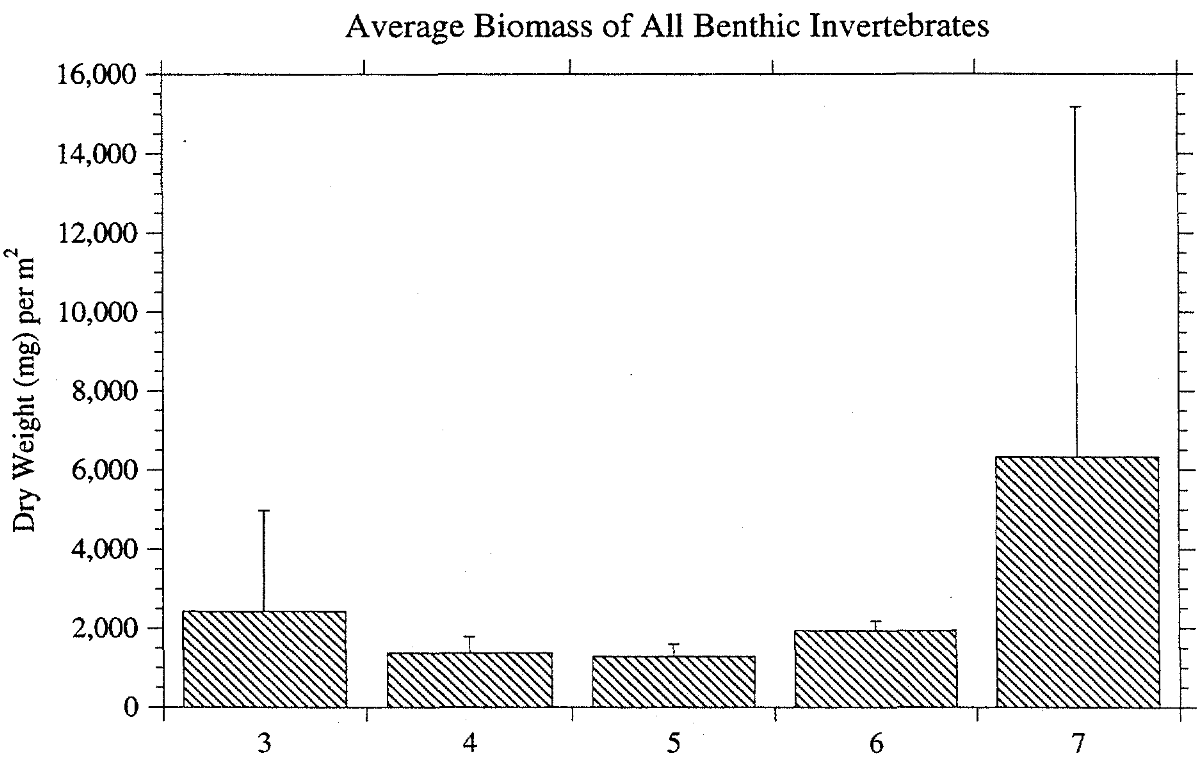
Figure 5-4
Mean Total PCB Concentration in Sediment - TI Pool



Note: Error bars represent one standard deviation.

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Figure 5-5
Biomass of Benthic Invertebrates - TI Pool

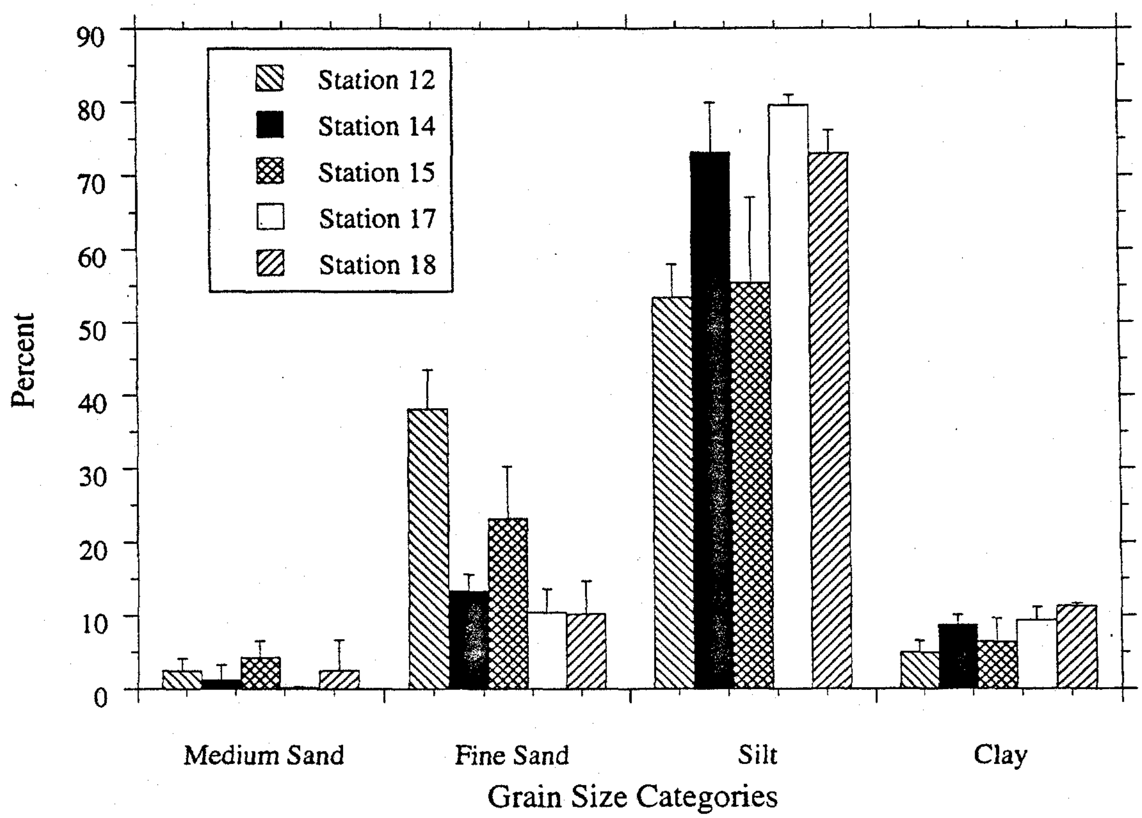

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Figure 5-6
Relative Percent Grain Size Classes - Lower Hudson River

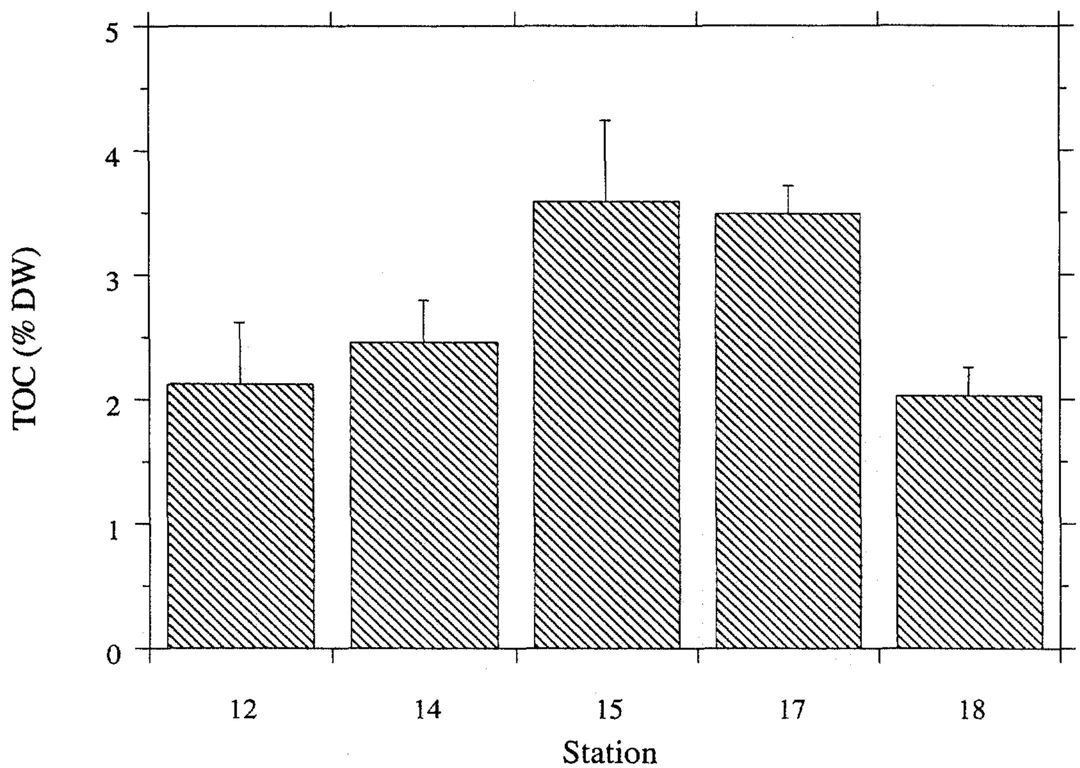

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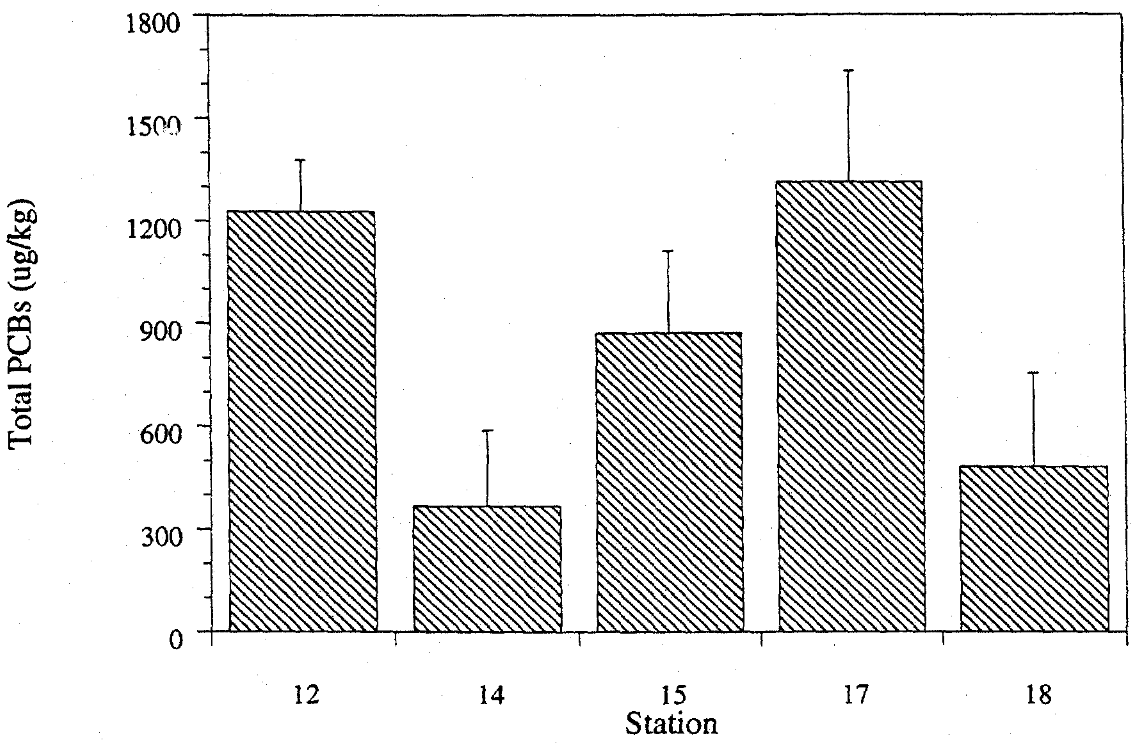
Figure 5-7
Mean Sediment TOC - Lower Hudson River



Note: Error bars represent one standard deviation.

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Figure 5-8
Mean Total PCB Concentration in Sediment - Lower Hudson River