APPENDICES

GATHRIGHT DAM LOW FLOW AUGMENTATION PROJECT ALLEGHANY COUNTY, VIRGINIA

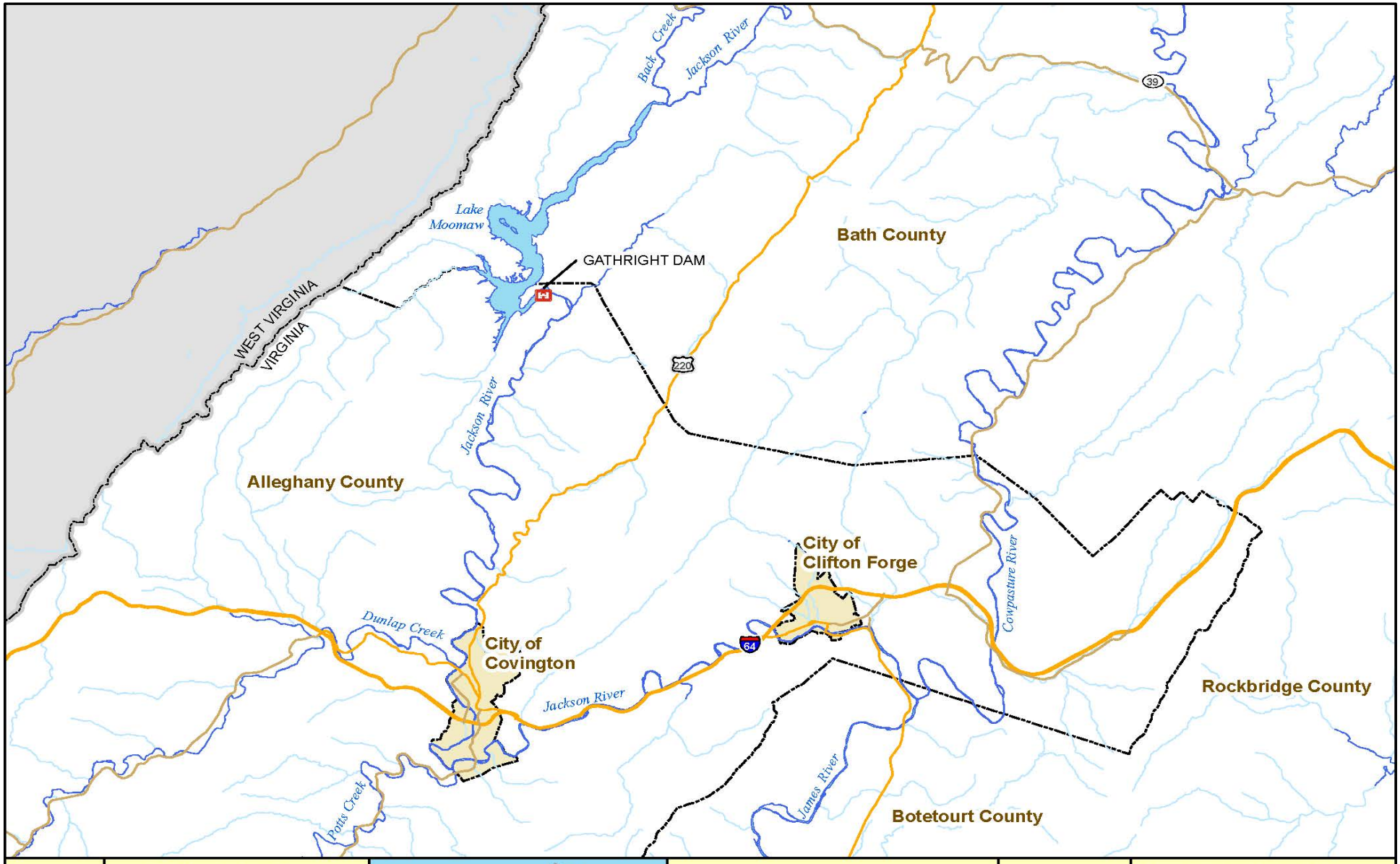
Norfolk District
803 Front Street
Norfolk, VA 23510-1096
April 2013

US Army Corps of Engineers ®

APPENDIX A

PLATES

PLATE 1



US Army Corps of Engineers
Norfolk District

Gathright Dam and Lake Moomaw Section 216

Overview of Study Area

STUDY AREA OVERVIEW

0 1 2 4 Miles

N

Projection:
Virginia State Plane
South Zone - NAD 83
U.S. Survey Feet

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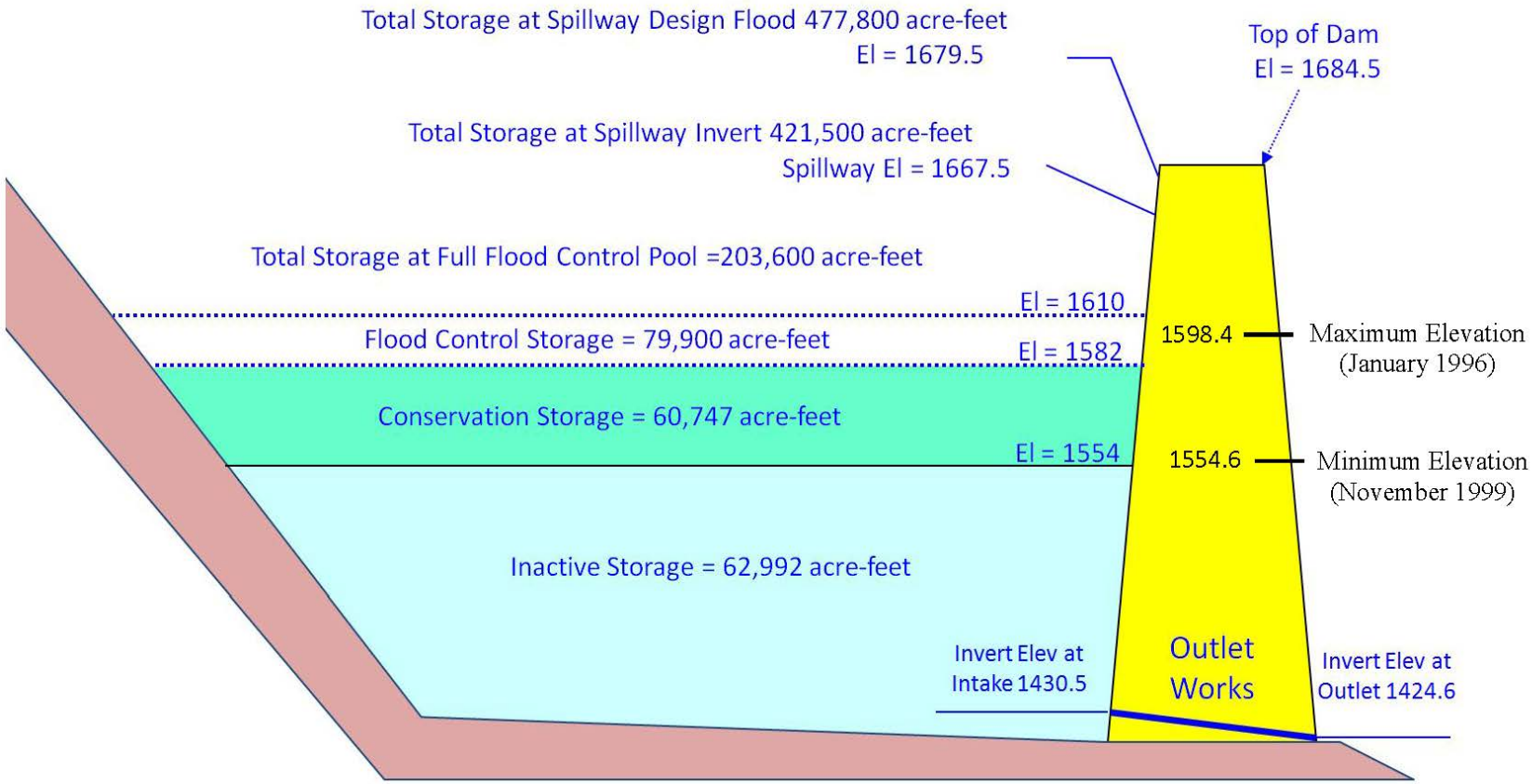
Prepared by: Jason O'Neal
Geospatial Section

Map File: Gathright_Dam_216_OVERVIEW.mxd
Map Date: 23 March 2011

Plate 1

PLATE 2



Gathright Dam and Lake Moomaw, VA
Section 216 Low Flow Augmentation Feasibility Study

National Geodetic Vertical Datum of 1929
(NVGD 29)

Figure 1:
Reservoir Storage Allocation
Not to Scale

APPENDIX B

TABLES

APPENDIX B

TABLES
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TABLES

This section includes tables which have been referenced in the main body of the report. The tables describe the fauna that resides within the project area, which includes Lake Moomaw, the Gathright Dam and the stretch of the Jackson River from the dam to the confluence with the Cowpasture River.

Table B-1. SPECIES WITH EITHER FEDERAL OR STATE STATUS

Status	Common Name	Scientific Name
FESE	Bat, Indiana	*Myotis sodalis*
FESE	Spinymussel, James	*Pleurobema collina*
FESE	Bat, gray	*Myotis grisescens*
FESE	Bat, Virginia big-eared	*Corynorhinus townsendii virginianus*
SE	Wren, Bewick's	*Thryomanes bewickii*
FSSE	Springsnail	*Fontigens morrisoni*
FSSE	Coil, shaggy	*Helicodiscus diadema*
SE	Shrew, American water	*Sorex palustris*
SE	Vole, rock	*Microtus chrotorrhinus*
ST	Falcon, peregrine	*Falco peregrinus*
ST	Sandpiper, upland	*Bartramia longicauda*
ST	Shrike, loggerhead	*Lanius ludovicianus*
ST	Sparrow, Henslow's	*Ammodramus henslowii*
FSST	Skipper, Appalachian grizzled	*Pyrgus wyandot*
FSST	Madtom, orangefin	*Noturus gilberti*
FSST	Eagle, bald	*Haliaeetus leucocephalus*
ST	Floater, green	*Lasmigona subviridis*
FSST	Pigtoe, Atlantic	*Fusconaia masoni*
ST	Shrike, migrant loggerhead	*Lanius ludovicianus migrans*
FS	Fritillary, regal	*Speyeria idalia idalia*
FS	Shiner, roughhead	*Notropis semperasper*
FS	Salamander, Peaks of Otter	*Plethodon hubrichti*
FS	Amphipod, Alleghany County Cave	*Stygobromus hoffmani*
FS	Amphipod, Bath County Cave	*Stygobromus mundus*
FS	Amphipod, Morrison's Cave	*Stygobromus morrisoni*
FS	Isopod, Vandel's Cave	*Caecidotea vandeli*
FS	Beetle, Maureen's shale stream	*Hydraena maureenae*
FS	Butterfly, Persius duskywing	*Erynnis persius persius*
FS	Coil, talus	*Helicodiscus triodus*
FS	Pseudoscorpion, cave	*Kleptochthonius anophthalmus*
FS	Lance, yellow	*Elliptio lanceolata*
FS	fritillary, Diana	*Speyeria diana*
CC	Rattlesnake, timber	*Crotalus horridus*

***** FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; SC=State Candidate; CC=Collection Concern; SS=State Special Concern (obsolete January 1, 2011)

Table B-2. SPECIES IDENTIFIED BY THE VIRGINIA WILDLIFE ACTION PLAN OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Tier	Common Name	Scientific Name
I	Bat, Indiana	*Myotis sodalis*
I	Spinymussel, James	*Pleurobema collina*
II	Bat, gray	*Myotis grisescens*
II	Bat, Virginia big-eared	*Corynorhinus townsendii virginianus*
I	Wren, Bewick's	*Thryomanes bewickii*
I	Springsnail	*Fontigens morrisoni*
I	Coil, shaggy	*Helicodiscus diadema*
II	Shrew, American water	*Sorex palustris*
II	Vole, rock	*Microtus chrotorrhinus*
I	Falcon, peregrine	*Falco peregrinus*
I	Sandpiper, upland	*Bartramia longicauda*
I	Shrike, loggerhead	*Lanius ludovicianus*
I	Sparrow, Henslow's	*Ammodramus henslowii*
I	Skipper, Appalachian grizzled	*Pyrgus wyandot*
II	Madtom, orangefin	*Noturus gilberti*
W2II	Eagle, bald	*Haliaeetus leucocephalus*
II	Floater, green	*Lasmigona subviridis*
II	Pigtoe, Atlantic	*Fusconaia masoni*
I	Fritillary, regal	*Speyeria idalia idalia*
II	Shiner, roughhead	*Notropis semperasper*
II	Salamander, Peaks of Otter	*Plethodon hubrichti*
II	Amphipod, Alleghany County Cave	*Stygobromus hoffmani*
II	Amphipod, Bath County Cave	*Stygobromus mundus*
II	Amphipod, Morrison's Cave	*Stygobromus morrisoni*
II	Isopod, Vandel's Cave	*Caecidotea vandeli*
II	Beetle, Maureen's shale stream	*Hydraena maureenae*
II	Butterfly, Persius duskywing	*Erynnis persius persius*
II	Coil, talus	*Helicodiscus triodus*
II	Pseudoscorpion, Cave	*Kleptochthonius anophthalmus*
III	Lance, yellow	*Elliptio lanceolata*
IV	fritillary, Diana	*Speyeria diana*
IV	Rattlesnake, timber	*Crotalus horridus*
I	Pinesnake, northern	*Pituophis melanoleucus melanoleucus*
I	Crossbill, red	*Loxia curvirostra*

Table B-2. SPECIES IDENTIFIED BY THE VIRGINIA WILDLIFE ACTION PLAN OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (Cont'd)

Tier	Common Name	Scientific Name
I	Sapsucker, yellow-bellied	*Sphyrapicus varius*
I	Warbler, black-throated green	*Dendroica virens*
I	Warbler, golden-winged	*Vermivora chrysoptera*
II	Duck, American black	*Anas rubripes*
II	Owl, northern saw-whet	*Aegolius acadicus*
II	Warbler, cerulean	*Dendroica cerulea*
II	Wren, winter	*Troglodytes troglodytes*
II	Fisher	*Martes pennanti pennanti*
III	Greensnake, smooth	*Opheodrys vernalis*
III	Turtle, eastern box	*Terrapene carolina carolina*
III	Bittern, least	*Ixobrychus exilis exilis*
III	Harrier, northern	*Circus cyaneus*
III	Night-heron, yellow-crowned	*Nyctanassa violacea violacea*
III	Owl, barn	*Tyto alba pratincola*
III	Redhead	*Aythya americana*
III	Tern, common	*Sterna hirundo*
III	Wren, sedge	*Cistothorus platensis*
III	Myotis, eastern small-footed	*Myotis leibii*
III	Rainbow, notched	*Villosa constricta*
III	Springsnail, Blue Ridge	*Fontigens orolibas*
III	Damselfly, Appalachian jewelwing	*Calopteryx angustipennis*
III	Butterfly, mottled duskywing	*Erynnis martialis*
IV	Darter, riverweed	*Etheostoma podostemone*
IV	Salamander, Jefferson	*Ambystoma jeffersonianum*
IV	Ribbonsnake, common	*Thamnophis sauritus sauritus*
IV	Scarletsnake, northern	*Cemophora coccinea copei*
IV	Snake, eastern hog-nosed	*Heterodon platirhinos*
IV	Snake, queen	*Regina septemvittata*
IV	Blackbird, rusty	*Euphagus carolinus*
IV	Bobwhite, northern	*Colinus virginianus*
IV	Catbird, gray	*Dumetella carolinensis*
IV	Chat, yellow-breasted	*Icteria virens virens*
IV	Chuck-will's-widow	*Caprimulgus carolinensis*
IV	Creeper, brown	*Certhia americana*

Table B-2. SPECIES IDENTIFIED BY THE VIRGINIA WILDLIFE ACTION PLAN OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (Cont'd)

Tier	Common Name	Scientific Name
IV	Cuckoo, yellow-billed	*Coccyzus americanus*
IV	Dowitcher, short-billed	*Limnodromus griseus*
IV	Flycatcher, willow	*Empidonax traillii*
IV	Grosbeak, rose-breasted	*Pheucticus ludovicianus*
IV	Heron, green	*Butorides virescens*
IV	Kingbird, eastern	*Tyrannus tyrannus*
IV	Meadowlark, eastern	*Sturnella magna*
IV	Ovenbird	*Seiurus aurocapilla*
IV	Parula, northern	*Parula americana*
IV	Pewee, eastern wood	*Contopus virens*
IV	Rail, yellow	*Coturnicops noveboracensis*
IV	Scaup, greater	*Aythya marila*
IV	Sparrow, field	*Spizella pusilla*
IV	Sparrow, grasshopper	*Ammodramus savannarum pratensis*
IV	Swallow, northern rough-winged	*Stelgidopteryx serripennis*
IV	Swift, chimney	*Chaetura pelagica*
IV	Tanager, scarlet	*Piranga olivacea*
IV	Tern, Forster's	*Sterna forsteri*
IV	Thrasher, brown	*Toxostoma rufum*
IV	Thrush, wood	*Hylocichla mustelina*
IV	Towhee, eastern	*Pipilo erythrophthalmus*
IV	Vireo, yellow-throated	*Vireo flavifrons*
IV	Warbler, black-and-white	*Mniotilta varia*
IV	Warbler, blue-winged	*Vermivora pinus*
IV	Warbler, Canada	*Wilsonia canadensis*
IV	Warbler, Kentucky	*Oporornis formosus*
IV	Warbler, prairie	*Dendroica discolor*
IV	Warbler, prothonotary	*Protonotaria citrea*
IV	Warbler, worm-eating	*Helmitheros vermivorus*
IV	Warbler, yellow	*Dendroica petechia*
IV	Waterthrush, Louisiana	*Seiurus motacilla*
IV	Whip-poor-will	*Caprimulgus vociferus*
IV	Woodcock, American	*Scolopax minor*
IV	Wren, marsh	*Cistothorus palustris*

Table B-2. SPECIES IDENTIFIED BY THE VIRGINIA WILDLIFE ACTION PLAN OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (Cont'd)

Tier	Common Name	Scientific Name
IV	Cottontail, Appalachian	*Sylvilagus obscurus*
IV	Shrew, long-tailed (= rock)	*Sorex dispar dispar*
IV	Skunk, eastern spotted	*Spilogale putorius putorius*
IV	Weasel, least	*Mustela nivalis allegheniensis*
IV	Woodrat, Allegheny	*Neotoma magister*
IV	Creeper	*Strophitus undulatus*
IV	Lance, Carolina	*Elliptio angustata*
IV	Mussel, triangle floater	*Alasmidonta undulata*
IV	Spike, Atlantic	*Elliptio producta*
IV	Crayfish	*Orconectes obscurus*
IV	Crayfish	*Orconectes cristavarius*
IV	Butterfly, early hairstreak	*Erora laeta*
IV	Butterfly, frosted elfin	*Callophrys irus*
IV	Butterfly, hoary elfin	*Callophrys polius*
IV	Butterfly, northern metalmark	*Calephelis borealis*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

KEY = Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Bittern, least	*Ixobrychus exilis exilis*
Blackbird, red-winged	*Agelaius phoeniceus*
Blackbird, rusty	*Euphagus carolinus*
Bluebird, eastern	*Sialia sialis*
Bobwhite, northern	*Colinus virginianus*
Bufflehead	*Bucephala albeola*
Bunting, indigo	*Passerina cyanea*
Bunting, snow	*Plectrophenax nivalis nivalis*
Canvasback	*Aythya valisineria*
Cardinal, northern	*Cardinalis cardinalis*
Catbird, gray	*Dumetella carolinensis*
Chat, yellow-breasted	*Icteria virens virens*
Chickadee, black-capped	*Poecile atricapillus*
Chickadee, Carolina	*Poecile carolinensis*
Chuck-will's-widow	*Caprimulgus carolinensis*
Coot, American	*Fulica americana*
Cormorant, double-crested	*Phalacrocorax auritus*
Cowbird, brown-headed	*Molothrus ater*
Creeper, brown	*Certhia americana*
Crossbill, red	*Loxia curvirostra*
Crossbill, white-winged	*Loxia leucoptera*
Crow, American	*Corvus brachyrhynchos*
Cuckoo, black-billed	*Coccyzus erythropthalmus*
Cuckoo, yellow-billed	*Coccyzus americanus*
Dickcissel	*Spiza americana*
Dove, mourning	*Zenaida macroura carolinensis*
Dowitcher, short-billed	*Limnodromus griseus*
Duck, American black	*Anas rubripes*
Duck, ring-necked	*Aythya collaris*
Duck, wood	*Aix sponsa*
Eagle, bald	*Haliaeetus leucocephalus*
Eagle, golden	*Aquila chrysaetos*
Egret, great	*Ardea alba egretta*
Falcon, peregrine	*Falco peregrinus*

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Finch, house	*Carpodacus mexicanus*
Finch, purple	*Carpodacus purpureus*
Flicker, northern	*Colaptes auratus*
Flycatcher, Acadian	*Empidonax virescens*
Flycatcher, alder	*Empidonax alnorum*
Flycatcher, great crested	*Myiarchus crinitus*
Flycatcher, least	*Empidonax minimus*
Flycatcher, willow	*Empidonax traillii*
Gadwall	*Anas strepera*
Gnatcatcher, blue-gray	*Polioptila caerulea*
Goldeneye, common	*Bucephala clangula americana*
Goldfinch, American	*Carduelis tristis*
Goose, Canada	*Branta canadensis*
Goshawk, northern	*Accipiter gentilis*
Grackle, common	*Quiscalus quiscula*
Grebe, pied-billed	*Podilymbus podiceps*
Grosbeak, blue	*Guiraca caerulea caerulea*
Grosbeak, evening	*Coccothraustes vespertinus*
Grosbeak, rose-breasted	*Pheucticus ludovicianus*
Grouse, ruffed	*Bonasa umbellus*
Gull, herring	*Larus argentatus*
Gull, ring-billed	*Larus delawarensis*
Harrier, northern	*Circus cyaneus*
Hawk, broad-winged	*Buteo platypterus*
Hawk, Cooper's	*Accipiter cooperii*
Hawk, red-shouldered	*Buteo lineatus lineatus*
Hawk, red-tailed	*Buteo jamaicensis*
Hawk, rough-legged	*Buteo lagopus johannis*
Hawk, sharp-shinned	*Accipiter striatus velox*
Heron, great blue	*Ardea herodias herodias*
Heron, green	*Butorides virescens*
Hummingbird, ruby-throated	*Archilochus colubris*
Jay, blue	*Cyanocitta cristata*
Junco, dark-eyed	*Junco hyemalis*
Kestrel, American	*Falco sparverius sparverius*

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Killdeer	*Charadrius vociferus*
Kingbird, eastern	*Tyrannus tyrannus*
Kingfisher, belted	*Ceryle alcyon*
Kinglet, golden-crowned	*Regulus satrapa*
Kinglet, ruby-crowned	*Regulus calendula*
Lark, horned	*Eremophila alpestris*
Loon, common	*Gavia immer*
Mallard	*Anas platyrhynchos*
Martin, purple	*Progne subis*
Meadowlark, eastern	*Sturnella magna*
Merganser, hooded	*Lophodytes cucullatus*
Mockingbird, northern	*Mimus polyglottos*
Moorhen, common	*Gallinula chloropus cachinnans*
Nighthawk, common	*Chordeiles minor*
Night-heron, yellow-crowned	*Nyctanassa violacea violacea*
Nuthatch, red-breasted	*Sitta canadensis*
Nuthatch, white-breasted	*Sitta carolinensis*
Oriole, Baltimore	*Icterus galbula*
Oriole, orchard	*Icterus spurius*
Osprey	*Pandion haliaetus carolinensis*
Ovenbird	*Seiurus aurocapilla*
Owl, barn	*Tyto alba pratincola*
Owl, barred	*Strix varia*
Owl, great horned	*Bubo virginianus*
Owl, northern saw-whet	*Aegolius acadicus*
Owl, short-eared	*Asio flammeus*
Parula, northern	*Parula americana*
Pewee, eastern wood	*Contopus virens*
Pheasant, ring-necked	*Phasianus colchicus*
Phoebe, eastern	*Sayornis phoebe*
Pigeon, rock	*Columba livia*
Pipit, American	*Anthus rubescens*
Rail, yellow	*Coturnicops noveboracensis*

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Rail, yellow	*Coturnicops noveboracensis*
Raven, common	*Corvus corax*
Redhead	*Aythya americana*
Redstart, American	*Setophaga ruticilla*
Robin, American	*Turdus migratorius*
Sandpiper, solitary	*Tringa solitaria*
Sandpiper, spotted	*Actitis macularia*
Sandpiper, upland	*Bartramia longicauda*
Sapsucker, yellow-bellied	*Sphyrapicus varius*
Scaup, greater	*Aythya marila*
Scaup, lesser	*Aythya affinis*
Scoter, white-winged	*Melanitta fusca deglandi*
Screech-owl, eastern	*Megascops asio*
Shrike, loggerhead	*Lanius ludovicianus*
Shrike, migrant loggerhead	*Lanius ludovicianus migrans*
Siskin, pine	*Carduelis pinus*
Snipe, Wilson's	*Gallinago delicata*
Sora	*Porzana carolina*
Sparrow, American tree	*Spizella arborea*
Sparrow, chipping	*Spizella passerina*
Sparrow, field	*Spizella pusilla*
Sparrow, fox	*Passerella iliaca*
Sparrow, grasshopper	*Ammodramus savannarum pratensis*
Sparrow, Henslow's	*Ammodramus henslowii*
Sparrow, house	*Passer domesticus*
Sparrow, Le Conte's	*Ammodramus leconteii*
Sparrow, savannah	*Passerculus sandwichensis*
Sparrow, song	*Melospiza melodia*
Sparrow, swamp	*Melospiza georgiana*
Sparrow, vesper	*Pooecetes gramineus*
Sparrow, white-crowned	*Zonotrichia leucophrys*
Sparrow, white-throated	*Zonotrichia albicollis*
Starling, European	*Sturnus vulgaris*
Stork, wood	*Mycteria americana*
Swallow, bank	*Riparia riparia*

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Swallow, barn	*Hirundo rustica*
Swallow, cliff	*Petrochelidon pyrrhonota pyrrhonota*
Swallow, tree	*Tachycineta bicolor*
Swallow, northern rough-winged	*Stelgidopteryx serripennis*
Swift, chimney	*Chaetura pelagica*
Tanager, scarlet	*Piranga olivacea*
Tanager, summer	*Piranga rubra*
Teal, blue-winged	*Anas discors orphna*
Teal, green-winged	*Anas crecca carolinensis*
Tern, common	*Sterna hirundo*
Tern, Forster's	*Sterna forsteri*
Thrasher, brown	*Toxostoma rufum*
Thrush, hermit	*Catharus guttatus*
Thrush, wood	*Hylocichla mustelina*
Titmouse, tufted	*Baeolophus bicolor*
Towhee, eastern	*Pipilo erythrophthalmus*
Turkey, wild	*Meleagris gallopavo silvestris*
Veery	*Catharus fuscescens*
Vireo, blue-headed	*Vireo solitarius*
Vireo, red-eyed	*Vireo olivaceus*
Vireo, warbling	*Vireo gilvus gilvus*
Vireo, white-eyed	*Vireo griseus*
Vireo, yellow-throated	*Vireo flavifrons*
Vulture, black	*Coragyps atratus*
Vulture, turkey	*Cathartes aura*
Warbler, black-and-white	*Mniotilta varia*
Warbler, black-throated blue	*Dendroica caerulescens*
Warbler, black-throated green	*Dendroica virens*
Warbler, blackburnian	*Dendroica fusca*
Warbler, blackpoll	*Dendroica striata*
Warbler, blue-winged	*Vermivora pinus*
Warbler, Canada	*Wilsonia canadensis*
Warbler, Cape May	*Dendroica tigrina*
Warbler, cerulean	*Dendroica cerulea*
Warbler, chestnut-sided	*Dendroica pensylvanica*

Table B-3. AVIAN RESOURCES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Warbler, golden-winged	*Vermivora chrysoptera*
Warbler, hooded	*Wilsonia citrina*
Warbler, Kentucky	*Oporornis formosus*
Warbler, magnolia	*Dendroica magnolia*
Warbler, mourning	*Oporornis philadelphia*
Warbler, Nashville	*Vermivora ruficapilla*
Warbler, palm	*Dendroica palmarum*
Warbler, pine	*Dendroica pinus*
Warbler, prairie	*Dendroica discolor*
Warbler, prothonotary	*Protonotaria citrea*
Warbler, worm-eating	*Helmitheros vermivorus*
Warbler, yellow	*Dendroica petechia*
Warbler, yellow-rumped	*Dendroica coronata cornata*
Warbler, yellow-throated	*Dendroica dominica*
Waterthrush, Louisiana	*Seiurus motacilla*
Waterthrush, northern	*Seiurus noveboracensis*
Waxwing, cedar	*Bombycilla cedrorum*
Whip-poor-will	*Caprimulgus vociferus*
Woodcock, American	*Scolopax minor*
Woodpecker, downy	*Picoides pubescens medianus*
Woodpecker, hairy	*Picoides villosus*
Woodpecker, pileated	*Dryocopus pileatus*
Woodpecker, red-bellied	*Melanerpes carolinus*
Woodpecker, red-headed	*Melanerpes erythrocephalus*
Wren, Bewick's	*Thryomanes bewickii*
Wren, Carolina	*Thryothorus ludovicianus*
Wren, house	*Troglodytes aedon*
Wren, marsh	*Cistothorus palustris*
Wren, sedge	*Cistothorus platensis*
Wren, winter	*Troglodytes troglodytes*
Yellowthroat, common	*Geothlypis trichas*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

Table B-4. TERRESTRIAL MAMMALS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Mussel, eastern elliptio	*Elliptio complanata*
Bat, big brown	*Eptesicus fuscus fuscus*
Bat, eastern red	*Lasiurus borealis borealis*
Bat, gray	*Myotis grisescens*
Bat, hoary	*Lasiurus cinereus cinereus*
Bat, Indiana	*Myotis sodalis*
Bat, little brown	*Myotis lucifugus lucifugus*
Bat, silver-haired	*Lasionycteris noctivagans*
Bat, Virginia big-eared	*Corynorhinus townsendii virginianus*
Bear, black	*Ursus americanus americanus*
Beaver, American	*Castor canadensis*
Bobcat	*Lynx rufus rufus*
Chipmunk, Fisher's eastern	*Tamias striatus fisheri*
Cottontail, Appalachian	*Sylvilagus obscurus*
Cottontail, eastern	*Sylvilagus floridanus mallurus*
Coyote	*Canis latrans*
Deer, white-tailed	*Odocoileus virginianus*
Fisher	*Martes pennanti pennanti*
Fox, common gray	*Urocyon cinereoargenteus cinereoargenteus*
Fox, red	*Vulpes vulpes fulva*
Lemming, Stone's southern bog	*Synaptomys cooperi stonei*
Mink, common	*Mustela vison mink*
Mink, southwestern	*Mustela vison vison*
Mole, eastern	*Scalopus aquaticus aquaticus*
Mole, hairy-tailed	*Parascalops breweri*
Mouse, common golden	*Ochrotomys nuttalli aureolus*
Mouse, deer	*Peromyscus maniculatus nubiterrae*
Mouse, house	*Mus musculus musculus*
Mouse, meadow jumping	*Zapus hudsonius americanus*
Mouse, northern white-footed	*Peromyscus leucopus noveboracensis*
Mouse, woodland jumping	*Napaeozapus insignis roanensis*
Muskrat, common	*Ondatra zibethicus zibethicus*
Myotis, eastern small-footed	*Myotis leibii*
Myotis, northern	*Myotis septentrionalis septentrionalis*

Table B-4. TERRESTRIAL MAMMALS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Opossum, Virginia	*Didelphis virginiana virginiana*
Otter, northern river	*Lontra canadensis lataxina*
Pipistrelle, eastern	*Pipistrellus subflavus subflavus*
Raccoon	*Procyon lotor lotor*
Rat, Norway	*Rattus norvegicus norvegicus*
Shrew, American water	*Sorex palustris*
Shrew, ashen masked	*Sorex cinereus cinereus*
Shrew, Kirtland's short-tailed	*Blarina brevicauda kirtlandi*
Shrew, least	*Cryptotis parva parva*
Shrew, long-tailed (= rock)	*Sorex dispar dispar*
Shrew, pygmy	*Sorex hoyi winnemana*
Shrew, smoky	*Sorex fumeus fumeus*
Shrew, southeastern	*Sorex longirostris longirostris*
Skunk, eastern spotted	*Spilogale putorius putorius*
Skunk, striped	*Mephitis mephitis mephitis*
Squirrel, eastern fox	*Sciurus niger vulpinus*
Squirrel, northern gray	*Sciurus carolinensis pennsylvanicus*
Squirrel, red	*Tamiasciurus hudsonicus abieticola*
Squirrel, southern flying	*Glaucomys volans volans*
Vole, coastal Gapper's red-backed	*Clethrionomys gapperi maurus*
Vole, common Gapper's red-backed	*Clethrionomys gapperi gapperi*
Vole, meadow	*Microtus pennsylvanicus pennsylvanicus*
Vole, pine	*Microtus pinetorum scalopsoides*
Vole, rock	*Microtus chrotorrhinus*
Weasel, least	*Mustela nivalis allegheniensis*
Weasel, long-tailed	*Mustela frenata noveboracensis*
Woodchuck	*Marmota monax monax*
Woodrat, Allegheny	*Neotoma magister*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

Table B-5. REPTILES AND AMPHIBIANS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Brownsnake, northern	*Storeria dekayi dekayi*
Bullfrog, American	*Lithobates catesbeianus*
Cooter, eastern river	*Pseudemys concinna concinna*
Copperhead, northern	*Agkistrodon contortrix mokasen*
Cornsnake, red	*Pantherophis guttatus*
Earthsnake, eastern smooth	*Virginia valeriae valeriae*
Frog, eastern cricket	*Acris crepitans crepitans*
Frog, northern green	*Lithobates clamitans melanota*
Frog, pickerel	*Lithobates palustris*
Frog, upland chorus	*Pseudacris feriarum feriarum*
Frog, wood	*Lithobates sylvaticus*
Gartersnake, eastern	*Thamnophis sirtalis sirtalis*
Greensnake, northern rough	*Opheodrys aestivus aestivus*
Greensnake, smooth	*Opheodrys vernalis*
Kingsnake, eastern	*Lampropeltis getula getula*
Lizard, eastern fence	*Sceloporus undulatus*
Milksnake, eastern	*Lampropeltis triangulum triangulum*
Newt, red-spotted	*Notophthalmus viridescens viridescens*
Peeper, northern spring	*Pseudacris crucifer crucifer*
Pinesnake, northern	*Pituophis melanoleucus melanoleucus*
Racer, northern black	*Coluber constrictor constrictor*
Racerunner, eastern six-lined	*Aspidoscelis sexlineata sexlineata*
Ratsnake, eastern	*Pantherophis alleghaniensis*
Ribbonsnake, common	*Thamnophis sauritus sauritus*
Rattlesnake, timber	*Crotalus horridus*
Salamander, Allegheny mountain dusky	*Desmognathus ochrophaeus*
Salamander, black-bellied	*Desmognathus quadramaculatus*
Salamander, cave	*Eurycea lucifuga*
Salamander, eastern red-backed	*Plethodon cinereus*
Salamander, four-toed	*Hemidactylium scutatum*
Salamander, Jefferson	*Ambystoma jeffersonianum*
Salamander, long-tailed	*Eurycea longicauda longicauda*
Salamander, marbled	*Ambystoma opacum*
Salamander, northern dusky	*Desmognathus fuscus*

Table B-5. REPTILES AND AMPHIBIANS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Salamander, northern red	*Pseudotriton ruber ruber*
Salamander, northern slimy	*Plethodon glutinosus*
Salamander, northern spring	*Gyrinophilus porphyriticus porphyriticus*
Salamander, northern two-lined	*Eurycea bislineata*
Salamander, Peaks of Otter	*Plethodon hubrichti*
Salamander, seal	*Desmognathus monticola*
Salamander, southern two-lined	*Eurycea cirrigera*
Salamander, spotted	*Ambystoma maculatum*
Salamander, valley and ridge	*Plethodon hoffmani*
Salamander, Wehrle's	*Plethodon wehrlei*
Salamander, white-spotted slimy	*Plethodon cylindraceus*
Scarletsnake, northern	*Cemophora coccinea copei*
Skink, broad-headed	*Plestiodon laticeps*
Skink, common five-lined	*Plestiodon fasciatus*
Skink, little brown	*Scincella lateralis*
Skink, northern coal	*Plestiodon anthracinus anthracinus*
Skink, southeastern five-lined	*Plestiodon inexpectatus*
Snake, eastern hog-nosed	*Heterodon platirhinos*
Snake, northern red-bellied	*Storeria occipitomaculata occipitomaculata*
Snake, northern ring-necked	*Diadophis punctatus edwardsii*
Snake, queen	*Regina septemvittata*
Stinkpot	*Sternotherus odoratus*
Toad, eastern American	*Anaxyrus americanus americanus*
Toad, Fowler's	*Anaxyrus fowleri*
Treefrog, gray	*Hyla versicolor*
Turtle, eastern box	*Terrapene carolina carolina*
Turtle, eastern painted	*Chrysemys picta picta*
Turtle, eastern snapping	*Chelydra serpentina serpentina*
Watersnake, northern	*Nerodia sipedon sipedon*
Wormsnake, eastern	*Carphophis amoenus amoenus*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

Table B-6. INSECTS AND ARACHNIDS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Armyworm	*Pseudaletia unipuncta*
Beetle, Maureen's shale stream	*Hydraena maureenae*
Borer, European corn	*Ostrinia nubilatis*
Butterfly, American copper	*Lycaena phlaeas*
Butterfly, American lady	*Vanessa virginiensis*
Butterfly, American snout	*Libytheana carinenta*
Butterfly, Appalachian azure	*Celastrina neglectamajor*
Butterfly, Appalachian brown	*Satyrodes appalachia*
Butterfly, Aprhodite fritillary	*Speyeria aphrodite*
Butterfly, Baltimore checkerspot	*Euphydryas phaeton*
Butterfly, banded hairstreak	*Satyrium calanus*
Butterfly, black swallowtail	*Papilio polyxenes asterius*
Butterfly, brown elfin	*Callophrys augustinus*
Butterfly, cabbage white	*Pieris rapae*
Butterfly, Carolina satyr	*Hermeuptychia sosybius*
Butterfly, carus skipper	*Polites carus*
Butterfly, checkered white	*Pontia protodice*
Butterfly, clouded sulphur	*Colias philodice*
Butterfly, columbine duskywing	*Erynnis lucilius*
Butterfly, common buckeye	*Junonia coenia*
Butterfly, common checkered-skipper	*Pyrgus communis*
Butterfly, common sootywing	*Pholisora catullus*
Butterfly, common wood-nymph	*Cercyonis pegala*
Butterfly, crossline skipper	*Polites origenes*
Butterfly, Delaware skipper	*Anatrytone logan*
Butterfly, dreamy duskywing	*Erynnis icelus*
Butterfly, Dun skipper	*Euphyes vestris*
Butterfly, dusky azure	*Celastrina nigra*
Butterfly, dusted skipper	*Atrytonopsis hianna*
Butterfly, early hairstreak	*Erora laeta*
Butterfly, eastern comma	*Polygonia comma*
Butterfly, eastern tailed-blue	*Everes comyntas*
Butterfly, eastern tiger swallowtail	*Papilio glaucus*
Butterfly, Edwards' hairstreak	*Satyrium edwardsii*

Table B-6. INSECTS AND ARACHNIDS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Butterfly, falcate orangetip	*Anthocharis midea*
Butterfly, frosted elfin	*Callophrys irus*
Butterfly, gemmed satyr	*Cyllopsis gemma*
Butterfly, golden-banded skipper	*Autochton cellus*
Butterfly, gray comma	*Polygonia progne*
Butterfly, gray hairstreak	*Strymon melinus*
Butterfly, great spangled fritillary	*Speyeria cybele*
Butterfly, green comma	*Polygonia faunus*
Butterfly, hackberry emperor	*Asterocampa celtis*
Butterfly, harvester	*Feniseca tarquinius*
Butterfly, hickory hairstreak	*Satyrium caryaevorum*
Butterfly, hoary edge	*Achalarus lyciades*
Butterfly, hoary elfin	*Callophrys polius*
Butterfly, Hobomok skipper	*Poanes hobomok*
Butterfly, Horace's duskywing	*Erynnis horatius*
Butterfly, Indian skipper	*Hesperia sassacus*
Butterfly, Juvenal's duskywing	*Erynnis juvenalis*
Butterfly, least skipper	*Ancyloxypha numitor*
Butterfly, little glassywing	*Pompeius verna*
Butterfly, little wood-satyr	*Megisto cymela*
Butterfly, meadow fritillary	*Boloria bellona*
Butterfly, monarch	*Danaus plexippus*
Butterfly, mottled duskywing	*Erynnis martialis*
Butterfly, mourning cloak	*Nymphalis antiopa*
Butterfly, northern broken dash	*Wallengrenia egeremet*
Butterfly, northern cloudywing	*Thorybes pylades*
Butterfly, northern metalmark	*Calephelis borealis*
Butterfly, northern pearly-eye	*Enodia anthedon*
Butterfly, olive juniper hairstreak	*Callophrys gryneus gryneus*
Butterfly, orange sulphur	*Colias eurytheme*
Butterfly, orange-barred sulphur	*Phoebis philea*
Butterfly, painted lady	*Vanessa cardui*
Butterfly, pearl crescent	*Phyciodes tharos*
Butterfly, Peck's skipper	*Polites peckius*

Table B-6. INSECTS AND ARACHNIDS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Butterfly, Persius duskywing	*Erynnis persius persius*
Butterfly, pepper and salt road-skipper	*Amblyscirtes hegon*
Butterfly, pipevine swallowtail	*Battus philenor*
Butterfly, question mark	*Polygonia interrogationis*
Butterfly, red admiral	*Vanessa atalanta*
Butterfly, red-spotted purple	*Limenitis arthemis astyanax*
Butterfly, sachem	*Atalopedes campestris*
Butterfly, silver-bordered fritillary	*Boloria selene*
Butterfly, silver-spotted skipper	*Epargyreus clarus*
Butterfly, silvery blue	*Glaucopsyche lygdamus*
Butterfly, silvery checkerspot	*Chlosyne nycteis*
Butterfly, sleepy duskywing	*Erynnis brizo*
Butterfly, sleepy orange	*Eurema nicippe*
Butterfly, southern cloudywing	*Thorybes bathyllus*
Butterfly, southern hairstreak	*Satyrium favonius*
Butterfly, spicebush swallowtail	*Papilio troilus*
Butterfly, spring azure	*Celastrina ladon*
Butterfly, striped hairstreak	*Satyrium liparops*
Butterfly, tawny emperor	*Asterocampa clyton*
Butterfly, tawny-edged skipper	*Polites themistocles*
Butterfly, variegated fritillary	*Euptoieta claudia*
Butterfly, viceroy	*Limenitis archippus*
Butterfly, white M hairstreak	*Parrhasius m-album*
Butterfly, wild indigo duskywing	*Erynnis baptisiae*
Butterfly, Zabulon skipper	*Poanes zabulon*
Butterfly, zebra swallowtail	*Eurytides marcellus*
Coil, shaggy	*Helicodiscus diadema*
Coil, talus	*Helicodiscus triodus*
Damselfly, Appalachian jewelwing	*Calopteryx angustipennis*
Earworm, corn	*Heliathis zea*
Gnat	*Culicoides guttipennis*
Moth, codling	*Cydia pomonella*
Moth, gypsy	*Lymantria dispar*
Pseudoscorpion, cave	*Kleptochthonius anophthalmus*

Table B-6. INSECTS AND ARACHNIDS OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Roadside-skipper, common	*Amblyscirtes vialis*
Skipper, Appalachian grizzled	*Pyrgus wyandot*
Tick, American dog	*Dermacentor variabilis*
Tick, brown dog	*Rhipicephalus sanguineus*
Tick, lone star	*Amblyomma americanum*
Tick, rabbit	*Haemaphysalis leporispalustris*
Tick, winter	*Dermacentor albipictus*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

Table B-7. FISH OCCURING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Bass, largemouth	*Micropterus salmoides*
Bass, rock	*Ambloplites rupestris*
Bass, smallmouth	*Micropterus dolomieu*
Bluegill	*Lepomis macrochirus*
Bullhead, brown	*Ameiurus nebulosus*
Bullhead, flat	*Ameiurus platycephalus*
Bullhead, yellow	*Ameiurus natalis*
Carp, common	*Cyprinus carpio*
Catfish, channel	*Ictalurus punctatus*
Catfish, flathead	*Pylodictis olivaris*
Catfish, white	*Ameiurus catus*
Chub, bluehead	*Nocomis leptocephalus*
Chub, bull	*Nocomis raneyi*
Chub, creek	*Semotilus atromaculatus*
Chub, river	*Nocomis micropogon*
Chubsucker, creek	*Erimyzon oblongus*
Crappie, black	*Pomoxis nigromaculatus*
Dace, blacknose	*Rhinichthys atratulus*
Dace, longnose	*Rhinichthys cataractae*
Dace, mountain redbelly	*Chrosomus oreas*
Darter, fantail	*Etheostoma flabellare*
Darter, johnny	*Etheostoma nigrum*
Darter, longfin	*Etheostoma longimanum*
Darter, riverweed	*Etheostoma podostemone*
Darter, Roanoke	*Percina roanoka*
Darter, shield	*Percina peltata*
Darter, stripeback	*Percina notogramma*
Fallfish	*Semotilus corporalis*
Jumprock, black	*Moxostoma cervinum*
Killifish, banded	*Fundulus diaphanus*
Madtom, margined	*Noturus insignis*
Madtom, orangefin	*Noturus gilberti*
Minnow, bluntnose	*Pimephales notatus*
Minnow, cutlips	*Exoglossum maxillingua*
Pickerel, chain	*Esox niger*
Pumpkinseed	*Lepomis gibbosus*

Table B-7. FISH OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(Cont'd)

COMMON NAME	SCIENTIFIC NAME
Quillback	*Carpiodes cyprinus*
Redhorse, golden	*Moxostoma erythrurum*
Redhorse, shorthead	*Moxostoma macrolepidotum*
Sculpin, mottled	*Cottus bairdii*
Shiner, comely	*Notropis amoenus*
Shiner, common	*Luxilus cornutus*
Shiner, crescent	*Luxilus cerasinus*
Shiner, golden	*Notemigonus crysoleucas*
Shiner, highland (= southern rosyface; = redface)	*Notropis micropteryx*
Shiner, mimic	*Notropis volucellus*
Shiner, rosefin	*Lythrurus ardens*
Shiner, roughhead	*Notropis semperasper*
Shiner, satinfin	*Cyprinella analostana*
Shiner, spottail	*Notropis hudsonius*
Shiner, swallowtail	*Notropis procne*
Shiner, white	*Luxilus albeolus*
Stoneroller, central	*Campostoma anomalum*
Sucker, northern hog	*Hypentelium nigricans*
Sucker, torrent	*Thoburnia rhothoeca*
Sucker, white	*Catostomus commersoni*
Sunfish, redbreast	*Lepomis auritus*
Trout, brook	*Salvelinus fontinalis*
Trout, brown	*Salmo trutta*
Trout, rainbow	*Oncorhynchus mykiss*
Warmouth	*Lepomis gulosus*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

Table B-8. AQUATIC MACROINVERTEBRATES OCCURRING OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME
Crayfish	*Orconectes obscurus*
Crayfish	*Orconectes cristavarius*
Crayfish	*Orconectes c. f. spinosus*
Crayfish, Appalachian brook	*Cambarus bartonii bartonii*
Crayfish, no common name	*Cambarus longulus*
Crayfish, no common name	*Cambarus acuminatus*
Crayfish, spiny cheek	*Orconectes limosus*
Crayfish, virile	*Orconectes virilis*
Creeper	*Strophitus undulatus*
Floater, green	*Lasmigona subviridis*
Lance, Carolina	*Elliptio angustata*
Lance, yellow	*Elliptio lanceolata*
Mussel, eastern elliptio	*Elliptio complanata*
Pigtoe, Atlantic	*Fusconaia masoni*
Rainbow, notched	*Villosa constricta*
Spike, Atlantic	*Elliptio producta*
Springsnail, Blue Ridge	*Fontigens orolibas*
Springsnail	*Fontigens morrisoni*
Spinymussel, James	*Pleurobema collina*

Source: VDGIF Online Database (the search area included a circle with a 10-mile radius around point latitude 37°52′00.6″, longitude 79°53′ 58.8″), 2011.

APPENDIX C

JACKSON RIVER HYDROGRAPHS

These Hydrographs were requested by the US Fish and Wildlife Service during the public review of this Environmental Assessment. The first described the Mean Monthly Flows in cubic feet per second (cfs) before the dam was build, during current operations of Gathright Dam and the Mean Flows projected for each of the three variations of the Preferred Alternative (PA). The second hydrograph shows the Minimum Mean Monthly Flows (cfs) that are now being met during current operations of the dam and for each of the three variations of the PA. There were no minimum low flow requirements prior to the construction of Gathright Dam.

Mean Monthly Flows (cfs)

Month	Pre-Dam	Current Operations	Preferred Alternative Peak Pulse 3000 cfs	Preferred Alternative Peak Pulse 3,500 cfs	Preferred Alternative Peak Pulse 4,000 cfs
January	555	434	434	434	434
February	679	527	527	527	527
March	876	839	839	839	839
April	646	733	733	733	733
May	499	635	635	635	635
June	289	408	400	397	395
July	187	291	281	278	275
August	178	292	283	279	277
September	143	274	285	285	286
October	309	207	223	232	240
November	271	310	310	310	310
December	443	340	340	340	340

Pre-Dam: USGS Gage 02012500 Jackson River at Falling Spring, VA ratioed to USGS Gage 02011800 Jackson River Below Gathright Dam near Hot Springs, VA (Apr 1925 - Nov 1979)
Current Operations: USGS Gage 02011800 Jackson River Below Gathright Dam near Hot Springs, VA (Apr 1982 - Sep 2012)
Preferred Alternatives: {USGS Gage 02011800 Jackson River Below Gathright Dam near Hot Springs, VA (Apr 1982 - Sep 2012)} - {Low Flow Augmentation Change} + {Pulse(s)}

Effect of Preferred Alternative on
Minimum Mean Monthly Flows (cfs)

Month	Pre-Dam	Current Low Flow Requirements	Preferred Alternative Peak Pulse 3000 cfs	3,500 cfs	4,000 cfs
January	N.A.	158	158	158	158
February	N.A.	168	168	168	168
March	N.A.	171	171	171	171
April	N.A.	194	194	194	194
May	N.A.	231	231	231	231
June	N.A.	269	261	258	256
July	N.A.	283	273	270	267
August	N.A.	278	269	265	263
September	N.A.	245	256	256	257
October	N.A.	188	204	213	221
November	N.A.	161	161	161	161
December	N.A.	158	158	158	158

Pre-Dam: N.A. - There were no minimum low flow requirements prior to Gathright Dam.
Current Operations: Gathright Dam and Lake Moomaw Final Regulation Manual, Aug 1984
Preferred Alternatives: {Current Low Flow Requirements} - {Low Flow Augmentation Change} + {Pulse(s)}

APPENDIX D
PROJECT REVIEW PACKAGE FOR THE U.S. FISH AND WILDLIFE SERVICE

Species Conclusions Table

Project Name: Gathright Dam Low Flow
Date: 26 March 2013

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
James spinymussel (*Pleurobema collina*)	* No suitable habitat present *No critical habitat present FWIS	No effect	The mussel is not currently found within the mainstem of Jackson River, but it has been found in tributaries of the river. This project will improve water quality of the Jackson River. This project will have no adverse impacts on the existing populations of James spinymussels.
Northeastern bulrush (*Scirpus ancistrochaetus*)	*No suitable habitat present *No critical habitat present	No effect	
Shale barren rock cress (*Arabis serotina*)	*No suitable habitat present *No critical habitat present	No effect	
Smooth coneflower *chinacea laevigata*)	*No suitable habitat present *No critical habitat present	No effect	
Indiana bat (*Myotis sodalis*)	*Potential habitat present and no current survey conducted. *No critical habitat present	No effect	Although female bats may inhabit trees within riparian forests surrounding the Jackson River during the summer, this project will have no adverse impacts on this species.
Bald Eagle	*Unlikely to disturb nesting bald eagles. *Does not intersect with an eagle concentration area.	No Eagle Act permit required	

IPaC – Species List

IPaC - Information, Planning, and Conservation System

Environmental Conservation Online System

Step 1 (/ipac/wizard/chooseLocation!prepare.action)
Location
Step 2 (/ipac/wizard/chooseActivities!prepare.action)
Activities
Step 3
Trust resources list
Step 4
Conservation measures

Natural Resources of Concern

An online Endangered Species Act species list IS available on this page for your project area, represented by the office(s) listed below.

The Endangered Species Act species list below is for planning purposes only -- it is not an official species list.

To request an official species list, click the **Request an Official Species list** link to the right and follow the instructions.

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE
6669 SHORT LANE GLOUCESTER, VA 23061 (804) 693-6694
http://www.fws.gov/northeast/virginiafield/ (http://www.fws.gov/northeast/virginiafield/) ()

Project Location Map:

Note: The map reflects the map extent and map layers selected on Step 1 Location page. To change what appears on this map, return to the Location page and adjust the map extent or map layers.

Project Counties:

Alleghany, VA | Bath, VA | Botetourt, VA | Covington, VA

Project type: Water Quality Modification

Endangered Species Act Species List (USFWS Endangered Species Program (http://www.fws.g

There are a total of **6** threatened, endangered, or candidate species, and/or designated critical habitat on your species list. Species on this list a and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a projec Please contact the designated FWS office if you have questions.

Species that may be affected by your project:

Clams	Status	Species Profile
James spinymussel (*Pleurobema collina*) Populatio	Endangered	species info (/ipac/wizard/speciesInformation!showSpeciesInformation.action?spcode=F025
Flowering Plants		
Northeastern bulrush (*Scirpus ancistrochaetu*	Endangered	species info (http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q21H)
Shale barren rock cress (*Arabis serotina*)	Endangered	species info (/ipac/wizard/speciesInformation!showSpeciesInformation.action?spcode=Q2X
Smooth coneflower (*Echinace*	Endangered	species info (http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q293)
Mammals		

townsendii virginianus) Population: Entire		

Don't see a species you expect to see? (#)

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program (http://refuges.fws.g

There are no National Wildlife Refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program (http://www.fws.gov/migratorybirds/)).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bal protection under the Bald and Golden Eagle Protection Act (http://www.fws.gov/midwest/eagle/protect/laws.html) (16 U.S.C. Concern (2008) (http://library.fws.gov/Bird_Publications/BCC2008.pdf) report identifies species, subspecies, and populations o additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et se

EAGLE NEST LOCATOR

WELCOME TO THE VIRGINIA BALD EAGLE NEST LOCATOR!

The Center for Conservation Biology (CCB) has created a Google Maps application to allow users to locate CCB-documented eagle territories. CCB encourages the use of our data sets in wildlife conservation and management applications, but as a professional courtesy we ask that data users read and agree to the full terms of our Data Use Agreement. By viewing the Eagle Nest Locator on this site you agree to the Data Use Agreement and Terms of Use for VaEagles Nest Locator.

Data displayed reflects data from the 2011 Annual Bald Eagle Survey. All data/maps used according to this agreement should be cited using the following text: Watts, B. D. and M. A. Byrd. 2011. Virginia bald eagle nest survey: 2011 breeding season. Center for Conservation Biology, College of William and Mary and Virginia Commonwealth University, Williamsburg, VA.

Nest Status Definitions:
“Active/Occupied” indicates an active nest and/or an occupied territory.
“Recently Active” indicates a nest that has been active within the past 3 years and is known to still exist.

Wh
E
R

Map and Data copyright of The Center for Conservation Biology @ ccbbirds.org

Help CCB by Reporting Eagle Nest Locations

Despite our best efforts, an unknown number of eagle nests go unrecorded each year. This is particularly true in the Piedmont and mountains of Virginia where the survey does not cover. We believe that the public knows of many nests that are unknown to us. All active or recently active nests known to CCB (surveyed in last year's Annual Bald Eagle Survey plus reported with confirmed location) are presented in the eagle nest locator. Please view nests in your local area and report nests known to you that do not appear. Visit our Report a Nest page for instructions. Thanks for your help!

Annual Survey

The data contained in the VaEagles Nest Locator comes directly from Virginia's annual bald eagle survey. Breeding eagles have been surveyed annually in the lower Chesapeake Bay since 1956. The

2011 survey represents the 56th consecutive survey. Each year CCB biologists fly a nest survey in February and March to map eagle nests and to determine their activity status. This survey is followed in late April and May by a productivity survey where chicks are counted in each nest. The survey covers all tributaries of the lower Chesapeake, as well as, other prominent bodies of water and requires more than 100 hours of flight time in a high-wing Cessna. Biologists survey all known nest structures to determine their activity status and search for newly established nests. During the 2011 breeding season, CCB surveyed more than 1000 nest structures and documented more than 730 breeding pairs that produced more than 980 chicks.

Regulatory Contacts

Bald Eagles are sensitive to human disturbance. Since the 1970s nest sites have been managed using a combination of spatial buffers and time-of-year restrictions. Human activities that are considered to be detrimental to breeding pairs (e.g. residential, commercial, and industrial development, logging, use of toxic chemicals) are restricted within a “primary buffer” and human activities that are considered to impact the integrity of the primary buffer (e.g. construction of high-density developments, multi-story buildings, new roadways) are restricted within a “secondary buffer”. Time-of-year restrictions are used to limit direct human activities (e.g. recreational activities, logging, mineral exploration, low-level aircraft operations) within buffer areas that may disturb eagles during sensitive periods of the nesting cycle.

The Virginia Department of Game and Inland Fisheries (VDGIF) has legal jurisdiction over issues relating to bald eagle protection. The VDGIF, through its environmental services section, reviews proposed projects from government agencies and private individuals to identify possible impacts. Such reviews are encouraged and usually result in a considerable savings in time and money to the landowner. The two agencies listed here are the lead agencies for bald eagle reviews and recommendations in Virginia.

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230-1104
(804) 367-8999

U. S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, Virginia 23061

Date:

Online Project Review Certification Letter

Project Name:

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA), and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250), as amended (Eagle Act). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA and Eagle Act conclusions. These conclusions resulted in "no effect" and/or "not likely to adversely affect" determinations for listed species and critical habitat and/or "no Eagle Act permit required" determinations for eagles regarding potential effects of your proposed project. We certify that the use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the "no effect" and "not likely to adversely affect" determinations for listed species and critical habitat and "no Eagle Act permit required" determinations for eagles. Additional coordination with this office is not needed.

Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species.

Should project plans change or if additional information on the distribution of listed species, critical habitat, or bald eagles becomes available, this determination may be reconsidered. This certification letter is valid for one year.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available at our website http://www.fws.gov/northeast/virginiafield/endspecies/project_reviews.html. If you have any questions, please contact Kimberly Smith of this office at (804) 693-6694, extension 124.

Sincerely,

/s/ Cynthia A. Schulz

Cindy Schulz
Supervisor
Virginia Field Office

Enclosures - project review package

APPENDIX E
PERTINENT CORRESPONDENCE

Comment Submitted to the USACE website by Teresa Milstead during the Public Review Period dated January 12, 2013.

Message From: Teresa Milstead
Email: sandman9520@ntelos.net
Response requested: Yes

Message:

Please direct these comments to the appropriate department.

I live in Alleghany County VA, and am concerned about the revision to the low-flow augmentation plan being proposed. I understand the need to increase dissolved oxygen in the Jackson/James rivers and the need to flush the undesirable flora and fauna from the rivers. In Alleghany Co the Jackson River (especially between the dam and the Covington water treatment facility) is the primary area of recreation for many residents and visitors. Every day between May and October, many kayaks float this stretch of the river from morning until night. The kayaks are filled with all ages of people, from kids to retirees. Releases of more than 350-400 cf/s (I think she means 3500-4000) have caused dangerous situations for kayakers that come from as far away as Lexington, Lewisburg, and Roanoke to float down the river. Two years ago, a pulse was released on Memorial day weekend, and virtually closed the river for everyone that had come to visit our area. Several boats were lost and rescues were required due to the lack of information about the event.

In addition, both the Homestead and Greenbrier Resorts bring busloads of tourists to kayak and canoe down this stretch, and numerous trout fishing enthusiasts come here on their own or on guided trips to fish the rich waters.

The environmental assessment states that there will be no impact on recreation due to the revised flow plan, EXCEPT a period of 8-13 hours after the release, when recreation would be restricted. I suggest that the time of the pulses be scheduled at night, so that the water will be safe during the hours of heaviest use of the river. Also, I suggest that the pulses be scheduled regularly, such as the first and third Tuesday of the months affected, and the schedule be posted daily in all newspapers in the area continuously. I also suggest that all state licensed tour guides, outfitters, and so forth be notified well ahead of the planned releases to avoid injury to tourists visiting our area. The two named resorts should especially be notified, since they bring visitors to our area from all over the country, to avoid serious injury or death if they are on the river when a pulse is released.

Whenever a schedule is set up, it should be permanently posted at all public access points along the river. While many people live on the river and launch their canoes, floats, and kayaks from their yard, most will have to use and access point to leave the river. The notices should be highly visible and prominently displayed well ahead of the first pulsed release so that lives are not endangered.

I also understand that the revised release plan will basically reduce the river level by 1-3 inches all summer long. While that doesn't sound like much, it will mean a significant change in the floating conditions for people who've been on this river all their lives.

Also, Alleghany Co has issued a water restriction due to the drought we are experiencing already. The river is low, Lake Moomaw is lower than I've ever seen it, and I still have salt on my vehicle from the snow we had several weeks ago. During the water use restriction, we are not allowed to wash our cars or water our yards or gardens. Will the revised plan cause further water restrictions during our hot summer months? Many people in this area are very poor, and depend on home gardens for food stores. Further water restrictions in this area could significantly impact the productivity of the home gardener.

The environmental assessment makes it clear that the problems in the river are primarily below the papermill, This does not surprise anyone, but the mill is the primary employer in the area. The county is well above the state in unemployment, and poorer as well. Nobody can afford to say "make Westvaco clean up the river" without fearing for their livelihood. It's not quite as bad as the coalminers in West Virginia, but that plant is one of the biggest polluters in the state, of both our water and our air. Not too many people even want to get on the "dirty Jackson" as it is called below the mill. Please don't let the attempt to reduce pollution below the mill ruin the few miles of pristine conditions we have on the Jackson River between Gathright Dam and the mill.

Thank you for the opportunity to voice my concerns. Please forward these comments to the environmental department as I could not find an email address in the Environmental Assessment for comments. If possible please respond when these comments are forwarded to the appropriate department.

Response to Teresa Milstead dated February 22, 2013:

Ms. Milstead,

Thank you for your email for January 12, 2013 regarding the Gathright Low Flow Augmentation Project. Your comments were thought provoking and I would like to take this opportunity to address them.

The first concern you expressed was in regard to the safety of people using the river during the pulses. We at the U.S. Corps of Engineers (the Corps) consider the safety of the communities below the dam and people who enjoy the Jackson River one of our highest priorities. In fact many of the ideas you suggested in your email were already under consideration. A schedule for the pulses will be determined each year before the summer season begins and the schedule will be made available to the public. The releases will occur on a regular timetable, such as having each release take place on a particular day each month. Once this schedule has been established, it will only be deviated from during unusual events, such as floods or drought events, and these deviations will be announced to the public as early as possible. This way, people who plan to use the river will be able to anticipate the releases and plan accordingly.

Currently, the Corps releases water from the Gathright Dam when flood events take place upstream of the Gathright Dam. The event that you described in your email, which occurred on Memorial Day 2011, was a result of a natural flooding event. It was not a planned release as described in this EA. However, after that event, the Corps realized that the agency needed to improve its communication with the communities downstream of the dam. We expanded the number of individuals and agencies that received notification of release events and we began posted releases on social media outlets such as FaceBook and Twitter.

With this proposed release schedule, the Corps will further increase its notification program. We have discussed creating a system where people can sign up to receive notices of high water events. Also, your suggestion to provide release information to the local outfitters and tour guides is an excellent idea and we plan to expand our notification list to include those businesses. We plan to post release schedules at river accesses, similarly to what has been done it the past. During past test pulses, the Corps posted notices at each U.S. Forest Service public assess location downstream of the Gathright Dam and at the assess point immediately below the dam.

Your second concern involved recreational opportunities on the Jackson River. The Corps manages Gathright Dam to maintain water related recreation in Lake Moomaw and to support the trout fishery downstream of the dam. The Corps considered recreation while planning this project. Throughout the planning process we have partnered with the Virginia Department of Environmental Quality (VDEQ) and the Virginia Department of Game and Inland Fisheries (VDGIF). Members of these agencies met with Trout Unlimited and the Isaac Walton League in order to determine the impacts on fishing below the dam. These stakeholders indicated that slight reduced daily releases would have a minimal but potentially positive impact for fisherman in the Jackson River, even considering the loss of fishing for part of 6 days during the pulse releases.

You also mentioned floating the river. We contacted a local outfitter to determine the impacts of this project on kayaking and canoeing. The best water levels for these trips are between 180 CFS

and 300 CFS. None of the proposed alternatives would reduce water levels to a point where canoes and kayaks would not be able to use the river. Depending on releases sizes, the proposed project may actually increase the amount of water released into the river during the month of October, expanding canoeing and kayaking opportunities on the Jackson River into the fall.

Although days available to float down the river will be reduced by the change in the proposed project, these releases will provide the opportunity for scheduled fast water kayaking opportunities which are not currently available on the Jackson River.

You also asked "if the revised plan will cause further water restrictions during the summer". This plan will not change water restrictions. Alleghany County decides when to put water restrictions into place using the level of Lake Moomaw as a guide. The water used for the pulse releases will be completely offset by the reduction in the monthly low flow augmentation releases. So the new release schedule will not have an effect on Lake Moomaw levels or water restrictions.

Your last concern was about the environmental conditions in the Jackson River above the Mead WestVACO plant. The Corps has worked closely with the VDEQ and the VDGIF for many years to ensure that the change to the release schedule will not harm the Jackson River. We have performed three test pulses over the past three years. Before and after those releases, state biologists have collected extensive amounts of data to study the impacts of the releases on the Jackson River downstream of the Gathright Dam. The state agencies have concluded that the pulses will not cause large, long-term impacts to river conditions. These agencies, along with the Norfolk District, are committed to continuing this monitoring in the future to ensure that this project does not cause effect this stretch of the Jackson River or in Lake Moomaw. We plan to hold annual meetings with our partnering agencies and Mead WestVACO each year to review water quality data collected during the prior year in order to access the affects of the releases on the Jackson River. We will be able to adjust the schedule if needed.

I hope that I have answered all of your concerns regarding the Gathright Low Flow Augmentation Project. I have added more information to the Environmental Assessment to reflect your concerns and suggestions.

Thank you for your interest in this project,

Janet Cote

Email submitted by Timothy Morse of Mead WestVACO during the Public Review Period dated January 14, 2013.

Ms. Janet Cote, Ecologist, USACE;

MWV appreciates the opportunity to provide comments on the Environmental Assessment (EA) completed in regards to the Gathright Dam Low Flow Augmentation Project.

I previously provided some verbal comments to you by telephone concerning some minor, generally typographical items in the draft EA, which you took note of.

MWV supports making revisions to the Gathright Dam Water Control Plan to incorporate pulse releases as described in the Environmental Assessment document. MWV applauds the USACE for their willingness to take these prudent steps to further improve aquatic habitat and water quality by modifying the operation of the Gathright Dam to better simulate a more natural flow regime for the Jackson River.

The adaptive management approach is a positive approach in that it enables flexibility and a reasoned response to actual, real world conditions within a defined framework.

Other significant, positive aspects are that these modifications can be made without incurring additional costs and that there are no significant adverse impacts.

MWV looks forward to seeing the full implementation and positive ecosystem impacts of the pulse releases.

Thank you for the opportunity to share these comments.

Sincerely,

Timothy M. Morse
SH&E Sr. Technical Adviser
MWV - Richmond, VA

timothy.morse@mwv.com
804-444-7054
540-968-0317 cell

Email submitted by Elizabeth McKercher of Virginia Department of Environmental Quality on October 05, 2012.

From: Mckercher, Elizabeth (DEQ)
Sent: Friday, October 05, 2012 3:12 PM
To: Reece, Owen R NAO
Cc: Dail, Mary (DEQ); Hill, Jason (DEQ); janet.cote@usace.army.mil; Butt, Arthur (DEQ)
Subject: Gathright EA: DEQ Comments

Good afternoon Owen,

DEQ's comments on the EA are attached. We had no comments on the supporting documents. We appreciate the opportunity to review and edit.

Best Regards, Liz

Liz McKercher

Watershed Programs Manager, Virginia Department of Environmental Quality
629 East Main Street, Richmond, Virginia 23219
PHONE 804.698.4291
FAX 804.698.4032
Mailing Address: P.O. Box 1105, Richmond, Virginia 23218

Email submitted by Darlene Burcham of the town of Clifton Forge dated January 23, 2013.

The town has no comments. I would ask you to revise your officials list. Mayor Jimmie Houff passed away in October. The new mayor is Carl Brinkley--carl.brinkley@cliftonforgeva.gov, thanks.

Email submitted by Kimberly Smith of the US Fish and Wildlife Service dated January 29, 2013.

Janet,

The Service has reviewed the Environmental Assessment dated December 2012 and entitled "Gathright Dam Low Flow Augmentation Project Alleghany County, Virginia." The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended, and Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

* We no longer provide individual responses to requests for project reviews. We have developed a website where you can conduct a project review. This online project review system will help you determine which federally listed species may occur within the action area. This site is available at: http://www.fws.gov/northeast/virginiafield/endspecies/Project_Reviews_Introduction.html.
* James spinymussel is misspelled on page 23 and on page 38 there is a space between spiny and mussel. Assessment is misspelled on Cover Page.
* We request that you provide a hydrograph in your Environmental Assessment that shows a comparison of the river flows at pre-dam, present (no action), and the preferred alternative throughout a typical year.

Thanks,
Kim

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Kimberly Smith
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
6669 Short Lane
Gloucester, VA 23061
Kimberly_Smith@fws.gov
804.693.6694 ext. 124
804.654.1924 work cell
804.693.9032 FAX
http://www.fws.gov/northeast/virginiafield/index
```````````````````````````````````````````````

Email submitted by Liz McKercher of the Virginia DEQ dated February 2, 2013.

Janet,

The only feedback DEQ would like to provide on the EA that was under public comment recently is a need for clarification regarding flow regimes and drought contingency. I provide feedback from our Office of Water Supply below.

During times of significant drought, the releases from Gathright Dam supply a large portion of the flow in the James River at the fall line. For example, during the drought of 2002, monthly average flow rates at Cartersville were 888 in August and 745 cfs in September. During this time, releases from Lake Moomaw would have been in the neighborhood of 150-200 cfs, which would be approximately 15-25% of flow at Cartersville during that time. Because water withdrawal amounts and in-stream flow prescriptions in the lower James River are based upon the regularity of the Jackson river flows, the Office of Water Supply makes the following comments/recommendations:

§ The duration of the test pulse was listed as 2 hours, and their intention to provide up to 6 pulses per year was indicated. However, no description of the duration of these 6 pulses, the interval between pulses, nor any criteria for determining frequency or duration was provided.

§ Pulse releases should be curtailed, and normal low-flow augmentation releases should be reinstated during times of significant drought, perhaps concurrently with drought Emergency declaration in any part of the James River above the fall-line.

Best Regards, Liz

Liz McKercher
Watershed Programs Manager, Virginia Department of Environmental Quality
629 East Main Street, Richmond, Virginia 23219
PHONE 804.698.4291 FAX 804.698.4032

Mailing Address: P.O. Box 1105, Richmond, Virginia 23218

Email submitted by Paul Bugas of the Virginia DGIS dated February 15, 2013.

Janet: Let's go with my original comments. Thanks, Paul

Paul Bugas
Region 4 Aquatics Manager
540-248-9370 (office)

-----Original Message-----
From: Cote, Janet NAO [mailto:Janet.Cote@usace.army.mil]
Sent: Friday, February 15, 2013 3:33 PM
To: Bugas, Paul (DGIF)
Subject: FW: Gathright Draft EA (UNCLASSIFIED)

Classification: UNCLASSIFIED

Here you go.
J

-----Original Message-----
From: Bugas, Paul (DGIF) [mailto:Paul.Bugas@dgif.virginia.gov]
Sent: Sunday, October 07, 2012 11:13 AM
To: Reece, Owen R NAO; Hill, Jason (DEQ); Dail, Mary (DEQ); Mckercher, Elizabeth (DEQ); Benelmouffok, Djamel; 'EL-Farhan, Raed'; Hudgins, Mark H NAO; Schulte, David M NAO
Cc: Cote, Janet NAO; Ives, Lawrence H NAO; Reeser, Steve (DGIF)
Subject: RE: Gathright Draft EA (UNCLASSIFIED)

Owen et al: Here is an edited version of the Gathright Draft EA from DGIF's viewpoint. My apologies for not getting it submitted on Friday. I am assuming a second draft will be forthcoming once everyone has responded this one? Paul

Paul Bugas
Region 4 Aquatics Manager
540-248-9370 (office)

Email submitted by Patrick Sheridan of the US Forest Service dated February 21, 2013.

Hi Janet.

I may have missed it, but I would appreciate knowing the pulse schedules for the year as far in advance as possible.

No other issues from me....thank you for your patience.

APPENDIX F

COMMENTS AND RESPONSES

Teresa Milstead (January 12 2013)

Comment: In Alleghany Co the Jackson River (especially between the dam and the Covington water treatment facility) is the primary area of recreation for many residents and visitors. Every day between May and October, many kayaks float this stretch of the river from morning until night. The kayaks are filled with all ages of people, from kids to retirees. Releases of more than 350-400 cf/s (I think she means 3500-4000) have caused dangerous situations for kayakers that come from as far away as Lexington, Lewisburg, and Roanoke to float down the river. Two years ago, a pulse was released on Memorial Day weekend, and virtually closed the river for everyone that had come to visit our area. Several boats were lost and rescues were required due to the lack of information about the event.

Response: The first concern you expressed was in regard to the safety of people using the river during the pulses. We at the U.S. Corps of Engineers (the Corps) consider the safety of the communities below the dam and people who enjoy the Jackson River one of our highest priorities. In fact many of the ideas you suggested in your email were already under consideration. A schedule for the pulses will be determined each year before the summer season begins and the schedule will be made available to the public. The releases will occur on a regular timetable, such as having each release take place on a particular day each month. Once this schedule has been established, it will only be deviated from during unusual events, such as floods or drought events, and these deviations will be announced to the public as early as possible. This way, people who plan to use the river will be able to anticipate the releases and plan accordingly.

Currently, the Corps releases water from the Gathright Dam when flood events take place upstream of the Gathright Dam. The event that you described in your email, which occurred on Memorial Day 2011, was a result of a natural flooding event. It was not a planned release as described in this EA. However, after that event, the Corps realized that the agency needed to improve its communication with the communities downstream of the dam. We expanded the number of individuals and agencies that received notification of release events and we began posted releases on social media outlets such as FaceBook and Twitter.

With this proposed release schedule, the Corps will further increase its notification program. We have discussed creating a system where people can sign up to receive notices of high water events. Also, your suggestion to provide release information to the local outfitters and tour guides is an excellent idea and we plan to expand our notification list to include those businesses. We plan to post release schedules at river accesses, similarly to what has been done it the past. During past test pulses, the Corps posted notices at each U.S. Forest Service public assess location downstream of the Gathright Dam and at the assess point immediately below the dam.

Comment: The environmental assessment states that there will be no impact on recreation due to the revised flow plan, EXCEPT a period of 8-13 hours after the release, when recreation would be restricted. I suggest that the time of the pulses be scheduled at night, so that the water will be safe during the hours of heaviest use of the river. Also, I suggest that the pulses be scheduled regularly, such as the first and third Tuesday of the months affected, and the schedule be posted daily in all newspapers in the area continuously. I also suggest that all state licensed tour guides, outfitters, and so forth be notified well ahead of the planned releases to avoid injury to tourists visiting our area. The two named resorts should especially be notified, since they bring visitors

to our area from all over the country, to avoid serious injury or death if they are on the river when a pulse is released.

Whenever a schedule is set up, it should be permanently posted at all public access points along the river. While many people live on the river and launch their canoes, floats, and kayaks from their yard, most will have to use and access point to leave the river. The notices should be highly visible and prominently displayed well ahead of the first pulsed release so that lives are not endangered.

I also understand that the revised release plan will basically reduce the river level by 1-3 inches all summer long. While that doesn't sound like much, it will mean a significant change in the floating conditions for people who've been on this river all their lives.

Response: Your second concern involved recreational opportunities on the Jackson River. The Corps manages Gathright Dam to maintain water related recreation in Lake Moomaw and to support the trout fishery downstream of the dam. The Corps considered recreation while planning this project. Throughout the planning process we have partnered with the Virginia Department of Environmental Quality (VDEQ) and the Virginia Department of Game and Inland Fisheries (VDGIF). Members of these agencies met with Trout Unlimited and the Isaac Walton League in order to determine the impacts on fishing below the dam. These stakeholders indicated that slight reduced daily releases would have a minimal but potentially positive impact for fisherman in the Jackson River, even considering the loss of fishing for part of 6 days during the pulse releases.

You also mentioned floating the river. We contacted a local outfitter to determine the impacts of this project on kayaking and canoeing. The best water levels for these trips are between 180 CFS and 300 CFS. None of the proposed alternatives would reduce water levels to a point where canoes and kayaks would not be able to use the river. Depending on releases sizes, the proposed project may actually increase the amount of water released into the river during the month of October, expanding canoeing and kayaking opportunities on the Jackson River into the fall.

Although days available to float down the river will be reduced by the change in the proposed project, these releases will provide the opportunity for scheduled fast water kayaking opportunities which are not currently available on the Jackson River.

Comment: Also, Alleghany Co has issued a water restriction due to the drought we are experiencing already. The river is low, Lake Moomaw is lower than I've ever seen it, and I still have salt on my vehicle from the snow we had several weeks ago. During the water use restriction, we are not allowed to wash our cars or water our yards or gardens. Will the revised plan cause further water restrictions during our hot summer months? Many people in this area are very poor, and depend on home gardens for food stores. Further water restrictions in this area could significantly impact the productivity of the home gardener.

Response: You also asked “if the revised plan will cause further water restrictions during the summer”. This plan will not change water restrictions. Alleghany County decides when to put water restrictions into place using the level of Lake Moomaw as a guide. The water used for the pulse releases will be completely offset by the reduction in the monthly low flow augmentation

releases. So the new release schedule will not have an effect on Lake Moomaw levels or water restrictions.

Comment: The environmental assessment makes it clear that the problems in the river are primarily below the papermill. This does not surprise anyone, but the mill is the primary employer in the area. The county is well above the state in unemployment, and poorer as well. Nobody can afford to say "make Westvaco clean up the river" without fearing for their livelihood. It's not quite as bad as the coalminers in West Virginia, but that plant is one of the biggest polluters in the state, of both our water and our air. Not too many people even want to get on the "dirty Jackson" as it is called below the mill. Please don't let the attempt to reduce pollution below the mill ruin the few miles of pristine conditions we have on the Jackson River between Gathright Dam and the mill.

Response: Your last concern was about the environmental conditions in the Jackson River above the Mead WestVACO plant. The Corps has worked closely with the VDEQ and the VDGIF for many years to ensure that the change to the release schedule will not harm the Jackson River. We have performed three test pulses over the past three years. Before and after those releases, state biologists have collected extensive amounts of data to study the impacts of the releases on the Jackson River downstream of the Gathright Dam. The state agencies have concluded that the pulses will not cause large, long-term negative impacts to river conditions. These agencies, along with the Norfolk District, are committed to continuing this monitoring in the future to ensure that this project does not cause effect this stretch of the Jackson River or in Lake Moomaw. We plan to hold annual meetings with our partnering agencies and Mead WestVACO each year to review water quality data collected during the prior year in order to access the affects of the releases on the Jackson River. We will be able to adjust the schedule if needed.

US Fish and Wildlife Service (January 29, 2013)

Comment: We no longer provide individual responses to requests for project reviews. We have developed a website where you can conduct a project review. This online project review system will help you determine which federally listed species may occur within the action area. This site is available at:
http://www.fws.gov/northeast/virginiafield/endspecies/Project_Reviews_Introduction.html.

Response: The Corps completed the online project review process. No impacts were determined to result from the implementation of this project. The documents produced from this evaluation are included in this document.

Comment: James spinymussel is misspelled on page 23 and on page 38 there is a space between spiny and mussel. Assessment is misspelled on Cover Page.

Response: The misspellings were fixing in the EA.

Comment: We request that you provide a hydrograph in your Environmental Assessment that shows a comparison of the river flows at pre-dam, present (no action), and the preferred alternative throughout a typical year.

Response: A hydrograph of peak flows on the Jackson River at Falling Springs, VA was added to the EA as Table 15. Two hydrographs, one showing the required minimum mean monthly flows and the other showing the mean monthly flows that would occur down stream of the Gathright Dam were added to the EA in Appendix c.

Virginia Department of Environmental Quality, Water Supply (January 23, 2013)

Comment: The only feedback DEQ would like to provide on the EA that was under public comment recently is a need for clarification regarding flow regimes and drought contingency. I provide feedback from our Office of Water Supply below.

During times of significant drought, the releases from Gathright Dam supply a large portion of the flow in the James River at the fall line. For example, during the drought of 2002, monthly average flow rates at Cartersville were 888 in August and 745 cfs in September. During this time, releases from Lake Moomaw would have been in the neighborhood of 150-200 cfs, which would be approximately 15-25% of flow at Cartersville during that time. Because water withdrawal amounts and in-stream flow prescriptions in the lower James River are based upon the regularity of the Jackson river flows, the Office of Water Supply makes the following comments/recommendations:

§ The duration of the test pulse was listed as 2 hours, and their intention to provide up to 6 pulses per year was indicated. However, no description of the duration of these 6 pulses, the interval between pulses, nor any criteria for determining frequency or duration was provided.

§ Pulse releases should be curtailed, and normal low-flow augmentation releases should be reinstated during times of significant drought, perhaps concurrently with drought Emergency declaration in any part of the James River above the fall-line.

Response: The DEQ was contacted on February 21 by Owen Reece to discuss the comments the agency provided. Mr. Reece summarized the conversation in the email included below.

I discussed the two DEQ comments with Brian McGurk, Environmental Program Planner, Office of Water Supply, Virginia Department of Environmental Quality on February 14, 2012. A summary of our discussion follows.

The first comment regarding the EA containing "no description of the duration of these 6 pulses, the interval between pulses, nor any criteria for determining frequency or duration was provided" will need to be addressed by revising the EA. Specifically:

(1) The pulse will be conducted over an eight hour period. Three hours to gradually increase the flow from that month's low flow augmentation flow up to the peak pulse flow. The peak pulse release will be held for two hours. The final three hours will gradually reduce the flow from the peak pulse flow to that month's low flow augmentation flow.
(2 & 3) The interval between the pulse should be addressed in the annual schedule of pulses developed each year based on hydrologic conditions and experience gained from the previous years of pulsing. Initially, there would be a three to four week interval between pulses.

Additionally, it should be included in the EA that the District will retain the ability to respond to significant drought conditions by modifying the releases from the project as has been done several times in the past to preserve conservation storage in Lake Moomaw.

Brian said the comments were developed by Robert Burgholzer in the Office of Water Supply and he believed my responses would satisfy the concerns expressed in the comments.

Virginia DGIS (February 15, 2013)
Comment: Mr. Paul Bugas provided a copy of the EA on which he included his comments.

Response: All comments provided by the Virginia DGIF were incorporated into the EA prior to the release of the document for public review.

US Forest Service (February 21, 2013)

Comment: Mr. Patrick Sheridan of the US Forest Service asked to be informed of the pulse schedule as soon as it is determined each year.

"I may have missed it, but I would appreciate knowing the pulse schedules for the year as far in advance as possible."

Response: An email (see below) was sent to Mr. Sheridan describing when the pulse schedules would be determined each year and to acknowledge that the Corps would inform the USFS of the schedule as so as it is established.

"The plan is to have annual meetings with the partners to discuss the previous year's experiences and to set the next years pulse schedule. I believe these are going to be held in March. I will make sure that Owen sends your Agency the schedule as soon as it's determined each year."