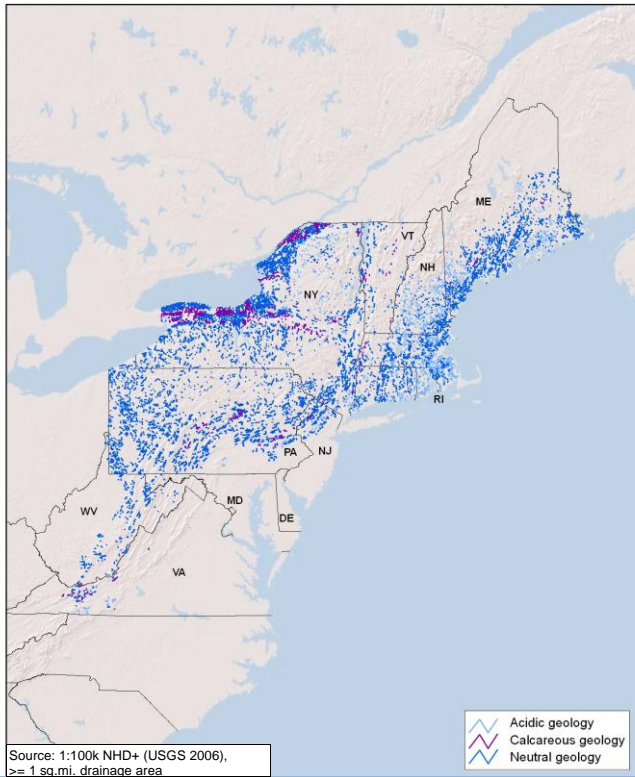


Low Gradient, Cool, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Shawsheen River, © John Pheilan

Description:

Cool, slow-moving, headwaters and creeks of low-moderate elevation flat, marshy settings. These small streams of moderate to low elevations occur on flats or very gentle slopes in watersheds less than 39 sq.mi in size. The cool slow-moving waters may have high turbidity and be somewhat poorly oxygenated. Instream habitats are dominated by glide-pool and ripple-dune systems with runs interspersed by pools and a few short or no distinct riffles. Bed materials are predominantly sands, silt, and only isolated amounts of gravel. These low-gradient streams may have high sinuosity but are usually only slightly entrenched with adjacent floodplain and riparian wetland ecosystems. Cool water temperatures in these streams means the fish community contains a higher proportion of cool and warm water species relative to coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

Headwaters and creeks also occur at higher elevations and on higher slopes, but these tend to have coarser substrates and faster water. Cool low gradient streams typically flow into low gradient cool rivers.

Places to Visit this Habitat:

Blacklog Creek, Tuscarora State Forest | PA Black Creek, Genesee Valley Greenway Trail | NY Beaver Brook, Beaver Brook Reservation | MA Canoe River headwaters, Maple Park Conservation Area | MA Blackledge River headwaters, Salmon River State Forest | CT

State Distribution: CT, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 16,579

% Conserved: 11.5 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
NY	41	6830	94	325	4726
PA	19	3163	53	167	2142
ME	15	2419	65	119	1631
MA	9	1430	26	216	856
NH	5	792	22	113	470
CT	4	643	27	50	403
WV	2	338	14	27	209
VT	2	294	5	26	190
NJ	2	272	35	6	167
VA	1	195	1	5	136
RI	1	145	6	25	80
MD	0	57	1	1	40

Associated Fish:

Most Abundant: white sucker, fallfish, common shiner, tessellated darter, creek chub, common shiner, centralstoneroller, longnose dace, bluntnose minnow, fathead minnow, mottled sculpin, eastern blacknose dace, smallmouth bass. **Less Abundant:** cutlip minnow, pumpkinseed, margined madtom, rock bass, brook trout, fantaildarter, northern hog sucker, largemouth bass, redbreast sunfish, bluegill, banded killifish, spottail shiner, johnny darter, green sunfish, silverjaw minnow, brown bullhead, river chub, reidside dace, swallowtail shiner, greenside darter, pearl dace, chain pickerel, yellow perch, redfin pickerel, pearl dace, yellow bullhead, golden shiner, american brook lamprey, swamp darter, creek chubsucker, banded sunfish, eastern mudminnow

Species of Concern (G1 - G4):

Fishes: reidside dace, mountain brook lamprey, pugnose shiner, bridle shiner, kanawha minnow, tennessee dace, black sculpin, northern brook lamprey, american brook lamprey, ironcolor shiner, blacknose shiner, new river shiner, appalachia darter, stripeback darter

Crayfish, Mussels, and Snails: brook floater, dwarf wedgemussel, tennessee heelsplitter, triangle floater, slippershell mussel, eastern pondmussel, eastern pearlshell, vernal physa

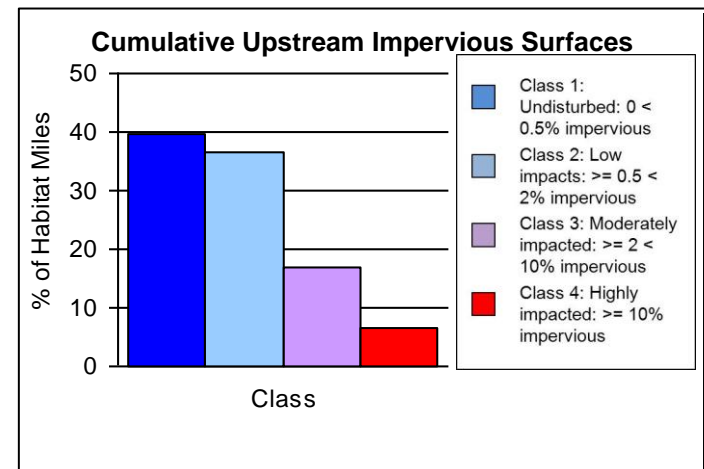
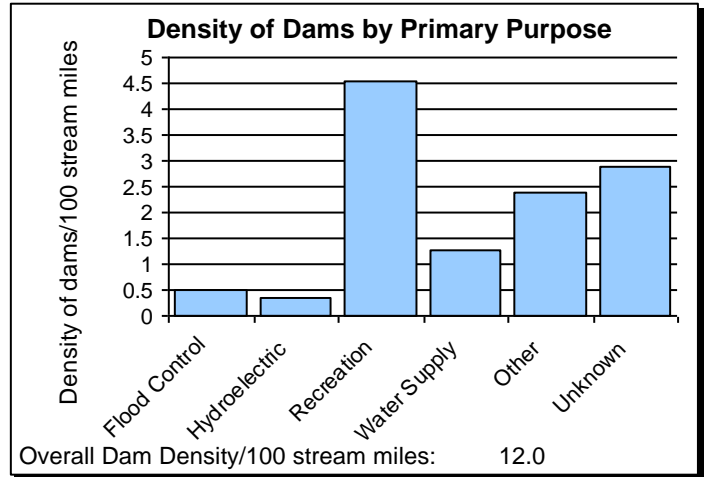
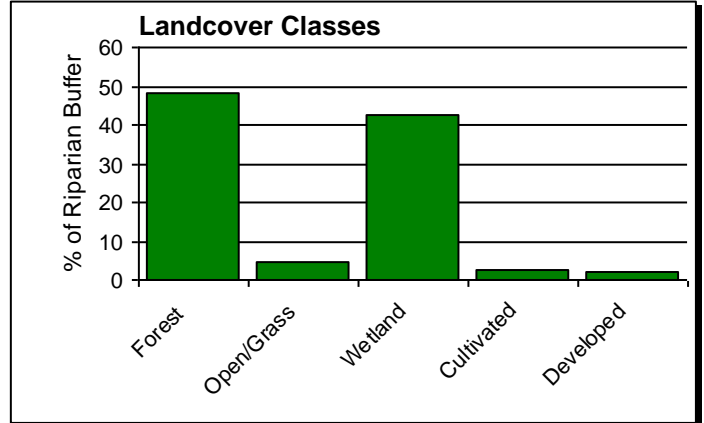
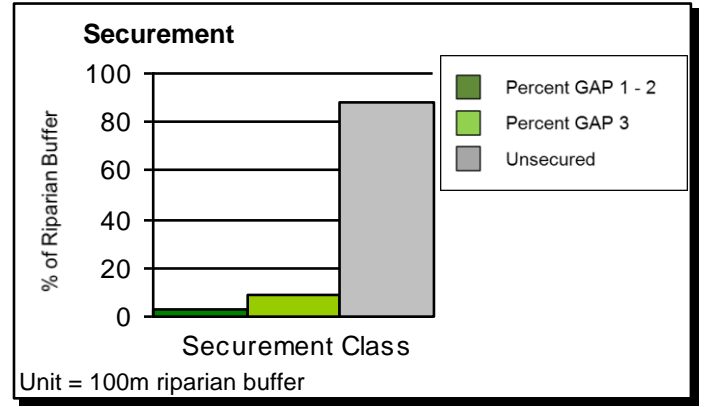
See Appendix 2 for scientific names

Crosswalk to State Names:

Vermont: Blacknose dace-Bluntnose minnow, Blacknose dace-Creek chub. **New Hampshire:** Low gradient wetland streams; Sandy glide streams, Warm water riffle streams. **New York:** Marsh headwater stream. **Maryland:** Piedmont Streams: low gradient variant; Cold Water Streams. **Pennsylvania:** Atlantic Basin Fish Coolwater Community 1, Ohio-Great Lakes Basins Fish Coolwater Stream Community



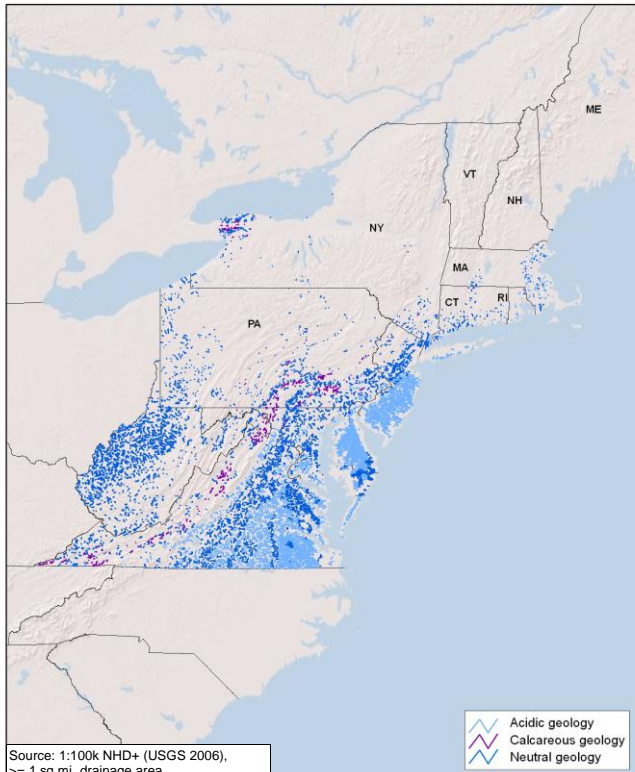
Creek chub, © Brian Gratwicke



Low Gradient, Warm, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Small Creek in Maryland, © MD DNR

Description:

Warm, slow-moving, headwaters and creeks of low-elevation flat, marshy settings. These small streams of the Mid-Atlantic region occur at moderate to low elevations on flats or very gentle slopes in watersheds less than 39 sq.mi in size. The warm slow-moving waters may have high turbidity and be somewhat poorly oxygenated. Instream habitats are dominated by glide-pool and ripple-dune systems with runs interspersed by pools and a few short or no distinct riffles. Bed materials are predominantly sands, silt, and only isolated amounts of gravel. Some examples flow through wetlands and these segments may be dominated by silt, muck, peat, marl deposits, organic matter, and woody or leafy debris. These low-gradient streams may have high sinuosity, but are usually only slightly entrenched with adjacent floodplain and riparian wetland ecosystems. Warm water temperatures in these streams means the fish community will contain a higher proportion of warmwater species relative to coolwater species, and are unlikely to support any resident coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

Headwaters and creeks also occur at higher elevations and on higher slopes, but these tend to have coarser substrates, faster, and cooler water. Warm low gradient streams typically flow into low gradient warm rivers.

Places to Visit this Habitat:

North Branch Metedeconk River headwaters, Turkey Swamp | NJ
 Manasquan River headwaters, Manasquan River Linear Park | NJ
 South Branch Rahway River headwaters, Merrill Park | NJ
 Little Gunpowder Falls, Gunpowder Falls State Park | MD
 Wolf Den Branch, Cedarville State Forest | MD

State Distribution: CT, DE, DC, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 17,704

% Conserved: 9.0 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	42	7455	26	162	5449
WV	15	2649	24	56	1898
NJ	13	2360	266	231	1337
MD	10	1727	58	145	1119
PA	9	1637	48	38	1148
DE	6	1087	23	59	761
NY	3	473	4	14	341
MA	1	161	5	29	93
CT	1	123	5	9	82
RI	0	29	2	6	15
DC	0	1	0	0	1
NH	0	1	0	0	0

Associated Fish:

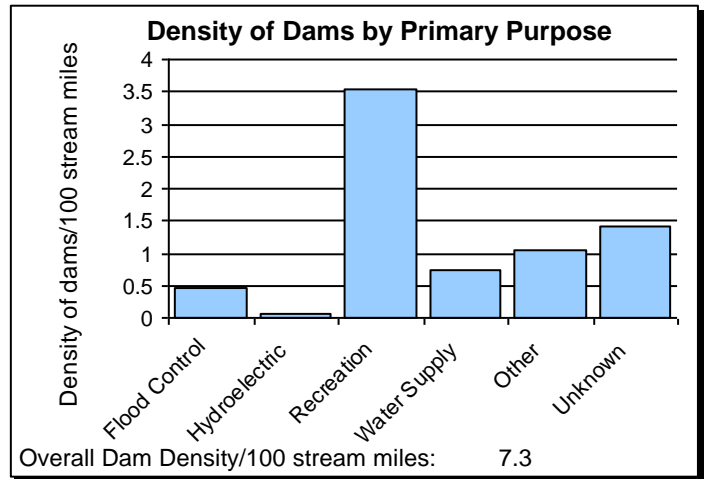
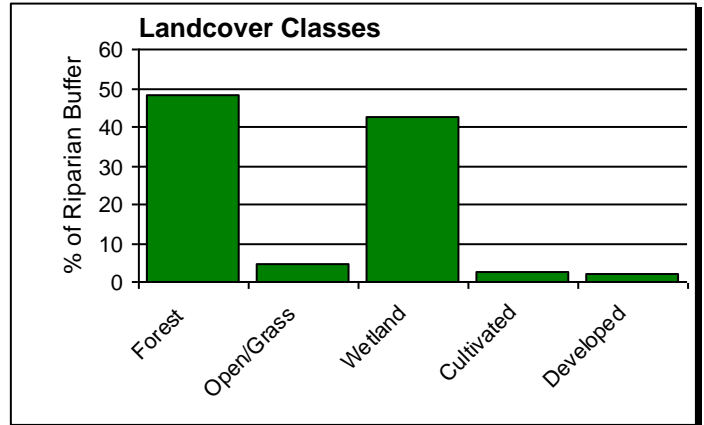
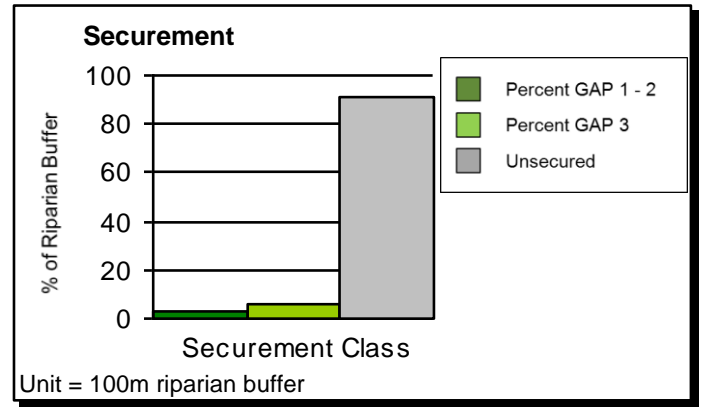
Most Abundant: white sucker, pumpkinseed, redbreast sunfish, goldern shiner, eastern blacknose dace, bluntnose minnow, tessellated darter, mottled sculpin, longnose dace, central stoneroller, fantail darter, bluehead chub, bluegill, black crappie, creek chub, common shiner, striped shiner, american eel, emerald shiner, spottail shiner, rosieside dace, swallowtail shiner, banded killifish, yellow perch, chain pickerel, brown bullhead, yellow bullhead, swamp darter.

Less Abundant: creek chubsucker, redbfin pickerel, banded sunfish, satinfin shiner, pearl dace, fallfish, eastern mudminnow, rock bass, green sunfish, mummichog, margined madtom, northern hog sucker, banded sculpin, crescent shiner, golden shiner, creek chubsucker, greensidedarter, johnny darter, river chub, smallmouth bass, mountain redbelly dace, spotfin shiner, rainbow darter, silverjaw minnow, pirate perch, longear sunfish, fathead minnow, torrent sucker, largemouth bass, cutlip minnow, rosyface shiner, bluespotted sunfish, sandshiner, saffron shiner, roanoke darter, bigeye chub.

Species of Concern (G1 - G4):

Fishes: carolina darter, kanawha minnow, tennessee dace, potomac sculpin, blackbanded sunfish, glassy darter, tonguetied minnow, speckled killifish, american brook lamprey, whitemouth shiner, ironcolor shiner, new river shiner, appalachia darter, stripeback darter
Crayfish, Mussels, and Snails: chowanoke crayfish, dwarf wedgemussel, cumberland bean, yellow lance, tennessee clubshell, tennessee pigtoe, roanoke slabshell, tennessee heelsplitter, slippershell mussel, eastern pondmussel, kidneyshell

See Appendix 2 for scientific names

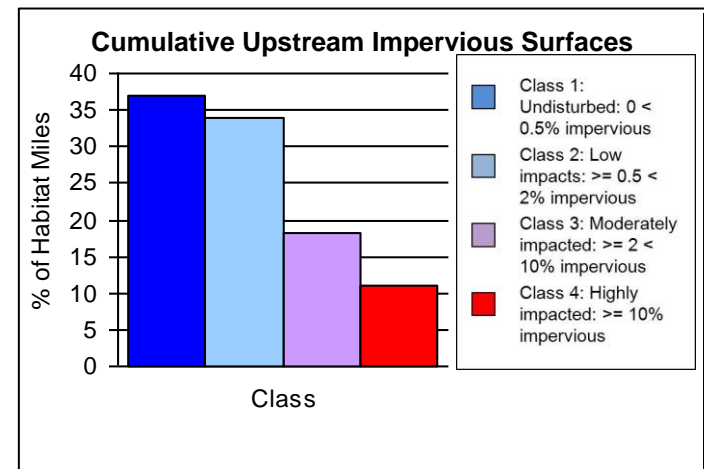


Crosswalk to State Names:

New York: Marsh headwater stream, Coastal plain stream. **Maryland:** Coastal Plain Streams, Blackwater Streams, Limestone Streams, Piedmont Streams: low gradient variant. **Pennsylvania:** Atlantic Basin Fish Warmwater Community 1, Ohio-Great Lakes Basins Fish Warmwater Stream Community



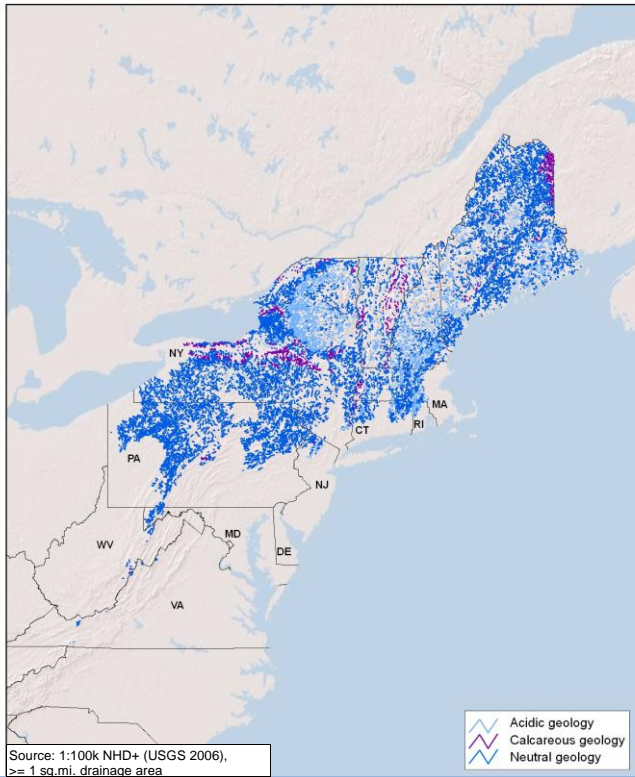
DNR
Bluntnose minnow, © OH



Moderate Gradient, Cold, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



East Aspetuck River, © H. Morrow Long

Description:

Cold, moderately fast-moving, headwaters and creeks of hills and gentle slopes. These small streams of northern regions or high elevations, occur on hills and slopes at moderate to high elevations in watersheds less than 39 sq.mi in size. They have cold moderately fast-moving waters water with good oxygenation. Instream habitats are dominated by riffle-pool development with low sinuosity, moderately entrenchment, and moderately narrow valleys. They have substrates dominated by cobble, gravel, and sand with occasional small patches of boulders. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Permanent cold water temperatures in these streams means coldwater fish species, such as brook trout, likely represent over half of the fish community. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

These moderate gradient streams are transitional types and often exhibit some characteristics of both the higher and lower gradient streams. Cold moderate gradient streams typically flow into moderate or low gradient cold and cool rivers in areas of less topography.

Places to Visit this Habitat:

Sucker Brook, Boughton Park | NY Stony Brook, State Game Land 57 in Tunkhannock | PA Houghton Brook, Mount Blue | ME Body Brook, Baxter State Park | ME North Branch Nulhegan River, Wenlock WMA | VT

State Distribution: CT, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 32,073

% Conserved: 17.8 Unit = Acres of 100m Riparian Buffer

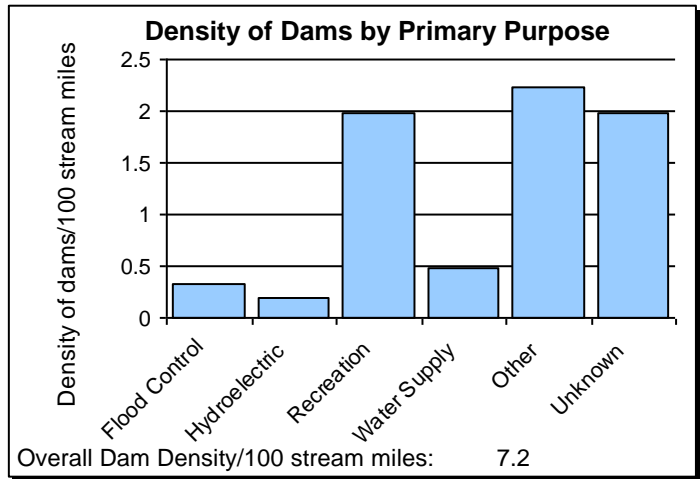
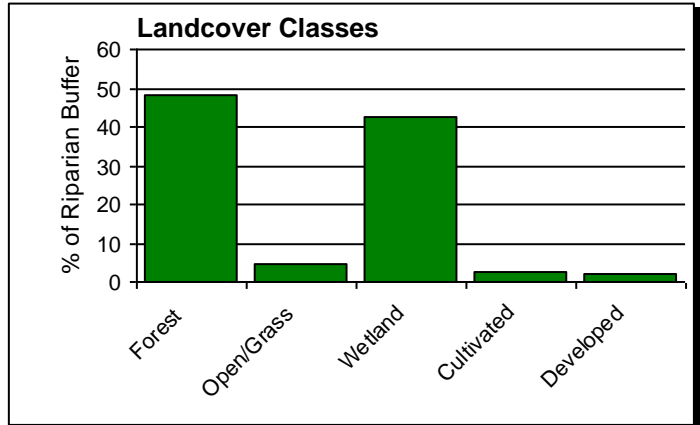
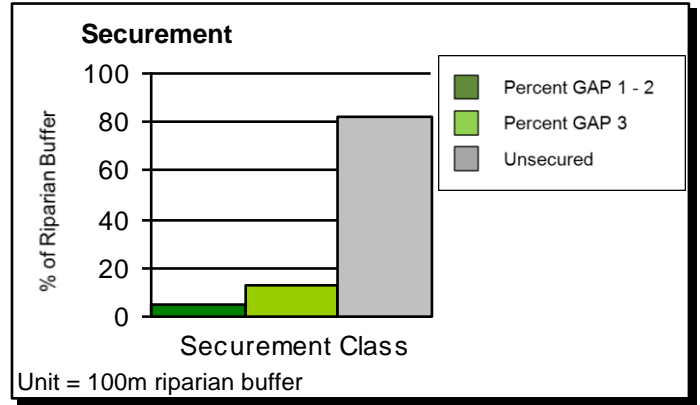
State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
NY	38	12183	883	777	7672
ME	27	8815	163	992	5739
PA	17	5439	120	719	3313
NH	6	1974	43	244	1236
VT	4	1352	25	79	923
MA	4	1227	22	182	744
CT	2	577	17	53	371
NJ	1	169	37	5	88
MD	0	135	4	14	87
RI	0	101	3	10	67
WV	0	64	2	10	36
VA	0	38	2	4	23

Associated Fish:

Most Abundant: brook trout, slimy sculpin, longnose dace, eastern blacknose dace, creek chub, white sucker, common shiner. Less Abundant: central stoneroller, mottled sculpin, fathead minnow, fallfish, bluntnose minnow, brook stickleback, tessellated darter, fantail darter, blue ridge sculpin, atlantic salmon, mountain redbelly dace, trout-perch, river chub, spottail shiner, northern hog sucker, finescale dace, rainbow darter, burbot, longnose sucker

Species of Concern (G1 - G4):

Fishes: mountain brook lamprey, bridle shiner, american brook lamprey
Crayfish, Mussels, and Snails: eastern pearlshell, vernal physa
 See Appendix 2 for scientific names

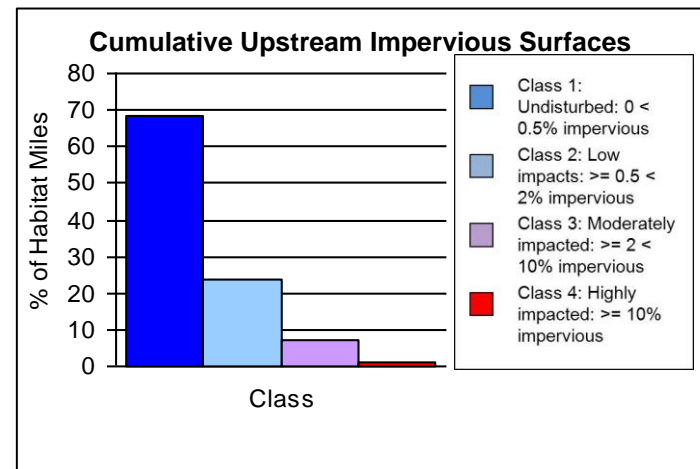


Crosswalk to State Names:

Vermont: Brook trout, Brook trout-slimy sculpin, Blacknose dace-Slimy sculpin. New Hampshire: Lower gradient cold-water streams; High gradient, very cold streams. New York: Rocky headwater stream, Marsh headwater stream. Maryland: Cold Water Streams, Highland Streams. Pennsylvania: Atlantic Basin Fish Coldwater Community, Ohio-Great Lakes Basins Fish Coldwater Community.



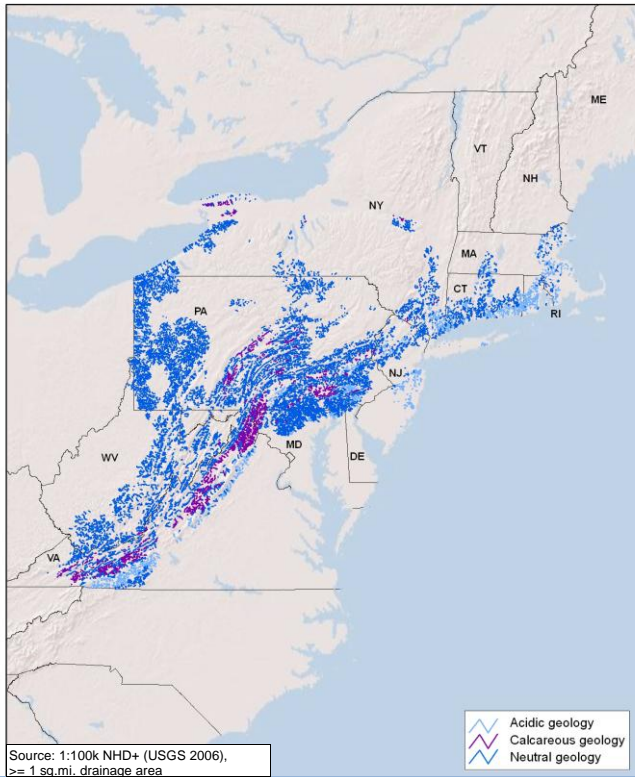
Slimy Sculpin, © Geoff Kimber



Moderate Gradient, Cool, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



North Fork of the South Branch Potomac River. © Tim Kiser

Description:

Cool, moderately fast-moving, headwaters and creeks of low elevation hills and gentle slopes. These small streams of the Southern New England and the Mid-Atlantic occur on hills and slopes at low to moderate elevations in watersheds less than 39 sq.mi in size. They have cool moderately fast-moving waters with good oxygenation. Instream habitats are dominated by riffle-pool development with low sinuosity, moderately entrenchment, and moderately narrow valleys. They have substrates dominated by cobble, gravel, and sand with occasional small patches of boulders. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Cool water temperatures in these streams means the fish community will contain a higher proportion of cool and warm water species relative to coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

These moderate gradient streams are transitional types and often exhibit some characteristics of both the higher and lower gradient streams. Similarly cool streams are transitional between cold and warm systems and may include biota found in both colder and warmer types. Cool moderate gradient streams typically flow into moderate or low gradient cool and warm rivers in areas of less topography.

Places to Visit this Habitat:

White Deer Creek, Bald Eagle State Forest | PA Pine Brook, Pine Brook Falls - Haase | CT Breakheart Brook, Arcadia Management Area | RI Right Fork Laurel Fork, Holly River State Park | WV Honey Creek, Reeds Gap State Park | PA

State Distribution: CT, DE, MD, MA, NH, NJ, NY, PA, RI, VA, WV

Total Habitat (mi): 21,323

% Conserved: 7.9 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
PA	47	10080	140	316	7380
VA	16	3329	58	155	2340
WV	12	2590	46	179	1753
NY	8	1717	9	42	1263
MD	5	1168	13	65	822
CT	5	1077	34	80	717
NJ	3	628	44	19	429
MA	2	459	5	57	298
RI	1	243	10	31	150
DE	0	28	0	5	16
NH	0	5	0	0	4

Associated Fish:

Most Abundant: white sucker, fallfish, common shiner, tessellated darter, eastern blacknose dace, mottled sculpin, central stoneroller, creek chub, longnose dace, fantail darter, pearl dace, rosyside dace, fathead minnow, smallmouth bass. **Less Abundant:** slimy sculpin, mountain redbelly dace, torrent sucker, bluntnose minnow, potomac sculpin, cutlip minnow, river chub, northern hog sucker, bluehead chub, green sunfish, rock bass, bluegill, greenside darter, rainbow darter, american eel, striped shiner, banded sculpin, margined madtom, crescent shiner, johnny darter, brook trout, creek chubsucker, pumpkinseed, fathead minnow, redbreast sunfish, southern redbelly dace.

Species of Concern (G1 - G4):

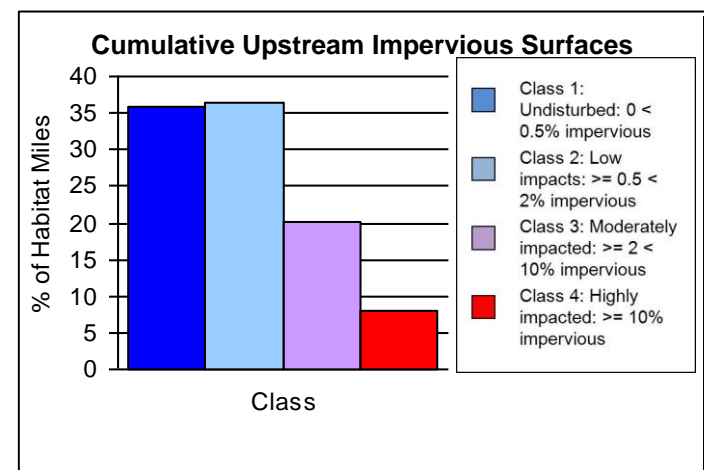
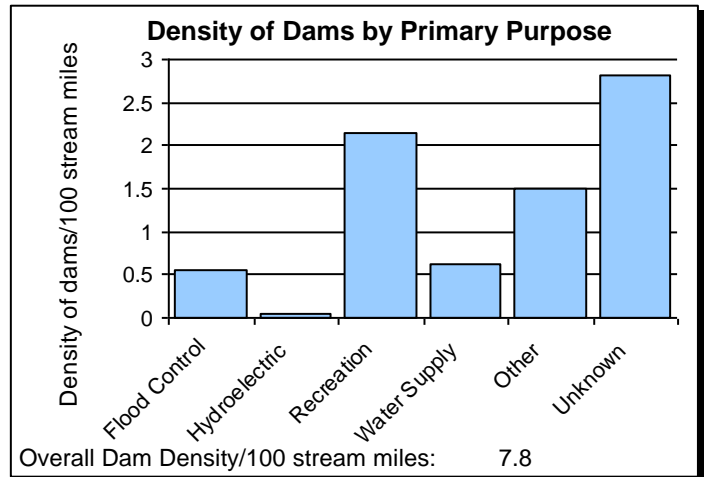
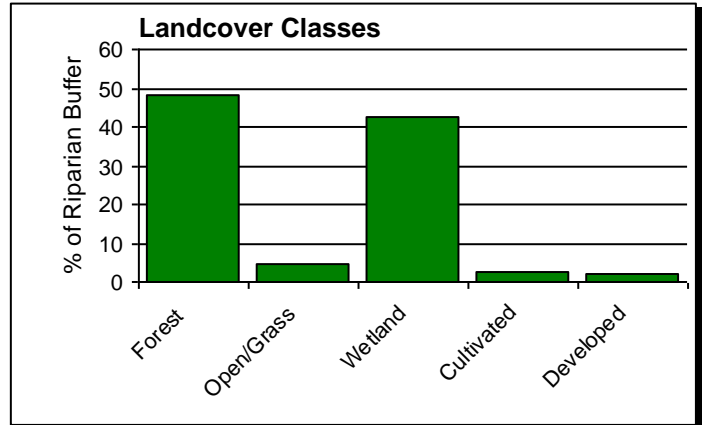
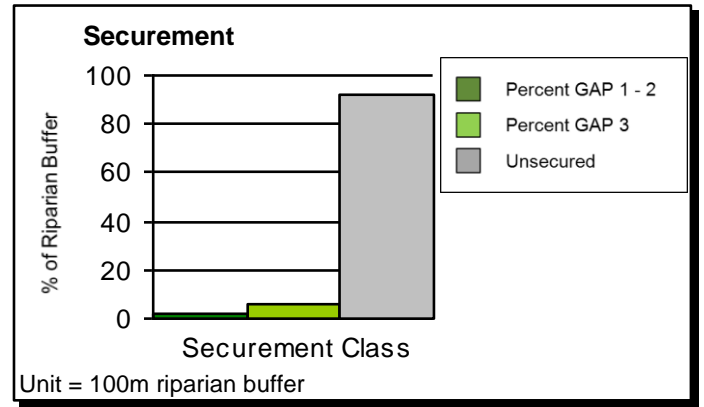
Fishes: cheat minnow, clinch dace, redbreast darter, candy darter, mountain brook lamprey, bridge shiner, kanawha minnow, tennessee dace, rustyside sucker, black sculpin, potomac sculpin, checkered sculpin, greenfin darter, tonguetied minnow, american brook lamprey, bigmouth chub, ironcolor shiner, blacknose shiner, new river shiner, mirror shiner, appalachia darter, stripeback darter
Crayfish, Mussels, and Snails: elk river crayfish, big sandy crayfish, new river crayfish, littlewing pearl mussel, tennessee heelsplitter, eastern pearlshell, kidneyshell, appalachian springsnail, vernal physa
 See Appendix 2 for scientific names

Crosswalk to State Names:

New Hampshire: Warm water riffle streams. **New York:** Rocky headwater stream, Marsh headwater stream. **Maryland:** Piedmont Streams, Cold Water Streams, Limestone Streams. **Pennsylvania:** Atlantic Basin Fish Coolwater Community 1, Ohio-Great Lakes Basins Fish Coolwater Stream Community.



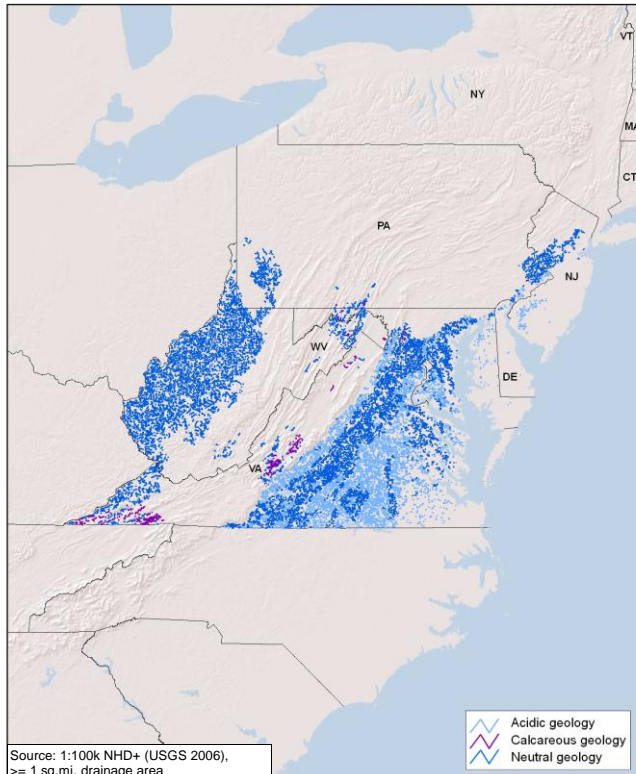
Mottled sculpin, © Ohio Nanfa



Moderate Gradient, Warm, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Eightmile River, © Tom Henthorn

Description:

Warm, moderately fast-moving, headwaters and creeks of low-elevation hills and gentle slopes. These small streams of the Mid-Atlantic region occur on hills and slopes at low to moderate elevations in watersheds less than 39 sq.mi in size. They have warm, moderately fast moving water with good oxygenation. Instream habitats are dominated by riffle-pool development with low sinuosity, moderately entrenchment, and moderately narrow valleys. They have substrates dominated by cobble, gravel, and sand with occasional small patches of boulder. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Warm water temperatures in these streams means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

These moderate gradient streams are transitional types and often exhibit some characteristics of both the higher and lower gradient streams. Warm moderate gradient streams typically flow into moderate or low gradient warm rivers in areas of less topography.

State Distribution: DE, DC, MD, NJ, NY, PA, VA, WV

Total Habitat (mi): 16,894

% Conserved: 4.3 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	56	9413	11	234	7101
WV	28	4717	17	66	3603
MD	9	1591	30	150	1062
PA	5	784	8	20	584
NJ	2	365	16	9	268
DE	0	18	0	3	11
DC	0	4	0	0	3
NY	0	2	0	0	1

Places to Visit this Habitat:

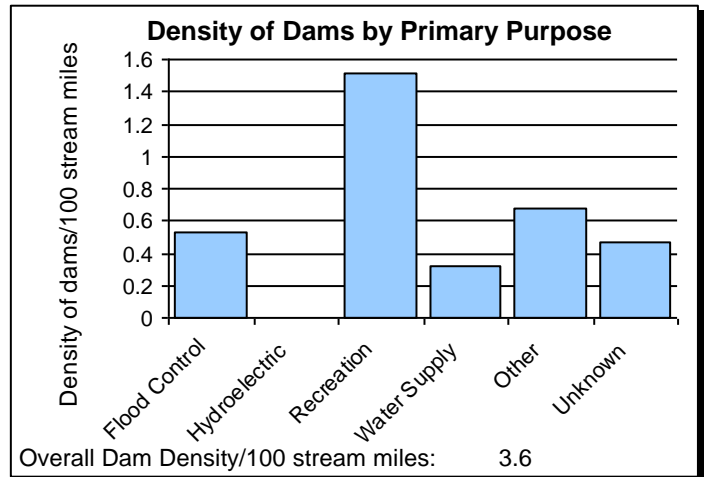
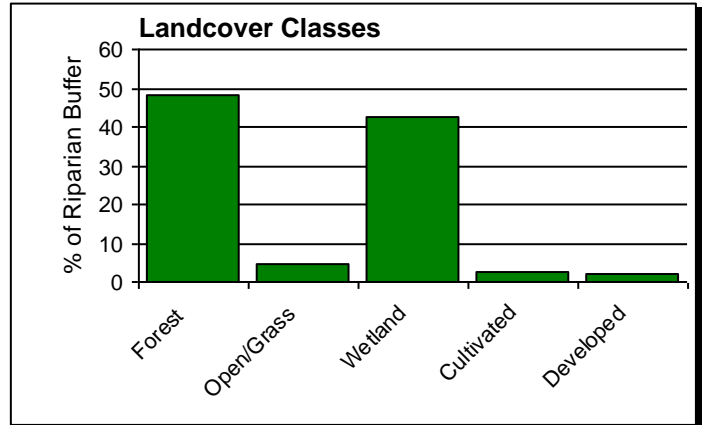
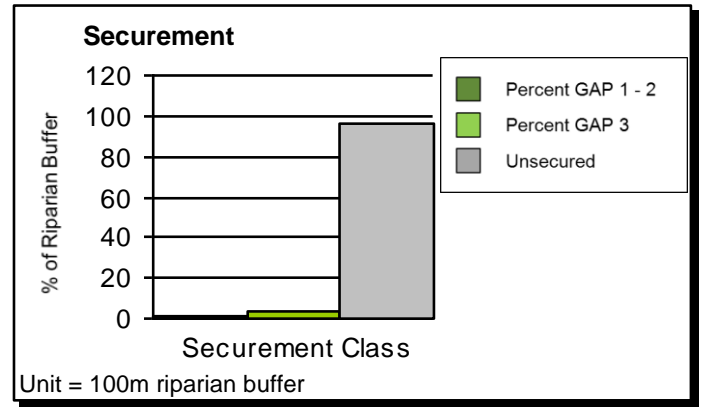
Hammond Branch, Hammond Park | MD Locketong Creek, Westcott Nature Preserve | NJ Patterson Creek, George Washington And Jefferson National Forest | VA Pimmit Run, Potomac Hills City Park | VA Panther Creek, Panther State Forest | WV

Associated Fish:

Most Abundant: eastern blacknose dace, creek chub, bluehead chub, mountain redbelly dace, central stoneroller, roside dace, fantail darter, striped shiner, crescent shiner, bluntnose minnow, white sucker. **Less Abundant:** rainbow darter, tessellated darter, silverjaw minnow, torrent sucker, bluegill, longnose dace, margined madtom, green sunfish, johnny darter, redbreast sunfish, mottled sculpin, northern hog sucker, banded sculpin, rock bass, cutlip minnow, fallfish, american eel, pumpkinseed, greenside darter, common shiner, roanoke hog sucker, rosefin shiner, creek chubsucker, highscale shiner, golden shiner, smallmouth bass, rosyface shiner, fantail darter

Species of Concern (G1 - G4):

Fishes: clinch dace, blackside dace, redbreast dace, tennessee dace, rustyside sucker, blackbanded sunfish, speckled killifish, bigmouth chub, new river shiner, appalachia darter, stripeback darter
Crayfish, Mussels, and Snails: elk river crayfish, spiny scale crayfish, littlewing pearl mussel, tennessee heelsplitter, kidneyshell, appalachian springsnail
 See Appendix 2 for scientific names

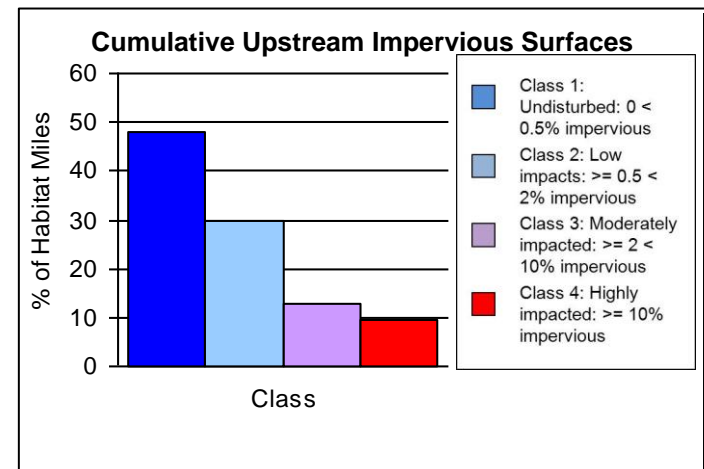


Crosswalk to State Names:

Maryland: Piedmont Streams. **Pennsylvania:** Atlantic Basin Fish Warmwater Community 1, Ohio-Great Lakes Basins Fish Warmwater Stream Community.



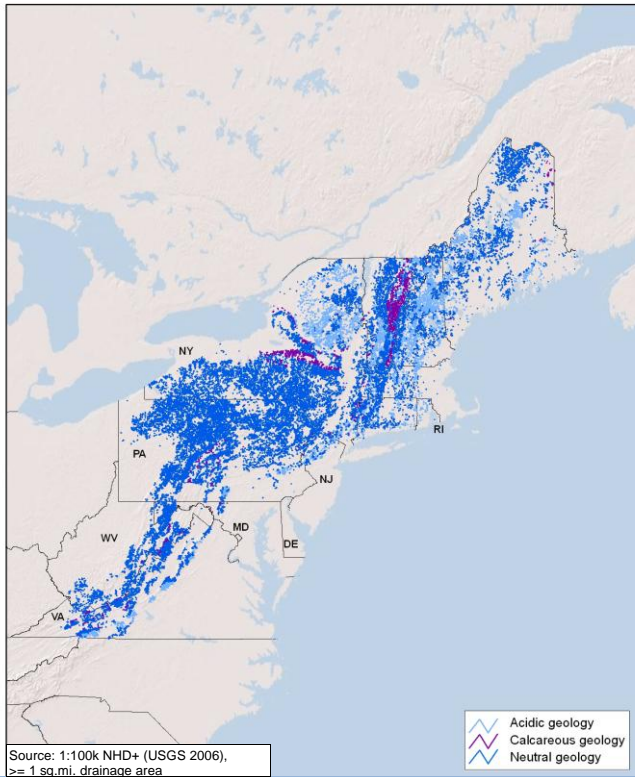
Bluehead Chub, © Outdoor Alabama



High Gradient, Cold, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



©Josh Royte

Description:

Cold, fast-moving headwaters and creeks of steeper slopes at moderate to high elevations. These small streams of northern regions or high elevations occur on steep slope in watersheds less than 39 sq.mi in size. The cold fast moving water has high water clarity and is well oxygenated. Instream habitats are dominated by riffles and cascade and step-pool systems. Channels are usually narrowly confined, high-gradient, and surrounded by upland forests. Bed materials often consist of bedrock, boulders, cobbles, and coarse gravel. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Permanent cold water temperatures in these streams means coldwater fish species, such as brook trout, likely represent over half of the fish community. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

Headwaters and creeks may also occur at lower elevations but these tend to be warmer, flatter, and slower. Coastal examples of high gradient headwaters are rare. Cold high gradient streams typically flows into moderate or low gradient cold and cool rivers in areas of less topography.

Places to Visit this Habitat:

Dry Brook, Satans Kingdom WMA | MA Warner Creek, Phoenicia Wild Forest | NY Lamentation Run, Allegheny National Forest Non-Reserved | PA Dish Mill Brook, Victory State Forest | VT Leatherwood Creek, Monongahela National Forest | WV

State Distribution: CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 36,183

% Conserved: 26.3 Unit = Acres of 100m Riparian Buffer

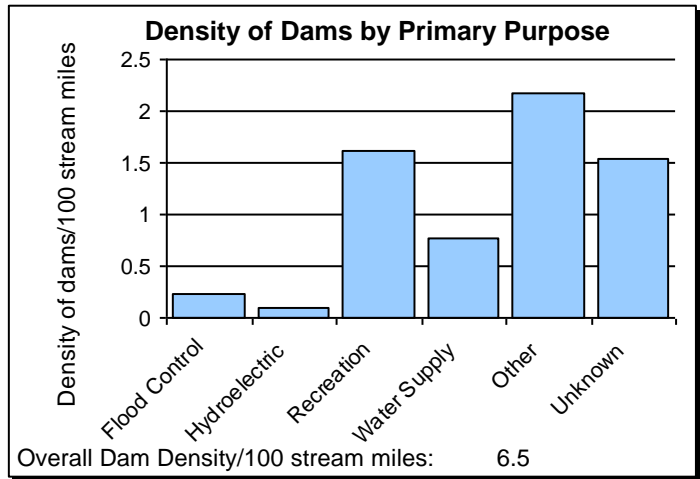
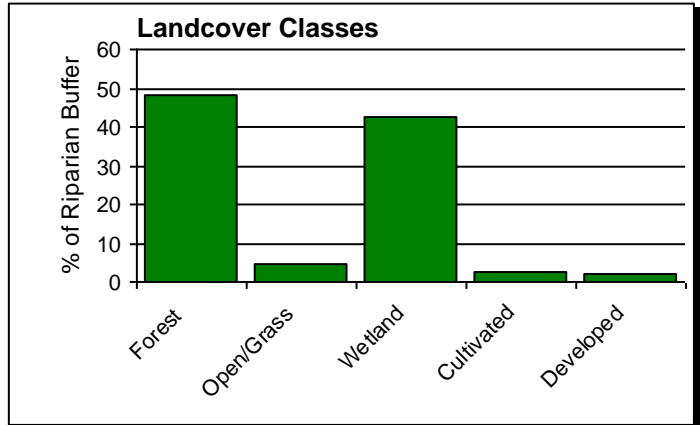
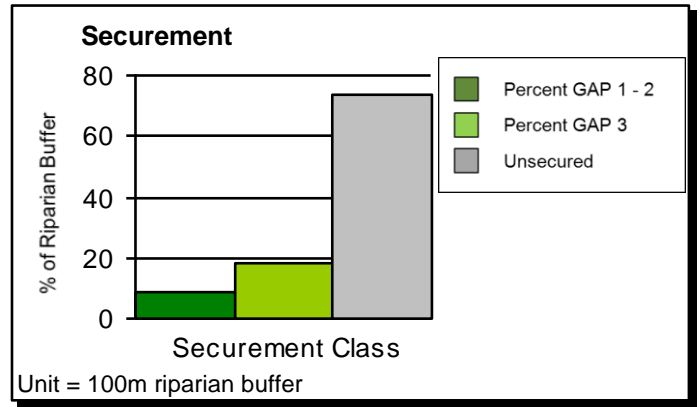
State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
NY	29	10443	1008	696	6458
PA	24	8847	293	1935	4756
ME	10	3799	180	454	2380
VT	10	3552	109	345	2313
NH	8	2868	265	594	1396
VA	6	2143	296	394	1004
WV	5	1692	58	273	1006
MA	3	1196	41	231	669
CT	2	816	37	74	526
NJ	1	403	65	28	224
MD	1	376	21	71	204
RI	0	47	1	9	28
DE	0	0	0	0	0

Associated Fish:

Most Abundant: brook trout, slimy sculpin, longnose dace, longnose sucker, eastern blacknose dace, creek chub Less Abundant: mottled sculpin, white sucker, fantail darter, common shiner, lake chub, fallfish, atlantic salmon.

Species of Concern (G1 - G4):

Fishes: black sculpin
Crayfish, Mussels, and Snails: eastern pearlshell
 See Appendix 2 for scientific names

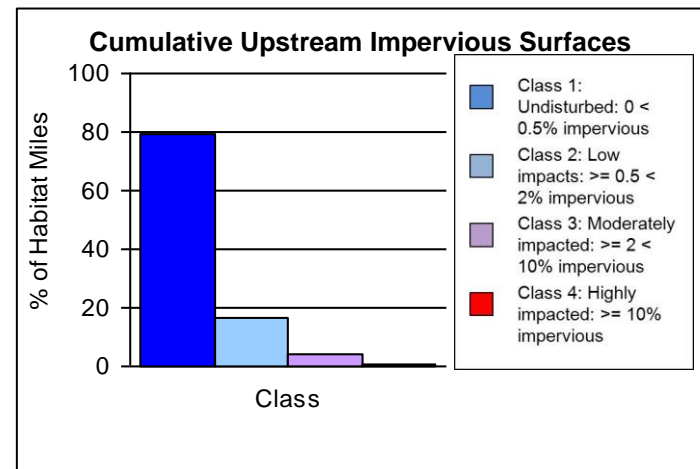


Crosswalk to State Names:

Vermont: Brook trout, Brook trout-slimy sculpin, Blacknose dace-Slimy sculpin. New Hampshire: High gradient, very cold streams; Very steep scour streams. New York: Rocky headwater stream. Maryland: Cold Water Streams. Pennsylvania: Atlantic Basin Fish Coldwater Community, Ohio-Great Lakes Basins Fish Coldwater Community.



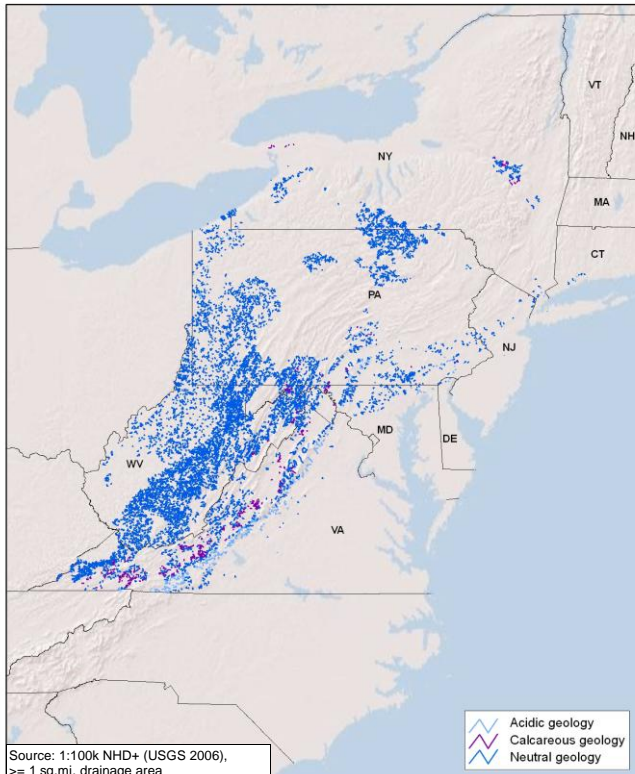
Brook trout, © USFWS Southeast



High Gradient, Cool, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Laurel Creek, © Ken Thomas

Description:

Cool, fast-moving headwaters and creeks of steeper slopes at low to moderate elevations. These small streams of the Mid-Atlantic, occur on steep slopes at low to moderate elevations in watersheds less than 39 sq.mi in size. The cool fast moving water has high water clarity and is well oxygenated. High-gradient instream habitats are dominated by riffles and cascade and step-pool systems. Channels are usually narrowly confined, high-gradient, and surrounded by upland forests. Bed materials often consist of bedrock, boulders, cobbles, and coarse gravel. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Cool water temperatures in these streams means the fish community will contain a higher proportion of cool and warm water species relative to coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

Headwaters and creeks may also occur at lower elevations but these tend to be warmer, flatter, and slower. Coastal examples of high gradient headwaters are rare. Cool high gradient streams typically flow into moderate or low gradient cool and warm rivers in areas of less topography.

Places to Visit this Habitat:

Deep Run, Green Ridge State Forest | MD Passage Creek, George Washington And Jefferson National Forest | VA Hedricks Creek, Gauley River National Recreation Area | WV Seneca Creek, Monongahela National Forest | WV Jeremys Run, Shenandoah National Park | VA

State Distribution: CT, DE, MD, NJ, NY, PA, VA, WV

Total Habitat (mi): 12,390

% Conserved: 12.9 Unit = Acres of 100m Riparian Buffer

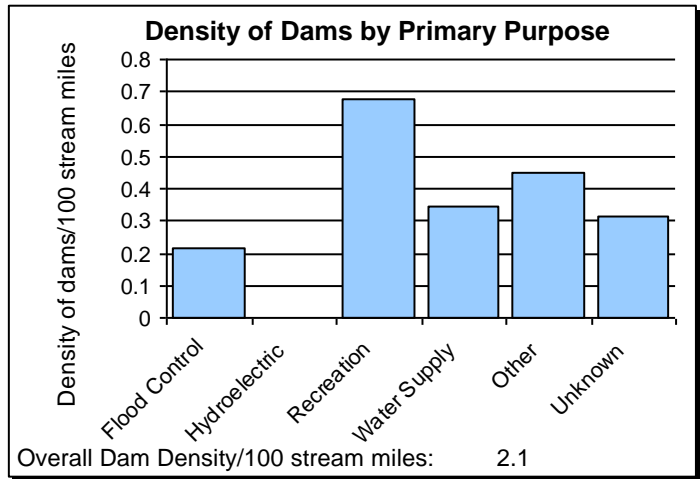
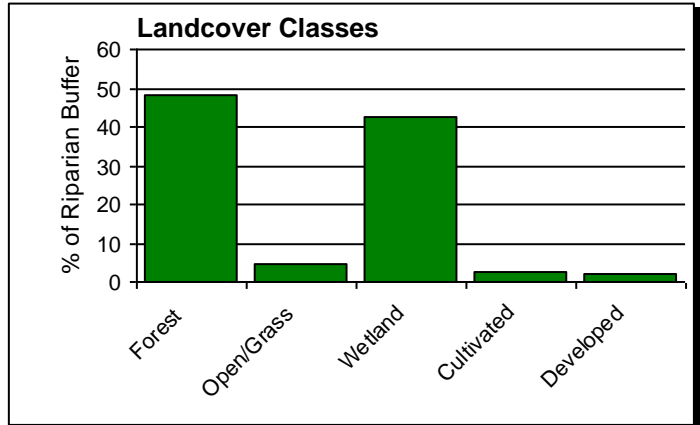
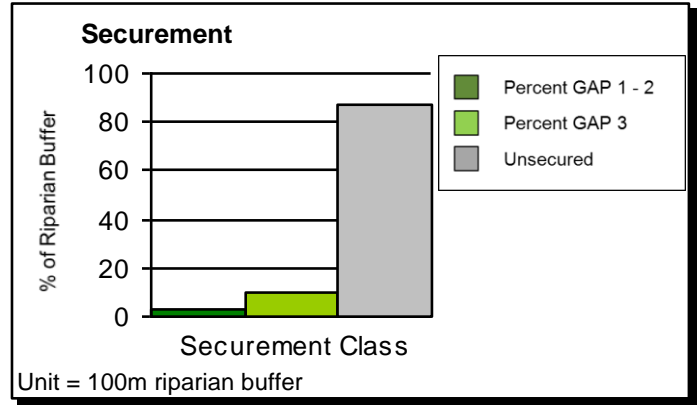
State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
WV	41	5054	110	356	3523
PA	31	3875	85	280	2702
VA	18	2262	87	243	1462
NY	5	640	0	9	491
MD	4	493	29	56	301
NJ	0	48	5	2	33
CT	0	11	0	1	8
DE	0	6	0	2	3

Associated Fish:

Most Abundant: white sucker, fallfish, common shiner, tessellated darter, eastern blacknose dace, creek chub, mottled sculpin, mountain redbelly dace, bluehead chub. Less Abundant: torrent sucker, brook trout, rosieside dace, golden rehorse, saffron shiner, central stoneroller, fantail darter, river chub, longnoes dace, rock bass, smallmouth bass.

Species of Concern (G1 - G4):

Fishes: black sculpin, checkered sculpin, tonguetied minnow, mirror shiner
Crayfish, Mussels, and Snails: elk river crayfish, big sandy crayfish, kidneyshell, appalachian springsnail
 See Appendix 2 for scientific names

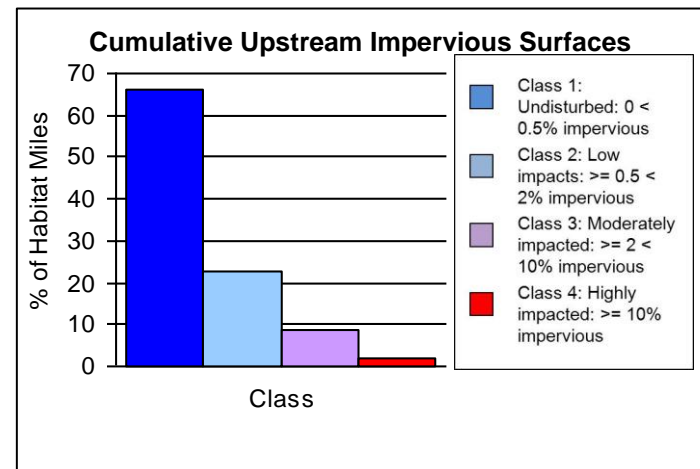


Crosswalk to State Names:

New York: Rocky headwater stream. Maryland: Highland Streams, Cold Water Streams, Piedmont Streams: high gradient variant.
Pennsylvania: Atlantic Basin Fish Coolwater Community 1, Ohio-Great Lakes Basins Fish Coolwater Stream Community



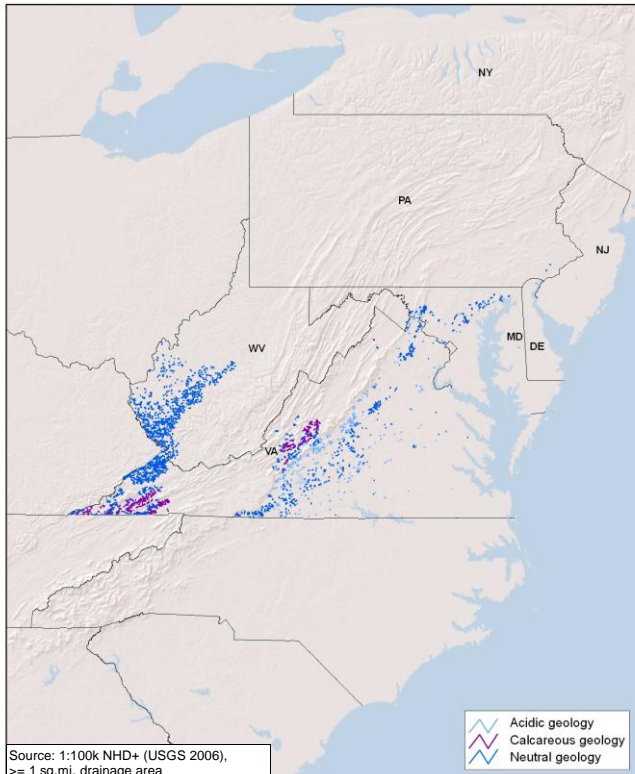
USGS Mountain redbelly dace, ©



High Gradient, Warm, Headwaters and Creeks

Macrogroup: Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Minnehaha River, © VFX Photography

Description:

Warm, fast-moving, headwaters and creeks of steeper slopes at low-elevation. These small streams of the Mid-Atlantic region occur on steep slopes at low to moderate elevations in watersheds less than 39 sq.mi in size. The warm fast-moving water has high water clarity and is well oxygenated. High-gradient instream habitats are dominated by riffles and cascade and step-pool systems. Channels are usually narrowly confined, high gradient, and surrounded by upland forests. Bed materials often consist of bedrock, boulders, cobbles, and coarse gravel. The predominant source of energy to the stream is terrestrial leaf litter or organic matter (these are allochthonous streams). Warm water temperatures in these streams means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Additional variation in the stream biological community is associated with acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota. The habitat can be further subdivided into 1) headwaters that drain watersheds less than 4 sq.mi, and have an average bankfull width of 16 feet or 2) Creeks that include larger streams with watersheds up to 39 sq.mi. and have an average bankfull width of 32 feet.

Similar Habitat Types:

Headwaters and creeks may also occur on more moderate and gentle slopes and in settings with cooler water temperatures. Coastal examples of high gradient headwaters are rare. Warm high gradient streams typically flow into moderate or low gradient warm rivers in areas of less topography.

Places to Visit this Habitat:

Miller Run, Patapsco Valley State Park | MD Rock Creek, Gambrill State Park | MD Donaldson Run, Donaldson Run Park | VA Left Fork Lynn Creek, East Lynn Lake Wildlife Management Area | WV Dancing Creek, Blue Ridge Parkway National Park | VA

State Distribution: DE, MD, NJ, PA, VA, WV

Total Habitat (mi): 2,681

% Conserved: 6.0 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	65	1746	21	66	1307
WV	29	783	2	23	602
MD	1	147	10	6	101
PA	0	3	0	0	2
DE	0	2	0	1	1
NJ	0	0	0	0	0

Associated Fish:

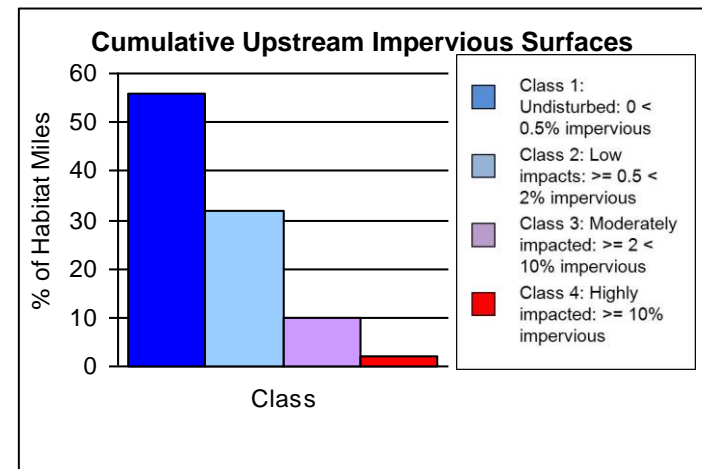
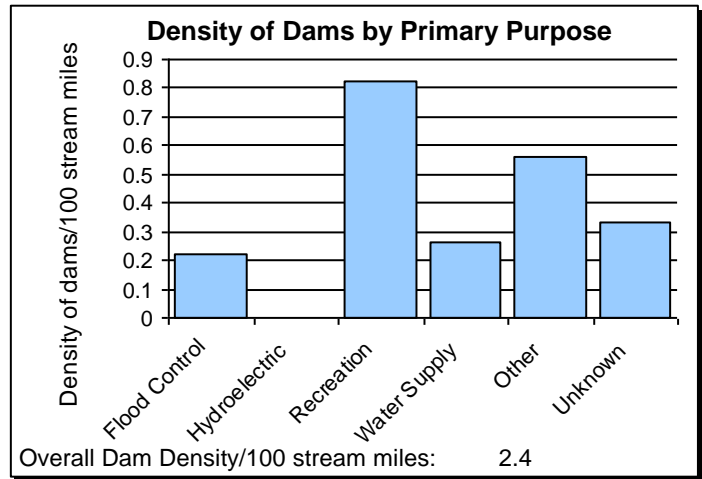
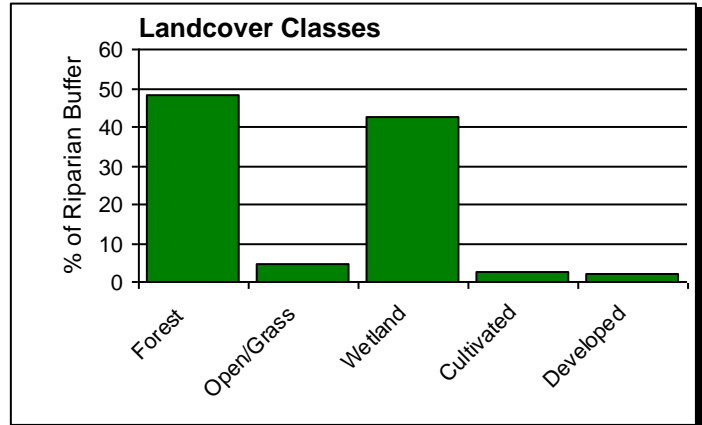
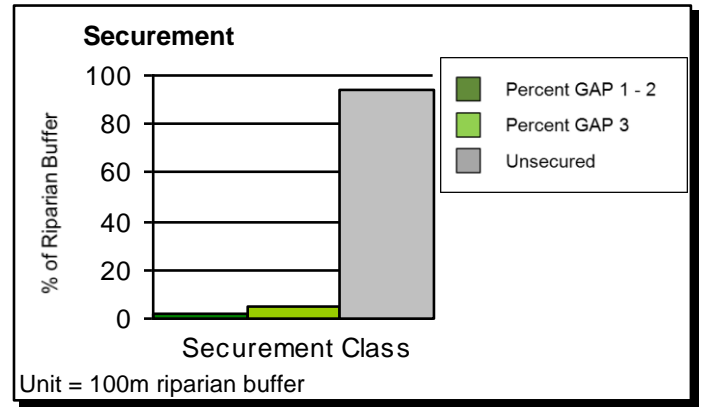
Most Abundant: mountain redbelly dace, rosyside dace, eastern blacknose dace, creek chub, longnose dace, rock bass, banded sculpin, fantail darter, bluehead chub. Less Abundant: central stoneroller, smallmouth bass, fallfish, mottled sculpin, pumpkinseed, white sucker, green sunfish, redbreast sunfish, torrent sucker, tennessee shiner.

Species of Concern (G1 - G4):

Fishes: tennessee dace, bluebreast darter
Crayfish, Mussels, and Snails: spiny scale crayfish, tennessee heelsplitter, kidneyshell, appalachian springsnail
 See Appendix 2 for scientific names

Crosswalk to State Names:

Maryland: Piedmont Streams: high gradient variant, Highland Streams.

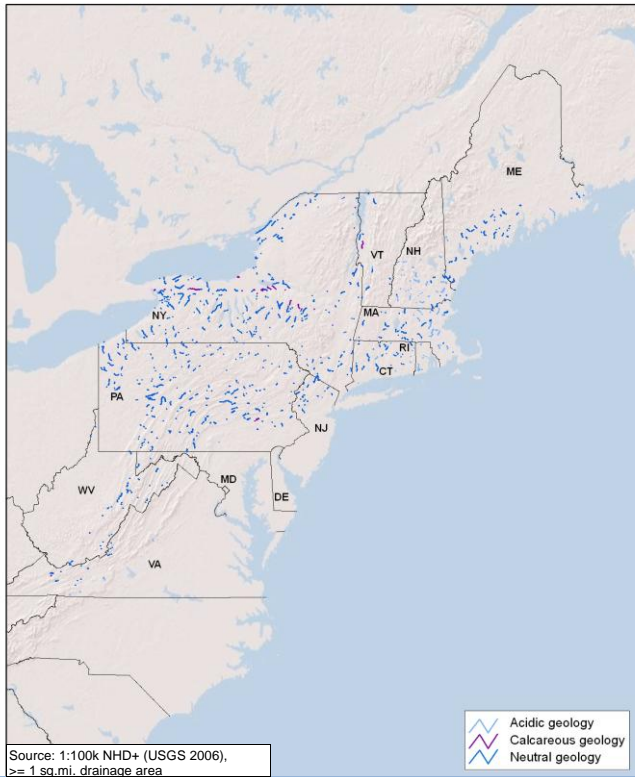


Rosyside dace, © Brian Gratwicke

Low Gradient, Cool, Small River

Macrogroup: Small River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Sudbury River, © John Phelan

Description:

Cool, slow-moving, small rivers of flat, marshy settings at low to moderate elevations. These small rivers drain small watersheds of up to 200 sq.mi. in size and have an average bankfull width of 65 feet. The slow-moving waters are dominated by runs with interspersed pool sections and a few short or no distinct riffles. Their substrate is usually dominated by silt, sand, and fine gravel, and they may exhibit high turbidity and be somewhat poorly oxygenated. These low-gradient rivers are often described as unconfined and have moderate to high sinuosity with broader valleys. They are typically surrounded by floodplain forest, wetlands, or eroded sand or clay banks or fine sediment bars. Cool water temperatures in these rivers means the fish community will contain a higher proportion of cool and warm water species relative to coldwater species. There will be less habitat with cool enough temperatures to support coldwater species year round. Additional variation in the biological community is expected in acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota.

Similar Habitat Types:

Small rivers also occur at higher elevations and on higher slopes, but these tend to have coarser substrates, cooler, and faster water. Warm low gradient small rivers typically flow into low gradient cool or warm medium rivers.

Places to Visit this Habitat:

Charles River, Elm Bank | MA Sudbury River, Great Meadows NWR | MA West River, High Tor Wilderness Management Area | NY Oak Orchard Creek, Iroquois National Game Refuge | NY Tohickon Creek, Nockamixon State Park | PA

State Distribution: CT, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 2,416

% Conserved: 13.4 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
NY	37	949	8	41	510
PA	23	594	15	20	324
MA	10	251	10	32	92
ME	8	215	5	6	109
NH	6	163	1	17	69
CT	4	109	8	5	49
VT	3	70	1	4	41
NJ	3	66	11	3	24
WV	2	52	2	4	27
VA	2	38	0	0	24
RI	1	24	0	3	10
MD	0	5	1	0	2

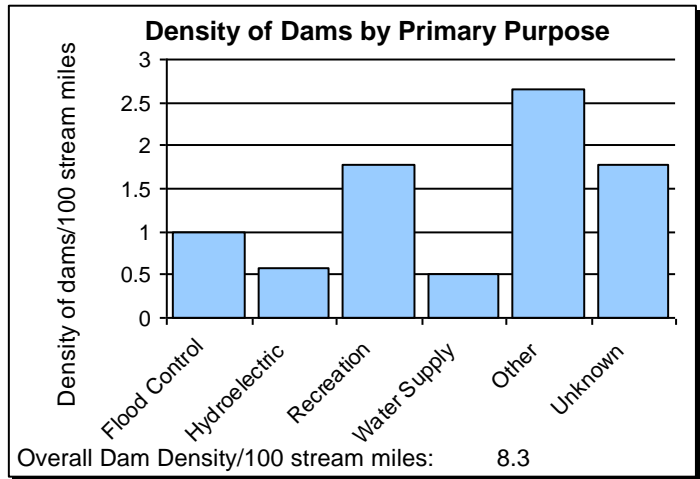
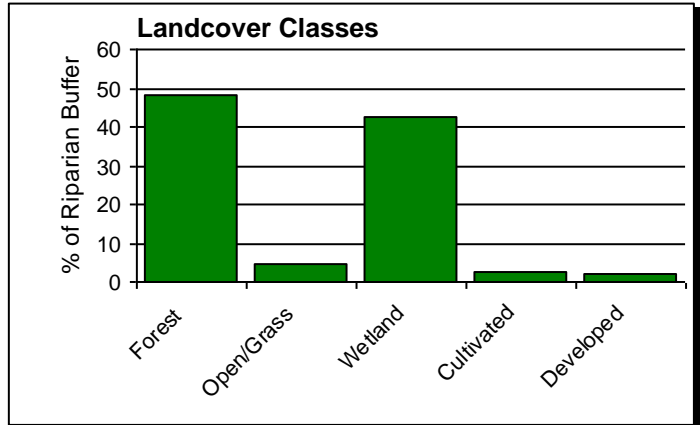
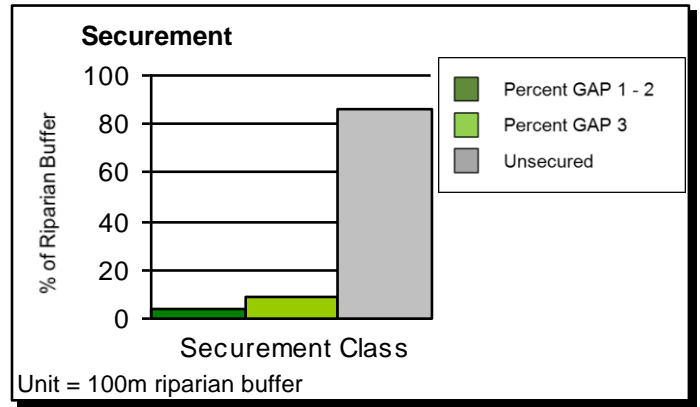
Associated Fish:

Most Abundant: bluegill, white sucker, eastern blacknose dace, silverjaw minnow, longnose dace, pumpkinseed, yellow perch, central stoneroller, bluntnose minnow, cutlip minnow, creek chub, tessellated darter, rock bass. **Less Abundant:** fallfish, largemouth bass, telescope shiner, american eel, common shiner, spottail shiner, river chub, greenside darter, brown bullhead, golden shiner, smallmouth bass, chain pickerel, redbreast sunfish, banded darter, brook silverside, green sunfish.

Species of Concern (G1 - G4):

Fishes: blotchside logperch, sickle darter, ohio lamprey, mountain brook lamprey, pugnose shiner, , bridle shiner, longhead darter, kanawha minnow, eastern sand darter, gravel chub, northern brook lamprey, american brook lamprey, blacknose shiner, new river shiner, tangerine darter, gilt darter, appalachia darter
Crayfish, Mussels, and Snails: oyster mussel, shiny pigtoe, littlewing pearl mussel, purple bean, clubshell, tennessee clubshell, tennessee pigtoe, fluted kidneyshell, rayed bean, brook floater, snuffbox, longsolid, yellow lamp mussel, tennessee heelsplitter, green floater, tidewater mucket, elktoe, triangle floater, slippershell mussel, eastern pond mussel, eastern pearlshell, round pigtoe, kidneyshell, spiny riversnail

See Appendix 2 for scientific names

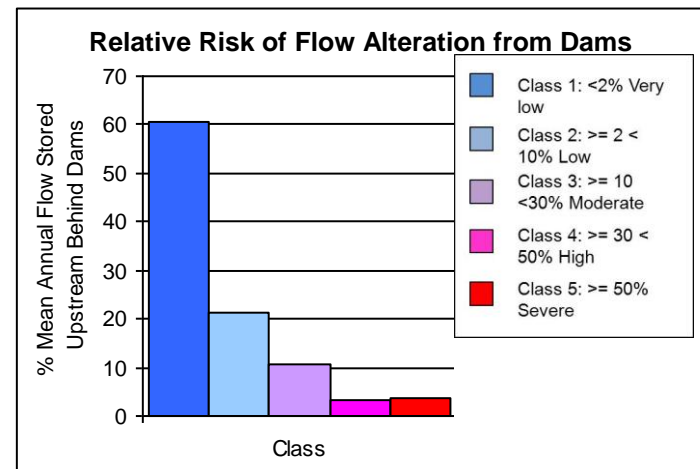


Crosswalk to State Names:

Vermont: Blacknose dace-Bluntnose minnow, White sucker-Tessellated darter, Tessellated darter-Fallfish. **New York:** Marsh headwater stream, Unconfined river, Backwater slough. **Pennsylvania:** Atlantic Basin Fish Coolwater Community 1, Ohio-Great Lakes Basins Fish Coolwater Stream Community



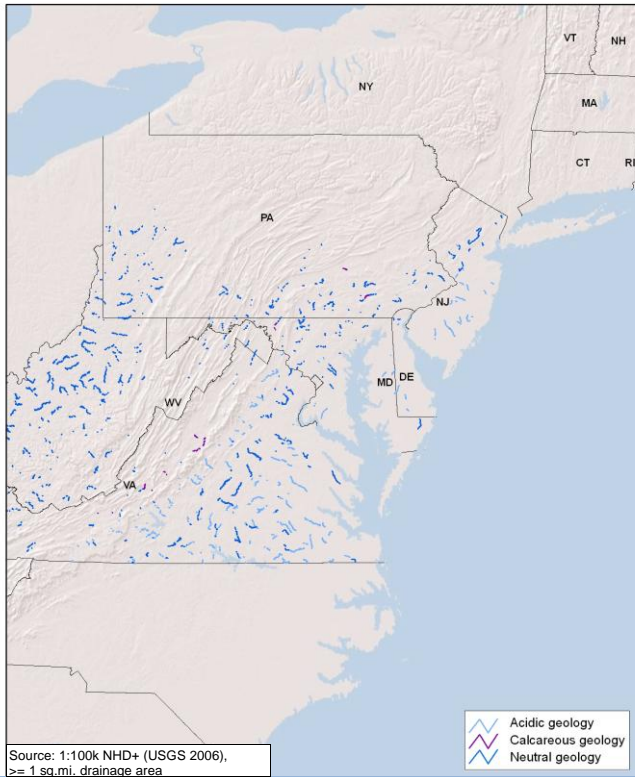
Bluegill, © Eric Engbretson



Low Gradient, Warm, Small River

Macrogroup: Small River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Conewago Creek, © USDA Forest Service

Description:

Warm, slow-moving, small rivers of flat, marshy settings at low elevations and throughout the southern Mid-Atlantic. These small rivers of southern regions, drain watersheds up to 200 sq.mi and have an average bankfull width of 62 feet. The slow-moving waters are dominated by runs with interspersed pool sections and a few short or no distinct riffles. Their substrate is usually dominated by silt, sand, and fine gravel, and they may exhibit high turbidity and be somewhat poorly oxygenated. These low-gradient rivers are often described as unconfined and have moderate to high sinuosity with broader valleys. They are typically surrounded by floodplain forest, wetlands, or eroded sand or clay banks or fine sediment bars. Warm water temperatures in these rivers means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Additional variation in the biological community is expected in acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota.

State Distribution: DE, MD, NJ, NY, PA, VA, WV

Total Habitat (mi): 2,488

% Conserved: 9.1 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	43	1092	7	23	651
WV	29	729	5	28	423
PA	14	343	7	4	209
NJ	7	178	16	22	68
MD	6	147	13	13	65
DE	1	24	1	2	13
NY	0	8	0	0	3

Similar Habitat Types:

Small rivers also occur at higher elevations and on higher slopes, but these tend to higher slopes, coarser substrates, faster, and cooler water. Warm low gradient small rivers typically flow into low gradient warm medium rivers.

Places to Visit this Habitat:

Crosswicks Creek, Crosswicks Creek Greenway | NJ Mad Horse Creek, Mad Horse Creek | NJ Great Egg Harbor River, Winslow | NJ Tuckahoe Creek, Tuckahoe Creek Park | VA Blackwater River, Blackwater Creek Natural Area | WV

Associated Fish:

Most Abundant: redbreast sunfish, white sucker, common shiner, swallowtail shiner, spottail shiner, tessellated darter, bluntnose minnow, american eel, greenside darter, longnose dace, banded killifish, satinfin shiner, green sunfish. **Less Abundant:** rock bass, central stoneroller, margined madtom, pumpkinseed, eastern blacknose dace, bluegill, largemouth bass, fallfish, rosyface shiner, creek chub, northern hog sucker, yellow bullhead, smallmouth bass, river chub, golden redhorse, redfin pickerel, banded darter, variegated darter, johnny darter, sand shiner.

Species of Concern (G1 - G4):

Fishes: duskytail darter, yellowfin madtom, roanoke logperch, ashy darter, golden darter, roughhead shiner, orangefin madtom, blotchside logperch, sickle darter, ohio lamprey, mountain brook lamprey, popeye shiner, longhead darter, eastern sand darter, potomac sculpin, glassy darter, tonguetied minnow, speckled killifish, american brook lamprey, river redhorse, ironcolor shiner, new river shiner, tangerine darter, channel darter, gilt darter, appalachia darter, stripeback darter

Crayfish, Mussels, and Snails: chowanoke crayfish, shiny pigtoe, finereyed pigtoe, littlewing pearlymussel, james spinymussel, purple bean, cumberland bean, yellow lance, atlantic pigtoe, clubshell, tennessee clubshell, tennessee pigtoe, slabside pearlymussel, fluted kidneyshell, brook floater, atlantic spike, roanoke slabshell, snuffbox, longsolid, yellow lampmussel, green floater, tidewater mucket, salamander mussel, rough rabbitsfoot, elktoe, triangle floater, slippershell mussel, eastern pondmussel, round pigtoe, kidneyshell, spiny riversnail

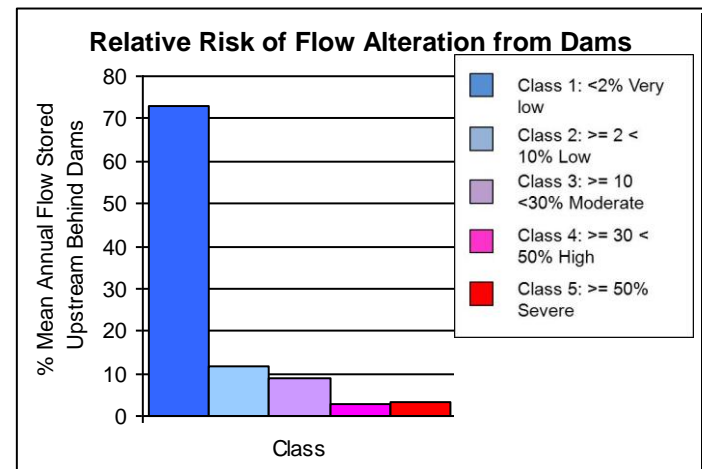
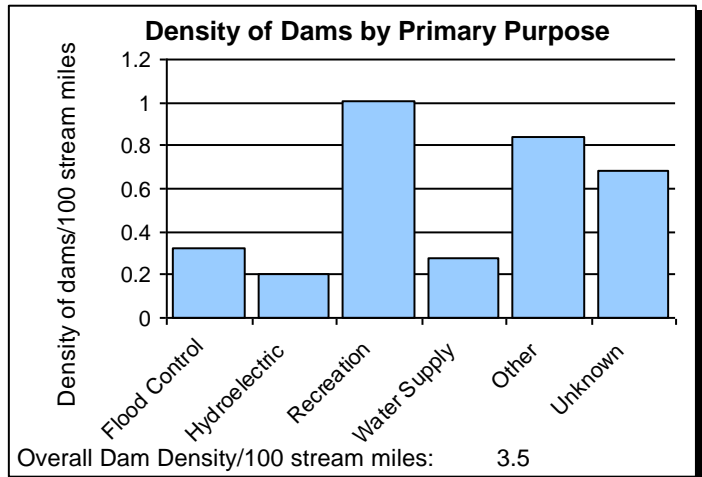
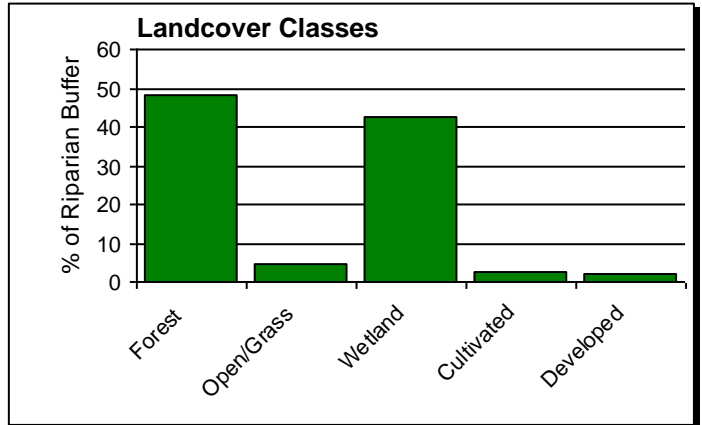
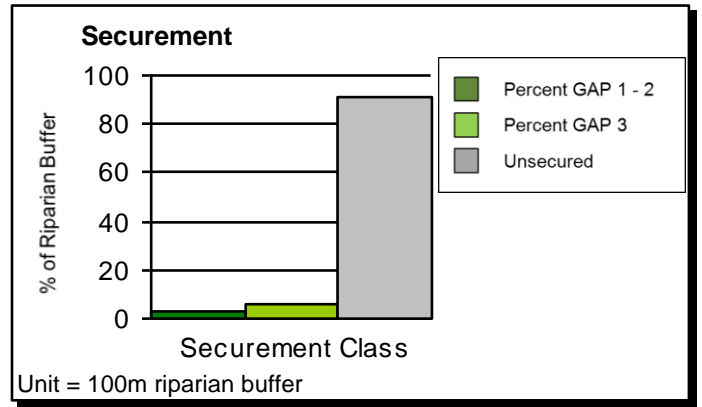
See Appendix 2 for scientific names

Crosswalk to State Names:

New York: Marsh headwater stream, Unconfined river, Backwater slough. **Maryland:** Piedmont Streams: low gradient variant; Coastal Plain Streams, Black Water Streams. **Pennsylvania:** Atlantic Basin Fish Warmwater Community 1, Ohio-Great Lakes Basins Fish Warmwater Stream Community



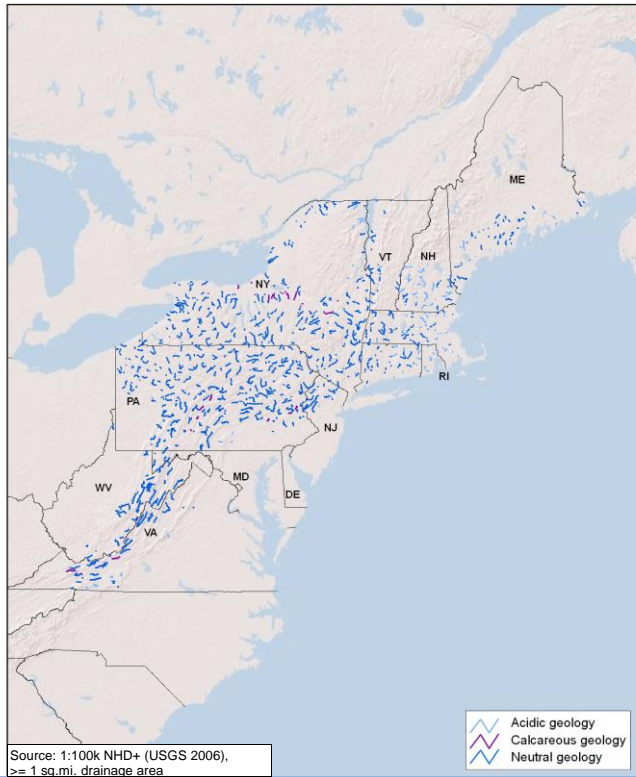
Redbreast sunfish, © Brian Gratwicke



Moderate Gradient, Cool, Small River

Macrogroup: Small River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Westfield River, © Eric Aldrich

Description:

Cool, moderately fast-moving, small rivers at moderate to low elevations in the north and at higher elevations in the south. These small rivers drain watersheds up to 200 sq.mi and have an average bankfull width of 62 feet. The moderately fast-moving waters are dominated by a well-defined pattern of alternating pools, riffles, and runs. Their substrate is composed of sand, gravel, and cobble, and they often have high water clarity and are well oxygenated. These moderate gradient rivers exhibit moderate to low sinuosity with moderately narrow valleys and adjacent riverside upland communities. Cool water temperatures in these rivers means the fish community will support few permanent coldwater species and will contain a higher proportion of cool and warm water species relative to coldwater species. Additional variation in the biological community is expected in acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota.

State Distribution: CT, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV

Total Habitat (mi): 6,343

% Conserved: 11.1 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
PA	33	2115	38	125	1195
NY	29	1866	7	37	1129
VA	8	536	15	18	308
WV	8	529	6	78	258
MA	5	310	7	26	160
NH	4	272	4	24	140
ME	3	210	6	2	121
CT	3	188	8	14	94
NJ	2	154	17	3	79
VT	2	137	3	3	79
MD	1	47	3	4	24
RI	0	31	0	2	17

Similar Habitat Types:

These moderate gradient small rivers are transitional types and often exhibit some characteristics of both the higher and lower gradient small rivers. Similarly cool rivers are transitional between cold and warm systems and may include biota found in both colder and warmer types. Cool moderate gradient small rivers typically flow into moderate or low gradient cool and warm larger rivers in areas of less topography.

Places to Visit this Habitat:

Westfield River, Streeter | MA Musconetcong River, Allamuchy | NJ Bush Kill, Delaware State Forest | PA Little Connewango River, Connewango Swamp WMA | NY Shavers Fork, Monongahela National Forest | WV

Associated Fish:

Most Abundant: eastern blacknose dace, longnose dace, white sucker, common shiner, central stoneroller, tessellated darter, cutlip minnow, slimy sculpin, fallfish, telescope shiner, creek chub, rock bass, american eel. **Less Abundant:** mottled sculpin, smallmouth bass, margined madtom, river chub, fantail darter, bluntnose minnow, tennessee shiner, brook trout, northern hog sucker, spottail shiner, pumpkinseed, rosyface shiner, bluehead chub, redbreast sunfish, fathead minnow, mountain redbelly dace, bigmouth chub, white shiner, shield darter, atlantic salmon, yellow perch, banded sculpin, striped shiner, greenside darter.

Species of Concern (G1 - G4):

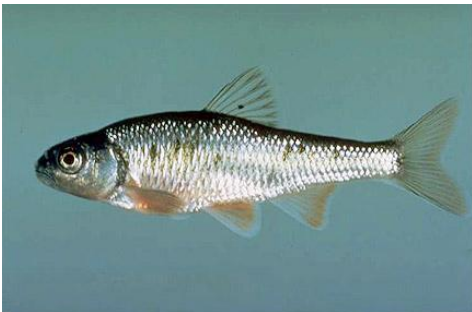
Fishes: clinch sculpin, cheat minnow, spotted darter, roughhead shiner, orangefin madtom, blotchside logperch, sickle darter, redds dace, candy darter, ohio lamprey, mountain brook lamprey, bridle shiner, longhead darter, kanawha minnow, eastern sand darter, black sculpin, gravel chub, bluebreast darter, greenfin darter, bluespar darter, swannanoa darter, tonguetied minnow, northern brook lamprey, american brook lamprey, greater redhorse, bigmouth chub, blacknose shiner, new river shiner, mirror shiner, channel darter, appalachia darter, stripeback darter

Crayfish, Mussels, and Snails: elk river crayfish, new river crayfish,, oyster mussel, shiny pigtoe, finereyed pigtoe, littleting pearl mussel, james spinymussel, cumberland bean, yellow lance, atlantic pigtoe, clubshell, tennessee clubshell, tennessee pigtoe, slabside pearl mussel, fluted kidneyshell, brook floater, snuffbox, longsolid, yellow lamp mussel, tennessee heelsplitter, green floater, rough rabbitsfoot, elktoe, triangle floater, slippershell mussel, eastern pondmussel, eastern pearlshell, round hickorynut, round pigtoe, kidneyshell, Chittenango Ovate Amber Snail, fontigens morrisoni, spiny riversnail

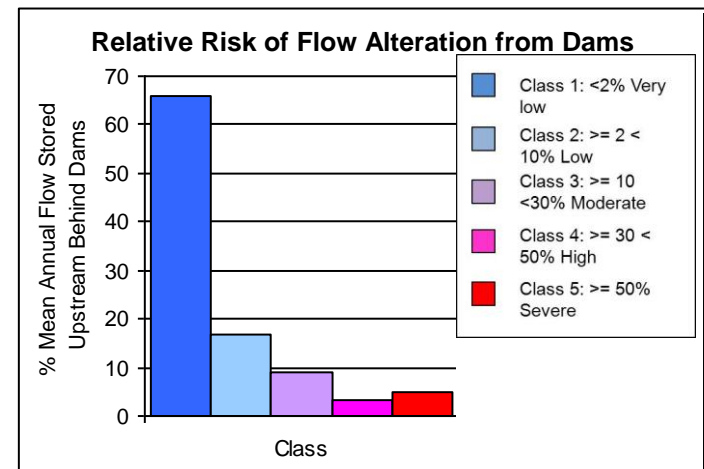
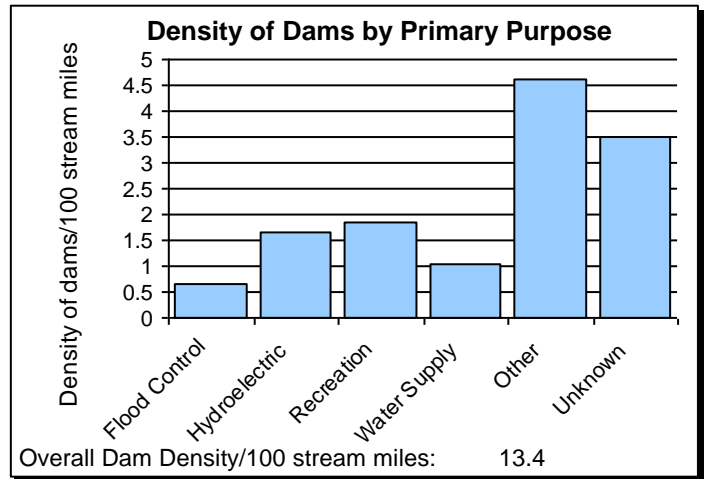
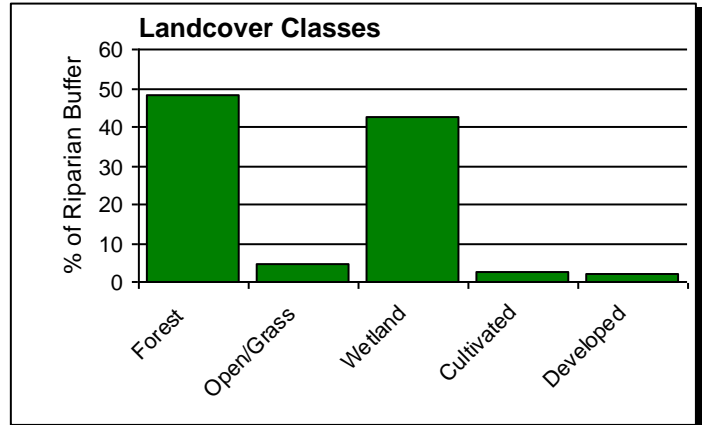
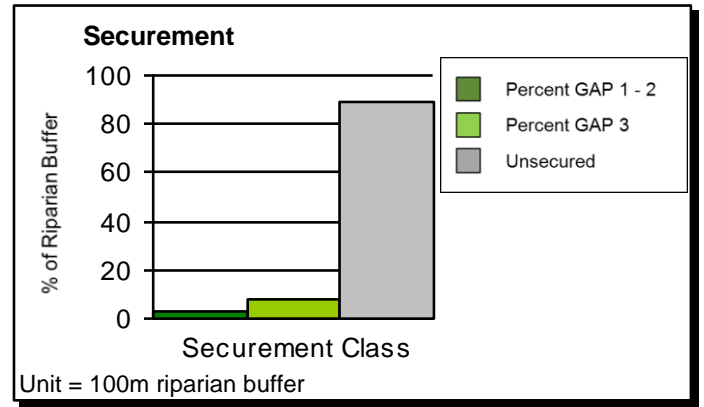
See Appendix 2 for scientific names

Crosswalk to State Names:

Vermont: White sucker-Tessellated darter. **New York:** Confined river. **Maryland:** Highland Streams. **Pennsylvania:** Atlantic Basin Fish Coolwater Community 2, Ohio-Great Lakes Basins Fish Coolwater Stream Community



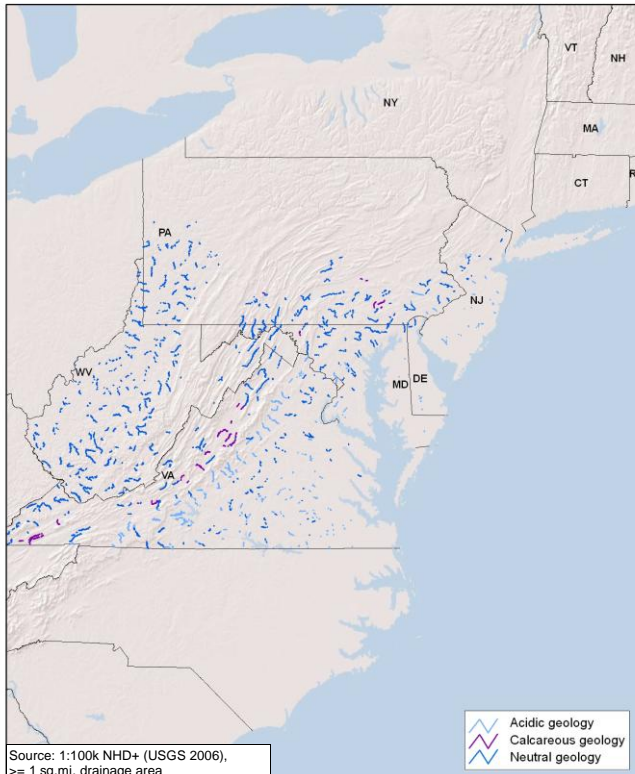
Common shiner, © Jon Cloutier



Moderate Gradient, Warm, Small River

Macrogroup: Small River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Sideling Creek, © Doug Samson

Description:

Warm, moderately fast-moving, small rivers of the southern Mid-Atlantic region. These small rivers of the south drain watersheds up to 200 sq.mi and have an average bankfull width of 69 feet. The moderately fast-moving waters are dominated by a well-defined pattern of alternating pools, riffles, and runs. Their substrate is composed of sand, gravel, and cobble, and they often have high water clarity and are well oxygenated. These moderate gradient rivers exhibit moderate to low sinuosity with moderately narrow valleys and adjacent riverside upland communities. Warm water temperatures in these rivers means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Additional variation in the biological community is expected in acidic, calcareous, and neutral geologic settings where the pH of the water will limit the distribution of certain macroinvertebrates, plants, and other aquatic biota.

State Distribution: DE, DC, MD, NJ, NY, PA, VA, WV

Total Habitat (mi): 3,664

% Conserved: 8.3 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	41	1501	4	26	918
WV	26	973	16	32	577
PA	21	773	14	24	456
MD	9	323	23	40	144
NJ	2	77	8	5	34
DE	1	20	0	3	10
DC	0	10	0	0	7
NY	0	1	0	0	1

Similar Habitat Types:

These moderate gradient rivers are transitional types and often exhibit some characteristics of both the higher and lower gradient streams. Warm moderate gradient small rivers typically flow into moderate or low gradient warm larger rivers in areas of less topography.

Places to Visit this Habitat:

Deer Creek, Rocks State Park | MD Gunpowder Falls, Gunpowder Falls State Park | MD Sideling Hill Creek, Sideling Hill Wildlife Management Area | PA Pennypack Creek, Penny Pack Park | PA Cranberry River, Monongahela National Forest | WV

Associated Fish:

Most Abundant: central stoneroller, bluntnose minnow, white sucker, redbreast sunfish, river chub, american eel, eastern blacknose dace, warpaint shiner, rock bass, common shiner, northern hog sucker, greenside darter, tennessee shiner, telescope shiner, rosyface shiner, tessellated darter, creek chub, crescent shiner, redline darter, bigeye chub, longnose dace, striped shiner. **Less Abundant:** rainbow darter, mimic shiner, smallmouth bass, mottled sculpin, cutlip minnow, banded sculpin, banded darter, whitetail shiner, fantail darter, mountain shiner, margined madtom, bluehead chub, gizzard shad, fallfish, black redhorse, bigmouth chub, green sunfish, spotfin shiner, johnny darter, bluegill, creek chubsucker, rosefin shiner, spottail shiner, longear sunfish, largemouth bass, shield darter, golden redhorse.

Species of Concern (G1 - G4):

Fishes: duskytail darter, yellowfin madtom, cheat minnow, roanoke logperch, roughhead shiner, orangefin madtom, blotchside logperch, sickle darter, sharphead darter, candy darter, tippecanoe darter, ohio lamprey, mountain brook lamprey, popeye shiner, longhead darter, fatlips minnow, kanawha minnow, potomac sculpin, gravel chub, bluebreast darter, greenfin darter, bluespar darter, swannanoa darter, glassy darter, tonguetied minnow, american brook lamprey, river redhorse, bigmouth chub, new river shiner, mirror shiner, tangerine darter, channel darter, gilt darter, appalachia darter, stripeback darter. **Crayfish, Mussels, and Snails:** elk river crayfish, big sandy crayfish, spiny scale crayfish, new river crayfish, cumberlandian combshell, shiny pigtoe, littlewing pearl mussel, james spiny mussel, purple bean, yellow lance, atlantic pigtoe, clubshell, tennessee clubshell, tennessee pigtoe, slabside pearl mussel, fluted kidneyshell, brook floater, atlantic spike, snuffbox, yellow lamp mussel, tennessee heelsplitter, green floater, salamander mussel, tan riffleshell, elktoe, triangle floater, slippershell mussel, northern lance, eastern pondmussel, round hickorynut, round pigtoe, kidneyshell, spiny riversnail

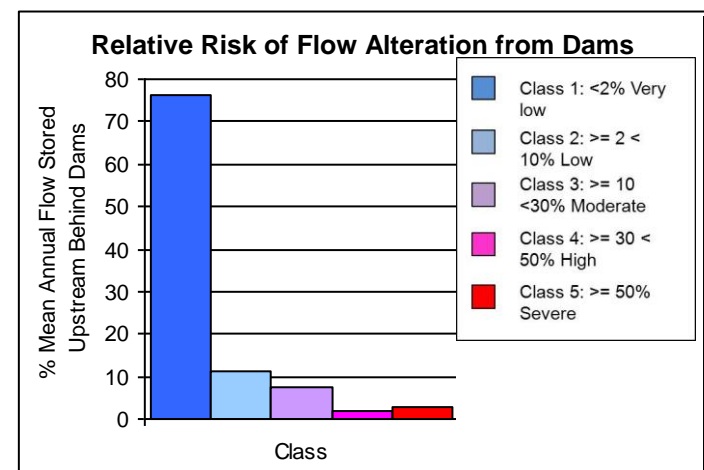
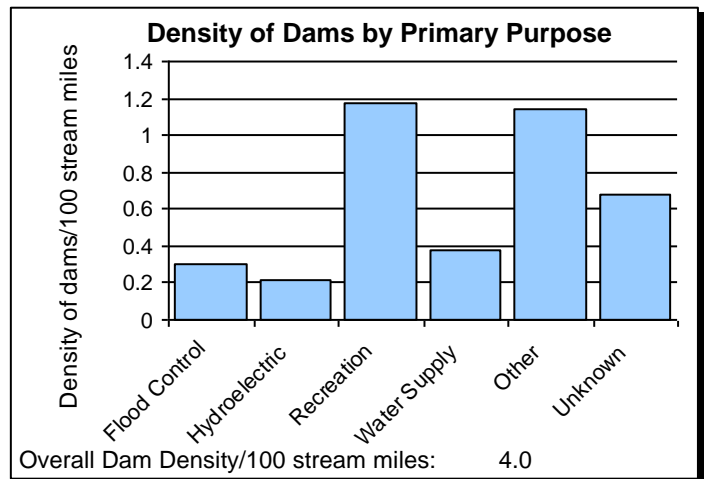
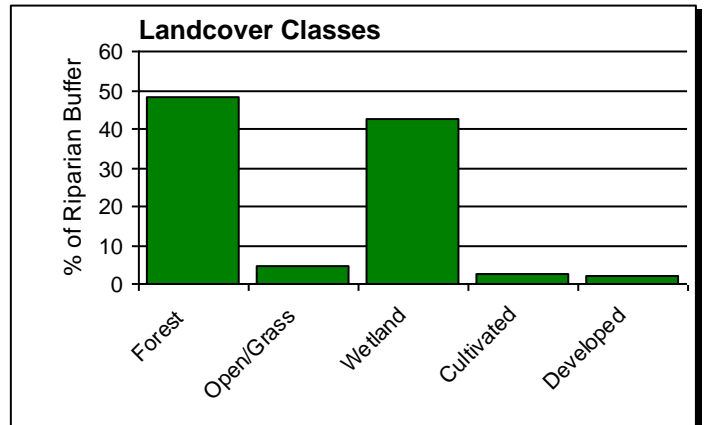
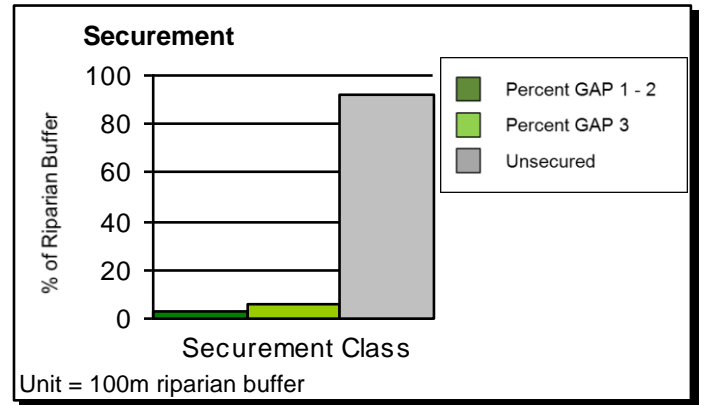
See Appendix 2 for scientific names

Crosswalk to State Names:

New York: Confined river. **Maryland:** Piedmont Streams, Highland Streams, Coastal Plain Streams. **Pennsylvania:** Atlantic Basin Fish Warmwater Community 2, Atlantic Basin Fish Warmwater Community 1, Ohio-Great Lakes Basins Fish Warmwater Stream Community, Ohio - Great Lakes Basins Mussels Fluted Shell Mussel Community, Susquehanna - Potomac River Basins Mussels Eastern Elliptical Community.



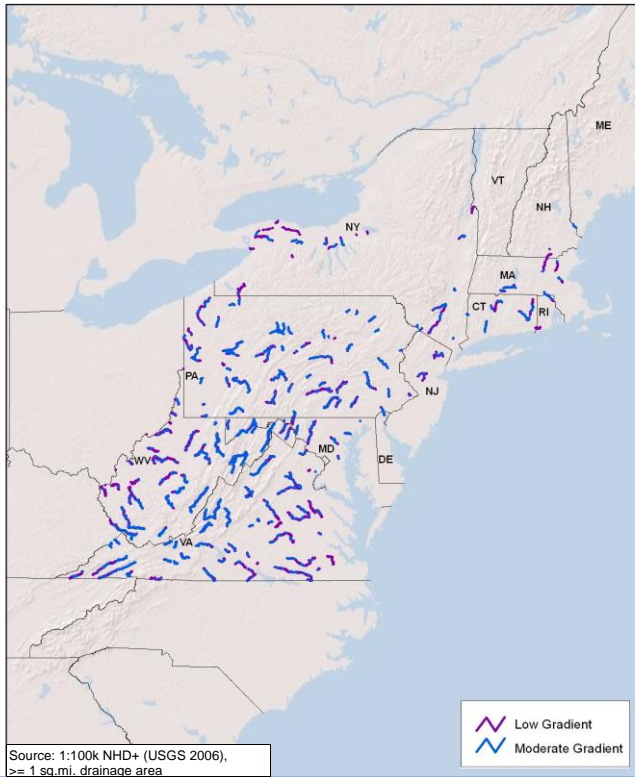
Central stoneroller, © Matthew Pintar



Warm, Medium River

Macrogroup: Medium River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Shavers Fork, © Tim Kiser

Description:

Warm, medium-sized rivers of the low elevation north and of the Mid-Atlantic. These medium sized rivers drain watersheds up to 1000 sq.mi. in size and have an average bankfull width of 115 feet. Slower moving, lower gradient sections of these rivers are expected to be more unconfined with higher sinuosity, broader floodplain valleys, more riparian wetlands, and lower width/depth ratios than the more moderate gradient portions. Warm water temperatures in these rivers means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Examples of this type in the region include French Creek, Conodoguinet Creek, North Branch Potomac, Cacapon, North Fork Shenandoah, Lieelt Kanawah, Elk, Mattaponi, Greenbrier, Appomattox, Guyandote, Tug Fork, Meherrin, Clinch, and North Fork Holston.

State Distribution: CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VA, WV

Total Habitat (mi): 4,953

% Conserved: 8.8 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	31	1566	11	43	953
WV	25	1272	11	60	761
PA	25	1245	37	29	737
NY	8	379	5	5	228
MD	4	203	20	19	92
CT	2	116	1	11	63
MA	2	98	5	9	47
NJ	1	70	9	3	32
RI	1	26	3	1	11
NH	0	15	0	2	7
DE	0	7	0	1	3
ME	0	5	0	0	3

Similar Habitat Types:

Cool and cold medium rivers are also found in the region. Warm medium rivers typically flow into larger warm rivers or directly to the coast.

Places to Visit this Habitat:

Patuxent River, Patuxent River State Park | MD Patapsco River, Patapsco Valley State Park | MD Roanoke River, Wasena | VA French Creek, French Creek State Park | PA Greenbrier River, Monongahela National Forest | WV

Associated Fish:

Most Abundant: bluntnose minnow, redbreast sunfish, rock bass, central stoneroller, spottail shiner, white sucker, smallmouth bass, american eel, northern hog sucker, greenside darter, spottin shiner, white shiner, pumpkinseed, common shiner, river chub, bluegill, telescope shiner, margined madtom, mimic shiner, swallowtail shiner, bluehead chub, tessellated darter, redline darter, rosyface shiner.

Less Abundant: tennessee shiner, largemouth bass, fantail darter, roanoke darter, longnose dace, banded darter, cutlip minnow, satinfin shiner, yellow bullhead, golden redbreast, striped shiner, green sunfish, yellow perch, creek chub, bigmouth chub, rainbow darter, fallfish, gizzard shad, banded sculpin, whitetail shiner, banded killifish, eastern silvery minnow, shield darter, johnny darter, white perch, longear sunfish, variegate darter, warpaint shiner, bull chub, logperch, black redbreast, comely shiner.

Species of Concern (G1 - G4):

Fishes: slender chub, yellowfin madtom, cheat minnow, roanoke logperch, spottin chub, ashy darter, golden darter, spotted darter, roughhead shiner, orangefin madtom, blotchside logperch, sickle darter, western sand darter, sharphead darter, candy darter, tippecanoe darter, ohio lamprey, mountain brook lamprey, popeye shiner, northern madtom, longhead darter, fatlips minnow, kanawha minnow, eastern sand darter, black sculpin, potomac sculpin, bluebreast darter, bluespar darter, swannanoa darter, northern brook lamprey, american brook lamprey, river redbreast, bigmouth chub, new river shiner, mirror shiner, mountain madtom, tangerine darter, channel darter, gilt darter, appalachia darter, stripeback darter, paddlefish

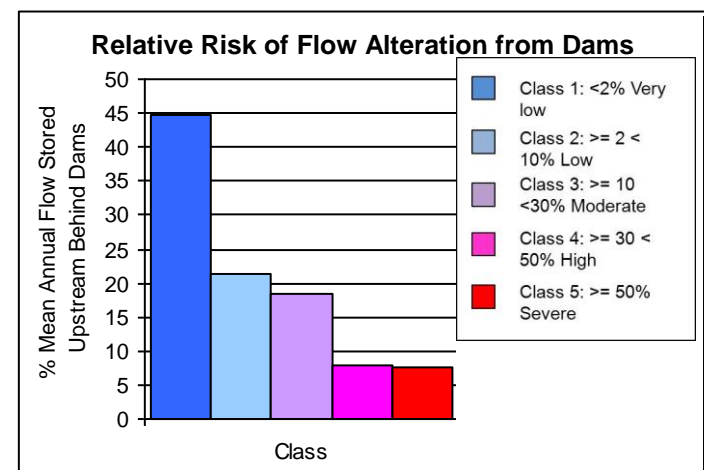
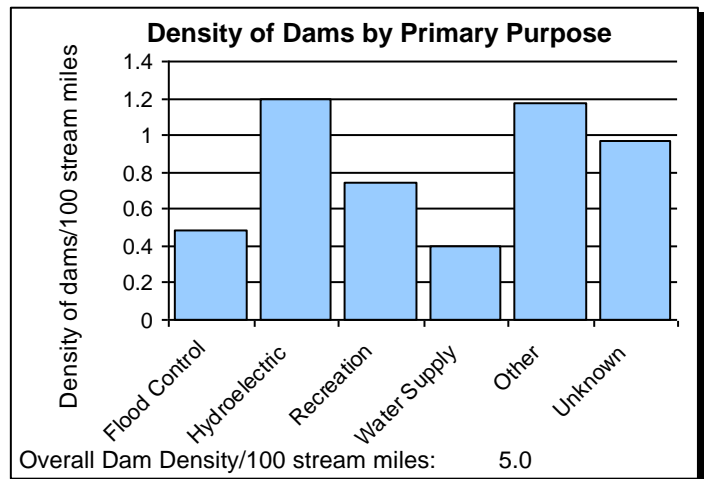
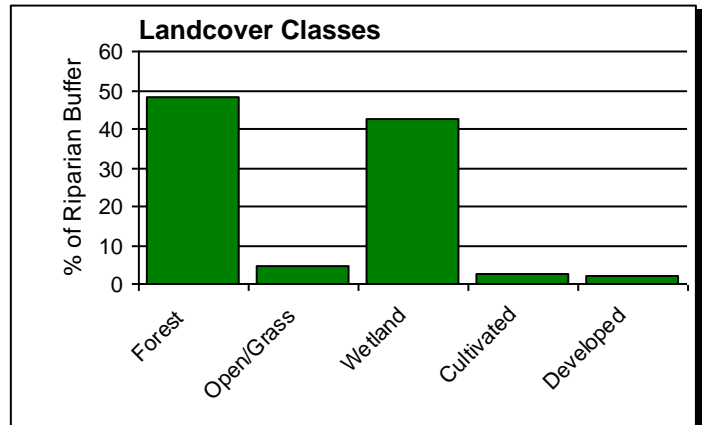
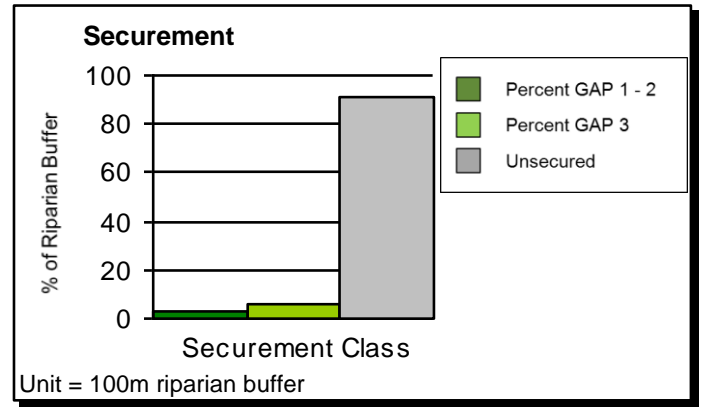
Crayfish, Mussels, and Snails: elk river crayfish, big sandy crayfish, fanshell, dromedary pearl mussel, cumberlandian combshell, oyster mussel, finereyed pigtoe, cracking pearl mussel, birdwing pearl mussel, virginia pigtoe, littlewing pearl mussel, james spiny mussel, rough pigtoe, cumberland monkeyface, appalachian monkeyface, purple bean, cumberland bean, yellow lance, atlantic pigtoe, pink mucket, clubshell, tennessee clubshell, pyramid pigtoe, tennessee pigtoe, slabside pearl mussel, black sandshell, fluted kidneyshell, rayed bean, brook floater, spectaclecase, roanoke slabshell, snuffbox, longsolid, yellow lamp mussel, tennessee heelsplitter, green floater, sheepsnose, rabbitsfoot, salamander mussel, purple lilliput, tan riffleshell, northern riffleshell, rough rabbitsfoot, green blossom, elktoe, triangle floater, slippershell mussel, northern lance, eastern pond mussel, round hickorynut, ohio pigtoe, round pigtoe, kidneyshell, pistolgrip spiny riversnail
See Appendix 2 for scientific names

Crosswalk to State Names:

New York: Confined river, Unconfined river, Backwater slough.
Pennsylvania: Atlantic Basin Fish Warmwater Community 2, Ohio-Great Lakes Basins Fish Warmwater Stream Community



Rock bass, © Pen Waggener

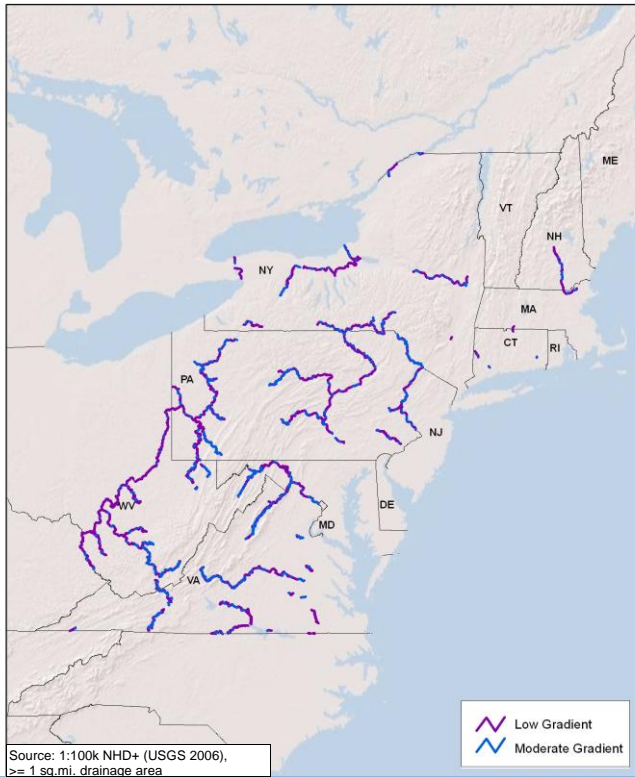


Warm, Large River



Macrogroup: Large River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Susquehanna River, © Nicholas A. Tonelli

Description:

Large, deep, warmwater rivers of the Mid-Atlantic and low elevations in the north. These very large and deep rivers drain watersheds >1000 sq.mi and have an average bankfull width of 250 feet. Slower moving, lower gradient sections of these rivers are expected to be more unconfined with higher sinuosity, broader floodplain valleys, more riparian wetlands, and lower width/depth ratios than the more moderate gradient portions. Species diversity is high in these large rivers, and assemblages characteristic of runs, pools, and the pelagic zone dominate the community. Profundal areas without effective light penetration are also found and support populations of bacteria, fungi, and other decomposers that break down organic matter reaching the bottom. In coastal connected river sections, anadromous species are often found. Warm water temperatures in these streams means the fish community will contain a higher proportion of warmwater species relative to coolwater species. These systems are unlikely to support any resident coldwater species. Examples of this type in the region include the lower Merrimack, Mohawk, Delaware, Susquehanna, West Branch Susquehanna, Allegheny, Juniata, Ohio, Monongahela, Potomac, South Fork Shenandoah, Kanawha, James, New, and Roanoke.

Similar Habitat Types:

Warm large rivers typically have a number of cool and warm medium sized or small river sized tributary systems draining into them.

State Distribution: CT, MD, MA, NH, NJ, NY, PA, VT, VA, WV

Total Habitat (mi): 3,853

% Conserved: 12.0 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
PA	31	1210	45	46	771
WV	25	969	40	34	584
VA	20	763	5	38	469
NY	16	605	6	22	402
MD	4	154	42	6	63
NH	2	66	1	6	38
NJ	2	60	19	8	17
MA	1	28	0	2	17
CT	0	17	0	0	11
VT	0	6	2	0	2

Places to Visit this Habitat:

Potomac River, C & O Canal National Historical Park | MD West Branch Susquehanna River, Bucktail State Park Natural Area | PA Youghiogheny River, Ohio State Park | PA Ohio River, Green Bottom Wildlife Management Area | WV Gauley River, Gauley River National Recreation Area | WV

Associated Fish:

Most Abundant: smallmouth bass, emerald shiner, spotfin shiner, redbreast sunfish, northern hog sucker, rock bass, bluntnose minnow, spottail shiner, mimic shiner, white sucker, rosyface shiner, fallfish, telescope shiner, bluegill, gizzard shad, pumpkinseed, logperch, black redhorse, greenside darter, streamline chub, banded darter, yellow perch, american eel, shield darter, tessellated darter, swallowtail shiner, channel catfish, golden redhorse. **Less Abundant:** roanoke darter, walleye, satinfin shiner, margined madtom, sand shiner, largemouth bass, central stoneroller, shorthead redhorse, longhead darter, river chub, yellow bullhead, silver redhorse, bigmouth chub, silver shiner, longnose dace, whitetail shiner, longear sunfish, variegate darter, blueback herring, rainbow darter, green sunfish, golden shiner, common shiner, sharpnose darter, redline darter, white perch, white shiner, freshwater drum, banded killifish, flathead catfish.

Species of Concern (G1 - G4):

Fishes: duskytail darter, cheat minnow, roanoke logperch, ashy darter, golden darter, spotted darter, orangefin madtom, blotchside logperch, shortnose sturgeon, lake sturgeon, atlantic sturgeon, western sand darter, candy darter, tippecanoe darter, ohio lamprey, popeye shiner, northern madtom, longhead darter, kanawha minnow, eastern sand darter, highfin carpsucker, streamline chub, gravel chub, bluebreast darter, bluespar darter, american brook lamprey, river redhorse, bigmouth chub, new river shiner, mountain madtom, tangerine darter, channel darter, gilt darter, appalachia darter, stripeback darter, paddlefish

Crayfish, Mussels, and Snails: fanshell, dromedary pearlymussel, birdwing pearlymussel, virginia pigtoe, orangefoot pimpleback, james spinymussel, rough pigtoe, yellow lance, atlantic pigtoe, pink mucket, clubshell, pyramid pigtoe, tennessee pigtoe, rayed bean, brook floater, spectaclecase, atlantic spike, roanoke slabshell, snuffbox, longsolid, yellow lampmussel, green floater, tidewater mucket, sheepnose, rabbitsfoot, salamander mussel, northern riffleshell, elktoe, triangle floater, butterfly, ebonyshell, hickorynut, round hickorynut, ohio pigtoe, round pigtoe, kidneyshell, monkeyface, pistolgrip

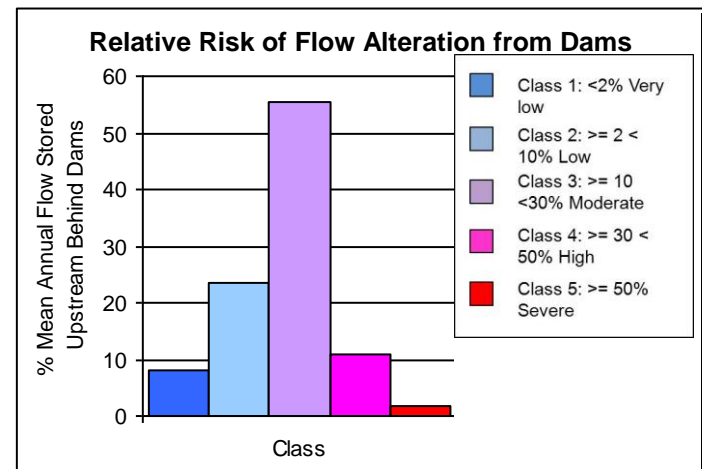
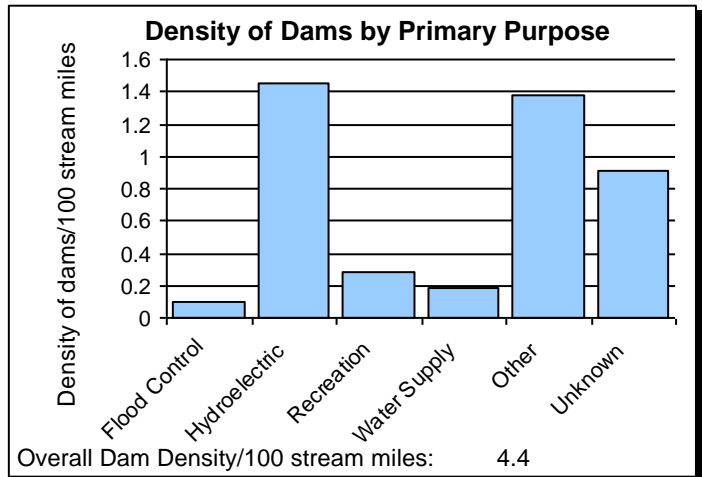
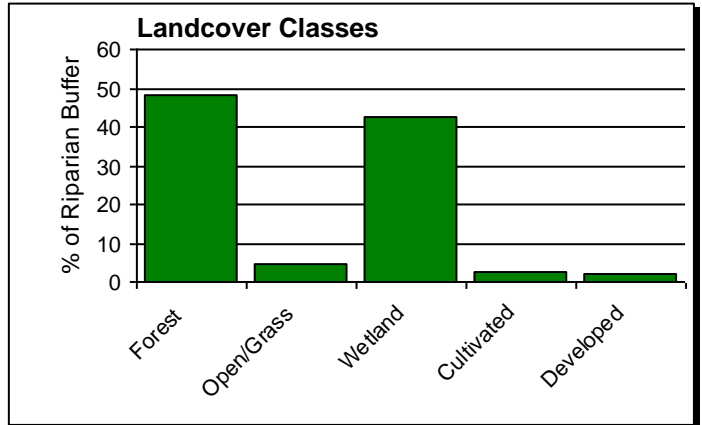
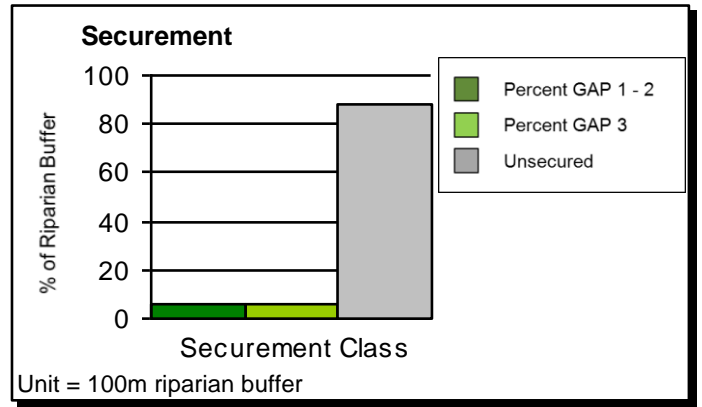
See Appendix 2 for scientific names

Crosswalk to State Names:

New York: Deepwater river. **Pennsylvania:** Atlantic Basin Fish River & Impoundment Community, Ohio-Great Lakes Basins Fish Large River Community

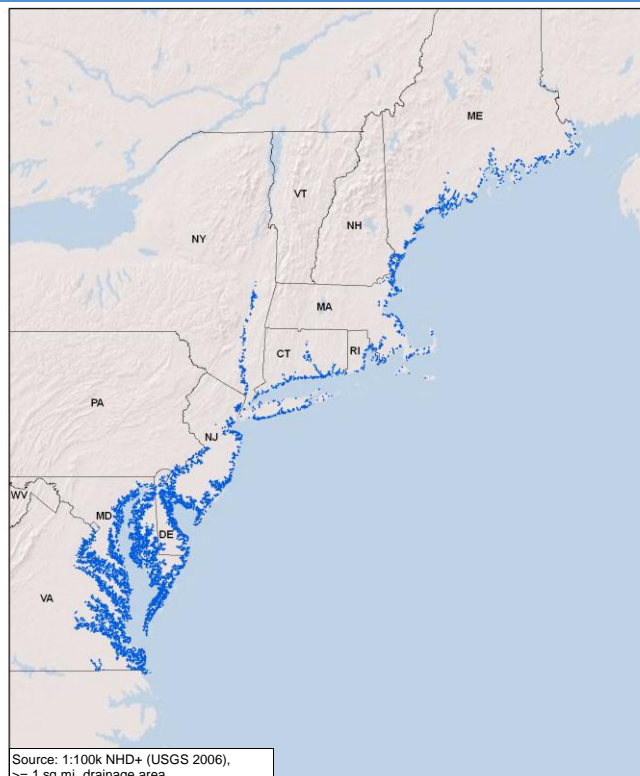


Black Redhorse, © Biotactic



Macrogroup: Tidal Headwaters and Creeks

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Quashnet River

Description:

Slow-moving, shallow, tidally influenced creeks and headwater streams. These tidal creeks and streams connect directly to the ocean or to large tidal rivers estuaries and have watersheds under 39 square miles. The water flow and level in these streams fluctuates with the tides creating subtidal habitat which is permanently flooded and an intertidal habitat exposed at low tide. Salinity typically ranges between 30 and 0.5 ppt and grades into a freshwater system in the upper portions of many of these reaches. Most tidal streams have moderately firm, sandy channel bottoms and vertical banks that are regularly eroded and slump into the creek bottom. Many have a very sinuous pattern as they wind through large salt marshes along the coast. Others have smaller associated brackish or salt marshes along their length and/or intertidal sand and mud flats in their lower portions. These streams and their associated estuaries support a rich diversity of plant and animals and serve as the primary nursery area for many marine fishes. The ecological importance of small tidal streams has historically been undervalued, but recent research is showing their collective influence on estuarine ecosystem function may equal or exceed that of larger tidal rivers.

Similar Habitat Types:

Tidal headwaters and creeks may drain directly to the coast or into larger tidal rivers and their estuaries. High gradient examples of tidal creeks and streams are rare but do occur occasionally along the northern rocky coast of the region.

Places to Visit this Habitat:

Wye River, Md Environmental Trust Easement | MD Cedar Run, Stafford Forge | NJ Bass River, Edwin B. Forsythe National Wildlife Refuge | NJ Pettaquanscutt River, John H. Chafee National Wildlife Refuge | RI Powhatan Creek, Colonial National Historical Park | VA

State Distribution: CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VA

Total Habitat (mi): 7,835

% Conserved: 13.2 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	31	2402	43	86	1690
MD	29	2307	50	169	1548
NJ	12	906	156	32	511
ME	8	654	29	24	445
DE	6	501	27	52	309
NY	4	336	10	17	238
MA	4	312	14	39	185
CT	3	218	9	12	151
NH	1	95	3	7	61
RI	1	71	3	5	50
PA	0	24	2	1	16
DC	0	7	0	1	6

Associated Fish:

Most Abundant: alewife, blueback herring, atlantic silverside, mummichog, striped killifish, sheepshead minnow, fourspine stickleback, threespine stickleback, american eel, winter flounder, black sea bass, bluefish, striped bass, naked goby, northern pipefish.

Less Abundant: eastern mudminnow, white sucker, tessellated darter, pumpkinseed, redbreast sunfish, largemouth bass, brook trout, satinfin shiner, banded killifish, sea lamprey, golden shiner, banded sunfish.

Species of Concern (G1 - G4):

Fishes: bridle shiner, glassy darter, spotfin killifish, american brook lamprey, ironcolor shiner

Crayfish, Mussels, and Snails: tidewater mucket, eastern pondmussel, new england siltsnail

See Appendix 2 for scientific names

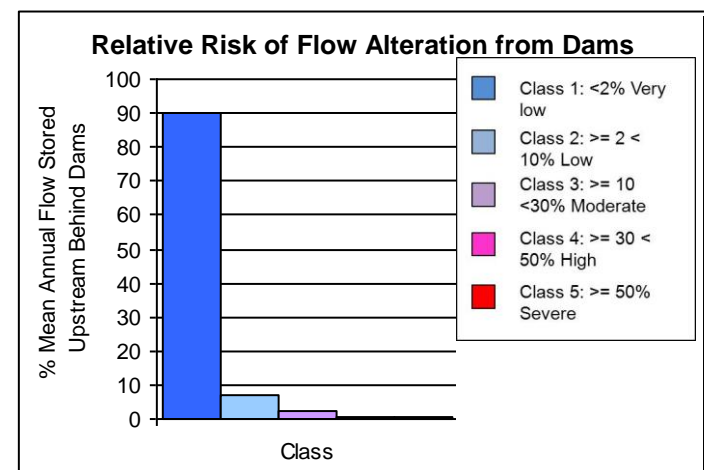
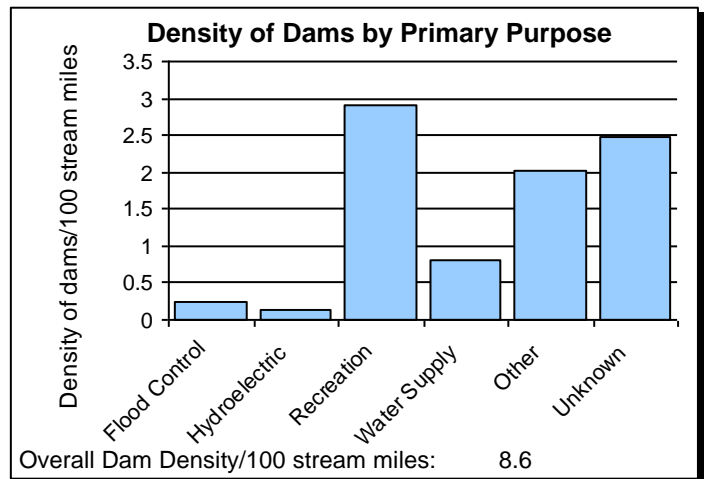
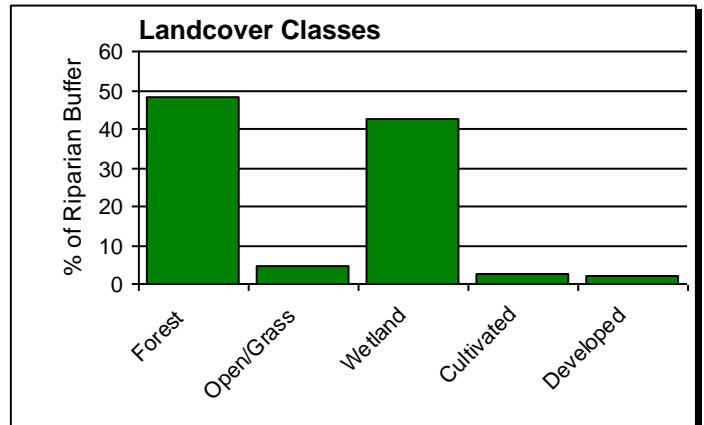
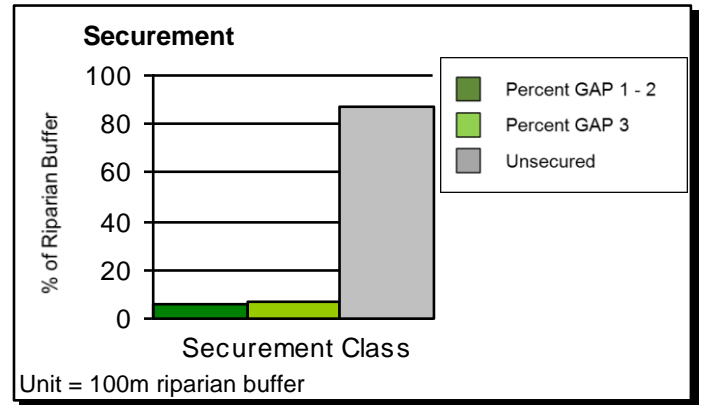
Crosswalk to State Names:

New York: Brackish interdunal swales, Brackish intertidal mudflats, Brackish intertidal shore, Brackish meadow, Brackish subtidal aquatic bed, Brackish tidal marsh, Coastal salt pond, Freshwater intertidal mudflats, Freshwater intertidal shore, Freshwater tidal creek, Freshwater tidal marsh, Freshwater tidal swamp, High salt marsh, Low salt marsh, Salt panne, Salt shrub, Saltwater tidal creek.

Maryland: Tidal Streams, Coastal Plain Streams, Blackwater Streams.



Alewife, © USDA Forest Service



Tidal Small and Medium River

Macrogroup: Tidal Small and Medium River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Nanticoke River, © Doug Samson

Description:

Slow moving, small to medium, tidally influenced rivers. These small to medium sized rivers connect directly to the ocean or to large estuaries and their water flow and level fluctuates with the tides. They drain watersheds up to 1,000 sq.mi.in size and have an average bankfull width of 89 feet. In the river there is a vertical salinity gradient, with a surface layer of fresh water (salinity less than 0.5 ppt) floating over a deeper layer of brackish water (salinity between 0.5 and 18.0ppt). Salinities at any one place in the river may fluctuate as the tides flow in and out because the "salt wedge" of brackish water alternately rises and falls with the tides. Vegetational and faunal communities found in and along the river are determined by both depth and salinity. Commonly associated communities include brackish and salt marshes, swamps, and mudflats. These rivers and their associated estuaries support a rich diversity of plant and animals and serve as the primary nursery area for many marine, estuarine, and anadromous fishes.

State Distribution: CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VA, WV

Total Habitat (mi): 1,885

% Conserved: 18.2 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
MD	32	589	40	106	539
VA	19	350	20	28	389
NJ	17	323	53	16	192
ME	8	150	4	11	122
DE	6	119	6	14	62
MA	6	110	3	15	74
NY	4	65	5	1	55
CT	3	53	1	6	26
RI	2	37	1	1	27
PA	1	23	3	1	10
NH	1	22	1	1	11
DC	0	7	0	0	7

Similar Habitat Types:

Tidal rivers typically have a number of connected smaller tidal creeks and may drain directly to the coast or into larger tidal rivers and their estuaries.

Places to Visit this Habitat:

Quinnipiac River, Quinnipiac River State Park, CT Nanticoke River, Nanticoke River Watershed Conservancy | DE Transquaking River, Fishing Bay Wildlife Management Area | MD Northwest River, Northwest River | VA Mattaponi River, Sandy Point State Forest | VA

Associated Fish:

Most Abundant: alewife, blueback herring, american shad, hickory shad, gizzard shad, striped bass, atlantic tomcod, american eel, rainbow smelt, sea lamprey, white perch, hogchoker, striped bass, banded killifish, spottail shiner, tessellated darter, pumpkinseed, bay anchovy. **Less Abundant:** pumpkinseed, white sucker, yellow perch, largemouth bass, redbreast sunfish, spottail shiner, chain pickerel, golden shiner, eastern silver minnow, common shiner, satinfish shiner, shorthead redhorse, redbfin pickerel.

Species of Concern (G1 - G4):

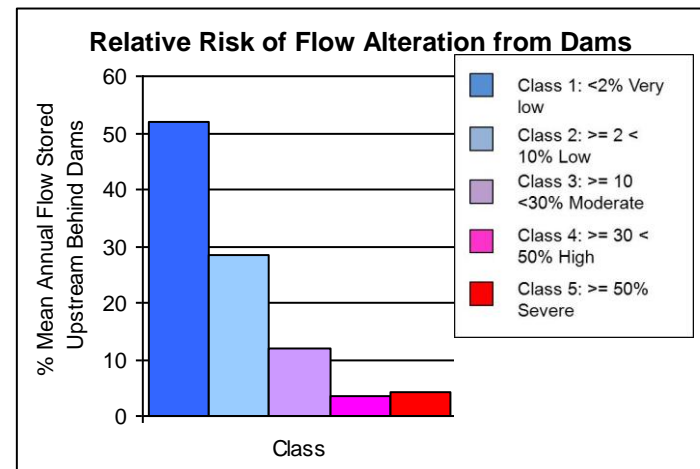
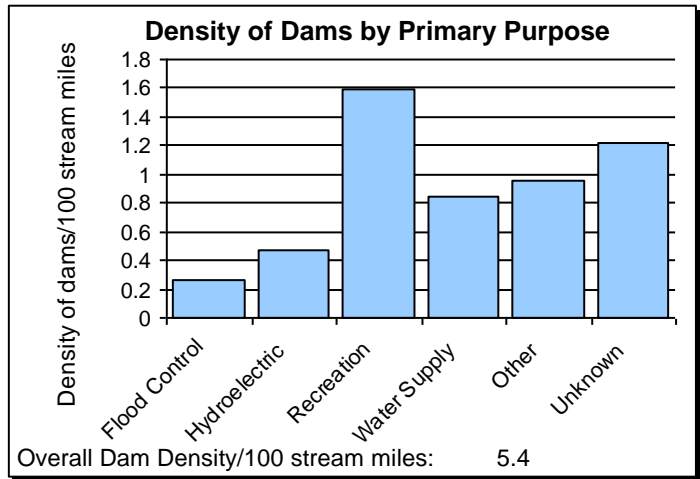
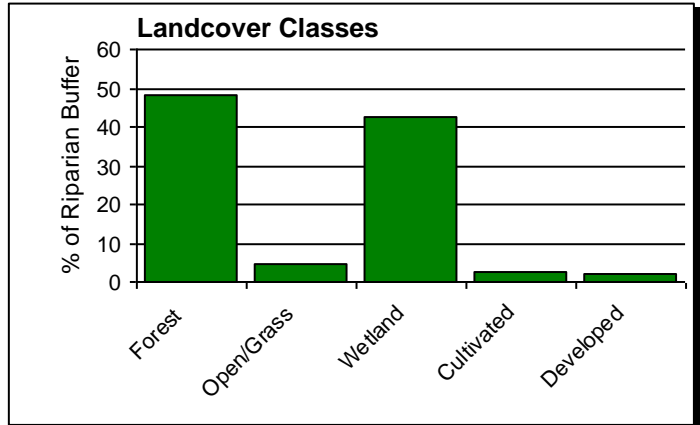
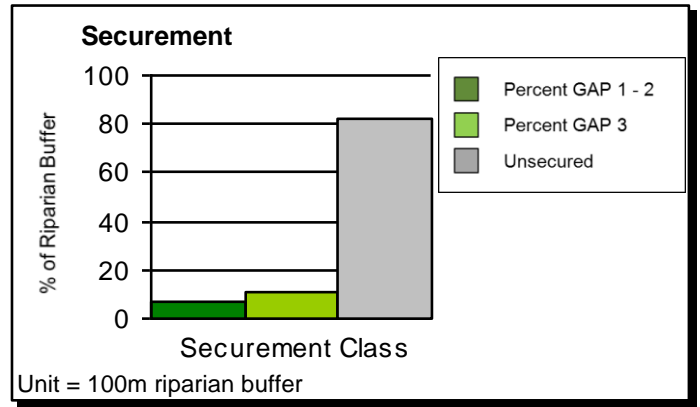
Fishes: shortnose sturgeon, atlantic sturgeon, glassy darter, spotfin killifish, ironcolor shiner
Crayfish, Mussels, and Snails: tidewater mucket, eastern pondmussel, new england siltsnail
 See Appendix 2 for scientific names

Crosswalk to State Names:

New York: Brackish interdunal swales, Brackish intertidal mudflats, Brackish intertidal shore, Brackish meadow, Brackish subtidal aquatic bed, Brackish tidal marsh, Coastal salt pond, Freshwater intertidal mudflats, Freshwater intertidal shore, Freshwater tidal creek, Freshwater tidal marsh, Freshwater tidal swamp, High salt marsh, Low salt marsh, Salt panne, Salt shrub, Saltwater tidal creek, Tidal river. **Maryland:** Tidal Streams, Coastal Plain Streams, Blackwater Streams.



American shad, © Raver Duane, USFWS



Macrogroup: Tidal Large River

This map is based on a model and has had little field-checking. Contact your State Natural Heritage Ecologist or State Fish Game Agency for more information about this habitat.



Source: 1:100k NHD+ (USGS 2006), >= 1 sq.mi. drainage area



Connecticut River, © Jerry Monkman

Description:

Slow moving, large, deep, tidally influenced rivers. These very large rivers connect directly to the ocean or to large estuaries and their water flow and level fluctuates with the tides. They have large upstream watersheds >1000 sq.mi and average bankfull widths of over 300 feet. In the river there is a vertical salinity gradient, with a surface layer of fresh water (salinity less than 0.5 ppt) floating over a deeper layer of brackish water (salinity between 0.5 and 18.0ppt). Salinities at any one place in the river may fluctuate as the tides flow in and out because the "salt wedge" of brackish water alternately rises and falls with the tides. Vegetational and faunal communities found in and along the river are determined by both depth and salinity. Commonly associated communities include brackish and salt marshes, swamps, and mudflats. Most of these rivers have extensive salt marshes an/or intertidal sand and mud flats at their mouths. These rivers and their associated estuaries support a rich diversity of plant and animals and serve as the primary nursery area for many marine, estuarine, and anadromous fishes.

Similar Habitat Types:

Large tidal rivers typically have a number of connected smaller tidal rivers and creeks.

State Distribution: CT, DE, DC, ME, MD, MA, NJ, NY, PA, VA

Total Habitat (mi): 1,026

% Conserved: 15.9 Unit = Acres of 100m Riparian Buffer

State	State Habitat %	Miles of Habitat	Acres GAP 1 - 2	Acres GAP 3	Total Acres Unsecured
VA	41	412	9	42	358
NY	15	146	5	16	87
ME	12	116	1	2	61
CT	10	99	6	8	59
NJ	8	77	10	11	45
MD	5	48	2	5	31
PA	5	46	1	3	29
MA	3	26	1	1	18
DE	2	25	9	2	9
DC	1	6	0	0	5

Places to Visit this Habitat:

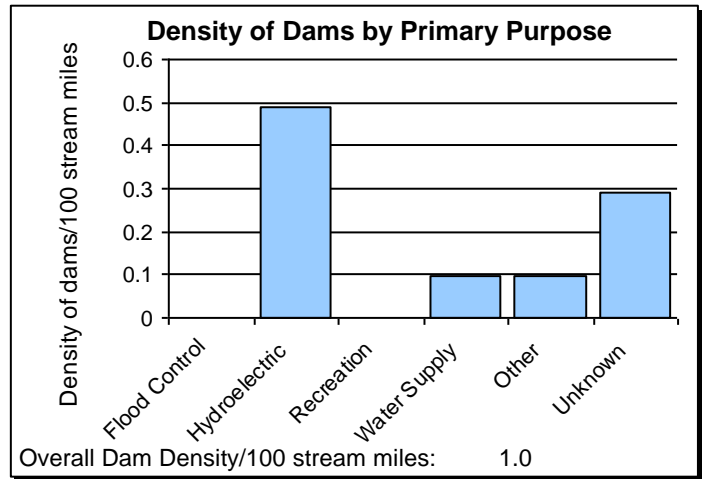
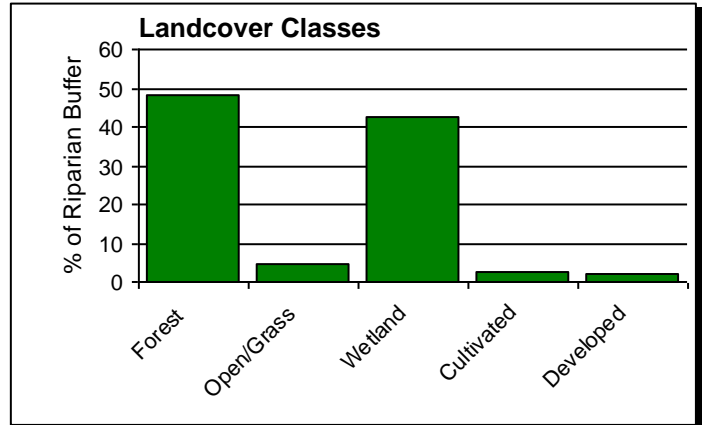
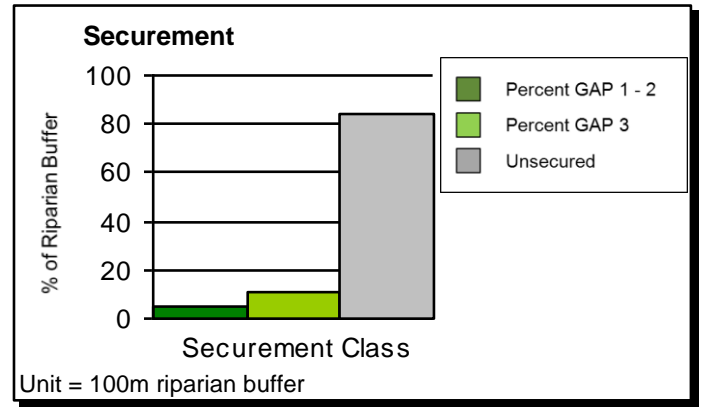
Connecticut River, Windsor Meadows State Park | CT Hudson River, Peebles Island | NY Schuylkill River, Fairmont Park | PA James River, James River National Wildlife Refuge | VA Delaware River, Supawna Meadows NWR | NJ

Associated Fish:

Most Abundant: atlantic sturgeon, shortnose sturgeon, atlantic salmon, alewife, blueback herring, american shad, hickory shad, gizzard shad, striped bass, atlantic tomcod, american eel, sea lamprey, hogchoker, banded killifish, spottail shiner, tessellated darter, pumpkinseed, bay anchovy, white perch. Less Abundant: spottail shiner, pumpkinseed, yellow perch, redbreast sunfish, largemouth bass, eastern silvery minnow, white sucker, fallfish, inland silverside.

Species of Concern (G1 - G4):

Fishes: shortnose sturgeon, atlantic sturgeon
Crayfish, Mussels, and Snails: tidewater mucket, eastern pondmussel, new england siltsnail
 See Appendix 2 for scientific names



Crosswalk to State Names:

New York: Brackish interdunal swales, Brackish intertidal mudflats, Brackish intertidal shore, Brackish meadow, Brackish subtidal aquatic bed, Brackish tidal marsh, Coastal salt pond, Freshwater intertidal mudflats, Freshwater intertidal shore, Freshwater tidal marsh, Freshwater tidal swamp, High salt marsh, Low salt marsh, Salt panne, Salt shrub, Tidal river.



Atlantic sturgeon © VA Park Staff

