A	В	С	D	E F G	Н	L	P		T	U		V	
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions		Working_Lands	Notes		
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Gradual Temperature Change /	e.g., altered sex-ratio in species relying upon a temperature dependent sex determination, reduction of dissolved oxygen that is available to fish species, earlier ice-free dates, thawing of permafrost affecting bird breeding sites. / e.g., manure, compost, chemical fertilizers. / Includes	Continue efforts to reduce C emissions to approximately that attain 100% carbon pollution net-zero emissions economy shading and aquatic plants opercentage of the benefits from the care partnershi and clean energy to conserv. (11.3.3), Increase partnershi and stakeholders to eliminate enrichment, and chemical frenichment causes low [02] gas contents, toxic to P. adal with end users to eliminate of effluents. Populations in small	ps with federal and state authoriti te loads of manure (organic erilizers (P, N, C). Organic , high hydrogen sulfide and metha msi. (9.3.1), "Increase partnership: or reduce discharges of toxic all lakes, pools or eddies, rivers, an	a e ies, ine s	Temperture Change reproductive strateging dependent sex deterring prefers small bodies of temperature, dissolve habitat. Nutrient Loa Species is a filter feed feeder, feeding on fin total suspended loads well as buildup of tox toxic, especially if the bodies of water adjace effluents from drainal population declines of A predilection for org lakes, pools or eddies m depth. Most comm	nic, muddy substrates of quiet bodies of wa , rivers, creeks). Also lives in larger lakes do on in mesotrophic waters (total chlorophyll	erature- amsi is in ss of n long. posit to high esses, as hese are small d runoff or oss and ater (small own to 1.5 = ~3-7
2 Euglesa adamsi	Adam peaclam	Aquatic Mollusk	Clam	IV b Creeks and Rivers	11.3.3, 9.3.1, 9.3.3	Nutrient Loads / Herbicides and	the use of inputs for controlling crop pests. E.g., herbicides, insecticides fungicides.	(9.3.3)	due to smaller dilution effects. "		μg/L, total P = ~10-30	$\mu$ g/L, total N = ~300-600 $\mu$ g/L, Secch depth	= ~2.5-4
3 Utterbackiana implicata	Alewife floater	Aquatic Mollusk	Mussel	IV a Creeks and Rivers	11.2.2, 9.1, 5.4.2	Urban Wastewater / Commercial	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Harvesting of aquatic species for commercial purposes that is governed by management measures for which the environmental impact is primarily on the species (as opposed to habitat damage from sea bottom trawling, Threat 7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife (Threat 9.4.4). E.g., commercial fisheries, use of nets and fishing gear for eels, factory ships, marine mammals caught in industrial fishing nets.	minimize and reverse climat biologically meaningful stand including elimination of mixi present, or provide sufficient best management practices areas such as nutrient and p with NMFS to implement regriver herring and shad such t freshwater runs. DWR also cherring and shad in inland w shad popualtions are at such	dards for the waste water effluent ng zones where rare species are t mitigation for impacts. Implemer to minimize impacts from resident esticide runoff. (9.1), Coordinate gulations that will minimize take o that benefits will be seen in annua ontinue to restrict take of river aters. Current river herring and a levels that natural recrutiment of ulations is difficult even with no	rit tial if	Continue propagation waterways that are so	and augmentation and reintroduction into itable.	
4 Theliderma sparsa	Appalachian rockshell	Aquatic Mollusk	Mussel	I a Creeks and Rivers	9.2, 9.3, 9.1		Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Coordinate with the Virginia Quality and Virginia Energy t meaningful biological standa to develop, meaningful biolodischarges. Mixing zones ne rare species occur, or sufficie known impacts. (9.2), Increa management practices such and protecting/establishing agriculture and forestry. (9.3 standards for the waste wat mixing zones where rare spe sufficient mitigation for impagination of the sufficient mitigation of the sufficien	<li>b), develop, biologically meaningfu er effluent, including elimination of scies are present, or provide acts. Implement best management ts from residential areas such as</li>	nd rial e sset t tttle		ropagation techniques and augment popula ns into waterways that are suitable.	ations and

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1 Scientific Name	Common Name	Grouning		Tier CC	OR Habitate	Threat Code	Threat Description		Actions	Working Lands	Notes
A  1 Scientific_Name  5 Fusconaia masoni	Common_Name  Atlantic pigtoe	Grouping  Aquatic Mollusk	Type  Mussel	E   Tier CC	Creeks and Rivers, Large	H Threat_Code	Domestic and Urban Wastewater / Agricultural and Forestry Effluents	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.  Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes		Working Lands	Notes  Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
6 Lemiox rimosus	Birdwing pearlymussel	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	-	spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		Continue propagation and augmentation and reintroduction into waterways that are suitable.
7 Ligumia recta	Black sandshell	Aquatic Mollusk	Mussel	III a	Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of		Continue propagation and augmentation and reintroduction into waterways that are suitable.

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1 Scientific Name	Common Name	Grouning	Tyne	Tier COR	2 Hahitate	Threat Code	Threat Description	·	Actions	Working Lands	Notes
A  1 Scientific_Name  8 Alasmidonta varicosa	B Common_Name	Grouping  Aquatic Mollusk	Type  Mussel	E F Tier COR	Creeks and Rivers, Large	H Threat_Code	Domestic and Urban Wastewater / Agricultural and Forestry Effluents	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Medium- to high-density development for residential use and buildings for related services. Allows very little to no maintenance of ecological functions. E.g., urban areas, suburbs, villages, schools, libraries, seniors' housing, hospitals  / Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental	Implement large-scale management and conservation actions to		Notes  Continue propagation and augmentation and reintroduction into waterways that are suitable.
Alasmidonta varicosa  Elliptio congaraea	Brook floater  Carolina slabshell	Aquatic Mollusk  Aquatic Mollusk	Mussel		Rivers  Creeks and Rivers, Tidal	9.1, 9.3, 1.1.1	Agricultural and Forestry Effluents / Dense Housing and Urban Areas  Changes in salinity / Industrial and	systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Medium- to high-density development for residential use and buildings for related services. Allows very little to no maintenance of ecological functions. E.g., urban areas, suburbs, villages, schools, libraries, seniors' housing, hospitals  / Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be	riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. Focus should be in northern VA, the Shenandoah Valley, and along the mainstem James River where populations of Brook Floater have been historically documented. (1.1.1)  Implement large-scale management and conservation actions to minimize and reverse climate change. (11.2.2), Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement		
10 Hemistena lata	Cracking pearlymussel	Aquatic Mollusk	Mussel	I b	Creeks and Rivers	9.2, 9.3, 9.1		spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of		Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

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1 Scientific Name	Common Namo	Crouning	Tuno	Tior COP	Habitata	Throat Codo	Threat Description	·	Actions	Working Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
11 Strophitus undulatus	Creeper	Aquatic Mollusk	Mussel		Creeks and Rivers, Large	91.93.1.1	Domestic and Urban Wastewater / Agricultural and Forestry Effluents	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss of riparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. (1.1)		Continue propagation and augmentation and reintroduction into waterways that are suitable.
11 Strophitus undulatus	Creeper	Aquatic Mollusk	Mussel	IV a	Rivers	9.1, 9.3, 1.1	/ Housing and Urban Areas	areas, offices, schools, hospitals, and urban parks, among others.	surfaces in order to help maintain the natural hydrograph. (1.1)		waterways that are suitable.
12 Medionidus conradicus	Cumberland moccasinshell	l Aquatic Mollusk	Mussel		Headwater Streams, Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		Continue propagation and augmentation and reintroduction into waterways that are suitable.
13 Theliderma intermedia	Cumberland rockshell	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

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1 Scientific Name	Common Name	Grouping	Type	Tier COR	R Habitats	Threat Code	Threat Description	Threat Long	Actions	Working Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR		Threat_Code	Threat_Description	Threat_Long  Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known	Working_Lands	Notes
14 Epioblasma brevidens	Cumberlandian combshell	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	-	silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		Continue propagation and augmentation and reintroduction into waterways that are suitable.
							Agricultural and Forestry Effluents	Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Fish passage or dam removal to		Develop propagation techniques and augment populations and conduct
15 Truncilla truncata	Deertoe  Dromedary pearlymussel	Aquatic Mollusk  Aquatic Mollusk	Mussel	I b	Creeks and Rivers  Creeks and Rivers	9.2, 9.3, 3.3.1 9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle	è	Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

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1 Scientific_Name	Common_Name	Grouping	Туре		COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
			- Appe					Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery / (9.2) / Anything that is related to or integrated with urban or housing	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss of riparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations		
								structures. Urban areas (cities), suburbs, villages, cottages, shopping	on impervious surfaces and properly handling runoff from these		Develop propagation techniques to augment remaining populations and
17 Prolasmidonta heterodon	Dwarf wedgemussel	Aquatic Mollusk	Mussel	I a	a Creeks and Rivers	9.1, 9.3, 1.1	/ Housing and Urban Areas	areas, offices, schools, hospitals, and urban parks, among others.	surfaces in order to help maintain the natural hydrograph. (1.1)		reintroduce extirpated popualtions in areas which are suitable.
18 Lampsilis radiata	Eastern lampmussel	Aquatic Mollusk	Mussel	IV a	Creeks and Rivers, Large Rivers, Tidal Creeks and Rivers, Large Tidal Rivers	11.2.2, 9.2, 9.1		/Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Implement large-scale management and conservation actions to minimize and reverse climate change. (11.2.2), Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2). develop.		Continue propagation and augmentation and reintroduction into waterways that are suitable.
19 Sagittunio nasutus	Eastern pondmussel	Aquatic Mollusk	Mussel	III a	Creeks and Rivers, Large Rivers, Tidal Creeks and Rivers, Large Tidal Rivers, Lakes, Ponds	11.2.2, 9.2, 9.1		/Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Implement large-scale management and conservation actions to minimize and reverse climate change. (11.2.2), Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and		Continue propagation and augmentation and reintroduction into waterways that are suitable.

A	В	С	D	E	F G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier (	COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
						·		Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known		
									impacts. (9.2), Increase partnerships to implement best		
							Industrial and Military Effluents /		management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for	e 	
									agriculture and forestry. (9.3), Fish passage or dam removal to		Develop propagation techniques and augment populations and conduct
20 Elliptio crassidens	Elephantear	Aquatic Mollusk	Mussel	II I	Creeks and Rivers	9.2, 9.3, 3.3.1	/ Hydroelectric Dams	agriculture and forestry (7.2) or oil spills from machinery (9.2) /	allow for passage of host fishes. (3.3.1)		reintroductions into waterways that are suitable.
21 Alasmidonta marginata	Elktoe	Aquatic Mollusk	Mussel	11 1	o Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
22 Cyprogenia stegaria	Fanshell	Aquatic Mollusk	Mussel		a Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,		è	Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

A	В	С	D	E	F G	Н	L	Р	Ť	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier CC	OR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
1 1											
								Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
								the difficulty in identifying contaminants or contaminant "cocktails" that			
								are responsible for environmental damage, other unknown contaminants	Coordinate with the Virginia Department of Environmental		
								monthidustries witt be tisted with thireat 3.2. This section excludes	Quality and Virginia Energy to develop meaningful biological		
								natural sources of contaminants that are found in the environment (e.g.,	standands for coal and gas extraction, and to develop,		
								mercury found in soils or in river substrates). Intoxication due to natural	meaningful biological standards to improve industrial discharges.		
								sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
								increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
								matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
								silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle		
								transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
								contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful		
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
								non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		Continue to develop propagation techniques and accept a societies and
22 Euroopaia aupoolus	Einerayed pigton	Aguatia Malluck	Museel		Crooks and Bivors	000001		discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
23 Fusconaia cuneolus	Finerayed pigtoe	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	chemicals, etc.	nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.
24 Ptychobranchus subtentus	Fluted kidneyshell	Aquatic Mollusk	Mussel	ІІ а	Creeks and Rivers	9.2, 9.3, 9.1	Industrial and Military Effluents /	natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		Continue propagation and augmentation and reintroduction into waterways that are suitable.
							Industrial and Military Effluents /	Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
25 Lasmigona costata	Flutedshell	Aquatic Mollusk	Mussel	IV b	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	cnemicals, etc.	nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.

A	В	С	D E	G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Type Tier Co	OR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
26 Potamilus fragilis	Fragile papershell	Aquatic Mollusk		Creeks and Rivers	9.2, 9.3, 3.3.1	Industrial and Military Effluents /	Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) /  Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increas	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Fish passage or dam removal to allow for passage of host fishes. (3.3.1)		Develop propagation techniques and conduct reintroductions into waterways that are suitable.
27 Epioblasma aureola	Golden riffleshell	Aquatic Mollusk	Mussel I c	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		
28 Pisidium dubium	Greater Eastern peaclam	Aquatic Mollusk	Clam IV b	Creeks and Rivers, Tidal Creeks and Rivers, Lakes	11.3.3, 9.3.1, 9.3.3	Gradual Temperature Change / Nutrient Loads / Herbicides and Pesticides	e.g., altered sex-ratio in species relying upon a temperature dependent sex determination, reduction of dissolved oxygen that is available to fish species, earlier ice-free dates, thawing of permafrost affecting bird breeding sites. / e.g., manure, compost, chemical fertilizers. / Includes the use of inputs for controlling crop pests. E.g., herbicides, insecticides,			Temperture Change - Most sphaeriids have temperature-dependent reproductive strategies. P. dubium is a hermaphrodite with a temperature-dependent sex determination, maturation, and brood size. This species has one of the largest brood sizes of all sphaeriids, with up to 20 young/brood for 10 mm-long specimens. Species living in shallow water bodies are subject to rapid changes in temperature, dissolved oxygen, droughts and even permanent loss of habitat. Nutrient Loads - A large species for Pisidium, up to 10 mm long. Species is a filter feeder of suspended single-celled algae, and deposit feeder, feeding on fine organic detritus. Accumulations of total suspended solids due to excess [P], [N], [C] could clog gills and pedal feeding processes, and buildup of toxic sediment gases. Pesticides, herbicides - these are toxic, especially if they have long half lives in sediments, particularly in habitats with fine sand and shallow water adjacent to agricultural lands with either overland runoff or effluents from drainage tiles, which hightens the risk of habitat loss and population declines or eliminations. Probably less tolerant of pollution because it is a species of cleaner, clear waters.  This is a large Pisidium spp (up to 10 mm long). Has an apparent preference for large, muddy creeks, but also common in fine sand in shallow water (< 5 m) in bays of large rivers and lakes. Has been recorded from 10 m depths. Most common in mesotrophic waters (total chlorophyll = ~3-7 μg/L, total P = ~10-30 μg/L, total N = ~300-600 μg/L, Secch depth = ~2.5-4 m).

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1 Scientific_Name	Common_Name	Grouping	Туре		COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Type	Tier	COR Habitats	Threat_Code		Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss or iparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules	of	Notes
					One also and Bissens I and			/ (9.2) / Anything that is related to or integrated with urban or housing	must be put in place along all waterways, as well as limitations		
29 Platynaias subviridis	Green floater	Aquatic Mollusk	Mussel	ı	Creeks and Rivers, Large a Rivers	9.1, 9.3, 1.1	Agricultural and Forestry Effluents  / Housing and Urban Areas	structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. (1.1)		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
30 Parvaspina collina	James spinymussel	Aquatic Mollusk	Mussel	1	Creeks and Rivers, Large a rivers	9.1, 9.3, 1.1		Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss or iparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. (1.1)	of o	Continue propagation and augmentation and reintroduction into waterways that are suitable.
31 Pegias fabula	Littlewing pearlymussel	Aquatic Mollusk	Mussel		Heawater Streams, Creeks c and Rivers	11.3, 9.3, 9.1	Agricultural and Forestry Effluents	Periods in which temperatures of the air, water or soil either exceed or fall below the normal range of variation. Events that may or may not be related to climate change. /Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from / machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Promote land use practices that ensure suitable riparian buffers minimize impervious surfaces and maintain natural groundwate inputs. (11.3), Increase partnerships to implement best management practices such as alternate water sources for cattl and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)	r e	

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1 Cojentific Name	Common Nama	Crouning		Tior COP	Habitata	Throat Code	Throat Description		Actions	Working Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
								Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants			
32 Fusconaia subrotunda	Longsolid	Aquatic Mollusk	Mussel	II b	Creeks and Rivers	9.2, 9.3, 9.1		mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
33 Venustaconcha constr		Aquatic Mollusk	Mussel	III a	Creeks and Rivers, Large	9.1, 9.3, 1.1	Domestic and Urban Wastewater / Agricultural and Forestry Effluents	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss or riparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. (1.1)	f	Continue propagation and augmentation and reintroduction into waterways that are suitable.
34 Pleurobema cordatum	Ohio pigtoe	Aquatic Mollusk	Mussel	II c	Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of		Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

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1 Scientific_Name	Common_Name	Grouping		COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
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1 1										
1 1							Wastewater (pollutants) from industrial and military sectors, including			
1 1							mines, energy production sectors and other resource extraction			
							industries. These effluents may result from deliberate or accidental			
							spills that are legal or illegal and (may) contain various nutrients,			
1 1							sediments, toxic substances and chemicals. Among others. Considering			
							the difficulty in identifying contaminants or contaminant "cocktails" that			
							are responsible for environmental damage, other unknown contaminants			
							from industries will be listed with Threat 9.2. This section excludes	Coordinate with the Virginia Department of Environmental		
							natural sources of contaminants that are found in the environment (e.g.,	Quality and Virginia Energy to develop meaningful biological		
								standands for coal and gas extraction, and to develop,		
							mercury found in soils or in river substrates). Intoxication due to natural	meaningful biological standards to improve industrial discharges		
							sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
							increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
							matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
							silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle	e	
							transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
1.1							contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful		
1.1							erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
							agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
1.1						Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		
							discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue propagation and augmentation and reintroduction into
35 Epioblasma capsaeformis	Ovster mussel	Aquatic Mollusk	Mussel	a Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		waterways that are suitable.
99 1	.,				,,			,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
							Wastawater (pollutants) from industrial and military costars, including			
							Wastewater (pollutants) from industrial and military sectors, including			
							mines, energy production sectors and other resource extraction			
							industries. These effluents may result from deliberate or accidental			
							spills that are legal or illegal and (may) contain various nutrients,			
							sediments, toxic substances and chemicals. Among others. Considering			
							the difficulty in identifying contaminants or contaminant "cocktails" that			
							are responsible for environmental damage, other unknown contaminants			
							from industries will be listed with Threat 9.2. This section excludes			
							natural sources of contaminants that are found in the environment (e.g.,			
							mercury found in soils or in river substrates). Intoxication due to natural	Coordinate with the Virginia Department of Environmental		
							sources of these contaminants are likely to result from an indirect threat	Quality and Virginia Energy to develop meaningful biological		
							increasing exposure and to which conservation actions can be	standands for coal and gas extraction, and to develop,		
							matched. / Wastewater (pollutants) that is generated by agricultural,	meaningful biological standards to improve industrial discharges		
							silvicultural and aquacultural activities. These discharges are	Mixing zones need to be eliminated in areas where rare species		
								occur, or sufficient mitigation implemented to offset known		
							transported primarily in drainage systems, runoff and eroded; they (may)	impacts. (9.2), Increase partnerships to implement best		
							contain various nutrients, toxic substances, chemicals, etc. Excludes	management practices such as alternate water sources for cattle	2	
							erosion and sedimentation that is associated with drainage systems in	and protecting/establishing vegetated stream buffers for		
							agriculture and forestry (7.2) or oil spills from machinery (9.2) /	agriculture and forestry. (9.3),Improved cleaning and sterilization	n	
						Agricultural and Forestry Effluents	Diseases caused by various taxa of pathogenic micro-organisms living	of aquatic gear and prohibiting discharge of foreign waters to		Continue propagation and augmentation and reintroduction into
36 Lampsilis pectorosa	Pheasantshell	Aquatic Mollusk	Mussel III	a Creeks and Rivers	9.2, 9.3, 8.4	/ Pathogens	within hosts.	minimize introduction and spread of pathogens. (8.4)		waterways that are suitable.
1.1										
							Wastewater (pollutants) from industrial and military sectors, including			
1.1							mines, energy production sectors and other resource extraction			
1.1							industries. These effluents may result from deliberate or accidental			
							spills that are legal or illegal and (may) contain various nutrients,			
							sediments, toxic substances and chemicals. Among others. Considering			
1.1							the difficulty in identifying contaminants or contaminant "cocktails" that			
1.1							are responsible for environmental damage, other unknown contaminants			
1.1							from industries will be listed with Threat 9.2. This section excludes	Coordinate with the Virginia Department of Environmental		
							natural sources of contaminants that are found in the environment (e.g.,	Quality and Virginia Energy to develop meaningful biological		
								standands for coal and gas extraction, and to develop,		
1.1							mercury found in soils or in river substrates). Intoxication due to natural	meaningful highgical standards to improve industrial discharges		
1.1							sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
							increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
							matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
1.1							silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle	e	
1.1							transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
							contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful		
							erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
1.1							agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
1 1						Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		
1 1							discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
37 Pustulosa pustulosa	Pimpleback	Aquatic Mollusk	Mussel	b Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.
57 . astatosa pastatosa	propaon	, iquatio i iottuak	, russet III	2 0.0000 unu myolo	٥.٤, ٥.٥, ٥.١	. Someone and Orban Wastewater			1	15

Λ	R	С	I	D I E	F	G	н	1	Р			T	T U		V
1 Scientific_Name	Common_Name	Grouping	Туре		r COR I		Threat_Code	Threat_Description	Threat_Long		Actions		Working_Lands	Notes	v
T SCIERUIL_NAME	Common_warme	Отопринд	Туре	ilet	COR	raundis	IIIIeat_coue	Timeat_Description	Wastewater (pollutants) from industrial ar mines, energy production sectors and oth industries. These effluents may result fron spills that are legal or illegal and (may) cor sediments, toxic substances and chemica the difficulty in identifying contaminants o are responsible for environmental damage	nd military sectors, including er resource extraction m deliberate or accidental ntain various nutrients, als. Among others. Considering or contaminant "cocktails" that e, other unknown contaminants			WORKING_LARIUS	NOTES	
38 Potamilus alatus	Pink heelsplitter	Aquatic Mollusk	Mussel	111	ь	Creeks and Rivers	9.2, 9.3, 3.3.1		from industries will be listed with Threat 9. natural sources of contaminants that are mercury found in soils or in river substrate sources of these contaminants are likely to increasing exposure and to which conserve matched. / Wastewater (pollutants) that is silvicultural and aquacultural activities. The transported primarily in drainage systems, contain various nutrients, toxic substance erosion and sedimentation that is associal agriculture and forestry (7.2) or oil spills from the substance and the substance and forestry (7.2) or oil spills from the substance and forestry (7.2)	found in the environment (e.g., es). Intoxication due to natural or result from an indirect threat ration actions can be is generated by agricultural, hase discharges are, runoff and eroded; they (may) es, chemicals, etc. Excludes ited with drainage systems in	Quality and Virginia Energy t standands for coal and gas e meaningful biological standa Mixing zones need to be elin occur, or sufficient mitigatio impacts. (9.2), Increase parti management practices such and protecting/establishing	rds to improve industrial discharge ninated in areas where rare species n implemented to offset known nerships to implement best as alternate water sources for catt regetated stream buffers for not passage or dam removal to	s	Develop propagation technique reintroductions into waterways	s and augment populations and conduct that are suitable.
39 Lampsilis abrupta	Pink mucket	Aquatic Mollusk	Mussel	1	a	Creeks and Rivers	9.2, 9.3, 9.1		Wastewater (pollutants) from industrial armines, energy production sectors and othe industries. These effluents may result fron spills that are legal or illegal and (may) cor sediments, toxic substances and chemica the difficulty in identifying contaminants o are responsible for environmental damage from industries will be listed with Threat 9. natural sources of contaminants that are f mercury found in soils or in river substrate sources of these contaminants are likely to increasing exposure and to which conservantched. / Wastewater (pollutants) that is silvicultural and aquacultural activities. The transported primarily in drainage systems, contain various nutrients, toxic substance erosion and sedimentation that is associated agriculture and forestry (7.2) or oil spills fron-point source wastewater from resider discharges (may) contain nutrients, sedim chemicals, etc.	er resource extraction in deliberate or accidental intain various nutrients, als. Among others. Considering or contaminant "cocktails" that e, other unknown contaminants i.2. This section excludes found in the environment (e.g., es). Intoxication due to natural io result from an indirect threat ration actions can be is generated by agricultural, hese discharges are , runoff and eroded; they (may) is, chemicals, etc. Excludes ted with drainage systems in from machinery (9.2) / Point or intial and urban areas; these	Quality and Virginia Energy t standands for coal and gas e meaningful biological standa Mixing zones need to be elin occur, or sufficient mitigatio impacts. (9.2), Increase parti management practices such and protecting/establishing agriculture and forestry. (9.3 standards for the waste wat mixing zones where rare spe sufficient mitigation for impa	rds to improve industrial discharge ninated in areas where rare species in implemented to offset known nerships to implement best as alternate water sources for catt vegetated stream buffers for ), develop, biologically meaningful er effluent, including elimination of cies are present, or provide locts. Implement best management is from residential areas such as	s tle	Continue propagation and reint	roduction into waterways that are suitable
40 Quadrula verrucosa	Pistolgrip	Aquatic Mollusk	Mussel	П	b	Creeks and Rivers	9.1, 9.3, 3.3.1		Point or non-point source wastewater fron these discharges (may) contain nutrients, chemicals, etc. / Wastewater (pollutants) agricultural, silvicultural and aquacultural are transported primarily in drainage syste (may) contain various nutrients, toxic subsectudes erosion and sedimentation that is systems in agriculture and forestry (7.2) or (9.2)	n residential and urban areas; sediments, toxic substances, ) that is generated by I activities. These discharges ems, runoff and eroded; they stances, chemicals, etc. is associated with drainage r oil spills from machinery	effluent, including elimination species are present, or provious implement best management from residential areas such a (9.1), Increase partnerships in practices such as alternate when the protecting establishing vege	tated stream buffers for agricultur age or dam removal to allow for	s.	Continue to develop propagation	n techniques and augment populations an terways that are suitable.

A	Тв	С	D	E	F G	Н	Τι	Р	Т	l u	V
1 Scientific_Name	Common_Name	Grouping	Туре		OR Habitats	Threat_Code	Threat_Description		Actions	Working_Lands	Notes
- Colemano_realine	Common_rume	отопринд	Турс	nici o	on musicuts	micuc_oouc	meat_besonption	THICK_LONG	Actions	Working_curius	Notes
								Mastauratay (nallutanta) from industrial and military agetars including			
								Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
								the difficulty in identifying contaminants or contaminant "cocktails" that			
								are responsible for environmental damage, other unknown contaminants			
									Coordinate with the Virginia Department of Environmental		
								natural sources of contaminants that are found in the environment (e.g.,	Quality and Virginia Energy to develop meaningful biological		
								mercury found in soils or in river substrates). Intoxication due to natural	standands for coal and gas extraction, and to develop,		
									meaningful biological standards to improve industrial discharges.		
								sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
								increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
								matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
								silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle		
								transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
								contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful		
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		
					Creeks and Rivers, Large		-	discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue propagation and augmentation and reintroduction into
41 Lampsilis ovata	Pocketbook	Aquatic Mollusk	Mussel	IV a		9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		waterways that are suitable.
41 Lampsius ovata	FOCKELDOOK	Aquatic Piottusk	Musset	IV a	Nivers	9.2, 9.3, 9.1	7 Domestic and Orban Wastewater	chemicals, etc.	nutrient and pesticide runon. (5.1)		water ways triat are suitable.
42 Toxolasma lividum	Purple liliput	Aquatic Mollusk	Mussel	II b	Creeks and Rivers, Lakes, Ponds	9.2, 9.3, 9.1	Industrial and Military Effluents /	natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of		
43 Theliderma cylindrica	Rabbitsfoot	Aquatic Mollusk	Mussel		Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standards for coal and gas extraction, and to develop,		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
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1 Scientific Name	Common Name	Grouning	Tyne	Tier COR	Hahitate	Threat Code	Threat Description	·	Actions	Working Lands	Notes
1 Scientific_Ivame	Common_wante	Grouping	Туре	ilei Cok	riabitats	Tilleat_Code	Illieat_Description	IIIIeat_Long	Actions	WOIKING_Lanus	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	·	natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standards for coal and gas extraction, and to develop,	Working Lands	Notes
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		Believed to be extirpated from VA. Must work with other states to obtain
							Agricultural and Forestry Effluents	discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		adults to translocate into VA, or to obtain broodstcok from which to
44 Paetulunio fabalis	Rayed bean	Aquatic Mollusk	Mussel	l b	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	chemicals, etc.	nutrient and pesticide runoff. (9.1)		propagate juveniles.
45 Elliptio roanokensis	Roanoke slabshell	Aquatic Mollusk	Mussel		Creeks and Rivers, Tidal Creeks and Rivers	9.1, 9.3, 1.1	Domestic and Urban Wastewater / Agricultural and Forestry Effluents	Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss of riparian buffers and increased impervious surfaces, which lead to loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from these surfaces in order to help maintain the natural hydrograph. (1.1)		Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
46 Pleurobema plenum	Rough pigtoe	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1		natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges. Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

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1 Scientific_Name	Common_Name	Grouping	Туре	Tier CC	OR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
							·	-			
								Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
								the difficulty in identifying contaminants or contaminant "cocktails" that			
								are responsible for environmental damage, other unknown contaminants			
								inom madatics with be tisted with finedt 6.2. fins section excitates	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological		
								natural sources of contaminants that are found in the environment (e.g.,	standands for coal and gas extraction, and to develop,		
								mercury found in soils or in river substrates). Intoxication due to natural	meaningful biological standards to improve industrial discharges.		
								sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
								increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
								matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
								silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle		
								transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
								contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful		
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
							Industrial and Military Effluents /	agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
								non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	sufficient mitigation for impacts. Implement best management		Continue to develop propagation techniques and augment populations and
47 Plethobasus cyphyus	Sheepnose	Aquatic Mollusk	Mussel		Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
47 I tetriobasus cypriyus	опсернозе	Aquatic Flottusk	riusset	II a	Orecks and rivers	9.2, 9.3, 9.1	7 Domestic and Orban Wastewater	Chemicals, etc.	nutrient and pesticide runon. (5.1)		conduct reintroductions into waterways that are suitable.
								Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
								the difficulty in identifying contaminants or contaminant "cocktails" that			
								are responsible for environmental damage, other unknown contaminants			
									Coordinate with the Virginia Department of Environmental		
								natural sources of contaminants that are found in the environment (e.g.,	Quality and Virginia Energy to develop meaningful biological		
								mercury found in soils or in river substrates). Intoxication due to natural	standands for coal and gas extraction, and to develop,		
								sources of these contaminants are likely to result from an indirect threat	meaningful biological standards to improve industrial discharges.		
								increasing exposure and to which conservation actions can be	Mixing zones need to be eliminated in areas where rare species		
								matched. / Wastewater (pollutants) that is generated by agricultural,	occur, or sufficient mitigation implemented to offset known		
								silvicultural and aquacultural activities. These discharges are	impacts. (9.2), Increase partnerships to implement best		
								transported primarily in drainage systems, runoff and eroded; they (may)	management practices such as alternate water sources for cattle		
								contain various nutrients, toxic substances, chemicals, etc. Excludes	and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3), develop, biologically meaningful		
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
								non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		
								discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
48 Fusconaia cor	Shiny pigtoe	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.
											·
								Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop,		
					Headwater Streams, Creeks			non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances,	sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
49 Pleuronaia dolabelloides	Slabside nearlymussel	Aquatic Mollusk	Mussel	ء ا		9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
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1 Scientific_Name	Common_Name	Grouping	Type Tie	er COR	Habitats 1	hreat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
- Colemano_Hame	Common_rume	Orouping	Турс	0011	Hubituts	illicut_oouc	Timeat_Description	Till Cut_Long	rectoris	Working_Lunus	110tcs
								Pariods in which temporatures of the air, water or sail aither avoid or			
								Periods in which temperatures of the air, water or soil either exceed or	Promote land use practices that ensure suitable riparian buffers,		
								fall below the normal range of variation. Events that may or may not be	minimize impervious surfaces and maintain natural groundwater		
								related to climate change. / Wastewater (pollutants) that is generated	inputs. (11.3), Increase partnerships to implement best		
								by agricultural, silvicultural and aquacultural activities. These	management practices such as alternate water sources for cattle		
								discharges are transported primarily in drainage systems, runoff and	and protecting/establishing vegetated stream buffers for		
								eroded; they (may) contain various nutrients, toxic substances,	agriculture and forestry. (9.3), develop, biologically meaningful		
								chemicals, etc. Excludes erosion and sedimentation that is associated	standards for the waste water effluent, including elimination of		
								with drainage systems in agriculture and forestry (7.2) or oil spills from	mixing zones where rare species are present, or provide		
									sufficient mitigation for impacts. Implement best management		
					Headwater Streams, Creeks				, ,		Continue to develop assessment on took since and accompany and allowed
			.						practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and
50 Pressodonta viridis	Slippershell mussel	Aquatic Mollusk	Mussel I	b	and Rivers	11.3, 9.3, 9.1	/ Domestic and Urban Wastewater	toxic substances, chemicals, etc.	nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.
								Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
1.1								industries. These effluents may result from deliberate or accidental			
1.1								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
1 1								the difficulty in identifying contaminants or contaminant "cocktails" that			
1.1								are responsible for environmental damage, other unknown contaminants			
									Coordinate with the Virginia Department of Environmental		
									Quality and Virginia Energy to develop meaningful biological		
1.1								natural sources of contaminants that are round in the environment (e.g.,	standands for coal and gas extraction, and to develop,		
								mercury found in soils or in river substrates). Intoxication due to natural	meaningful biological standards to improve industrial discharges.		
								sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species		
								increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known		
								matched. / Wastewater (pollutants) that is generated by agricultural,			
								silvicultural and aquacultural activities. These discharges are	impacts. (9.2), Increase partnerships to implement best		
								transported primarily in drainage systems, rupoff and graded; they (may)	management practices such as alternate water sources for cattle		
								contain various nutrients, toxic substances, chemicals, etc. Excludes	and protecting/establishing vegetated stream buffers for		
									agriculture and forestry. (9.3), develop, biologically meaningful		
									standards for the waste water effluent, including elimination of		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide		
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management		
							Agricultural and Forestry Effluents	discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue propagation and augmentation and reintroduction into
51 Epioblasma triquetra	Snuffbox	Aquatic Mollusk	Mussel	a	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	chemicals, etc.	nutrient and pesticide runoff. (9.1)		waterways that are suitable.
								/ Wastewater (pollutants) that is generated by agricultural, silvicultural			
								and aguacultural activities. These discharges are transported primarily			
								in drainage quetome runoff and are ded, they (may) contain various	Fish passage or dam removal to allow for passage of host fishes.		
								and the second s	(3.3.1), Increase partnerships to implement best management		
									practices such as alternate water sources for cattle and		
								sedimentation that is associated with drainage systems in agriculture	protecting/establishing vegetated stream buffers for agriculture		
							and Forestry Effluents / Increase in	and forestry (7.2) or oil spills from machinery (9.2) / Increase in the	and forestry. (9.3), Reduce carbon emissions to help mitigate		
							Fluctuations in the Precipitation	fluctuations that are related to the precipitation regime, which have	climate change that leads to rainfall regime alterations, which		
52 Cumberlandia monodonta	Spectaclecase	Aquatic Mollusk	Mussel	b	Creeks and Rivers	3.3.1, 9.3, 11.4.4	Regime	impacts on the hydrology of natural habitats.	leads to hydrological/flow regime changes. (11.4.4)		Develop propagation techniques
		·									
1 1											
1.1											
1 1								Wastewater (pollutants) from industrial and military sectors, including			
1 1								mines, energy production sectors and other resource extraction			
1 1								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
1 1											
1 1								the difficulty in identifying contaminants or contaminant "cocktails" that			
1 1								are responsible for environmental damage, other unknown contaminants			
1 1								non made no ma be noted man impart of the coolien executes	Coordinate with the Virginia Department of Environmental		
								natural sources or contaminants that are round in the chimolinicht (c.g.,	Quality and Virginia Energy to develop meaningful biological		
								mercury found in soils or in river substrates). Intoxication due to natural	standards for coal and gas extraction, and to develop,		
								sources of these contaminants are likely to result from an indirect threat	meaningful biological standards to improve industrial discharges.		
								increasing exposure and to which conservation actions can be	Mixing zones need to be eliminated in areas where rare species		
1 1									occur, or sufficient mitigation implemented to offset known		
1.1								matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best		
1 1								silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle		
1.1								transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for		
1.1									agriculture and forestry. (9.3), develop, biologically meaningful		
1 1								I amount a more and a constitution and a state of the constitution	standards for the waste water effluent, including elimination of		
									mixing zones where rare species are present, or provide		
									sufficient mitigation for impacts. Implement best management		
	Tennessee hean (nurnle										Continue propagation and augmentation and rointroduction into
F3 Vanustagenaha traha!!-	Tennessee bean (purple	Aguatia Mallusk	Mussal	_	Crooks and Divers	2222			practices to minimize impacts from residential areas such as		Continue propagation and augmentation and reintroduction into
53 Venustaconcha trabalis	bean)	Aquatic Mollusk	musset	a	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	uncinicais, etc.	nutrient and pesticide runoff. (9.1)		waterways that are suitable.

Α	В	С	D	E F G	Н	L	Р	Т	U	V
Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats T	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
							Wastewater (pollutants) from industrial and military sectors, including			
							mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants			
							natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known impacts. (9.2), Increase partnerships to implement best		
						Industrial and Military Effluents /	agriculture and forestry (7.2) or oil spills from machinery (9.2) $$ / Point or non-point source wastewater from residential and urban areas; these	management practices such as alternate water sources for sattle	e	
4 Pleurobema oviforme	Tennessee clubshell	Aquatic Mollusk	Mussel	Headwater Streams, Creeks II b and Rivers 9	9.2, 9.3, 9.1	Agricultural and Forestry Effluents  / Domestic and Urban Wastewater		practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
5 Alasminota holstonia	Tennessee heelsplitter	Aquatic Mollusk	Mussel	Headwater Streams, Creeks  II b and Rivers 1	11.3, 9.3.2, 9.1	Changes in Temperature Regimes / Soil Erosion, Sedimentation /	Periods in which temperatures of the air, water or soil either exceed or fall below the normal range of variation. Events that may or may not be related to climate change. / Erosion and sedimentation that are due to agricultural or silvicultural activities, regardless of the presence of local drainage systems (threat 7.2.4 and 7.2.5). / Point or non-point source	Promote land use practices that ensure suitable riparian buffers, minimize impervious surfaces and maintain natural groundwate inputs. (11.3), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3.2), develop, biologically meaningfu standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1)	r ==	Continue propagation and augmentation and reintroduction into waterways that are suitable.
							natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction, and to develop, meaningful biological standards to improve industrial discharges		
							increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	agriculture and forestry. (9.3), develop, biologically meaningful standards for the waste water effluent, including elimination of		
				Headwater Streams, Creeks		Agricultural and Forestry Effluents	discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as		Continue to develop propagation techniques and augment populations and

A	В	С	D	E F	G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
								Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,			
								sediments, toxic substances and chemicals. Among others. Considering			
								the difficulty in identifying contaminants or contaminant "cocktails" that			
								are responsible for environmental damage, other unknown contaminants			
									Coordinate with the Virginia Department of Environmental		
									Quality and Virginia Energy to develop meaningful biological		
								mercury found in soils or in river substrates). Intoxication due to natural	standands for coal and gas extraction, and to develop,		
								sources of these contaminants are likely to result from an indirect threat	meaningful biological standards to improve industrial discharge	es.	
								increasing exposure and to which conservation actions can be	Mixing zones need to be eliminated in areas where rare specie	S	
								matched. / Wastewater (pollutants) that is generated by agricultural,	occur, or sufficient mitigation implemented to offset known		
								silvicultural and aquacultural activities. These discharges are	impacts. (9.2), Increase partnerships to implement best		
								transported primarily in drainage systems, runoff and eroded; they (may)	management practices such as alternate water sources for cat	tle	
								contain various nutrients, toxic substances, chemicals, etc. Excludes	and protecting/establishing vegetated stream bullers for	.	
									agriculture and forestry. (9.3), develop, biologically meaningfu		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	standards for the waste water effluent, including elimination of	T	
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these			
									sufficient mitigation for impacts. Implement best management practices to minimize impacts from residential areas such as	4	Continue to develop propagation techniques and augment populations and
57 Amblema plicata	Threeridge	Aquatic Mollusk	Mussel	III b	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		conduct reintroductions into waterways that are suitable.
37 Ambiema pileata	micenage	Aquatic Flottusk	Plusset	III D	CICCKS and Tivers	9.2, 9.3, 9.1	7 Domestic and Orban Wastewater	chemicals, etc.	nutrient and pesticide runon. (3.1)		conduct reintroductions into waterways that are suitable.
								/ Wastewater (pollutants) from industrial and military sectors, including			
								mines, energy production sectors and other resource extraction			
								industries. These effluents may result from deliberate or accidental			
								spills that are legal or illegal and (may) contain various nutrients,	Implement large-scale management and conservation actions	to	
								sediments, toxic substances and chemicals. Among others. Considering	minimize and reverse climate change. (11.2.2), Coordinate wit	:h	
								the difficulty in identifying contaminants or contaminant "cocktails" that	the Virginia Department of Environmental Quality and Virginia		
								are responsible for environmental damage, other unknown contaminants	Energy to develop meaningful biological standands for coal and	t	
								from industries will be listed with Threat 9.2. This section excludes	gas extraction, and to develop, meaningful biological standard	S	
								natural sources of contaminants that are found in the environment (e.g.,	to improve industrial discharges. Mixing zones need to be		
								mercury found in soils or in river substrates). Intoxication due to natural	eliminated in areas where rare species occur, or sufficient		
									mitigation implemented to offset known impacts. (9.2), develo	p,	
								sources of these contaminants are likely to result from an indirect threat		,	
					Crooks and Divora Large		Changes in calinity / Industrial and	increasing exposure and to which conservation actions can be matched. / Point or non-point source wastewater from residential and	including elimination of mixing zones where rare species are		
					Creeks and Rivers, Large Rivers, Tidal Creeks and			•	present, or provide sufficient mitigation for impacts. Implemen		
EQ Atlanticonoha cohrace	ea Tidewater mucket	Aquatic Mollusk	Mussel		Rivers, Large Tidal Rivers	11.2.2, 9.2, 9.1	Urban Wastewater	urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	areas such as nutrient and pesticide runoff. (9.1)	.ldl	Continue propagation and augmentation and reintroduction into
58 Atlanticoncha ochrace	ed Huewater Hucket	Aquatic Mottusk	Musset	III d	nivers, Large Huat nivers	11.2.2, 9.2, 9.1	Oldali wastewatei	substances, chemicats, etc.	areas such as nutrient and pesticide runon. (9.1)		waterways that are suitable.
									Develop, biologically meaningful standards for the waste wate	r	
									effluent, including elimination of mixing zones where rare		
									species are present, or provide sufficient mitigation for impact	s.	
									Implement best management practices to minimize impacts		
									from residential areas such as nutrient and pesticide runoff.		
								Point or non-point source wastewater from residential and urban areas;	(9.1), Increase partnerships to implement best management		
									practices such as alternate water sources for cattle and		
								these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by	protecting/establishing vegetated stream buffers for agriculture	re	
									and forestry. (9.3), Work with localities and regulatory agencie	s	
								agricultural, silvicultural and aquacultural activities. These discharges	to develop, biologically meaningful standards for impacts		
								are transported primarily in drainage systems, runoff and eroded; they	associated with urban and suburban development such as loss		
								(may) contain various nutrients, toxic substances, chemicals, etc.	riparian buffers and increased impervious surfaces, which lead	to	
								Excludes erosion and sedimentation that is associated with drainage	loss of instream habitat due to factors such as runoff and		
								systems in agriculture and forestry (7.2) or oil spills from machinery	hydrological changes. Biologically-relevant riparian buffer rules		
I					Headwater Streams, Creek			(9.2) / Anything that is related to or integrated with urban or housing	must be put in place along all waterways, as well as limitations		
			1		Land Divore Tidal Haadwate	or I	Agricultural and Forgetry Effluents	structures. Urban areas (cities), suburbs, villages, cottages, shopping	on impervious surfaces and properly handling runoff from thes	0	Continue propagation and augmentation and reintroduction into
59 Alasmidonta undulata	a Triangle floater	Aquatic Mollusk	Mussel		and Rivers, Tidal Headwate Streams	9.1, 9.3, 1.1	/ Housing and Urban Areas	areas, offices, schools, hospitals, and urban parks, among others.	surfaces in order to help maintain the natural hydrograph. (1.1		Continue propagation and augmentation and reintroduction into waterways that are suitable.

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1 Scientific Name	Common Name	Grouping	Туре			Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	V
- Colemand Traine	oominon_tvante	отопринд	Турс		On madical	Timedi_Gode	meat_sessipaen	med_cong		Working Lunus	Notes	
60 Euglesa walkeri	Walker peaclam	Aquatic Mollusk	Clam	IV b	Creeks and Rivers, Lakes	11.3.3, 9.3.1, 9.3.3	Gradual Temperature Change / Nutrient Loads / Herbicides and Pesticides	e.g., altered sex-ratio in species relying upon a temperature dependent sex determination, reduction of dissolved oxygen that is available to fish species, earlier ice-free dates, thawing of permafrost affecting bird breeding sites. / e.g., manure, compost, chemical fertilizers. / Includes the use of inputs for controlling crop pests. E.g., herbicides, insecticides, fungicides.		es, ne	reproductive strategy, is a her growth, maturation, and brood are subject to rapid changes in and even permanent loss of heare less at risk than population Averages 4 mm long. Accumul [P], [N], [C] could clog gills and toxic sediment gases. Pesticid they have long half lives in sed adjacent to agricultural lands of drainage tiles hightens the risk eliminations.  principally in slow-moving cree lakes or ponds, creeks/rivers.	eri has a temperature-dependent maphrodite with a temperature-dependent d size. It prefers small bodies of water, which a temperature, dissolved oxygen, droughts abitat. Populations in large lakes and rivers as in small water bodies. <b>Nutrient Loads</b> - ations of total suspended solids due to excess pedal feeding processes, and buildup of es, <b>herbicides</b> - these are toxic, especially if iments. Living in small bodies of water with either overland runoff or effluents from to fhabitat losses and population declines or Found eks and rivers with a soft bottom, or small Occassionally in large lakes and rivers. Most ris (total chlorophyll = ~3-7 µg/L, total P = ~10-/L, Secch depth = ~2.5-4 m).
61 Lampsilis cariosa	Yellow lampmussel	Aquatic Mollusk	Mussel	II a	Creeks and Rivers, Large Rivers, Tial Creeks and Rivers, Large Tidal Rivers	9.1, 9.3, 1.1		Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agricultur and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss riparian buffers and increased impervious surfaces, which lead loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from thes surfaces in order to help maintain the natural hydrograph. (1.1	e s of to	Continue propagation and aug waterways that are suitable.	mentation and reintroduction into
62 Elliptio lanceolata	Yellowlance	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.1, 9.3, 1.1		Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Anything that is related to or integrated with urban or housing structures. Urban areas (cities), suburbs, villages, cottages, shopping areas, offices, schools, hospitals, and urban parks, among others.	Develop, biologically meaningful standards for the waste water effluent, including elimination of mixing zones where rare species are present, or provide sufficient mitigation for impacts Implement best management practices to minimize impacts from residential areas such as nutrient and pesticide runoff. (9.1), Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agricultur and forestry. (9.3), Work with localities and regulatory agencies to develop, biologically meaningful standards for impacts associated with urban and suburban development such as loss riparian buffers and increased impervious surfaces, which lead loss of instream habitat due to factors such as runoff and hydrological changes. Biologically-relevant riparian buffer rules must be put in place along all waterways, as well as limitations on impervious surfaces and properly handling runoff from thes surfaces in order to help maintain the natural hydrograph. (1.1)	s.  e s  of to	Develop propagation techniqu reintroductions into waterway	es and augment populations and conduct s that are suitable.

A	В	С	D	E F	G	Н	L	P	Т	U	V	
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Ha	bitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	
								Wastewater (pollutants) from industrial and military sectors, including				
								mines, energy production sectors and other resource extraction				
								industries. These effluents may result from deliberate or accidental				
								spills that are legal or illegal and (may) contain various nutrients,				
								sediments, toxic substances and chemicals. Among others. Considering				
								the difficulty in identifying contaminants or contaminant "cocktails" that				
								are responsible for environmental damage, other unknown contaminants	Coordinate with the Virginia Department of Environmental			
1 1								from industries will be listed with Threat 9.2. This section excludes	Quality and Virginia Energy to develop meaningful biological			
								natural sources of contaminants that are found in the environment (e.g.,	standands for coal and gas extraction, and to develop,			
								mercury found in soils or in river substrates). Intoxication due to natural	meaningful biological standards to improve industrial discharges.			
								sources of these contaminants are likely to result from an indirect threat	Mixing zones need to be eliminated in areas where rare species			
								increasing exposure and to which conservation actions can be	occur, or sufficient mitigation implemented to offset known			
								matched. / Wastewater (pollutants) that is generated by agricultural,	impacts. (9.2), Increase partnerships to implement best			
								silvicultural and aquacultural activities. These discharges are	management practices such as alternate water sources for cattle			
1 1								transported primarily in drainage systems, runoff and eroded; they (may)	and protecting/establishing vegetated stream buffers for			
								contain various nutrients, toxic substances, chemicals, etc. Excludes	agriculture and forestry. (9.3), develop, biologically meaningful			
								erosion and sedimentation that is associated with drainage systems in	standards for the waste water effluent, including elimination of			
1 1								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	mixing zones where rare species are present, or provide			
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	sufficient mitigation for impacts. Implement best management			
1 1							,	discharges (may) contain nutrients, sediments, toxic substances,	practices to minimize impacts from residential areas such as			
63 Pleurobema sintoxia	Round Pigtoe	Aquatic Mollusk	Mussel	I a Cre	eeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)			