А	В	С	D	E F G	Н	I 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 CO2 emissions to approximately 50% attain 100% carbon pollution-fronet-zero emissions economy by shading and aquatic plants of sn percentage of the benefits from and clean energy to conservatio (11.3.3), Increase partnerships and stakeholders to eliminate loenrichment), and chemical ferilienrichment causes low [O2], hig gas contents, toxic to P. adamsi. with end users to eliminate or seffluents. Populations in small la	s below 2005 levels by 2030; ee electricity by 2035; achieve a 2050. Increase riparian buffer a left and the second secon	es,	Temperture Change - reproductive strategie dependent sex determ prefers small bodies of temperature, dissolved habitat. Nutrient Load Species is a filter feede feeder, feeding on fine total suspended loads well as buildup of toxic toxic, especially if they bodies of water adjace effluents from drainag population declines or A predilection for orga lakes, pools or eddies, m depth. Most commo	nic, muddy substrates of quiet bodies of water rivers, creeks). Also lives in larger lakes down i n in mesotrophic waters (total chlorophyll = ~3
						Nutrient Loads / Herbicides and	the use of inputs for controlling crop pests. E.g., herbicides, insecticides fungicides.				· ·	
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 decludes 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.	Implement large-scale manager minimize and reverse climate ch biologically meaningful standard including elimination of mixing a present, or provide sufficient mibest management practices to rareas such as nutrient and pesti with NMFS to implement regulariver herring and shad such that freshwater runs. DWR also conthering and shad in inland water shad popualtions are at such leve existing Alewife Floater populat other impacts to the species. (5.	nange. (11.2.2), Develop, as for the waste water effluent, sones where rare species are itigation for impacts. Implemen minimize impacts from resident cide runoff. (9.1), Coordinate titions that will minimize take of benefits will be seen in annual inue to restrict take of river rs. Current river herring and rels that natural recrutiment of ions is difficult even with no	it ial	Continue propagation waterways that are su	and augmentation and reintroduction into table.
4 Theliderma sparsa	Appalachian monkeyface	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 De Quality and Virginia Energy to demeaningful biological standands to develop, meaningful biological discharges. Mixing zones need trare species occur, or sufficient known impacts. (9.2), Increase pranagement practices such as a and protecting/establishing veg- agriculture and forestry. (9.3), of standards for the waste water	evelop, implement, and enforce for coal and gas extraction, and al standards to improve industrito be eliminated in areas where mitigation implemented to offs partnerships to implement best alternate water sources for catted stream buffers for evelop, biologically meaningful fffluent, including elimination of s are present, or provide. Implement best management om residential areas such as	d ial e exet set f		opagation techniques and augment population s into waterways that are suitable.

	l R		T n	F F	: I	н	1	D D	Т	I 11	V
1 Scientific Name	Common Name	Grouning		Tier CC	NR Habitate	Threat Code	Threat Description	·	Actions	Working Lands	Notes
Scientific_Name 5 Fusconaia masoni	Common_Name Atlantic pigtoe	Grouping Aquatic Mollusk	Type Mussel	E f	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		U Working Lands	Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
							-		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
6 Lemiox rimosus	Birdwing pearlymussel	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater		nutrient and pesticide runoff. (9.1)		waterways that are suitable.
	Black sandshell	Aquatic Mollusk				9.2, 9.3, 9.1	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) / 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.

A	В	С	D	E F	G	Н	L	Р	T	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
8 Alasmidonta varicosa	Brook floater	Aquatic Mollusk	Mussel		Creeks and Rivers, Large Rivers	9.1, 9.3, 1.1.1	Domestic and Urban Wastewater / Agricultural and Forestry Effluents		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 fo 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 standard 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. 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)	r S	Continue propagation and augmentation and reintroduction into waterways that are suitable.
9 Elliptio congaraea	Carolina slabshell	Aquatic Mollusk	Mussel		Creeks and Rivers, Tidal Creeks and Rivers	11.2.2, 9.2, 9.1	Changes in salinity / Industrial and	from industries will be listed with I hreat 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	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.		Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
10 Hemistena lata	Cracking pearlymussel	Aquatic Mollusk	Mussel	I b	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 practices used as a discrete water sources for cattle		Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

A	В	С	D	E F G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	_	Tier COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
								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	<u></u>	
							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	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		
				Creeks and Divers Large			(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		
11 Strophitus undulatus	Creeper	Aquatic Mollusk	Mussel	IV a Rivers	9.1, 9.3, 1.1		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 propagation and augmentation and reintroduction into waterways that are suitable.
12 Medionidus conradicus	Cumberland moccasinshel	ll Aquatic Mollusk	Mussel	Headwater Streams, Creeks	9.2, 9.3, 9.1	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) / Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.			Continue propagation and augmentation and reintroduction into waterways that are suitable.
13 Theliderma intermedia	Cumberland monkeyface	Aquatic Mollusk	Mussel	I a Creeks and Rivers	9.2, 9.3, 9.1	Industrial and Military Effluents /	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,			Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

A	В	С	D	I E I E	G	н	T .	Р	Т	U	V
1 Scientific Name	Common Name	Grouping	_		_	Threat Code	Threat Description	·	Actions	Working Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	_	Threat_Code	Threat_Description	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		Working_Lands	Notes
14 Epioblasma brevidens	Cumberlandian combshell	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1	-	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.	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)	3	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			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.

Ι Δ	l R	· ·	Т р	I E I E	G	Тн	1 1	p	т	U	T v
1 Scientific Name	Common Name	Grouping	Туре	Tier COF		Threat_Code	Threat_Description	'	Actions	Working_Lands	Notes
Scientific_Name	Common_Name	Grouping	туре	Her CO	R Habitats	Inreat_Code	Inreat_Description	Threat_Long	Actions	working_Lands	Notes
									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.		
								Point or non-point source wastewater from residential and urban areas;	(9.1), Increase partnerships to implement best management		
								these discharges (may) contain nutrients, sediments, toxic substances,	practices such as alternate water sources for cattle and		
									protecting/establishing vegetated stream buffers for agriculture		
								chemicals, etc. / Wastewater (pollutants) that is generated by	and forestry. (9.3), Work with localities and regulatory agencies		
								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 of	f	
								(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		
							Demostic and Hele Western	systems in agriculture and forestry (7.2) or oil spills from machinery	hydrological changes. Biologically-relevant riparian buffer rules		
								/ (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		
							Agricultural and Forestry Effluents	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 Alasmidonta heterodon	Dwarf wedgemussel	Aquatic Mollusk	Mussel	I 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.
								/ 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 with		
								the difficulty in identifying contaminants or contaminant "cocktails" that	the Virginia Department of Environmental Quality and Virginia		
									Energy to develop meaningful biological standards for coal and		
								are responsible for environmental damage, other unknown contaminants	gas extraction, and to develop, meaningful biological standards		
								from industries will be listed with Threat 9.2. This section excludes	to improve industrial discharges. Mixing zones need to be		
								natural sources of contaminants that are found in the environment (e.g.,	eliminated in areas where rare species occur, or sufficient		
								mercury found in soils or in river substrates). Intoxication due to natural	mitigation implemented to offset known impacts. (9.2), develop,		
								sources of these contaminants are likely to result from an indirect threat	biologically meaningful standards for the waste water effluent,		
								increasing exposure and to which conservation actions can be	including elimination of mixing zones where rare species are		
					Creeks and Rivers, Large		Changes in salinity / Industrial and	matched. / Point or non-point source wastewater from residential and			
					Rivers, Tidal Creeks and			urban areas; these discharges (may) contain nutrients, sediments, toxic	present, or provide sufficient mitigation for impacts. Implement		Castiana assaulta and annountation and asiatus distinction into
40	F4	A		n,					best management practices to minimize impacts from residential	I	Continue propagation and augmentation and reintroduction into
18 Lampsilis radiata	Eastern lampmussel	Aquatic Mollusk	Mussel	IV a	Rivers, Large Tidal Rivers	11.2.2, 9.2, 9.1	Urban Wastewater	substances, chemicals, etc.	areas such as nutrient and pesticide runoff. (9.1)		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	Implement large-scale management and conservation actions to		
								spills that are legal or illegal and (may) contain various nutrients,	minimize and reverse climate change. (11.2.2), Coordinate with		
								sediments, toxic substances and chemicals. Among others. Considering			
								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 from industries will be listed with Threat 9.2. This section excludes	Energy to develop meaningful biological standards for coal and		
								from industries will be listed with Threat 9.2. This section excludes	gas extraction, and to develop, meaningful biological standards		
								natural sources of contaminants that are found in the environment (e.g.,	to improve industrial discharges. Mixing zones need to be		
									chimitated in areas where rare species occur, or sufficient		
								mercury found in soils or in river substrates). Intoxication due to natural	mitigation implemented to offset known impacts. (9.2), develop,		
								sources of these contaminants are likely to result from an indirect threat	biologically meaningful standards for the waste water effluent,		
					Creeks and Rivers, Large			increasing exposure and to which conservation actions can be	including elimination of mixing zones where rare species are		
					Rivers, Tidal Creeks and		Changes in salinity / Industrial and	matched. / Point or non-point source wastewater from residential and	present, or provide sufficient mitigation for impacts. Implement		
					Rivers, Large Tidal Rivers,		Military Effluents / Domestic and	urban areas; these discharges (may) contain nutrients, sediments, toxic	best management practices to minimize impacts from residentia	1	Continue propagation and augmentation and reintroduction into
19 Sagittunio nasutus	Eastern pondmussel	Aquatic Mollusk	Mussel	III a	Lakes, Ponds	11.2.2, 9.2, 9.1	Urban Wastewater	substances, chemicals, etc.	areas such as nutrient and pesticide runoff. (9.1)		waterways that are suitable.
Toughtturno nuoutuo	Edotorn ponumuosot	/ iquatio Fiotiusk	. 145500	ını a	Editor, Fortura	11.2.2, 0.2, 0.1	C. Dan Tradicitates	ousstances, enemicate, etc.	areas saon as had terre and pesticide ration. (5.1)		acc. ways that are suitable.

A	В	С	D	E F	G	Т	L	P	Т	U	V
Scientific_Name	Common_Name	Grouping	Туре	Tier COR	-	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 of the contaminants of the contaminants of the contaminant			
								from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g.,	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 sources of these contaminants are likely to result from an indirect threat	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,	Mixing zones need to be eliminated in areas where rare species occur, or sufficient mitigation implemented to offset known		
								silvicultural and aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may)	impacts. (9.2), Increase partnerships to implement best management practices such as alternate water sources for cattle		
							Industrial and Military Effluents /	contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in	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
Elliptio crassidens	Elephantear	Aquatic Mollusk	Mussel	II b	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.
Alasmidonta marginata	Elktoe	Aquatic Mollusk	Mussel	II b	Creeks and Rivers	9.2, 9.3, 9.1	Industrial and Military Effluents /	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,		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
							Industrial and Military Effluents /	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		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 C	OR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier C	OR Habitats	Threat_Code	Threat_Description	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 management practices such as alternate water sources for cattle		Notes
23 Fusconaia cuneolus	Finerayed pigtoe	Aquatic Mollusk	Mussel	I a	Creeks and Rivers	9.2, 9.3, 9.1		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,	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.
24 Ptychobranchus subtentus		Aquatic Mollusk	Mussel			9.2, 9.3, 9.1	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) / 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.
25 Lasmigona costata	Flutedshell	Aquatic Mollusk	Mussel	IV b	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.

Λ.	D		D		G	ш	1	D	Т	U	V
A A	D	2		Tire COD		Thursd Onda	Thurst Description	Thursday and	A - 12		V V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
							Industrial and Military Effluents / Agricultural and Forestry Effluents	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 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 conduct reintroductions into
26 Potamilus fragilis	Fragile papershell	Aquatic Mollusk	Mussel	II C	Creeks and Rivers	9.2, 9.3, 3.3.1	/ Hydroelectric Dams		allow for passage of host fishes. (3.3.1)		waterways that are suitable.
27 Epioblasma aureola	Golden riffleshell	Aquatic Mollusk	Mussel	I c	Creeks and Rivers	9.2, 9.3, 9.1	Industrial and Military Effluents / Agricultural and Forestry Effluents / Domestic and Urban Wastewater	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)		
28 Pisidium dubium	Greater Eastern peaclam	Aquatic Mollusk	Clam		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).

	T 5	1 6	1 5	1 - 1	- I C	T	<u> </u>		T -		T v
A Colombido Novo	B B	2	D	E		Thurs at Oads	Thurst Description	Thurst Laure	Author	U U	V
1 Scientific_Name	Common_Name Green floater	Grouping Aquatic Mollusk	Type		COR Habitats Creeks and Rivers, Large Rivers	Threat_Code 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 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 D	Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
29 Lasmigona subviridis 30 Parvaspina collina	James spinymussel	Aquatic Mollusk	Mussel		Creeks and Rivers, Large	9.1, 9.3, 1.1	Domestic and Urban Wastewater	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)	f o	Continue propagation and augmentation and reintroduction into waterways that are suitable.
31 Pegias fabula	Littlewing pearlymussel	Aquatic Mollusk	Mussel	ı	Heawater Streams, Creeks 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, 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	

Δ	В		D	F F	G	П	T i	Р	т	11	V
1 Cojentific Name	Common Namo	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
3Clentine_Name	Common_Name	Glouping	Туре	Her Con	nauliais	IIIIeat_code	meat_Description	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		WURRING_Lanus	Notes
32 Fusconaia subrotuno	Longsolid	Aquatic Mollusk	Mussel	II b	Creeks and Rivers	9.2, 9.3, 9.1		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.	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.
33 Venustaconcha cons	icta Notched rainbow	Aquatic Mollusk	Mussel	III a	Creeks and Rivers, Large Rivers	9.1, 9.3, 1.1	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.
34 Pleurobema cordatui		Aquatic Mollusk	Mussel			9.2, 9.3, 9.1	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) / 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.

Δ.	R	· ·	D E	F G	н	1	P	Т	T U	V
1 Scientific_Name	Common_Name	Grouping		COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
Scientific_Ivame	Common_wante	Grouping	Type	CON Habitats	Tilleat_Code	meat_bescription	Till Eat_Long	Actions	WOIKING_Lanus	Notes
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			
1 1							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			
								Coordinate with the Virginia Department of Environmental		
							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	_	
							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			
							erosion and sedimentation that is associated with drainage systems in	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			
							discharges (may) contain nutrients, sediments, toxic substances,	sufficient mitigation for impacts. Implement best management		Continue propagation and augmentation and reintroduction into
2E Enjohlasma aspassfarmit	Ovetor muscal	Aquatia Mallusk	Mussal	Crooks and Bivers	020201			practices to minimize impacts from residential areas such as		Continue propagation and augmentation and reintroduction into
35 Epioblasma capsaeformis	Oyster musset	Aquatic Mollusk	Mussel I	a Creeks and Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	cnemicals, etc.	nutrient and pesticide runoff. (9.1)		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.,	Coordinate with the Virginia Department of Environmental		
							mercury found in soils or in river substrates). Intoxication due to natural	Quality and Virginia Energy to develop meaningful biological		
							sources of these contaminants are likely to result from an indirect threat	standands for coal and gas extraction, and to develop,		
							increasing exposure and to which conservation actions can be	meaningful biological standards to improve industrial discharges		
							matched. / Wastewater (pollutants) that is generated by agricultural,	Mixing zones need to be eliminated in areas where rare species		
							silvicultural and aquacultural activities. These discharges are	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			
							erosion and sedimentation that is associated with drainage systems in	management practices such as alternate water sources for cattle	=	
						Industrial and Military Effluents /	agriculture and forestry (7.2) or oil spills from machinery (9.2) /	and protecting/establishing vegetated stream buffers for		
						-		agriculture and forestry. (9.3), Improved cleaning and sterilization	1	Continue annuality and accompatible and relative dusting into
26 4-4	Dhaaaaataball	A	Marana	Out also and Birraria	00000		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 Actinonaias 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.
							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		
							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		2	
1 1							transported primarily in drainage systems, runoff and eroded; they (may)	management practices such as alternate water sources for cattle	-	
1 1							contain various nutrients, toxic substances, chemicals, etc. Excludes	and protecting/establishing vegetated stream buffers for		
							erosion and sedimentation that is associated with drainage systems in	agriculture and forestry. (9.3), develop, biologically meaningful		
							agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	standards for the waste water effluent, including elimination of		
						Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	mixing zones where rare species are present, or provide		
								sufficient mitigation for impacts. Implement best management		Continue to develop propagation techniques and accept accept to the
27 Ovolensias nustrilis -	Dimploheel	Aquatia Mallineli	Museel	b Crooks and Diver-	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
37 Cyclonaias pustulosa	Pimpleback	Aquatic Mollusk	Mussel	b 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.

Δ	R	r	D	E F G	Н	ı	P	Т	U	T v
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	·	Actions	Working_Lands	Notes
. Josephane_Name	Sommon_Hamile	Orouping	.356	THE CONTRIBUTIONS	inicac_oode	cat_Description	Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction		TOKING_LUNUS	
							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			
							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	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		
38 Potamilus alatus	Pink heelsplitter	Aquatic Mollusk	Mussel	III b Creeks and Rivers	9.2, 9.3, 3.3.1	Industrial and Military Effluents /	erosion and sedimentation that is associated with drainage systems in	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)	9	Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
39 Lampsilis abrupta	Pink mucket	A quatic Mollusk	Mussel	I a 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		Continue propagation and reintroduction into waterways that are suitable.
40 Tritogonia verrucosa	Pistolgrip	Aquatic Mollusk	Mussel	II b Creeks and Rivers	9.1, 9.3, 3.3.1		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	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), Fish passage or dam removal to allow for passage of host fishes. (3.3.1)		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.

A	В	С	D	Е	F G	Н	L	Р	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier Co	OR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier Ct	OR Habitats	Threat_Code	Threat_Description	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 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		Notes
									agriculture and forestry. (9.3), develop, biologically meaningful 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		
					Creeks and Rivers, Large			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 propagation and augmentation and reintroduction into
41 Lampsilis ovata	Pocketbook	Aquatic Mollusk	Mussel	IV a	Rivers	9.2, 9.3, 9.1	/ Domestic and Urban Wastewater	chemicals, etc.	nutrient and pesticide runoff. (9.1)		waterways that are suitable.
42 Toxolasma lividum	Purple liliput	Aquatic Mollusk	Mussel	II b	Creeks and Rivers, Lakes, Ponds	9.2, 9.3, 9.1		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	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 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.

Δ.	R		D D	E E	G	н	1	P	Т	I 11	V
1 Scientific Name	Common Name	Grouning	Tyne	Tier COR	Hahitate	Threat Code	Threat Description	·	Actions	Working Lands	Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	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		Working_Lands	Notes
44 Paetulunio fabalis	Rayed bean	Aquatic Mollusk	Mussel	I b	Creeks and Rivers	9.2, 9.3, 9.1		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,	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)		Believed to be extirpated from VA. Must work with other states to obtain adults to translocate into VA, or to obtain broodstcok from which to propagate juveniles.
45 Elliptio roanokensis	Roanoke slabshell	Aquatic Mollusk	Mussel		Creeks and Rivers, Tidal Creeks and Rivers	9.1, 9.3, 1.1	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		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.

А	В	С	D	E	F G	Н	L	Р	Т	U	V
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	Coordinate with the Virginia Department of Environmental		
								monthiadatica with be tisted with thiede 6.2. This section excitaces	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 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		
								erosion and sedimentation that is associated with drainage systems in	agriculture and forestry. (9.3), develop, biologically meaningful		
								agriculture and forestry (7.2) or oil spills from machinery (9.2) / Point or	standards for the waste water effluent, including elimination of 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
47 Plethobasus cyphyus	Sheepnose	Aquatic Mollusk	Mussel	II 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.
											·
48 Fusconaia cor	Shiny pigtoe	Aquatic Mollusk	Mussel	I a	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		Continue to develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.
					Headwater Streams, Creeks		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,		Continue to develop propagation techniques and augment populations and
49 Pleuronaia dolabelloides	Stabside pearlymussel	Aquatic Mollusk	Mussel	ı a	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 F G	Н	I t	Р	Т	U	V
1 Scientific Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
50 Alasmidonta viridis	Slippershell mussel	Aquatic Mollusk	Mussel	Headwater Streams, Creeks b and Rivers	11.3, 9.3, 9.1			Promote land use practices that ensure suitable riparian buffers, minimize impervious surfaces and maintain natural groundwater 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), 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.
51 Epioblasma triquetra	Snuffbox	Aquatic Mollusk	Mussel	I a 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,			Continue propagation and augmentation and reintroduction into waterways that are suitable.
52 Cumberlandia monodor	nta Spectaclecase	Aquatic Mollusk	Mussel	I b Creeks and Rivers	3.3.1, 9.3, 11.4.4	and Forestry Effluents / Increase in	in drainage systems, runoff and eroded; they (may) contain various	Fish passage or dam removal to allow for passage of host fishes. (3.3.1), 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), Reduce carbon emissions to help mitigate climate change that leads to rainfall regime alterations, which leads to hydrological/flow regime changes. (11.4.4)		Develop propagation techniques
53 Venustaconcha trabalis	Tennessee bean (purple		Mussel	I a Creeks and Rivers	9.2, 9.3, 9.1	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) / 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		Continue propagation and augmentation and reintroduction into waterways that are suitable.

	۸	D		D	E F	G	Н	I i	р	т	U	V
1 6	cientific_Name	Common_Name	Grouping	Туре	Tier COR		Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
H	CIEIICIIC_IVAIIIE	Common_ivalile	Grouping	Туре	ilei CON	Habitats	Tilleat_Code	mieat_bescription	Tilleat_Long	Actions	WOIKING_Lanus	Notes
									L			
									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	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 highgical standards to improve industrial discharge	es.	
									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 catt	tle	
									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		1	
								Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these	mixing zones where rare species are present, or provide		
						Headwater Streams, Creek			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 populatio
	laurahama ayifarma	Tannagaa alubahali	Agustia Malluak	Mariana						1		
54 1	leurobema oviforme	Tennessee clubshell	Aquatic Mollusk	Mussel	II b	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.
55 L	asmigona holstonia	Tennessee heelsplitter	Aquatic Mollusk	Mussel		Headwater Streams, Creek and Rivers	S 11.3, 9.3.2, 9.1	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 wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc.	Promote land use practices that ensure suitable riparian buffer minimize impervious surfaces and maintain natural groundwate inputs. (11.3), Increase partnerships to implement best management practices such as alternate water sources for catt and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3.2), develop, biologically meaning 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)	er ful f	Continue propagation and augmentation and reintroduction into waterways that are suitable.
56 [leuronaia barnesiana	Tennessee pigtoe	Aquatic Mollusk	Mussel		Headwater Streams, Creek 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 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 discharge 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 catt and protecting/establishing vegetated stream buffers for agriculture and forestry. (9-3), develop, biologically meaningful standards for the waste water effluent, including elimination of	s tle	Continue to develop propagation techniques and augment populatio conduct reintroductions into waterways that are suitable.
ן טכ	curondid namesiana	remiessee pigtoe	Aquatic Mottusk	เทนจอยเ	II D	anu Nivers	ಶ.೭, ಶ.ಎ, ಶ.1	/ Domestic and Orban wastewater	טווכווווטמנס, צוני.	nathent and pesticide runon. (9.1)		conduct reintroductions into waterways that are suitable.

А	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 discharg	es.	
								increasing exposure and to which conservation actions can be	Mixing zones need to be eliminated in areas where rare species	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 car	tle	
								contain various nutrients, toxic substances, chemicals, etc. Excludes	and protecting/establishing vegetated stream buners 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	Т	
							Industrial and Military Effluents /	non-point source wastewater from residential and urban areas; these			
									sufficient mitigation for impacts. Implement best managemen 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.
57 Ambiema piicata	Tilleelluge	Aquatic Plottusk	Musset	III D	Creeks and nivers	9.2, 9.3, 9.1	/ Domestic and Orban Wastewater	chemicats, 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,	Implement large-scale management and conservation actions	to	
									minimize and reverse climate change. (11.2.2), Coordinate wi	:h	
								sediments, toxic substances and chemicals. Among others. Considering	the Virginia Department of Environmental Quality and Virginia		
								the difficulty in identifying contaminants or contaminant "cocktails" that	Energy to develop meaningful plological standands for coal an	t	
								are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes	gas extraction, and to develop, meaningful biological standard	s	
									to improve industrial discharges. Mixing zones need to be		
								natural sources of contaminants that are found in the environment (e.g.,	eliminated in areas where rare species occur, or sufficient		
								mercury found in soils or in river substrates). Intoxication due to natural	mitigation implemented to offset known impacts. (9.2), develo	p,	
								sources of these contaminants are likely to result from an indirect threat		,	
					One store and Division Leads		Observation and in the Albertain and and	increasing exposure and to which conservation actions can be	including elimination of mixing zones where rare species are		
					Creeks and Rivers, Large		-		present, or provide sufficient mitigation for impacts. Implement		
CO Atlanticanaha cah	Tidoustor musicat	Agustia Mallusk	Mussal		Rivers, Tidal Creeks and	11 0 0 0 0 0 1		urban areas; these discharges (may) contain nutrients, sediments, toxic		tial	Continue propagation and augmentation and reintroduction into
58 Atlanticoncha och	racea Tidewater mucket	Aquatic Mollusk	Mussel	III a	Rivers, Large Tidal Rivers	11.2.2, 9.2, 9.1	Urban Wastewater	substances, chemicals, etc.	areas such as nutrient and pesticide runoff. (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.		
									(9.1), Increase partnerships to implement best management		
								Point or non-point source wastewater from residential and urban areas;	practices such as alternate water sources for cattle and		
								these discharges (may) contain nutrients, sediments, toxic substances,	protecting/establishing vegetated stream buffers for agricultu	re	
								chemicals, etc. / Wastewater (pollutants) that is generated by	and forestry. (9.3), Work with localities and regulatory agencies		
								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	of	
								(may) contain various nutrients, toxic substances, chemicals, etc.	riparian buffers and increased impervious surfaces, which lead		
								Excludes erosion and sedimentation that is associated with drainage	loss of instream habitat due to factors such as runoff and		
1								systems in agriculture and forestry (7.2) or oil spills from machinery	hydrological changes. Biologically-relevant riparian buffer rule	i	
					Headwater Streams, Creek	(S	Domestic and Urban Wastewater /	(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		
					i leauwatei Streams, Creek		Bonnoono ana Orban Maoromator 7	(O.2) This state of the control of t	mast be put in place diong all water ways, as well as innitations	'	
					and Rivers, Tidal Headwate				on impervious surfaces and properly handling runoff from the		Continue propagation and augmentation and reintroduction into

A	В	C.	T D	E F G	Т	L	P P	Т	l u	V
1 Scientific Name	Common Name	Grouping		Tier COR Habitats		Threat Description	'	Actions		Notes
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	e.g., altered sex-ratio in species relying upon a temperature dependent sex determination, reduction of dissolved oxygen that is available to fish	Continue efforts to reduce CO2 and other greenhouse gas emissions to approximately 50% below 2005 levels by 2030; attain 100% carbon pollution-free electricity by 2035; achieve a net-zero emissions economy by 2050. Increase riparian buffer shading and aquatic plants of smaller water bodies. Deliver a percentage of the benefits from federal investments in climate and clean energy to conservation and recovery of SGCNs. (11.3.3), Increase partnerships with federal and state authoritic and stakeholders to eliminate loads of manure (organic enrichment), and chemical ferilizers (P, N, C). Organic enrichment causes low [O2], high hydrogen sulfide and methar gas contents, toxic to P. adamsi. (9.3.1), "Increase partnerships	e	Temperture Change - P. walkeri has a temperature-dependent reproductive strategy, is a hermaphrodite with a temperature-dependent growth, maturation, and brood size. It prefers small bodies of water, which are subject to rapid changes in temperature, dissolved oxygen, droughts and even permanent loss of habitat. Populations in large lakes and rivers are less at risk than populations in small water bodies. Nutrient Loads - Averages 4 mm long. 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. Living in small bodies of water adjacent to agricultural lands with either overland runoff or effluents from drainage tiles hightens the risk of habitat losses and population declines or eliminations.
							species, earlier ice-free dates, thawing of permafrost affecting bird	with end users to eliminate or reduce discharges of toxic		principally in slow-moving creeks and rivers with a soft bottom, or small
						Gradual Temperature Change /	breeding sites. / e.g., manure, compost, chemical fertilizers. / Includes		i	lakes or ponds, creeks/rivers. Occassionally in large lakes and rivers. Most
60 Pisidum walkeri	Walker peaclam	Aquatic Mollusk	Clam	IV b Creeks and Rivers, Lakes	11 2 2 0 2 1 0 2 2	Nutrient Loads / Herbicides and	the use of inputs for controlling crop pests. E.g., herbicides, insecticides fungicides.	i, creeks are particularly at risk due to smaller dilution effects. " (9.3.3)		common in mesotrophic waters (total chlorophyll = \sim 3-7 µg/L, total P = \sim 10-30 µg/L, total N = \sim 300-600 µg/L, Secch depth = \sim 2.5-4 m).
61 Lampsilis cariosa	Yellow lampmussel	Aquatic Mollusk	Mussel	Creeks and Rivers, Large Rivers, Tial Creeks and II a 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 of to	Continue propagation and augmentation and reintroduction into waterways that are suitable.
62 Elliptio lanceolata	Yellow lance	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)	e of to	Develop propagation techniques and augment populations and conduct reintroductions into waterways that are suitable.