A	В	С	D	E F	G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
								Withdrawal of fresh surface water for human consumption, crop production or			
								other purposes. E.g., withdrawal by municipalities, spring water bottling	Virginia Marine Resources Commission to enact BMPs		
								companies and farmers; reservoirs for firefighting, creation of man-made	for water withdrawals to reduce entrainment and		
								lakes. / 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	ameliorate saltwater intrusion and warming		
								to climate change. / Facilities or activities that alter the natural water regime	impactsEncourage natural flows to help ameliorate		
								(flow or water levels).	saltwater intrusion and warming impacts. Limit impacts		
									of freshwater withdrawals through proper placement and operation (time of year restrictions) and require		
									best practices for intake design (7.2.6), Work with		
									partners to protect natural flow regimes to combat		
									increased effects of water temperature changes. Stop or		
									slow contributing factors to climate change (11.3), Put		
									tight restrictions on and limit the construction of new		
									dams. Remove obsolete dams to restore and increase		
									spawning and rearing habitat. Require safe, timely and		
					Tidal headwaters, Tidal Creeks				effective passage of alewife on functional dams that will		
					and Rivers, Large Rivers, Tidal				not be removed (7.2).		
					Big Rivers, Tidal Wetlands,		Withdrawal of Surface Water / Changes in		, ,		
					Estuaries, Marine Nearshore,		Temperature Regimes / Dams and Water				
2 Alosa pseudoharengus	Alewife	Freshwater Fish	Fish	IV a	Marine Offshore and Oceanic	7.2.6, 11.3, 7.2	Management/Use				
							-	/ Wastewater (pollutants) that is generated by agricultural, silvicultural and	Coordinate with VDWR biologists to prevent stocking		
								aquacultural activities. These discharges are transported primarily in drainage	non-native salmonds such as brown trout (Salmo trutta)		
								systems, runoff and eroded; they (may) contain various nutrients, toxic	into waters containing pearl dace (8.1.3), Increase		
								substances, chemicals, etc. Excludes erosion and sedimentation that is	partnerships to implement best management practices		
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	to reduce ALL sources of agriculture and forestry		
								from machinery (9.2) / Periods in which temperatures of the air, water or soil	pollution (9.3), Decrease fossil fuel emmisions. Increase		
							Aquatic Animals / Agricultural and Forestry	either exceed or fall below the normal range of variation. Events that may or	stream shading by planting riparian buffers to cool		
							Effluents / Changes in Temperature	may not be related to climate change.	stream temperatures (11.3).		
3 Margariscus margarita	Allegheny pearl dace	Freshwater Fish	Freshwater Fish	IV b	Creeks and Rivers	8.1.3, 9.3, 11.3	Regimes				
	.0 . , ,					.,,	<u> </u>	Point or non-point source wastewater from residential and urban areas; these	Develop, biologically meaningful standards for the waste		
								discharges (may) contain nutrients, sediments, toxic substances, chemicals,	water effluent (9.1), Increase partnerships to implement		
								etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural	best management practices to reduce ALL sources of		
								and aquacultural activities. These discharges are transported primarily in	agriculture and forestry pollution (9.3), Avoid		
								drainage systems, runoff and eroded; they (may) contain various nutrients,	construction of new dams and remove old, non-		
								toxic substances, chemicals, etc. Excludes erosion and sedimentation that is	functioning dams. Dams that cannot be replaced should		
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	be retrofited to allow fish passage. Coordinate with the		
								from machinery (9.2) / Facilities or activities that alter the natural water	Virginia Department of Transportations to replace and		
							Domestic and Urban Wastewater /	regime (flow or water levels).	install new culverts that allow movement of aquatic		
	American brook						Agricultural and Forestry Effluents / Dams	regime (now or water tevets).	species (7.2).		
4 Lethenteron appendix	lamprey	Freshwater Fish	Freshwater Fish	IV c	Creeks and Rivers	9.1, 9.3, 7.2	and Water Management/Use				
+ Ectriciteron appendix	tumprey	Treshwater rish	T Conwater 1 ion	., .	Orecks und rivers	0.1, 0.0, 7.2	und Water Hanagement ooc	Harvesting of aquatic species for commercial purposes that is governed by	Coordinate with the Virginia Department of Marine		Additional conservation actions my include,
								management measures for which the environmental impact is primarily on the	Resources to develop regulations to prevent the bycatch		coordinate with the Virginia Department of
								species (as opposed to habitat damage from sea bottom trawling, Threat	of anadromous fishes by commercial fisheries, and		Marine Resources to enforce regulations to
								7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife	develop, promote, and enforce sustainable fishing		prevent the poaching of glass eels (5.4.3),
								(Threat 9.4.4). E.g., commercial fisheries, use of nets and fishing gear for eels,	practices (5.4.2), Avoid construction of new dams and		Continued coordination with FERC, USFWS,
					Headwater Streams, Creeks and	1		factory ships, marine mammals caught in industrial fishing nets. // Facilities	remove old, non-functioning dams. Dams that cannot		and NMFS to address eel passage in new
					Rivers, Large Rivers, Tidal	-		or activities that alter the natural water regime (flow or water levels).	be replaced should be retrofited to allow fish passage.		projects and facilities undergoing re-
					Headwaters, Tidal Creeks and			or doubles that atter the natural water regime (now or water tevels).	Coordinate with the Virginia Department of		licensing (3.3.1)
					Rivers, Tidal Large Rivers, Lakes				Transportations to replace and install new culverts that		
					Ponds, Tidal Wetlands,	'			allow movement of aquatic species (7.2).		
					Estuaries, Marine Nearshore,		Commercial Fishing / Hydroelectric Dams				
5 Anguilla rostrata	American eel	Freshwater Fish	Fish	II a	Marine Offshore and Oceanic	54233172	/ Dams and Water Management/Use				
J Milguilla 103tiala	, and roun cet	1 TOSHWALET FISH	1 1311	ıı a	riamic Onshore and Oceanic	0.4.2, 0.0.1, 7.2	, Danis and Water Flanagement/Ose	Withdrawal of fresh surface water for human consumption, crop production or	Limit impacts of freshwater withdrawals through proper		
								other purposes. E.g., withdrawal by municipalities, spring water bottling	placement and operation (time of year restrictions) and		
								companies and farmers; reservoirs for firefighting, creation of man-made	require best practices for intake design. (7.2.6),		
									Continue moratorium on fishing to allow for rebuilding		
								lakes. / Harvesting of aquatic species for commercial purposes that is	of stocks. (5.4.2), Put tight restrictions on and limit the		
								governed by management measures for which the environmental impact is	construction of new dams. Remove obsolete dams to		
								primarily on the species (as opposed to habitat damage from sea bottom	restore and increase spawning and rearing habitat.		
					Crooks and Divors Laura Divors			trawling, Threat 7.3.6). Includes bycatch but excludes ghost fishing gear	Require safe, timely and effective passage of American		
					Creeks and Rivers, Large Rivers,			entangling wildlife (Threat 9.4.4). E.g., commercial fisheries, use of nets and	shad on functional dams that will not be removed. (7.2)		
					Tidal Creeks and Rivers, Tidal			fishing gear for eels, factory ships, marine mammals caught in industrial			
					Large Rivers, Tidal Wetlands,		Withdrawal of Curfors Water / Commenced	fishing nets. / Facilities or activities that alter the natural water regime (flow or			'
C Alexa earlite-te	Amaniaan -ll	Freehousts - Fish	Fieb	п .	Estuaries, Marine Nearshore,	700 5 40 70	Withdrawal of Surface Water / Commercial	,			
6 Alosa sapidissima	American shad	Freshwater Fish	Fish	II b	Marine Offshore and Oceanic	7.2.6, 5.4.2, 7.2	Fishing / Dams and Water Management/Use				

А	l B		D	E F	G	Н	T i	P	Т	U	T v
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR		Threat_Code	Threat_Description	Threat_Long	'	Working_Lands	· ·
Scientific_Name	Common_Name	Grouping	туре	Hei COK	Habitats	Illieat_Coue	Illieat_Description	-		WOIKING_Lanus	Notes
								Point or non-point source wastewater from residential and urban areas; these	Increase partnerships to implement best management		
								discharges (may) contain nutrients, sediments, toxic substances, chemicals,	practices to reduce ALL sources of urban pollution (9.1),		
								etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural	Increase partnerships to implement best management		
								and aquacultural activities. These discharges are transported primarily in	practices to reduce ALL sources of agriculture and		
								drainage systems, runoff and eroded; they (may) contain various nutrients,	forestry pollution (9.3), Decrease fossil fuel emmisions.		
								toxic substances, chemicals, etc. Excludes erosion and sedimentation that is	Increase stream shading by planting riparian buffers to		
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	cool stream temperatures (11.3).		
								from machinery (9.2) / Periods in which temperatures of the air, water or soil			
								either exceed or fall below the normal range of variation. Events that may or			
							Domestic and Urban Wastewater /	may not be related to climate change.			
							Agricultural and Forestry Effluents /				
7 Percina gymnocephala	Appalachia darter	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers, Large Rivers	9.1, 9.3, 11.3	Changes in Temperature Regimes				
								Wastewater (pollutants) from industrial and military sectors, including mines,	Coordinate with the Virginia Department of		
								energy production sectors and other resource extraction industries. These	Environmental Quality and Virginia Energy to develop		
1 1									meaningful biological standards for coal and gas		
								effluents may result from deliberate or accidental spills that are legal or illegal	extraction. (9.2), Increase partnerships to implement		
								and (may) contain various nutrients, sediments, toxic substances and			
								chemicals. Among others. Considering the difficulty in identifying	best management practices such as alternate water		
1 1								contaminants or contaminant "cocktails" that are responsible for	sources for cattle and protecting/establishing vegetated		
								environmental damage, other unknown contaminants from industries will be	stream buffers for agriculture and forestry. (9.3.2),		
								listed with Threat 9.2. This section excludes natural sources of contaminants	Avoid construction of new dams and remove old, non-		
								that are found in the environment (e.g., mercury found in soils or in river	functioning dams. Dams that cannot be replaced should		
									be retrofited to allow fish passage. Coordinate with the		
								substrates). Intoxication due to natural sources of these contaminants are	Virginia Department of Transportations to replace and		
								likely to result from an indirect threat increasing exposure and to which	install new culverts that allow movement of aquatic		
1 1								conservation actions can be matched. / Wastewater (pollutants) that is	species. (7.2)		
								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.			
1 1											
1 1								Excludes erosion and sedimentation that is associated with drainage systems			
1 1								in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Facilities or			
								activities that alter the natural water regime (flow or water levels).			
							Industrial and Military Effluents /				
							Agricultural and Forestry Effluents / Dams				
8 Allohistium cinereum	Ashy darter	Freshwater Fish	Freshwater Fish	l b	Creeks and Rivers	9.2, 9.3, 7.2	and Water Management/Use				
0 / ttomstam emercam	7.011y durtor	Treshwater Fish	T TCSTIWATCT T ISTI	1 5	Orecks und rivers	0.2, 0.0, 7.2	und Water Flandgement Oce	Harvesting of aquatic angular for commercial purposes that is governed by	Coordinate with the Virginia Department of Marine		
								Harvesting of aquatic species for commercial purposes that is governed by			
								management measures for which the environmental impact is primarily on the	Resources to develop regulations to prevent the		
								species (as opposed to habitat damage from sea bottom trawling, Threat	overfishing by recreational and commercial fisheries.		
								7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife	(5.4.2), Avoid construction of new dams and remove		
								(Threat 9.4.4). E.g., commercial fisheries, use of nets and fishing gear for eels,	old, non-functioning dams. Dams that cannot be		
								factory ships, marine mammals caught in industrial fishing nets. / Facilities or	replaced should be retrofited to allow fish passage.		
								activities that alter the natural water regime (flow or water levels). /	Coordinate with the Virginia Department of		
								detivities that after the natural valer regime (new or water terets).	Transportations to replace and install new culverts that		
									allow movement of aquatic species. (7.2), reduce		
									standing stocks of Blue Catfish in Chesapeake Bay rivers		
1 1									(8.1.3). Additional conservation actions may include		
1 1									limit impacts of freshwater withdrawals through proper		
1 1											
1 1									placement and operation (time of year restrictions) and		
1 1									require best practices for intake design (7.2.6), Continue		
									moratorium on harvest across all sectors to allow for		
									rebuilding of stocks (5.4), Continue efforts to work with		
									ACOE on dredging outside of established TOYRs;		
									coordinate with regulatory partners to implement		
									shipping best practices (i.e. low speed in estuaries) to		
1 1									reduce ship strikes (4.3).		
1 1									, , ,		
1 1											
1 1					Tidal Larga Divara Faturaria		Commercial Fishing / Dame and Materia				
1 . 1					Tidal Large Rivers, Estuaries,		Commercial Fishing / Dams and Water				
9 Acipenser oxyrinchus	Atlantic sturgeon	Freshwater Fish	Fish	I b	Marine Nearshore	5.4.2, 7.2, 8.1.3	Management/Use / Aquatic Animals				
1 1								Point or non-point source wastewater from residential and urban areas; these	Develop, biologically meaningful standards for the waste		
1 1								discharges (may) contain nutrients, sediments, toxic substances, chemicals,	water effluent (9.1), Increase partnerships to implement		
1 1								etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural	best management practices to reduce ALL sources of		
1 1								and aquacultural activities. These discharges are transported primarily in	agriculture and forestry pollution (9.3), Avoid		
1 1									construction of new dams and remove old, non-		
								drainage systems, runoff and eroded; they (may) contain various nutrients,	functioning dams. Dams that cannot be replaced should		
1								toxic substances, chemicals, etc. Excludes erosion and sedimentation that is	be retrofited to allow fish passage. Coordinate with the		
1								associated with drainage systems in agriculture and forestry (7.2) or oil spills	Virginia Department of Transportations to replace and		
1								from machinery (9.2) / Facilities or activities that alter the natural water			
							Domestic and Urban Wastewater /	regime (flow or water levels).	install new culverts that allow movement of aquatic		
							Agricultural and Forestry Effluents / Dams		species (7.2).		
10 Moxostoma ariommum	Rigeve iumprock	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers	9.1, 9.3, 7.2	and Water Management/Use				
10 Intoxostorna anominalii	Digoyo Juliipi ook	i restiwatel i isti	i realiwater I fall	iii C	OTOGRA UTU TIIVOTA	0.1, 0.0, 7.2	and Hatel FlandSement/036			l .	

	Α	В	С	D	E	F	G	Н	L	P	Т	U V
1 Scientif	fic Name	Common_Name	Grouping	Туре	Tier Co	COR Ha	abitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands Notes
				1,74					Timest_2 costs.p.scs.		Decrease fossil fuel emissions. Develop partnerships	
										below the normal range of variation. Events that may or may not be related to	with landowners to increase stream shading by planting	
											riparian buffers to cool stream temperatures (11.3),	
										climate change. / Wastewater (pollutants) that is generated by agricultural,	Increase partnerships to implement best management	
										silvicultural and aquacultural activities. These discharges are transported	practices to reduce ALL sources of agriculture and	
										primarily in drainage systems, runoff and eroded; they (may) contain various	forestry pollution (9.3), Avoid construction of new dams	
										nutrients, toxic substances, chemicals, etc. Excludes erosion and	and remove old, non-functioning dams. Dams that	
										sedimentation that is associated with drainage systems in agriculture and	cannot be replaced should be retrofited to allow fish	
										forestry (7.2) or oil spills from machinery (9.2) / Facilities or activities that	passage. Coordinate with the Virginia Department of	
										alter the natural water regime (flow or water levels).	Transportations to replace and install new culverts that	
											i i	
									Changes in Temperature Regimes /		allow movement of aquatic species (7.2).	
						He	eadwater Streams, Creeks and		Agricultural and Forestry Effluents / Dams			
11 Cottus b	paileyi	Black sculpin	Freshwater Fish	Freshwater Fish	IV c	Riv	vers	11.3, 9.3, 7.2	and Water Management/Use			
	-									Structures (dams) built by beavers create habitats for a number of species;	Coordinate the County Extension Agents and VDWR	
										however, these dams may be dismantled by humans. Dismantling of dams	Biologists to educate landowners on the importance of	
										result in habitat loss by drying-out the beaver-created basin and flooding lands		
											alternative to dam and beaver removal such as flow	
										downstream. It could also potentially cause loss of accumulated sediments	control devices to prevent extreme flooding and	
										due to increased flow in streams farther downstream. / Wastewater	damage to property. (7.2.2), Increase partnerships to	
										(pollutants) that is generated by agricultural, silvicultural and aquacultural	implement best management practices to reduce ALL	
										activities. These discharges are transported primarily in drainage systems,	, ,	
										runoff and eroded; they (may) contain various nutrients, toxic substances,	sources of agriculture and forestry pollution (9.3),	
										chemicals, etc. Excludes erosion and sedimentation that is associated with	Coordinate with County Extension Agents and VDWR	
										drainage systems in agriculture and forestry (7.2) or oil spills from machinery	Fisheries Biologists to educate landowners on the	
										(9.2) / Deliberately killing individuals of an aquatic species for human gain	importance of maintaining submerged vegetation in	
										that is governed by management measures. E.g., control of lampreys using	their ponds and lakes. Prevent introduction of Grass	
										lampricides, control of mosquitos in their aquatic larval stage (BTi), water	Carp (Ctenopharyngodon idella) and suggest targeted	
									Beaver Dam Management / Agricultural and		vegetation removal when possible (5.4.4)	
						Cr	eeks and Rivers, Ponds, Non		Forestry Effluents / Management/Control of			
12 [	anthus chasts des	Plackbanded a field	Frochweter Field	Erochwoter Field				72202544	, ,			
12 Enneaca	anthus chaetodon	Blackbanded sunfish	Freshwater Fish	Freshwater Fish	I a	a IIu	aat wettands	7.2.2, 9.3, 5.4.4	Aquatic Species			
										Wastewater (pollutants) from industrial and military sectors, including mines,		
										8,1	Environmental Quality and Virginia Energy to develop	
											meaningful biological standands for coal and gas	
										and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement	
										chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of	
										contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid	
										environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non-	
										listed with Threat 9.2. This section excludes natural sources of contaminants	functioning dams. Dams that cannot be replaced should	
										that are found in the environment (e.g., mercury found in soils or in river	be retrofited to allow fish passage. Coordinate with the	
										substrates). Intoxication due to natural sources of these contaminants are	Virginia Department of Transportations to replace and	
											install new culverts that allow movement of aquatic	
										likely to result from an indirect threat increasing exposure and to which	species (7.2).	
										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) / Facilities or		
										activities that alter the natural water regime (flow or water levels).		
									Industrial and Military Effluents /	<b></b>		
Chrosor	mus (Phoxinus)								Agricultural and Forestry Effluents / Dams			
13 cumber	, ,	Blackside dace	Freshwater Fish	Freshwater Fish	II .	, L.	eadwater Streams	9.2, 9.3, 7.2	and Water Management/Use			
5 cumber	turiucii3l3	Diackside date	i realiwater FISH	i restiwatet FISII	II a	, пе	Jaawatei otteattis	٥.٢, ٥.٥, ١.٢	and water management/USE	Wastawatar (nallutants) from industrial and military assets in studio and	Coordinate with the Virginia Department of	
										, ,	Coordinate with the Virginia Department of	
											Environmental Quality and Virginia Energy to develop	
										effluents may result from deliberate or accidental spills that are legal or illegal	meaningful biological standards for coal and gas	
										and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement	
										chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of	
				The state of the s						contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid	
										environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non-	
											l	
										listed with Threat 9.2. This section excludes natural sources of contaminants	functioning dams. Dams that cannot be replaced should	
											be retrofited to allow fish passage. Coordinate with the	
										that are found in the environment (e.g., mercury found in soils or in river	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and	
										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	be retrofited to allow fish passage. Coordinate with the	
										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	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and	
										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	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic	
										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	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic	
										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;	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic	
										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	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic	
										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;	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic	
										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.	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	
										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	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	
									Industrial and Military Effluents /	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) / Facilities or	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	
									Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams	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) / Facilities or	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	

A	В	С	D	E F	G	Н	L	Р		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,	Coordinate with the Virginia Department of	
								energy production sectors and other resource extraction industries. These	Environmental Quality and Virginia Energy to develop	
								effluents may result from deliberate or accidental spills that are legal or illegal	meaningful biological standands for coal and gas	
								and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement	
								chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of	
								contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid	
								environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non- functioning dams. Dams that cannot be replaced should	
								listed with Threat 9.2. This section excludes natural sources of contaminants	be retrofited to allow fish passage. Coordinate with the	
								that are found in the environment (e.g., mercury found in soils or in river	Virginia Department of Transportations to replace and	
								substrates). Intoxication due to natural sources of these contaminants are	install new culverts that allow movement of aquatic	
								likely to result from an indirect threat increasing exposure and to which	species (7.2).	
								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) / Facilities or		
								activities that alter the natural water regime (flow or water levels).		
							Industrial and Military Effluents /			
	B				Headwater Streams, Creeks and		Agricultural and Forestry Effluents / Dams			
15 Erimystax insignis	Blotched chub	Freshwater Fish	Freshwater Fish	III c	Rivers	9.2, 9.3, 7.2	and Water Management/Use			
								Wastewater (pollutants) from industrial and military sectors, including mines,	Coordinate with the Virginia Department of	
								energy production sectors and other resource extraction industries. These	Environmental Quality and Virginia Energy to develop	
								effluents may result from deliberate or accidental spills that are legal or illegal	meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement	
								and (may) contain various nutrients, sediments, toxic substances and	best management practices to reduce ALL sources of	
								chemicals. Among others. Considering the difficulty in identifying	agriculture and forestry pollution (9.3), Avoid	
								contaminants or contaminant "cocktails" that are responsible for	construction of new dams and remove old, non-	
								environmental damage, other unknown contaminants from industries will be	functioning dams. Dams that cannot be replaced should	
								listed with Threat 9.2. This section excludes natural sources of contaminants	be retrofited to allow fish passage. Coordinate with the	
								that are found in the environment (e.g., mercury found in soils or in river	Virginia Department of Transportations to replace and	
								substrates). Intoxication due to natural sources of these contaminants are	install new culverts that allow movement of aquatic	
								likely to result from an indirect threat increasing exposure and to which	species (7.2)	
								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) / Facilities or		
							Industrial and Military Effluents /	activities that alter the natural water regime (flow or water levels).		
							Industrial and Military Effluents /			
16 Daraina hurtani	Diotoboido lognorob	Freehweter Fieh	Freshwater Fish		Crooks and Divora	9.2, 9.3, 7.2	Agricultural and Forestry Effluents / Dams			
16 Percina burtoni	Blotchside logperch	Freshwater Fish	riesiiwatei risii	II a	Creeks and Rivers	9.2, 9.3, 7.2	and Water Management/Use	Withdrawal of fresh surface water for human consumption, crop production or	Limit impacts of freshwater withdrawals through proper	
									placement and operation (time of year restrictions) and	
								other purposes. E.g., withdrawal by municipalities, spring water bottling companies and farmers; reservoirs for firefighting, creation of man-made	require best practices for intake design. (7.2.6), Put tight	
								lakes. / Facilities or activities that alter the natural water regime (flow or water	restrictions on and limit the construction of new dams.	
								levels). / Harvesting of aquatic species for commercial purposes that is	Remove obsolete dams to restore and increase	
								governed by management measures for which the environmental impact is	spawning and rearing habitat. Require safe, timely and	
								,	effective passage on functional dams that will not be	
								primarily on the species (as opposed to habitat damage from sea bottom	removed. Ensure BMP adherance for surface water	
								trawling, Threat 7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife (Threat 9.4.4). E.g., commercial fisheries, use of nets and	withdrawals and maintain groundwater levels that	
									ensure base flows. (7.2), Coordinate with VMRC, NMFS,	
					Creeks and Rivers, Tidal Creeks			fishing gear for eels, factory ships, marine mammals caught in industrial fishing nets.	and ASMFC to develop harvest strategies to reduce	
					and Rivers, Tidal Large Rivers,			noning nets.	commercial bycatch of Mid-Atlantic stock (i.e.	
					Tidal Wetlands, Estuaries,		Withdrawal of Surface Water / Dams and		observers, caps) (5.4.2)	
					Marine Nearshore, Marine		Water Management/Use / Commercial			
17 Alosa aestivalis	Blueback herring	Freshwater Fish	Fish	IV a	· ·	7.2.6, 7.2, 5.4.2	Fishing			
niusa aestivatis	Dinepack Helling	i icaliwatel Fiall	1 1311	IV d	Onstitute and Oceanic	7.2.0, 7.2, 0.4.2	i iotiliig	Point or non-point source wastewater from residential and urban areas; these	Develop hiologically meaningful standards for the waste	
								discharges (may) contain nutrients, sediments, toxic substances, chemicals,	water effluent (9.1), Increase partnerships to implement	
								etc. / Wastewater (pollutants) that is generated by agricultural, silvicultural	best management practices to reduce ALL sources of	
								and aquacultural activities. These discharges are transported primarily in	agriculture and forestry pollution (9.3), Avoid	
								drainage systems, runoff and eroded; they (may) contain various nutrients,	construction of new dams and remove old, non-	
Ī								toxic substances, chemicals, etc. Excludes erosion and sedimentation that is	functioning dams. Dams that cannot be replaced should	
Ī									be retrofited to allow fish passage. Coordinate with the	
								associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2). / Eacilities or activities that alter the natural water	Virginia Department of Transportations to replace and	
Ī							Domestic and Urban Wastewater /	from machinery (9.2) / Facilities or activities that alter the natural water regime (flow or water levels).	install new culverts that allow movement of aquatic	
					Headwater Streams, Creeks and		Agricultural and Forestry Effluents / Dams	Togime (now or water tevets).	species (7.2).	
18 Etheostoma jessiae	Blueside darter	Freshwater Fish	Freshwater Fish	III c	· ·	9.1, 9.3, 7.2	and Water Management/Use			

	A	В	С	D	E F G	н	L	P	Т	l u		V
1 50	ientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	· ·	Actions	Working_Lands	Notes	<u> </u>
H				.,,,,	no. con manage				Coordinate with the Virginia Department of			
								" ,	Environmental Quality and Virginia Energy to develop			
								8) p	meaningful biological standands for coal and gas			
									extraction (9.2), Increase partnerships to implement			
								chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of			
								contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid			
								environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non-			
								listed with Threat 9.2. This section excludes natural sources of contaminants	functioning dams. Dams that cannot be replaced should			
								that are found in the environment (e.g., mercury found in soils or in river	be retrofited to allow fish passage. Coordinate with the			
								substrates). Intoxication due to natural sources of these contaminants are	Virginia Department of Transportations to replace and			
								likely to result from an indirect threat increasing exposure and to which	install new culverts that allow movement of aquatic			
								conservation actions can be matched. / Wastewater (pollutants) that is	species (7.2).			
								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) / Facilities or				
								activities that alter the natural water regime (flow or water levels).				
							Industrial and Military Effluents /	3 ( ) , , , , , , , , , , , , , , , , , ,				
					Headwater Streams, Cree	eks and	Agricultural and Forestry Effluents / Dams					
19 C	ottus sp. 1	Bluestone sculpin	Freshwater Fish	Freshwater Fish	III a Rivers	9.2, 9.3, 7.2	and Water Management/Use					
آ اِنا ا						, 0.0, /.2		Point or non-point source wastewater from residential and urban areas; these	Increase partnerships to implement best management		+	
									practices to reduce ALL sources of urban pollution (9.1),			
									Increase partnerships to implement best management			
								and aquacultural activities. These discharges are transported primarily in	practices to reduce ALL sources of agriculture and			
								drainage systems, runoff and eroded; they (may) contain various nutrients,	forestry pollution (9.3), Avoid construction of new dams			
								toxic substances, chemicals, etc. Excludes erosion and sedimentation that is	and remove old, non-functioning dams. Dams that			
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	cannot be replaced should be retrofited to allow fish			
								from machinery (9.2) / Facilities or activities that alter the natural water	passage. Coordinate with the Virginia Department of			
								regime (flow or water levels).	Transportations to replace and install new culverts that			
							Domestic and Urban Wastewater /	,	allow movement of aquatic species (7.2).			
							Agricultural and Forestry Effluents / Dams					
20 M	oxostoma sp.	Brassy jumprock	Freshwater Fish	Freshwater Fish	IV c Creeks and Rivers	9.1, 9.3, 7.2	and Water Management/Use					
	•			-			-	Facilities or activities that alter the natural water regime (flow or water levels).	Avoid construction of new dams and remove old, non-			
								/ Wastewater (pollutants) that is generated by agricultural, silvicultural and	functioning dams. Dams that cannot be replaced should			
								aquacultural activities. These discharges are transported primarily in drainage	be retrofited to allow fish passage. Coordinate with the			
									Virginia Department of Transportations to replace and			
									install new culverts that allow movement of aquatic			
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	species (7.2), Increase partnerships to implement best			
								from machinery (9.2) / Deliberately killing individuals of an aquatic species for	management practices to reduce ALL sources of			
								human gain that is governed by management measures. E.g., control of	agriculture and forestry pollution (9.3), Coordinate with			
								lampreys using lampricides, control of mosquitos in their aquatic larval stage	County Extension Agents and VDWR Fisheries Biologists			
								(BTi), water weed cutting.	to educate landowners on the importance of			
									maintaining submerged vegetation in their ponds and lakes. Prevent introduction of Grass Carp			
									(Ctenopharyngodon idella) and suggest targeted			
									vegetation removal when possible (5.4.4).			
							Dams and Water Management/Use /					
					Creeks and Rivers, Large	Rivers,	Agricultural and Forestry Effluents /					
21 N	otropis bifrenatus	Bridle shiner	Freshwater Fish	Freshwater Fish	I a Large Tidal Rivers, Ponds	7.2, 9.3, 5.4.4	Management/Control of Aquatic Species					
7								, , , , , , , , , , , , , , , , , , , ,	Coordinate with the Virginia Department of			
									Environmental Quality and Virginia Energy to develop			
								effluents may result from deliberate or accidental spills that are legal or illegal	meaningful biological standands for coal and gas			
								and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement			
								chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of			
								contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid			
								environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non-			
								listed with Threat 9.2. This section excludes natural sources of contaminants	functioning dams. Dams that cannot be replaced should			
								that are found in the environment (e.g., mercury found in soils or in river	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and			
								substrates). Intoxication due to natural sources of these contaminants are	install new culverts that allow movement of aquatic			
								likely to result from an indirect threat increasing exposure and to which	species (7.2).			
								conservation actions can be matched. / Wastewater (pollutants) that is	Species (7.2).			
								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) / Facilities or				
								activities that alter the natural water regime (flow or water levels).				
1 1							Industrial and Military Effluents /					
							Agricultural and Forestry Effluents / Dams and Water Management/Use					

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1 Scientific Name	Common Name	Grouping	Туре		⊢ OR Hal		Threat Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	V
23 Salvelinus fontinalis	Brook trout	Freshwater Fish	Freshwater Fish	IV a		dwater Streams, Creeks and	-	Changes in Temperature Regimes / Agricultural and Forestry Effluents / Aquatic Animals	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) /	Decrease fossil fuel emissions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Coordinate with VDWR biologists to prevent stocking non-native salmonds such as brown trout (Salmo trutta) into waters containing brook trout (8.1.3).	TOTALIS_Lditus		
24 Pimephales vigilax	Bullhead minnow	Freshwater Fish	Freshwater Fish	IV c	Cro	eks and Rivers	9.1, 9.3, 7.2	Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
25 Etheostoma osburni	Candy darter	Freshwater Fish	Freshwater Fish	l a		eks and Rivers	8.1.3, 9.3, 11.2	Aquatic Animals / Agricultural and Forestry Effluents / Changes in Geochemical Regime	/ 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) / Large-scale changes in an ecosystem's physiochemical makeups	Develop and enforce regulations that prevent the introduction of Variegate Darter (Etheostoma variatum) into waters near to or containing Candy Darter. Educate the public on the potential harm of releasing unused bait and moving aquatic organisms (8.1.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Decrease fossil fuel emmisions. Increase stream shading by planting riparian buffers to cool stream temperatures (11.3)			
								Changes in Temperature Regimes / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Decrease fossil fuel emmisions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
26 Etheostoma collis	Carolina darter	Freshwater Fish	Freshwater Fish  Freshwater Fish	II c	Неа	dwater Streams, Creeks and	11.3, 9.3, 7.2	and Water Management/Use  Changes in Temperature Regimes / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Decrease fossil fuel emissions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			

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1 5	cientific Name	Common Name	Grouping			-	Threat Code	Threat Description	Threat Long	· ·	Ů	Notes	<u> </u>
1 S	A cientific_Name	B Common_Name	Grouping	Type	E F Tier COR	-	H Threat_Code	Threat_Description	Threat_Long  Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, 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) / Facilities or activities that alter the natural water regime (flow or water levels).	Actions  Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop, implement, and enforce meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	Working_Lands	Notes	V
28 P	ercina copelandi	Channel darter	Freshwater Fish	Freshwater Fish	II c	Creeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use  Changes in Temperature Regimes /	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Decrease fossil fuel emmisions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
20 0	ottus sp. 7	Checkered sculpin	Freshwater Fish	Freshwater Fish	IV c	Headwater Streams, Creeks and Rivers	11.3, 9.3, 7.2	Agricultural and Forestry Effluents / Dams and Water Management/Use					
	hrosomus sp. cf. saylori	·	Freshwater Fish	Freshwater Fish		Headwater Streams	9.2, 9.3, 8.1.3	Industrial and Military Effluents / Agricultural and Forestry Effluents / Aquatic Animals	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) /	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Develop regulations to prevent the introduction non-native minnows (leuciscids) into waters containing Clinch Dace. Educate the public on the potential harm of releasing unused bait and moving aquatic organisms (8.1.3)			

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1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR		Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	1
			7.					Wastewater (pollutants) from industrial and military sectors, including mines,	Coordinate with the Virginia Department of	<u></u>	
								energy production sectors and other resource extraction industries. These	Environmental Quality and Virginia Energy to develop		
								effluents may result from deliberate or accidental spills that are legal or illegal			
								and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement		
								chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of		
								contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid		
								environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non- functioning dams. Dams that cannot be replaced should		
								listed with Threat 9.2. This section excludes natural sources of contaminants	be retrofited to allow fish passage. Coordinate with the		
								that are found in the environment (e.g., mercury found in soils or in river	Virginia Department of Transportations to replace and		
								substrates). Intoxication due to natural sources of these contaminants are	install new culverts that allow movement of aquatic		
								likely to result from an indirect threat increasing exposure and to which	species (7.2).		
								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) / Facilities or			
								activities that alter the natural water regime (flow or water levels).			
							Industrial and Military Effluents /	acamaco maranto maranta mater regimo (non en mater terete).			
							Agricultural and Forestry Effluents / Dams				
31 Cottus sp. 4	Clinch sculpin	Freshwater Fish	Freshwater Fish	III c	Headwater Streams	9.2, 9.3, 7.2	and Water Management/Use				
,		-					5	Wastewater (pollutants) from industrial and military sectors, including mines,	Coordinate with the Virginia Department of		
								energy production sectors and other resource extraction industries. These	Environmental Quality and Virginia Energy to develop		
								effluents may result from deliberate or accidental spills that are legal or illegal			
								and (may) contain various nutrients, sediments, toxic substances and	extraction (9.2), Increase partnerships to implement		
								chemicals. Among others. Considering the difficulty in identifying	best management practices to reduce ALL sources of		
								contaminants or contaminant "cocktails" that are responsible for	agriculture and forestry pollution (9.3), Avoid		
								environmental damage, other unknown contaminants from industries will be	construction of new dams and remove old, non- functioning dams. Dams that cannot be replaced should		
								listed with Threat 9.2. This section excludes natural sources of contaminants	be retrofited to allow fish passage. Coordinate with the		
								that are found in the environment (e.g., mercury found in soils or in river	Virginia Department of Transportations to replace and		
								substrates). Intoxication due to natural sources of these contaminants are	install new culverts that allow movement of aquatic		
								likely to result from an indirect threat increasing exposure and to which	species (7.2).		
								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) / Facilities or			
							Industrial and Military Effluents /	activities that alter the natural water regime (flow or water levels).			
							Agricultural and Forestry Effluents / Dams				
32 Percina sciera	Dusky darter	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers	9.2, 9.3, 7.2	and Water Management/Use				
32 l'elcilla sciela	Dusky darter	Trestiwater risii	i restiwater i isii	III C	Creeks and rivers	9.2, 9.3, 7.2	and water management ose	Wastewater (pollutants) that is generated by agricultural, silvicultural and	Increase partnerships to implement best management		
								aquacultural activities. These discharges are transported primarily in drainage			
								systems, runoff and eroded; they (may) contain various nutrients, toxic	protecting/establishing vegetated stream buffers for		
								substances, chemicals, etc. Excludes erosion and sedimentation that is	agriculture and forestry. (9.3), Coordinate with the		
								associated with drainage systems in agriculture and forestry (7.2) or oil spills	Virginia Department of Health to determine which		
								from machinery (9.2) / Liquid domestic waste that is produced by urban	homes in the Copper Creek watershed are straight		
								centers and discharged primarily by the sewage system. E.g., discharges from	piping and provide incentives to connect to municipal		
								municipal waste treatment plants, leaks from sewers/septic tanks, untreated	sewer lines or septic tanks. (9.1.1), Develop and		
								discharged, pit toilets, medical components in water (birth control hormones,	implement techniques to prevent the invasion of the		
								antidepressants, antibiotics), toxoplasmosis, etc. / Plants and animals that	Fantail Darter (Etheostoma flabellare) into remaining		
								were originally present in ecosystem(s), but whose populations have increased	Duskytail Darter habitat. (8.2)		
ı								to a level where they are now "out of control" or overabundant as a direct or			
								indirect result of certain human activities.			
							Agricultural and Forestry Effluents /				
							Domestic Wastewater / Problematic Native				
33 Etheostoma percnurum	n Duskytail darter	Freshwater Fish	Freshwater Fish	I a	Creeks and Rivers	9.3, 9.1.1, 8.2	Plants and Animals				
								Periods in which temperatures of the air, water or soil either exceed or fall	Work toward decreasing fossil fuel emmisions. Develop		
								below the normal range of variation. Events that may or may not be related to	partnerships with landowners to increase stream		
								climate change. / Wastewater (pollutants) that is generated by agricultural,	shading by planting riparian buffers to cool stream		
								silvicultural and aquacultural activities. These discharges are transported	temperatures (11.3), Increase partnerships to		
								primarily in drainage systems, runoff and eroded; they (may) contain various	implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid		
								nutrients, toxic substances, chemicals, etc. Excludes erosion and	construction of new dams and remove old, non-		
								sedimentation that is associated with drainage systems in agriculture and	functioning dams. Dams that cannot be replaced should		
								forestry (7.2) or oil spills from machinery (9.2) / Facilities or activities that	be retrofited to allow fish passage. Coordinate with the		
								alter the natural water regime (flow or water levels).	Virginia Department of Transportations to replace and		
									install new culverts that allow movement of aquatic		
							Changes in Temperature Posimos /		species (7.2)		
							Changes in Temperature Regimes / Agricultural and Forestry Effluents / Dams				
34 Phenacobius crassilabr	rum Fatline minnow	Freshwater Fish	Freshwater Fish	II c	Creeks and Rivers	11.3, 9.3, 7.2	and Water Management/Use				
24 It HeHaconing Classigni	rum i ambs miiillow	I I CONWALE I FISH	i iconwalei FiSII	II C	OLCEVO BLIG UIVELO	11.0, 0.0, /.2	and Marci Lianakemenn 026		T. Control of the Con	1	

A I	В	C	D	I E I	F I	G	Н	L	P	Т	Ιυ	T	V
1 Scientific Name	Common Name	Grouping	Туре		COR Habit		Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	
	<u>-</u>							Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develor meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced she be retrofited to allow fish passage. Coordinate with Virginia Department of Transportations to replace ar install new culverts that allow movement of aquatic species (7.2).	uld he		
35 Aplodinotus grunniens	Freshwater drum	Freshwater Fish	Freshwater Fish	II (	c Creel	ks and Rivers	9.2, 9.3, 7.2	and Water Management/Use					
36 Nothonotus denoncourti	Golden darter	Freshwater Fish	Freshwater Fish		b Creel	ks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Environmental Quality and Virginia Energy to develor meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced she be retrofited to allow fish passage. Coordinate with Virginia Department of Transportations to replace ar install new culverts that allow movement of aquatic species (7.2).	uld he		
Nothonotus	Greenfin darter	Freshwater Fish	Freshwater Fish			ks and Rivers	9.3, 7.2, 11.3	Agricultural and Forestry Effluents / Dams and Water Management/Use / Changes in Temperature Regimes	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) / Facilities or activities that alter the natural water regime (flow or water levels). / 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.	Increase partnerships to implement best manageme practices such as alternate water sources for cattle a protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3.2), Avoid construction onew dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2), Decrease fossil fuel emmisions. Increase streashading by planting riparian buffers to cool stream temperatures. (11.3)	nd f		

## Add and processes of the control	1 Scientific No.	A I	Common Nama	Grouping	Type	E F	G Habitate	Threat Code	Threat Description	P P	Actions	Working Lands	Notes
Secretary of the second of the	1 Scientific_Na	ime	Common_Name	Grouping	Туре	Her COR	Habitats	Threat_Code	Threat_Description	Threat_Long Withdrawal of fresh surface water for human consumption, even production or	Actions Limit impacts of freehwater withdrawals through proper	Working_Lands	
And the second s	38 Alosa medioci	ris	<b>Hickory shad</b>	Freshwater Fish	Fish	IV a	Large Tidal Rivers, Tidal Wetlands, Estuaries, Marine Nearshore, Marine Offshore and		Water Management/Use / Commercial	other purposes. E.g., withdrawal by municipalities, spring water bottling companies and farmers; reservoirs for firefighting, creation of man-made lakes. / Facilities or activities that alter the natural water regime (flow or water levels). / Harvesting of aquatic species for commercial purposes that is governed by management measures for which the environmental impact is primarily on the species (as opposed to habitat damage from sea bottom trawling, Threat 7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife (Threat 9.4.4). E.g., commercial fisheries, use of nets and fishing gear for eels, factory ships, marine mammals caught in industrial	placement and operation (time of year restrictions) and require best practices for intake design (7.2.6), Put tight restrictions on and limit the construction of new dams. Remove obsolete dams to restore and increase spawning and rearing habitat. Require safe, timely and effective passage on functional dams that will not be removed. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species. Ensure BMP adherance for surface water withdrawals and maintain groundwater levels that ensure base flows (7.2), Develop, promote, and enforce sustainable fishing practices across all sectors. This includes bycatch,		include coordinating with the Virginia Marine Resources Commission to establish recreational limit on hickory shad (5.4.1).
entroping region may be the second of the control o										Point or non-point source wastewater from residential and urban areas; these	Increase partnerships to implement best management		
Protein on one positionate or control stated or control stated or control stated and calls an anticology of the protein control state of the protein protein protein state of the protein prot	39 Hybopsis hyps	sinotus	Highback chub	Freshwater Fish	Freshwater Fish	IV c	Headwater Streams	9.1.9.3.7.2	Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that		
Schalage programme, Sectionary, Sectionary, Controllary, Sectionary, Co	ээ турорага пурс	Siliotus	THE HOUCK CHUD	11C31Water 11311	Treshwaterrish	IV C	ricudwater otreams	0.1, 0.0, 7.2	and water Flanagement osc	Point or non-point source wastewater from residential and urban areas: these	Increase partnerships to implement best management		
Point or non-point source wastewater from residential and urban a resist, there discharges granterships to implement and excitations, selements, social exhabitances, chemicals, social and selements	40 Hudsonius alt	tipinnis	Highfin shiner	Freshwater Fish	Freshwater Fish	IV c	,		Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water	Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that		
and exposurations achetics. These discharge are transpagement primarily in drainage systems, runoff and ended; they (may) contain various anxients. Associated with drainage systems, runoff and ended they (may) contains uniteration that is associated with drainage systems in angiculture and interestry (7.2) pr ori significant forms muchinery (2.2) in activities or activities that after the natural water regime (flow or water levels).  4 **Tottus sp. 5*** Hoiston sculpin**  **Tottus sp. 5***  **Hoiston sculpin**  **Freshwater Fish**  **It is a contained to the service of								, ,	9	Point or non-point source wastewater from residential and urban areas; these	Increase partnerships to implement best management		
however, these dams may be dismantled by humans. Dismantling of dams result in habitate by drying-orcerated basin and flooding lands downstream. It could also potentially cause loss of accumulated sediments due to increased flow in streams farther downstream. / Erosion and sedimentation that are due to agricultural activities, ergardless of the presence of lotal drainage systems (threat 7.2.4 and 72.5.) / Deliberately killing individuals of an aquatic species for human gain that is governed by management measures. E.g., control of mosquitos in their aquatic larval stage (BTI), water weed cutting.  The provided alternative to dam and beaver removal such as flow and advantage to property (7.2.12), to provide sufficient riparian before a control of the property of the property (7.2.12), to provide sufficient riparian before a control of mosquitos in their aquatic larval stage (BTI), water weed cutting.  The provided alternative to dam and beaver removal such as flow and advantage to the determative to dam and beaver removal submitted activatives to prevent extreme flooding and dampet to property (7.2.12), to provide sufficient riparian before a control of forest control of forest property (7.2.12), to provide alternative to dam and beaver removal submitted activatives to prevent extreme flooding and dampet to property (7.2.12), to provide alternative to dam and beaver removal submitted activatives to dam and beaver removal submitted and the property (7.2.12), to provide alternative to dam and between the time provide and the property (7.2.12), to provide alternative to dam and beaver removal when control devices to prevent extreme flooding and dampet to property (7.2.12), to provide alternative to dam and beaver removal when control devices to prevent extreme flooding and dampet to property (7.2.12), to provide sufficient riparian between the provided and the prov	41 Cottus sp. 5		Holston sculpin	Freshwater Fish	Freshwater Fish	III c	· ·		Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that		
Beaver Dam Management / Soil Erosion,  Creeks and Rivers, Non-tidal Sedimentation / Management/Control of							Charles and Discore May 155		_	however, these dams may be dismantled by humans. Dismantling of dams result in habitat loss by drying-out the beaver-created basin and flooding lands downstream. It could also potentially cause loss of accumulated sediments due to increased flow in streams farther downstream. / 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). / Deliberately killing individuals of an aquatic species for human gain that is governed by management measures. E.g., control of lampreys using lampricides, control of mosquitos in their aquatic larval stage (BTI), water	Biologists to educate landowners on the importance of beavers in maintaing fish and wildlife habitat. Provide alternative to dam and beaver removal such as flow control devices to prevent extreme flooding and damage to property (7.2.2), Coordinate with the Virginia Department of Forestry to provide sufficient riparian buffers around occupied Ironcolor Shiner ponds when conducting logging activities (9.3.2), Coordinate with County Extension Agents and VDWR Fisheries Biologists to educate landowners on the importance of maintaining submerged vegetation in their ponds and lakes. Prevent introduction of grass carp (Ctenopharyngodon idella) and suggest targeted		

, I A	В	С	D	E F	G	Н	L	P	T	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR		Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
								Periods in which temperatures of the air, water or soil either exceed or fall	Decrease fossil fuel emmisions. Develop partnerships		
ı								below the normal range of variation. Events that may or may not be related to	with landowners to increase stream shading by planting		
ı								climate change. // Wastewater (pollutants) that is generated by agricultural,	riparian buffers to cool stream temperatures (11.3),		
ı								silvicultural and aquacultural activities. These discharges are transported	Develop and enforce regulations that prevent the		
ı								primarily in drainage systems, runoff and eroded; they (may) contain various	introduction of the variegate darter (Etheostoma		
ı								nutrients, toxic substances, chemicals, etc. Excludes erosion and	variatum) into waters near to or containing Kanawha  Darter. Educate the public of the potential harm of		
ı								sedimentation that is associated with drainage systems in agriculture and	releasing unused bait and moving aquatic organisms		
ı								forestry (7.2) or oil spills from machinery (9.2)	(8.1.3), Increase partnerships to implement best		
ı I									management practices to reduce ALL sources of		
ı							Ob an data in Tanan analysis Baring a 44 analysis		agriculture and forestry pollution (9.3).		
ı I					Hardwater Street and Construction		Changes in Temperature Regimes / Aquatic				
43 Ethoootomo konowk	Nanawha dartar	Frankwater Fieh	Frankrister Field		Headwater Streams, Creeks and		Animals / Agricultural and Forestry				
43 Etheostoma kanawh	nae Kanawha darter	Freshwater Fish	Freshwater Fish	III c	Rivers	11.3, 8.1.3, 9.3	Effluents	Deviade in which temperatures of the air water or sail either evened or fall	Decrease fossil fuel emmisions. Develop partnerships		
ı								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	with landowners to increase stream shading by planting		
ı								climate change. / Wastewater (pollutants) that is generated by agricultural,	riparian buffers to cool stream temperatures (11.3),		
ı I								silvicultural and aquacultural activities. These discharges are transported	Increase partnerships to implement best management		
ı								primarily in drainage systems, runoff and eroded; they (may) contain various	practices to reduce ALL sources of agriculture and		
ı I								nutrients, toxic substances, chemicals, etc. Excludes erosion and	forestry pollution (9.3), Avoid construction of new dams		
ı 1								sedimentation that is associated with drainage systems in agriculture and	and remove old, non-functioning dams. Dams that		
ı								forestry (7.2) or oil spills from machinery (9.2) / Facilities or activities that	cannot be replaced should be retrofited to allow fish		
ı 1								alter the natural water regime (flow or water levels).	passage. Coordinate with the Virginia Department of		
ı								atter the natural vator regime (now or water tovels).	Transportations to replace and install new culverts that		
ı							Changes in Temperature Regimes /		allow movement of aquatic species (7.2).		
ı							Agricultural and Forestry Effluents / Dams				
44 Phenacobius teretul	lus Kanawha minnow	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers	11.3, 9.3, 7.2	and Water Management/Use				
i T			-			. ,		Structures (dams) built by beavers create habitats for a number of species;	Coordinate the County Extension Agents and VDWR		
ı 1								however, these dams may be dismantled by humans. Dismantling of dams	Biologists to educate landowners on the importance of		
ı 1								result in habitat loss by drying-out the beaver-created basin and flooding lands	beavers in maintaing fish and wildlife habitat. Provide		
ı								downstream. It could also potentially cause loss of accumulated sediments	alternative to dam and beaver removal such as flow		
ı I								due to increased flow in streams farther downstream. / Wastewater	control devices to prevent extreme flooding and		
ı 1								(pollutants) that is generated by agricultural, silvicultural and aquacultural	damage to property (7.2.2), Increase partnerships to		
ı 1								activities. These discharges are transported primarily in drainage systems,	implement best management practices to reduce ALL		
ı								runoff and eroded; they (may) contain various nutrients, toxic substances,	sources of agriculture and forestry pollution (9.3), Coordinate with County Extension Agents and VDWR		
ı I								chemicals, etc. Excludes erosion and sedimentation that is associated with	Fisheries Biologists to educate landowners on the		
ı								drainage systems in agriculture and forestry (7.2) or oil spills from machinery	importance of maintaining submerged vegetation in		
ı I								(9.2) / Deliberately killing individuals of an aquatic species for human gain	their ponds and lakes. Prevent introduction of grass		
ı								that is governed by management measures. E.g., control of lampreys using	carp (Ctenopharyngodon idella) and suggest targeted		
ı								lampricides, control of mosquitos in their aquatic larval stage (BTi), water	vegetation removal when possible (5.4.4).		
ı I					Headwater Streams, Creeks and		Beaver Dam Management / Agricultural and				
i L.					Rivers, Lakes, Ponds, Non-tidal		Forestry Effluents / Management/Control of				
45 Erimyzon sucetta	Lake chubsucker	Freshwater Fish	Freshwater Fish	III c	Wetlands	7.2.2, 9.3, 5.4.4	Aquatic Species				
ı								Structures (dams) built by beavers create habitats for a number of species;	Coordinate the County Extension Agents and VDWR		
ı								however, these dams may be dismantled by humans. Dismantling of dams	Biologists to educate landowners on the importance of		
ı 1								result in habitat loss by drying-out the beaver-created basin and flooding lands	alternative to dam and beaver removal such as flow		
ı I								downstream. It could also potentially cause loss of accumulated sediments	control devices to prevent extreme flooding and		
ı								due to increased flow in streams farther downstream. / Wastewater	damage to property (7.2.2), Increase partnerships to		
ı 1								(pollutants) that is generated by agricultural, silvicultural and aquacultural	implement best management practices to reduce ALL		
ı I								activities. These discharges are transported primarily in drainage systems,	sources of agriculture and forestry pollution (9.3),		
ı 1								runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and sedimentation that is associated with	Coordinate with County Extension Agents and VDWR		
ı 1								drainage systems in agriculture and forestry (7.2) or oil spills from machinery	Fisheries Biologists to educate landowners on the		
ı								(9.2) / Deliberately killing individuals of an aquatic species for human gain	importance of maintaining submerged vegetation in		
ı 1								that is governed by management measures. E.g., control of lampreys using	their ponds and lakes. Prevent introduction of grass		
ı								lampricides, control of mosquitos in their aquatic larval stage (BTi), water	carp (Ctenopharyngodon idella) and suggest targeted		
ı							Beaver Dam Management / Agricultural and		vegetation removal when possible (5.4.4).		
ı 1					Creeks and Rivers, Lakes,		Forestry Effluents / Management/Control of				
46 Fundulus lineolatus	Lined topminnow	Freshwater Fish	Freshwater Fish	IV c	Ponds, Non-tidal Wetlands	7.2.2, 9.3, 5.4.4	Aquatic Species				
- I James and a second and a				· ·	,	,,		/ Wastewater (pollutants) that is generated by agricultural, silvicultural and	Prevent the introduction of redbreast sunfish (Lepomis		
ı 1								aquacultural activities. These discharges are transported primarily in drainage			
ı								systems, runoff and eroded; they (may) contain various nutrients, toxic	the public on the potential harm of stocking non-native		
ı								substances, chemicals, etc. Excludes erosion and sedimentation that is	gamefish (8.1.3), Increase partnerships to implement		
ı 1								associated with drainage systems in agriculture and forestry (7.2) or oil spills	best management practices to reduce ALL sources of		
ı								from machinery (9.2) / Facilities or activities that alter the natural water	agriculture and forestry pollution (9.3), Avoid		
ı 1								regime (flow or water levels).	construction of new dams and remove old, non-		
ı I								is some (new or mater tereto).	functioning dams. Dams that cannot be replaced should		
ı 1									be retrofited to allow fish passage. Coordinate with the		
. I									Virginia Department of Transportations to replace and		
١						I .			install new culverts that allow movement of aquatic	1	The second secon
							Aquatic Animals / Agricultural and Forestry		species (7.2).		
							Aquatic Animals / Agricultural and Forestry Effluents / Dams and Water				

A	В	С	D	I E I F	G	Т	l L	P	Т	l u l	V
1 Scientific Name	Common Name	Grouning					Threat Description	Threat Long	Actions	Ü	
A  1 Scientific_Name  48 Etheostoma longimanur	B Common_Name  m Longfin darter	Grouping  Freshwater Fish	Type  Freshwater Fish	E F Tier COR	Creeks and Rivers	Threat_Code  9.1, 9.3, 7.2	Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use  Domestic and Urban Wastewater /	Pinterat_Long 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) / Facilities or activities that alter the natural water regime (flow or water levels).  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) / 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.	Actions Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).  Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Decrease fossil fuel emmisions. Increase stream shading by planting riparian buffers to cool stream temperature (11.3).	Working_Lands Notes	V
Paranotropis spectrunculus	Mirror shiner	Freshwater Fish	Freshwater Fish	II c	Headwater Streams. Creeks ar Rivers	9.1, 9.3, 11.3	Agricultural and Forestry Effluents / Changes in Temperature Regimes  Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).		
50 Ichthyomyzon greeleyi  51 Noturus eleutherus	Mountain brook lamprey	y Freshwater Fish  Freshwater Fish	Freshwater Fish	III c	Headwater Streams  Creeks and Rivers	9.1, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction. (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. (9.3.2), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species. (7.2)		

	A	В	С	l D	I E I	F	G	Н	L	P	Т	lυ	1	V
1 8	Scientific_Name	Common_Name	Grouping	Туре	Tier C	OR Habitats		Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	
	occinino_nume		Этогранд						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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
F2	_ythrurus lirus	Mountain shiner	Freshwater Fish	Freshwater Fish	IV c	Creeks and Riv	vore	9.2, 9.3, 7.2	Agricultural and Forestry Effluents / Dams and Water Management/Use					
			FreshwaterFish	Freshwater Fish	IV c		eams, Creeks and Non-tidal				Coordinate the County Extension Agents and VDWR Biologists to educate landowners on the importance of beavers in maintaing fish and wildlife habitat. Provide alternative to dam and beaver removal such as flow control devices to prevent extreme flooding and damage to property (7.2.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Coordinate the County Extension Agents and VDWR Fisheries Biologists to educate landowners on the importance of maintaining submerged vegetation in their ponds and lakes. Prevent removal using Grass Carp (Ctenopharyngodon idella) (5.4.4).			
	·		Frashwater Fish	Freshwater Fish		Crooke and Div			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) / 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.	practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Decrease fossil fuel emmisions. Increase stream shading by planting riparian buffers to cool stream temperatures (11.3).			
	Miniellus scabriceps		Freshwater Fish  Freshwater Fish		II c			9.1, 9.3, 11.3 9.3, 9.1, 7.2		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. / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), develop, biologically meaningful standards for the waste water effluent (9.1), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2)			

Α .	D			I . I	<sub>c</sub> T	<u> </u>	T 11	1 ,		T +	I 11	- V	
1 Cojentific Name	Common Nome	Crouning			_			Threat Description	·	Actions	0		
A  1 Scientific_Name  56 Polyodon spathula	B Common_Name  Paddlefish	G Grouping  Freshwater Fish		E Tier C	C	G abitats reels and Rivers, Large Tidal vers	H Threat_Code	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	Threat_Long  Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is generated by agricultural, 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) / Facilities or activities that alter the natural water regime (flow or water levels).	extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2)	Working_Lands	Notes	
57 Percina crassa	Piedmont darter	Freshwater Fish		IV c		reeks and Rivers	9.1, 9.3, 7.2	Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
58 Notropis ariommus	Preumont darter  Popeye shiner	Freshwater Fish	Freshwater Fish	II c		reeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			

Α Α	В	C	D	E F	G	Н	L	P	<u>T</u>	U	V
Scientific_Name	Common_Name	Grouping	Туре	Tier COI	R Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands No	ites
								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	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement		
								chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for	best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-		
								environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants	functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the		
								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	Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic		
								likely to result from an indirect threat increasing exposure and to which conservation actions can be matched. / Wastewater (pollutants) that is	species (7.2).		
								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			
							Industrial and Military Effluents /	in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Facilities or activities that alter the natural water regime (flow or water levels).			
Moxostoma carinatum	River redhorse	Freshwater Fish	Freshwater Fish	IV b	Creeks and Rivers, Large F	Rivers 929372	Agricultural and Forestry Effluents / Dams and Water Management/Use				
	THE TOURIST	1 1 SOLIWARDI I ISII	FIGSHWARE FISH	IV D	Orocko ana macio, Laige f	0.2, 0.0, /.2	and race, i anagement 030	/ Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported primarily in drainage	Develop and enforce regulations to prevent the introduction of Rock Bass ( <i>Ambloplites rupestris</i> ) into waters containing Roanoke Bass.(8.1.3), Increase		
								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	partnerships to implement best management practices such as alternate water sources for cattle and		
								from machinery (9.2) / Facilities or activities that alter the natural water regime (flow or water levels).	protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3.2), Avoid construction of new dams and remove old, non-functioning dams.		
									Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install		
Ambloplites cavifrons	Roanoke bass	Freshwater Fish	Freshwater Fish	I a	Creeks and Rivers, Large F	Rivers 813 93 72	Aquatic Animals / Agricultural and Forestry Effluents / Dams and Water Management/Use		new culverts that allow movement of aquatic species. (7.2)		
Timble parties out mone	nouncia pass	- I resimules risin	- Toolinator Flori		0.0000 0.0000, 20.000	0.216, 0.6, 7.12	Tital agonion a coo	infrastructure network for transporting oil and natural has products aboveground or underground, including seismic lines, but excluding extraction	Coordinate with USFWS to monitor and assess impacts of pipeline and powerline projects within the species		
								sites (Threat 3.1) / Wastewater (pollutants) that is generated by agricultural, silvicultural and aquacultural activities. These discharges are transported	range (4.2.2), Increase partnerships to implement best management practices to reduce ALL sources of		
								primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic substances, chemicals, etc. Excludes erosion and	agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should		
								sedimentation that is associated with drainage systems in agriculture and forestry (7.2) or oil spills from machinery (9.2) / Facilities or activities that	be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and		
							Oil and Gas Pipelines / Agricultural and Forestry Effluents / Dams and Water	alter the natural water regime (flow or water levels).	install new culverts that allow movement of aquatic species (7.2)		
Percina rex	Roanoke logperch	Freshwater Fish	Freshwater Fish	II a	Creeks and Rivers	4.2.2, 9.3, 7.2	Management/Use	/ Wastewater (pollutants) that is generated by agricultural, silvicultural and	Develop regulations to prevent the introduction of non-		
								aquacultural activities. These discharges are transported primarily in drainage systems, runoff and eroded; they (may) contain various nutrients, toxic	native minnows (Leuscisids) into waters containing Roughhead Shiner. Educate the public of the potential harm in releasing unused bait and moving aquatic		
								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) / Facilities or activities that alter the natural water	organisms, (8.1.3), Increase partnerships to implement best management practices to reduce ALL sources of		
								regime (flow or water levels).	agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should		
									be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and		
							Aquatic Animals / Agricultural and Forestry Effluents / Dams and Water		install new culverts that allow movement of aquatic species. (7.2)		
Notropis semperasper	Roughhead shiner	Freshwater Fish	Freshwater Fish	l b	Creeks and Rivers	8.1.3, 9.3, 7.2	Management/Use				

A	В	С	D	E F G	Н	L	P	Т	U V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands Notes
						·	/ Wastewater (pollutants) 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) / Facilities or activities that alter the natural water regime (flow or water levels).	Develop regulations to prevent the introduction of the Torrent Sucker (Thoburnia rhothoeca) into waters containing Rustyside Sucker. Educate the public of the potential harm of releasing unused bait and moving aquatic organisms (8.1.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	
						Aquatic Animals / Agricultural and Forestry			
C2 Theh	Durahasida aya	Frankrich - Firt	Frankrich - : F'	Headwater Streams, Creeks		Effluents / Dams and Water			
63 Thoburnia hamiltoni  64 Miniellus stramineus	Rustyside sucker	Freshwater Fish	Freshwater Fish	III c Rivers  V c Creeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	
						Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2)	
65 Sander canadensis  66 Lythrurus fasciolaris	Sauger Scarlet shiner	Freshwater Fish  Freshwater Fish	Freshwater Fish  Freshwater Fish	III b Creeks and Rivers  Headwater Streams, Creeks  Rivers	9.2, 9.3, 7.2	and Water Management/Use  Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Develop, biologically meaningful standards for the waste water effluent (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	

A	В	С	D	E F	G	Н	L	P	Т	U	V
1 Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
		Faceburges Field			Create and Divers	24.03.72	Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).		
Nothonotus acuticeps	Sharphead darter	Freshwater Fish	Freshwater Fish	I a	Creeks and Rivers	9.1, 9.3, 7.2	and Water Management/Use				
							Changes in Temperature Regimes / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Decrease fossil fuel emissions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).		
8 Percina oxyrhynchus	Sharpnose darter	Freshwater Fish	Freshwater Fish	II c	Creeks and Rivers, Large Rivers	11.3, 9.3, 7.2	and Water Management/Use				
59 Acipenser brevirostrum		Freshwater Fish	Fish	I c	Large Tidal Rivers, Estuaries, Marine Nearshore	5.4.2, 7.2, 9.1	Commercial Fishing / Dams and Water Management/Use / Domestic and Urban Wastewater	Harvesting of aquatic species for commercial purposes that is governed by management measures for which the environmental impact is primarily on the species (as opposed to habitat damage from sea bottom trawling, Threat 7.3.6). Includes bycatch but excludes ghost fishing gear entangling wildlife (Threat 9.4.4). E.g., commercial fisheries, use of nets and fishing gear for eels, factory ships, marine mammals caught in industrial fishing nets. / Facilities or activities that alter the natural water regime (flow or water levels). / 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 Marine Resources to develop and enforce regulations to prevent the overfishing by recreational and commercial fisheries (5.4.2), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2), Domestic wastewater from urban centers via SSO systems and runoff from urban and agricultural development contribute to poor water quality. Coordinate with VDEQ and municipal regulators on water treatment upgrades and water quality improvements (9.1).		An additional conservation action would be to Increase partnerships to implement best management practices such as alternate water sources for cattle and protecting/establishing vegetated stream buffers for agriculture and forestry. (9.3.2)
. Separate Drevinositum	Silvinose stargeon		TOIL	i C	. ASTRO TOGRAPHO	0.7.2, 7.2, 0.1	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) / Facilities or activities that alter the natural water regime (flow or water levels).	practices to reduce ALL sources of urban pollution (9.1),		
Denois ender	Olada da c	For a bound of the			Out also and Dis		Agricultural and Forestry Effluents / Dams				
Percina williamsi	Sickle darter	Freshwater Fish	Freshwater Fish	I c	Creeks and Rivers	9.1, 9.3, 7.2	and Water Management/Use				

	Α	В	С	D	E F	G	Н	L	P	Т	U V
1 5	cientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands Notes
1 5	A icientific_Name	Common_Name	Grouping		E F Tier COR		H 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	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	·
								Industrial and Military Effluents /	detailed that are included water regime (now or water create).		
71	1oxostoma anisurum	Silver redhorse	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers, Large Rivers	9.2, 9.3, 7.2	Agricultural and Forestry Effluents / Dams and Water Management/Use			
	irimystax cahni	Slender chub	Freshwater Fish	Freshwater Fish		Creeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop, implement, and enforce meaningful biological standands for coal and gas extraction (9.2),Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species. (7.2)	
73 <b>!</b>	10xostoma breviceps	Smallmouth redhorse	Freshwater Fish	Freshwater Fish	IV b	Creeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and	Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	

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Position to management income anotherwise from management income anotherwise from management income anotherwise from management income anotherwise from management in advantagement in management in management in advantagement in management in ma	
Point or non-point source wastewater from residential and urban areas, these discharges (may) contain nurbients, sedients, toxic substances, chemicals, etc. //Wastewater (pollutans) that is generated by agricultural, shick-cultural and aquicultural activities. These discharges are transported primarily in drainage systems, runoff and ecoded; they (may) contain various substances, chemicals, etc. Excludes erosion and sedimentation that is associated with drainage systems in agriculture and forestry (2) or oll spills from machinery (8, 2) / Facilities or activities that atter the natural veter regime (flow or water fewels).  Domestic and Urban Wastewater / Agroutural and Forestry Effluents / Dames and Water Management/Use  Point or non-point source wastewater from residential and urban areas, these discharges (may) contain nurbients, sediments), to contain nurban search and aquicultural activities. These discharges importance that after the natural veter regime (flow or water fewels).  Point or non-point source wastewater from residential and urban areas, these discharges (may) contain nurbants, sediments), to contain nurbants, sediments, to calculate standard and aquicultural activities. These discharges are transported primarily in derivatives, and appropriate of the point or non-point source wastewater from residential and urban areas, these discharges (may) contain nurbants, sediments, to calculate standards or advantage of the contain nurbants, and appropriate to the contain nurbants, sediments, to calculate and torstory (2) or oil spills from machinery (2) 2) / Facilities or activities that atter the natural water regime (flow or water fevels).	
Point or non-point source wastewater from residential and urban areas; these discharges (may) contain nutrients, sediments, toxic substances, chemicals, etc. //Wastewater (pollutants) theat is generated by agricultural, silvicultural and advancers are transprinted primary 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) / Facilities or activities that alter the natural water regime (flow or water levels).  Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop, implement and and assextraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.1), no-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Tanacham and	
Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams Freshwater Fish Freshwater Fish I a Creeks and Rivers 9.1, 9.3, 7.2 and Water Management/Use	
Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource and resource and other resources and resource an	

	A	В	С	D	E F	G	Н	L	Р	Т	U		V
1	Scientific_Name	Common_Name	Grouping		Tier COI	R Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	
								Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
78	Noturus flavus	Stonecat	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers	9.2, 9.3, 7.2	and Water Management/Use					
79	Morone saxatilis	Striped bass	Freshwater Fish	Fish	III a	Headwater Streams, Large Rivers, Tidal Creeks and Rivers, Large Tidal Rivers, Estuaries, Marine Nearshore, Marine Offshore and Oceanic	7.2.6, 7.2.1, 5.4.1		Withdrawal of fresh surface water for human consumption, crop production or other purposes. E.g., withdrawal by municipalities, spring water bottling companies and farmers; reservoirs for firefighting, creation of man-made lakes. / Construction, operation and water management using non-power dams. Includes the dismantling of man-made dams and excludes dams used for power generation (Threat 3.3.1) but excludes lock system (Threat 4.3.3.) / Harvesting of aquatic species for recreation or subsistence that is governed by management measures. Illegal harvesting by fishing should be classified unde "Poaching/persecution of aquatic species" (Threat 5.4.4). Includes bycatch and damage to released individuals, but exercises contamination of habitats due to solid lead from fishing gear (Threat 9.4.2). E.g., recreational fishing of sturgeon, accidental catching of mudpuppies during ice fishing, turtles ingesting hooks, personal collection for fishkeeping with authorized species.	placement and operation (time of year restrictions) and require best practices for intake design (7.2.6), Continue to work with landowners and state/regional/local entities to remove barriers not critical to energy generation or water management (i.e. low-head dams, perched culverts.) Avoid construction of new dams and remove old non-functioning dams. Dams that cannot		include coordinatir Department of Ma	•
	Phenacobius mirabilis			Freshwater Fish	IV c	Creeks and Rivers	9.2, 9.3, 7.2		Wastewater (pollutants) from industrial and military sectors, including mines, energy production sectors and other resource extraction industries. These effluents may result from deliberate or accidental spills that are legal or illegal and (may) contain various nutrients, sediments, toxic substances and chemicals. Among others. Considering the difficulty in identifying contaminants or contaminant "cocktails" that are responsible for environmental damage, other unknown contaminants from industries will be listed with Threat 9.2. This section excludes natural sources of contaminants that are found in the environment (e.g., mercury found in soils or in river substrates). Intoxication due to natural sources of these contaminants are likely to result from an indirect threat 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) / Facilities or activities that alter the natural water regime (flow or water levels).	Environmental Quality and Virginia Energy to develop, implement, and enforce meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			

A	В	С	D	E F	G	П		P	<u> </u>	<u> </u>		v
Scientific_Name	Common_Name	Grouping	Туре	Tier COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes	
Filosophus and a second se		Farabanas Fish			Headwater Streams, Creeks and		Changes in Temperature Regimes / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Decrease fossil fuel emissions. Develop partnerships with landowners to increase stream shading by planting riparian buffers to cool stream temperatures (11.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
Etheostoma swannanoa	Swannanoa darter	Freshwater Fish	Freshwater Fish	IV b	Rivers	11.3, 9.3, 7.2	and Water Management/Use	/ Wastewater (pollutants) that is generated by agricultural, silvicultural and	Develop regulations to prevent the introduction non-			
							Aquatic Animals / Agricultural and Forestry	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) / Facilities or activities that alter the natural water regime (flow or water levels).	native leuciscids into waters containing Tennessee Dace. Educate the public on the potential harm of releasing unused bait and moving aquatic organisms (8.1.3), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2)			
Chrosomus (Phoxinus) tennesseensis	Tennessee dace	Freshwater Fish	Freshwater Fish	I a	Headwater Streams	8.1.3, 9.3, 7.2	Effluents / Dams and Water  Management/Use					
B Exoglossum laurae	Tonguetied minnow	Freshwater Fish	Freshwater Fish	III c	Creeks and Rivers	9.1, 9.3, 7.2	Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Increase partnerships to implement best management practices to reduce ALL sources of urban pollution (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, non-functioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
							Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Coordinate with the Virginia Department of Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (3.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Coordinate with the Virginia Department of Health to determine which homes or businesses in the Big Sandy watershed are straight piping and provide incentives to connect to municipal sewer lines or septic tanks. (9.1.1)			

A	В	С	D	Е	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	
85 Ammocrypta clara	Western sand darter	Freshwater Fish	Freshwater Fish	IV	С	Creeks and Rivers	9.2, 9.3, 7.2	Industrial and Military Effluents / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).			
86 Miniellus alborus	Whitemouth shiner	Freshwater Fish	Freshwater Fish			Headwater Streams, Creeks ar Rivers		Domestic and Urban Wastewater / Agricultural and Forestry Effluents / Dams and Water Management/Use	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) / Facilities or activities that alter the natural water regime (flow or water levels).	Develop, biologically meaningful standards for the waste water effluent (9.1), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Avoid construction of new dams and remove old, nonfunctioning dams. Dams that cannot be replaced should be retrofited to allow fish passage. Coordinate with the Virginia Department of Transportations to replace and install new culverts that allow movement of aquatic species (7.2).	t l		
87 Noturus flavipinnis	Yellowfin madtom	Freshwater Fish	Freshwater Fish	ı	a	Creeks and Rivers	9.2, 9.3, 8.1.3	Industrial and Military Effluents / Agricultural and Forestry Effluents / Aquatic Animals	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) /	Environmental Quality and Virginia Energy to develop meaningful biological standands for coal and gas extraction (9.2), Increase partnerships to implement best management practices to reduce ALL sources of agriculture and forestry pollution (9.3), Develop regulation to prevent the non-native madtoms (Noturus spp.) into waters containing Yellowfin Madtom. Educate the public on the potential harm of releasing unused baits and the moving aquatic organisms (8.1.3).			