

	A	B	C	D	E	F	G	H	L	P	T	U	V
1	Scientific_Name	Common_Name	Grouping	Type	Tier	COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
2	Neotoma magister	Allegheny woodrat	Mammal	Mammal	IV	a	Forests and Woodlands, Cliff and Talus, Caves and Karst,	1.1.2., 11.1.1, 8.1.1	/ Changes in Vegetation Communities / Terrestrial Animals	/ Major changes in an ecosystem resulting in changes to vegetation communities distinguished from natural vegetation succession, which may threaten open-country species (Threat 7.3.2). E.g., migration of deciduous trees towards the boreal forest, rising sea levels, desertification, thawing permafrost (in tundra), coral bleaching. /	Protect rocky habitat from fragmentation and loss. (1.1.2), Address oak decline. Promote oak-hickory forests. Plant hybrid American chestnut. (11.1.1), Treat raccoons for the roundworm parasite. (8.1.1)	Timbered Forested Uplands	
3	Sylvilagus obscurus	Appalachian cottontail	Mammal	Mammal	IV	a	Forests and Woodlands, Shrublands	1.1.2, 8.1.1,	Low-Density Housing Areas / Terrestrial Animals /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect upland hardwoods from human development. (1.1.2), Address competition from eastern cottontail through habitat protection. (8.1.1)	Timbered Forested Uplands	
4	Tursiops truncatus	Atlantic bottlenose dolphin	Mammal	Mammal	III	b	Tidal Rivers and Streams, Estuaries, Marine Nearshore, Marine Offshore and Oceanic	5.4.1, 5.4.2, 8.4.2	Recreational of Subsistence Fishing / Commercial Fishing / Viral Pathogens	Harvesting of aquatic species for recreation or subsistence that is governed by management measures. Illegal harvesting by fishing should be classified under "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. / 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. / e.g., ranavirus in amphibians, rabies in raccoons.	1. Maintain an effective marine mammal stranding response program to accurately identify and document recreational fishery interactions among bottlenose dolphin strandings in Virginia. Develop a voluntary recreational fishery interaction reporting program for saltwater anglers to further quantify the frequency and magnitude of interactions between dolphins and recreational fishing gear. Compile, summarize and disseminate the information gathered in actions #1 and #2 to appropriate fisheries management agencies to inform future actions designed to avoid or minimize recreational fishery interactions among bottlenose dolphins (5.4.1). 2. Work with the VMRC to establish a fishery observer program for state regulated commercial fisheries in Virginia waters to document bycatch rates and other data associated with state fisheries-related bottlenose dolphin interactions. Develop the justification for and explore the feasibility of establishing a state commercial fishery gear marking system to further aid in the determination of dolphin interactions with state fisheries. Compare fishing effort and fishery interaction data collected from stranded bottlenose dolphins to identify temporal and spatial trends in commercial fishery-related takes (5.4.2). 3. Maintain an effective marine mammal stranding response program that has the capacity and expertise to detect pathogens, parasites and contaminants in bottlenose dolphin (and other marine mammal species) strandings in Virginia. Develop a state institutional framework for detecting and responding to disease-related dolphin mortality events that require resources and staff beyond capacity of the VA Stranding Response Program or any single state or federal agency. Help ensure funding for the NOAA Fisheries Unusual Mortality Working Group gets reinstated and is maintained over the long term so that future pathogenic-related mortality events receive the necessary oversight and assistance from the working group (8.4.2).		
5	Glaucomys sabrinus coloratus	Carolina northern flying squirrel	Mammal	Mammal	I	a	Boreal Forest	11.1.1, 11.3.4, 9.5.1	Changes in Vegetation Communities / Increase in Temperature Fluctuations / Acid Rain	Major changes in an ecosystem resulting in changes to vegetation communities distinguished from natural vegetation succession, which may threaten open-country species (Threat 7.3.2). E.g., migration of deciduous trees towards the boreal forest, rising sea levels, desertification, thawing permafrost (in tundra), coral bleaching. / Increase in temperature fluctuations, which disturb the phenological responses of wildlife. E.g., raise in the frequency of freeze-thaw events, rain-on-snow events, etc. /	Plant and promote (selective cutting) spruce-fir forests. (11.1.4), Reverse climate change. (11.3.4), Reduce acid rain emissions. (9.5.1)		
6	Peromyscus gossypinus gossypinus	Cotton mouse	Mammal	Mammal	IV	a	Forests and Woodlands, Beaches and Dunes	1.1.1, 1.2.1,	Dense Housing and Urban Areas / Commercial and Industrial Areas /	Medium- to high-density development for residential use and buildings for related services. Allows very little to no maintenance of ecological functions. E.g., urban areas, suburbs, villages, schools, libraries, seniors' housing, hospitals / industrial parks, manufacturing plants, offices, shopping centers, all military base facilities, power plants, seaports, shipyards, airports /	Protection and management of swamps and bottomland and riparian forests. (1.1.1, 1.2.1)	Timbered Forested Uplands	
7	Sciurus niger cinereus	Delmarva fox squirrel	Mammal	Mammal	II	a	Forests and Woodlands	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect and expand current habitat. (1.1.2)	Timbered Forested Uplands	

	A	B	C	D	E	F	G	H	L	P	T	U	V
1	Scientific_Name	Common_Name	Grouping	Type	Tier	COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
8	Myotis leibii	Eastern small-footed myotis	Mammal	Mammal	IV	a	Forests and Woodlands, Cliff and Talus, Artificial Impoundments, Caves and Karst	6.1.7, 8.4.3., 1.1.2	Caving / / Low-Density Housing Areas	/ / Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges.	Restrict caving activities during the hibernation period at known hibernacula. (6.1.7), Support studies addressing the impacts of White-nose Syndrome (WNS) on cave bats (e.g., biological and chemical fungal treatments). (8.4.3), Protect rocky habitat from fragmentation and loss. (1.1.2)		
9	Spilogale putorius putorius	Eastern spotted skunk	Mammal	Mammal	IV	a	Forests and Woodlands	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect rocky habitat from fragmentation and loss. (1.1.2)		
10	Balaenoptera physalus	Fin whale	Mammal	Mammal	IV	b	Marine Offshore and Oceanic	6.1.8, 4.3.1, 3.3.2	Wildlife Observation/Photography / Shipping / Wind Farms	Wildlife observation activities without any gathering that disturb the target species due to harassment or through the use of attractants and lures. E.g., photographers attracting birds of prey with domestic rodents. / Ships striking wildlife, damage associated with wake waves, disturbance caused by the presence of vessels transporting people and goods /	1. Develop a marine wildlife harassment reporting program for the general public designed to document and track irresponsible boater viewing behavior around large whale species. Develop a social marketing campaign that clearly defines harassment and promotes safe viewing practices and behaviors around large whales. Integrate marine wildlife-safe viewing practices and behaviors in boating safety course curricula, on boat registration and saltwater license webpages and in the annual publications of saltwater fishing regulations (6.1.8). 2. Maintain an effective marine mammal stranding response program that is able to accurately detect, document and track trends in vessel strike-related fin whale strandings. Develop a state institutional framework for detecting and responding to large whale vessel collision-related stranding events that require resources and staff beyond capacity of the VA Stranding Response Program or any single state or federal agency. Work with the VA Maritime Association, Ports Authority, US Navy, NOAA Fisheries and other stakeholders to develop best practices for minimizing vessel collisions in the lower Chesapeake Bay where federal vessel speed restrictions do not apply (4.3.1). 3. Support and participate in state and regional research and monitoring initiatives designed to assess the impacts of offshore wind energy development on fin whales. Ensure the expansion of NOAA Fisheries aerial surveys into Virginia offshore waters to fully assess the seasonal distribution and abundance of fin whales (and other large whale species) in the central Atlantic WEA by requiring the OSW industry to fund these surveys through the state permitting process. Ensure the expansion of the passive acoustic monitoring network in the central Atlantic Wind Energy Area (WEA) to measure the presence of fin whales before, during and after construction of OSW facilities within the WEA by requiring the OSW industry to fund the expansion and maintenance of the network through the state permitting process (3.3.2).		
11	Myotis grisescens	Gray bat	Mammal	Mammal	IV	a	Forests and Woodlands, Grasslands, Shrublands	6.1.7	Caving / /	/ /	Restrict caving activities during both summer and winter periods at select caves supporting gray bats. (6.1.7)		
12	Lasiurus cinereus	Hoary bat	Mammal	Mammal	IV	a	Forests and Woodlands	3.3.1	Hydroelectric Dams / /	/ /	Curtail wind operations during spring and fall migration. (3.3.1)	Timbered Forested Uplands	

	A	B	C	D	E	F	G	H	L	P	T	U	V
1	Scientific_Name	Common_Name	Grouping	Type	Tier	COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
13	Megaptera novaengliane	Humpback whale	Mammal	Mammal	III	b	Marine Offshore and Oceanic	6.1.8, 5.4.2, 4.3.1	Wildlife Observation/Photography / Commercial Fishing / Shipping	Wildlife observation activities without any gathering that disturb the target species due to harassment or through the use of attractants and lures. E.g., photographers attracting birds of prey with domestic rodents. / 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. / Ships striking wildlife, damage associated with wake waves, disturbance caused by the presence of vessels transporting people and goods	1. Support and participate in state and regional research and monitoring initiatives designed to assess the impacts of offshore wind (OSW) energy development on northern right whales. Ensure the expansion of NOAA Fisheries aerial surveys into Virginia offshore waters to fully assess the seasonal distribution and abundance of right whales (and other large whale species) in the central Atlantic Wind Energy Area (WEA) by requiring the OSW industry to fund these surveys through the state permitting process. Ensure the expansion of the passive acoustic monitoring network in the central Atlantic WEA to measure the presence of right whales before, during and after construction of OSW facilities within the WEA by requiring the OSW industry to fund the expansion and maintenance of the network through the state permitting process (6.1.8). 2. Work with the VMRC to establish a fishery observer program for state regulated commercial fisheries in Virginia waters to document the prevalence and types of northern right whale interactions with state fisheries. Develop the justification for and explore the feasibility of establishing a state commercial fishery gear marking system to further aid in the determination of large whale interactions with state fisheries. Work with state fisheries managers, commercial gear specialists and commercial fishers to develop best practices for avoiding or minimizing large whale interactions with state fisheries (5.4.2). 3. Maintain an effective marine mammal stranding response program that is able to accurately detect, document and track trends in vessel strike-related northern right whale strandings. Develop a state institutional framework for detecting and responding to large whale vessel collision related stranding events that require resources and staff beyond capacity of the VA Marine Mammal Stranding Response Program or any single state or federal agency. Work with the VA Maritime Association, Ports Authority, US Navy, NOAA Fisheries and other stakeholders to develop best practices for minimizing vessel collisions in the lower Chesapeake Bay where federal vessel speed restrictions do not apply (4.3.1).		
14	Myotis sodalis	Indiana bat	Mammal	Mammal	I	a	Forests and Woodlands, Grasslands, Shrublands, Caves and Karst	6.1.7, 8.4.3., 3.3.1	Caving / / Hydroelectric Dams	/ /	Restrict caving activities during the hibernation period at known hibernacula. (6.1.7), Support studies addressing the impacts of White-nose Syndrome (WNS) on cave bats (e.g., biological and chemical fungal treatments). (8.4.3), Curtail wind operations during spring and fall migration. Site land based wind away from known major hibernacula. (3.3.1)	Timbered Forested Uplands	
15	Myotis lucifugus	Little brown bat	Mammal	Mammal	I	a	Forests and Woodlands, Grasslands, Shrublands, Caves and Karst	6.1.7, 8.4.3., 3.3.1	Caving / / Hydroelectric Dams	/ /	Restrict caving activities during the hibernation period at known hibernacula. (6.1.7), Support studies addressing the impacts of White-nose Syndrome (WNS) on cave bats (e.g., biological and chemical fungal treatments). (8.4.3), Curtail wind operations during spring and fall migration. Site land based wind away from known major hibernacula. (3.3.1)	Timbered Forested Uplands	
16	Sorex dispar dispar	Long-tailed shrew	Mammal	Mammal	IV	c	Forests and Woodlands, Cliff and Talus	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect upland hardwoods (talus - cool damp forest) from human development. (1.1.2)	Timbered Forested Uplands	
17	Sylvilagus palustris palustris	Marsh rabbit	Mammal	Mammal	IV	a	Forests and Woodlands, Riparian and Floodplains	1.1.2, 11.3.4,	Low-Density Housing Areas / Increase in Temperature Fluctuations /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / Increase in temperature fluctuations, which disturb the phenological responses of wildlife. E.g., raise in the frequency of freeze-thaw events, rain-on-snow events, etc. /	Protect upland hardwoods (talus - cool damp forest) from human development. (1.1.2), Reverse climate change. (11.3.4)	Timbered Forested Uplands	
18	Myotis septentrionalis	Northern long-eared bat	Mammal	Mammal	I	a	Forests and Woodlands, Caves and Karst	6.1.7, 8.4.3., 5.3.1	Caving / / Complete Removal of the Forest Cover	/ / Cutting removing the majority of the forest cover. E.g., clear-cutting and related cuts (CT, CRS, CPRS, CPHRS, CPPTM).	Restrict caving activities during the hibernation period at known hibernacula. (6.1.7), Support studies addressing the impacts of White-nose Syndrome (WNS) on cave bats (e.g., biological and chemical fungal treatments). (8.4.3), Protect/manage known maternity roosts. (5.3.1)	Timbered Forested Uplands	

	A	B	C	D	E	F	G	H	L	P	T	U	V
1	Scientific_Name	Common_Name	Grouping	Type	Tier	COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
19	Eubalaena glacialis	Northern right whale	Mammal	Mammal	I	a	Marine Offshore and Oceanic	3.3.2, 5.4.2, 4.3.1	Wind Farms / Commercial Fishing / Shipping	/ 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. / Ships striking wildlife, damage associated with wake waves, disturbance caused by the presence of vessels transporting people and goods	1. Support and participate in state and regional research and monitoring initiatives designed to assess the impacts of offshore wind (OSW) energy development on northern right whales. Ensure the expansion of NOAA Fisheries aerial surveys into Virginia offshore waters to fully assess the seasonal distribution and abundance of right whales (and other large whale species) in the central Atlantic Wind Energy Area (WEA) by requiring the OSW industry to fund these surveys through the state permitting process. Ensure the expansion of the passive acoustic monitoring network in the central Atlantic WEA to measure the presence of right whales before, during and after construction of OSW facilities within the WEA by requiring the OSW industry to fund the expansion and maintenance of the network through the state permitting process. (3.3.2) 2. Work with the VMRC to establish a fishery observer program for state regulated commercial fisheries in Virginia waters to document the prevalence and types of northern right whale interactions with state fisheries. Develop the justification for and explore the feasibility of establishing a state commercial fishery gear marking system to further aid in the determination of large whale interactions with state fisheries. Work with state fisheries managers, commercial gear specialists and commercial fishers to develop best practices for avoiding or minimizing large whale interactions with state fisheries (5.4.2). 3. Maintain an effective marine mammal stranding response program that is able to accurately detect, document and track trends in vessel strike-related northern right whale strandings. Develop a state institutional framework for detecting and responding to large whale vessel collision related stranding events that require resources and staff beyond capacity of the VA Marine Mammal Stranding Response Program or any single state or federal agency. Work with the VA Maritime Association, Ports Authority, US Navy, NOAA Fisheries and other stakeholders to develop best practices for minimizing vessel collisions in the lower Chesapeake Bay where federal vessel speed restrictions do not apply. (4.3.1)		
20	Peromyscus leucopus easti	Pungo white-footed mouse	Mammal	Mammal	III	c	Forests and Woodlands, Beaches and Dunes	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect, manage, preserve coastal habitats. (1.1.2),	Timbered Forested Uplands	
21	Corynorhinus rafinesquii macrotis	Rafinesque's eastern bigeared bat	Mammal	Mammal	IV	a	Forests and Woodlands, Grasslands, Shrublands	1.1.2., 4.1.3,	/ Bridges /	/ includes road and rail network bridges. /	Protect coastal bottomland hardwood forests from development. (1.1.2), Identify, manage, protect bridges and culverts where this species is known to occupy. (4.1.3)	Timbered Forested Uplands	
22	Lasiurus borealis	Red bat	Mammal	Mammal	IV	a	Forests and Woodlands	3.3.1	Hydroelectric Dams / /	/ /	Curtail wind operations during spring and fall migration. (3.3.1)	Timbered Forested Uplands	
23	Microtus chrotorrhinus	Rock vole	Mammal	Mammal	II	a	Forests and Woodlands,	5.3.1, 8.1.1, 8.1.2	Complete Removal of the Forest Cover / Terrestrial Animals / Terrestrial Plants	Cutting removing the majority of the forest cover. E.g., clear-cutting and related cuts (CT, CRS, CPRS, CPHRS, CPPTM). / /	Protect/conservate high order stream habitat. (5.3.1), Control invasive insects (e.g., hemlock wooly adelgide, gypsy moth, etc.) that may change both habitat and prey base. (8.1.1), Control invasive plants (e.g., Japanese stilt grass) that may change both habitat and prey base. (8.1.2)	Timbered Forested Uplands	
24	Lasionycteris noctivagans	Silver-haired bat	Mammal	Mammal	IV	a	Forests and Woodlands	3.3.1	Hydroelectric Dams / /	/ /	Curtail wind operations during spring and fall migration. (3.3.1)	Timbered Forested Uplands	
25	Lepus americanus virginianus	Snowshoe hare	Mammal	Mammal	I	a	Forests and Woodlands, Boreal Forests	11.3.4, 11.1.1,	Increase in Temperature Fluctuations / Changes in Vegetation Communities /	Increase in temperature fluctuations, which disturb the phenological responses of wildlife. E.g., raise in the frequency of freeze-thaw events, rain-on-snow events, etc. / Major changes in an ecosystem resulting in changes to vegetation communities distinguished from natural vegetation succession, which may threaten open-country species (Threat 7.3.2). E.g., migration of deciduous trees towards the boreal forest, rising sea levels, desertification, thawing permafrost (in tundra), coral bleaching. /	Reverse climate change (11.3.4), Plant and promote (selective cutting) spruce-fir forests. Promote understory growth. (11.1.1)	Timbered Forested Uplands	
26	Sciurus niger niger	Southeastern fox squirrel	Mammal	Mammal	III	a	Forests and Woodlands	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Expand existing habitat. manage, protect and connect longleaf pine habitats. (1.2)	Timbered Forested Uplands	

	A	B	C	D	E	F	G	H	L	P	T	U	V
1	Scientific_Name	Common_Name	Grouping	Type	Tier	COR	Habitats	Threat_Code	Threat_Description	Threat_Long	Actions	Working_Lands	Notes
27	Myotis austroriparius	Southeastern myotis	Mammal	Mammal	IV	a	Forests and Woodlands, Grasslands, Shrublands,	1.1.2	Low-Density Housing Areas / /	Extensive development that is residential (including resorts), where the spacing allows ecological functions to continue to some extent. This type of development is seen particularly in rural and agroforestry areas. E.g., residential buildings in agricultural areas, cottages, vacation homes near water bodies, ecotourism lodges, fishing resorts, backcountry ski lodges. / /	Protect coastal bottomland hardwood forests from development. (6.3)	Timbered Forested Uplands	
28	Perimyotis subflavus	Tri-colored bat	Mammal	Mammal	III	a	Forests and Woodlands, Caves and Karst	6.1.7, 8.4.3., 4.1.3	Caving / / Bridges	/ / includes road and rail network bridges.	Restrict caving activities during the hibernation period at known hibernacula. (6.1.7), Support studies addressing the impacts of White-nose Syndrome (WNS) on cave bats (e.g., biological and chemical fungal treatments). (8.4.3), Identify, manage, protect bridges and culverts where this species is known to occupy. (4.1.3)	Timbered Forested Uplands	
29	Corynorhinus townsendii virginianus	Virginia big-eared bat	Mammal	Mammal	I	a	Forests and Woodlands, Grasslands, Shrublands, Caves and Karst,	6.1.7, 3.3.1,	Caving / Hydroelectric Dams /	/ /	Restrict caving activities during both summer and winter periods at select caves supporting gray bats. (6.1.7), Curtail wind operations during spring and fall migration. Site land based wind away from known major hibernacula. (3.3.1)		
30	Glaucomys sabrinus fuscus	Virginia northern flying squirrel	Mammal	Mammal	I	a	Boreal Forest	11.1.1, 9.5.1, 11.3.4	Changes in Vegetation Communities / Acid Rain / Increase in Temperature Fluctuations	Major changes in an ecosystem resulting in changes to vegetation communities distinguished from natural vegetation succession, which may threaten open-country species (Threat 7.3.2). E.g., migration of deciduous trees towards the boreal forest, rising sea levels, desertification, thawing permafrost (in tundra), coral bleaching. / / Increase in temperature fluctuations, which disturb the phenological responses of wildlife. E.g., raise in the frequency of freeze-thaw events, rain-on-snow events, etc.	Plant and promote (selective cutting) spruce-fir forests. (11.1.1), Reduce acid rain emissions. (9.5.1), Reverse climate change. (11.3.4)		
31	Sorex palustris	Water shrew	Mammal	Mammal	II	a	Forests and Woodlands, Boreal Forests, Riparian and Floodplains	5.3.1, 8.1.1, 8.1.2	Complete Removal of the Forest Cover / Terrestrial Animals / Terrestrial Plants	Cutting removing the majority of the forest cover. E.g., clear-cutting and related cuts (CT, CRS, CPRS, CPHRS, CPPTM). / /	Protect/conservate high order stream habitat. (5.3.1), Control invasive insects (e.g., hemlock woolly adelgide, gypsy moth, etc.) that may change both habitat and prey base. (8.1.1), Control invasive plants (e.g., Japanese stilt grass) that may change both habitat and prey base. (8.1.2)	Timbered Forested Uplands	
32	Trichechus manatus latirostris	West Indian manatee	Mammal	Mammal	III	b	Marine Nearshore	6.1.4, 9.1.2, 9.6.2	Recreational Boating / Runoff / Thermal Pollution	Use of recreational boats and watercraft that disturb wildlife, incur collisions with animals, and induce wake damage. Excludes the spread of invasive species (Threat 8.1). E.g., yacht, zodiac boats, watercraft / Effluents resulting from urban activities that are separate from the water supply system. For oils and other hydrocarbons, refer to Threat 9.2.1. E.g., salt/sand used to de-ice roads, fertilizers and pesticides used for lawns, parks, golf courses. / e.g., heated water discharges from power plants (coal, gas, nuclear, etc.), atmospheric radiation resulting from ozone layer thinning.	1. Compile and update existing guidelines on wildlife-safe boating practices in VA's coastal waters. Disseminate updated wildlife-safe boating practices to recreational boaters through social media, website links, boating safety courses, the DWR boat registration webpage, and in the annual publications of fresh and saltwater fishing regulations. Engage recreational boaters in manatee conservation by encouraging them to report manatee sightings to the appropriate entity (currently the Virginia Aquarium & Marine Science Center Stranding Response Program) (6.1.4). 2. Support and promote the development of best management practices designed to reduce nitrogen- and phosphorus-based fertilizer and pesticide runoff into VA's coastal waters to minimize harmful algal blooms that increase water turbidity, block sunlight and kill seagrasses. Build upon past social marketing efforts to discourage the residential use of nitrogen- and phosphorus-based fertilizers and pesticides and promote nature-based alternatives. Support intensive monitoring of toxic algal blooms in coastal VA, especially those that produce brevetoxins which are especially harmful to manatees. (9.1.2) 3. Develop a multi-agency response plan for entrained manatees in warm water discharge areas (e.g., Surry Nuclear Power Plant). Develop a partnership with governmental, commercial and private entities that have the resources, equipment, supplies and expertise to assist with manatee entrapment response. Maintain an effective stranding response program to oversee and coordinate manatee entrapment response in VA. (9.6.2)		