AGENDA

Board of Wildlife Resources
Wildlife and Boat Committee
7870 Villa Park Drive
Henrico, Virginia 23228

May 24, 2023
10:00 am

Committee Members: Mr. Leon Boyd, Chair, Ms. Catherine Claiborne, Mr. Michael Formica, Mr. Jon Cooper, (alternate), Mr. George Terwilliger, (alternate)

DWR Staff Liaisons: Mr. Cale Godfrey and Dr. Mike Bednarski and Mr. Tom Guess

1. Call to Order and Welcome
   Mr. Leon Boyd

2. Approval of the March 15, 2023 Committee Meeting Minutes ***Final Action***
   Mr. Leon Boyd

3. Public Comment – Non - Agenda Item
   Mr. Leon Boyd

4. Wildlife Regulation Proposals ***Final Action***
   Mr. Cale Godfrey

5. Boat Regulations Proposals ***Final Action***
   Mr. Tom Guess

6. Virginia Wildlife Corridor Action Plan
   Ms. Jenn Allen

7. Contribution of Freshwater Fishing to Virginia's Economy
   Dr. Mike Bednarski

8. Wildlife Division Update
   Dr. Gray Anderson

9. Fish Division Update
   Dr. Mike Bednarski

10. Boating Division Update
    Mr. Tom Guess

11. Director's Report
    Mr. Ryan Brown

12. Chair's Report
    Mr. Leon Boyd

13. Next Meeting Date: Wednesday, August 16, 2023
    Mr. Leon Boyd

14. Additional Business/Comments
    Mr. Leon Boyd

15. Adjournment
    Mr. Leon Boyd

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES

BOARD REGULATION PROPOSALS
Staff Final Recommendations
May 2023

Wildlife Regulation Proposals – Staff Final Recommendation Summary

Deer & Elk Regulations

4VAC15-90-10	***Recommended as proposed***
4VAC15-90-80	***Recommended as proposed***
4VAC15-90-89	***Recommended as proposed***
4VAC15-90-90	***Recommended as proposed***
4VAC15-90-91	***Recommended as proposed***
4VAC15-90-530	***Recommended as proposed***
4VAC15-90-540	***Recommended as proposed***

Bear & Wild Turkey Regulations

4VAC15-50-11	***Recommended as proposed***
4VAC15-240-31	***Recommended as proposed***
4VAC15-240-32	***Recommended as proposed***
4VAC15-240-40	***Do not recommend at this time***
4VAC15-240-51	***Do not recommend at this time***

General Regulations

4VAC15-20-66	***Recommended as proposed***
4VAC15-20-130	***Recommended as proposed***
4VAC15-40-195	***Recommended as proposed***
4VAC15-40-276	***Recommended as proposed***
4VAC15-40-285	***Recommended as proposed***
4VAC15-40-290	***Recommended as proposed***
4VAC15-90-500	***Recommended as proposed***
4VAC15-90-510	***Recommended as proposed***

Furbearer & Small Game Regulations

4VAC15-110-20	***Recommended as proposed***
4VAC15-110-25	***Recommended as proposed***
4VAC15-110-35	***Recommended as proposed***
4VAC15-110-80	***Recommended as proposed***
4VAC15-230-60	***Recommended as proposed***

Waterfowl & Waterfowl Blind Regulations

4VAC15-260-85	***Recommended as proposed***
4VAC15-260-86	***Recommended as proposed***
4VAC15-260-120	***Recommended as proposed***

Contents Page

Deer & Elk Regulations

4VAC15-90-10

Game: Deer: Open season; generally.

Summary:

The proposal is to (i) add an early (September) antlerless-only firearms deer season on private lands in Carroll, Floyd, Montgomery, and Pulaski counties, (ii) add early and late (January through March) antlerless-only firearms deer seasons on private lands in Bedford and York counties, (iii) extend the general firearms deer season on private lands in Roanoke County from two to four weeks, (iv) simplify the provision for early and late antlerless-only firearms seasons in disease focus zones, and (v) provide for a 7-week general firearms deer season in cities and towns statewide.

Proposed language of amendment:

4VAC15-90-10. Open season; generally.

A. It shall be lawful to hunt deer in the following localities, including the cities and towns therein, during the following seasons, all dates inclusive.

Locality	Season
Accomack County	Saturday prior to the third Monday in November through the first Saturday in January
Albemarle County	Saturday prior to the third Monday in November through the first Saturday in January
Alleghany County	Saturday prior to the third Monday in November and for 14 consecutive days following
Amelia County	Saturday prior to the third Monday in November through the first Saturday in January
Amherst County (west of Business U.S. 29 from the James River to its intersection with U.S. 29 just south of the Town of Amherst continuing north on U.S. 29 to the Tye River, except on national forest lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Amherst County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following

Amherst County (east of Business U.S. 29, as defined above)	Saturday prior to the third Monday in November through the first Saturday in January
Appomattox County	Saturday prior to the third Monday in November through the first Saturday in January
Arlington County	Saturday prior to the third Monday in November through the first Saturday in January
Arlington County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Augusta County	Saturday prior to the third Monday in November and for 14 consecutive days following
Bath County	Saturday prior to the third Monday in November and for 14 consecutive days following
Bedford County (except on national forest lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Bedford County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Bedford County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Bland County	Saturday prior to the third Monday in November and for 14 consecutive days following
Botetourt County	Saturday prior to the third Monday in November and for 14 consecutive days following
Brunswick County	Saturday prior to the third Monday in November through the first Saturday in January

Buchanan County	Saturday prior to the third Monday in November and for 14 consecutive days following
Buckingham County	Saturday prior to the third Monday in November through the first Saturday in January
Campbell County	Saturday prior to the third Monday in November through the first Saturday in January
Caroline County	Saturday prior to the third Monday in November through the first Saturday in January
Carroll County (private lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Carroll County (public lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Carroll County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Carroll County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Charles City County	Saturday prior to the third Monday in November through the first Saturday in January
Charlotte County	Saturday prior to the third Monday in November through the first Saturday in January
Chesapeake (City of)	October 1 through November 30
Chesterfield County	Saturday prior to the third Monday in November through the first Saturday in January
Clarke County	Saturday prior to the third Monday in November through the first Saturday in January

Clarke County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Craig County	Saturday prior to the third Monday in November and for 14 consecutive days following
Culpeper County (except Chester F. Phelps Wildlife Management Area)	Saturday prior to the third Monday in November through the first Saturday in January
Culpeper County (Chester F. Phelps Wildlife Management Area)	Saturday prior to the third Monday in November and for 14 consecutive days following
Culpeper County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Culpeper County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Cumberland County	Saturday prior to the third Monday in November through the first Saturday in January
Dickenson County	Saturday prior to the third Monday in November and for 14 consecutive days following
Dinwiddie County	Saturday prior to the third Monday in November through the first Saturday in January
Essex County	Saturday prior to the third Monday in November through the first Saturday in January
Fairfax County	Saturday prior to the third Monday in November through the first Saturday in January

Fairfax County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Fauquier County (except Chester F. Phelps Wildlife Management Area)	Saturday prior to the third Monday in November through the first Saturday in January
Fauquier County (Chester F. Phelps Wildlife Management Area)	Saturday prior to the third Monday in November and for 14 consecutive days following
Fauquier County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Fauquier County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Floyd County	Saturday prior to the third Monday in November and for 28 consecutive days following
Floyd County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Floyd County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Fluvanna County	Saturday prior to the third Monday in November through the first Saturday in January
Franklin County	Saturday prior to the third Monday in November and for 28 consecutive days following

Frederick County (non-national forest lands)	Saturday prior to the third Monday in November through the first Saturday in January
Frederick County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Frederick County (non-national-forest lands antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Giles County	Saturday prior to the third Monday in November and for 14 consecutive days following
Gloucester County	Saturday prior to the third Monday in November through the first Saturday in January
Goochland County	Saturday prior to the third Monday in November through the first Saturday in January
Grayson County	Saturday prior to the third Monday in November and for 14 consecutive days following
Greene County	Saturday prior to the third Monday in November through the first Saturday in January
Greensville County	Saturday prior to the third Monday in November through the first Saturday in January
Halifax County	Saturday prior to the third Monday in November through the first Saturday in January
Hanover County	Saturday prior to the third Monday in November through the first Saturday in January
Henrico County	Saturday prior to the third Monday in November through the first Saturday in January
Henry County	Saturday prior to the third Monday in November and for 28 consecutive days following

Highland County	Saturday prior to the third Monday in November and for 14 consecutive days following
Isle of Wight County	Saturday prior to the third Monday in November through the first Saturday in January
James City County	Saturday prior to the third Monday in November through the first Saturday in January
King and Queen County	Saturday prior to the third Monday in November through the first Saturday in January
King George County	Saturday prior to the third Monday in November through the first Saturday in January
King William County	Saturday prior to the third Monday in November through the first Saturday in January
Lancaster County	Saturday prior to the third Monday in November through the first Saturday in January
Lee County	Saturday prior to the third Monday in November and for 14 consecutive days following
Loudoun County	Saturday prior to the third Monday in November through the first Saturday in January
Loudoun County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Louisa County	Saturday prior to the third Monday in November through the first Saturday in January
Lunenburg County	Saturday prior to the third Monday in November through the first Saturday in January
Madison County	Saturday prior to the third Monday in November through the first Saturday in January

Madison County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Madison County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Mathews County	Saturday prior to the third Monday in November through the first Saturday in January
Mecklenburg County	Saturday prior to the third Monday in November through the first Saturday in January
Middlesex County	Saturday prior to the third Monday in November through the first Saturday in January
Montgomery County (non-national forest lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Montgomery County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Montgomery County (non-national forest lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Montgomery County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Nelson County (west of Route 151, except on national forest lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Nelson County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following

Nelson County (east of Route 151)	Saturday prior to the third Monday in November through the first Saturday in January
New Kent County	Saturday prior to the third Monday in November through the first Saturday in January
Northampton County	Saturday prior to the third Monday in November through the first Saturday in January
Northumberland County	Saturday prior to the third Monday in November through the first Saturday in January
Nottoway County	Saturday prior to the third Monday in November through the first Saturday in January
Orange County	Saturday prior to the third Monday in November through the first Saturday in January
Orange County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Orange County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Page County	Saturday prior to the third Monday in November and for 14 consecutive days following
Page County (non-national forest lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Page County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~

Patrick County	Saturday prior to the third Monday in November and for 28 consecutive days following
Pittsylvania County	Saturday prior to the third Monday in November through the first Saturday in January
Powhatan County	Saturday prior to the third Monday in November through the first Saturday in January
Prince Edward County	Saturday prior to the third Monday in November through the first Saturday in January
Prince George County	Saturday prior to the third Monday in November through the first Saturday in January
Prince William County	Saturday prior to the third Monday in November through the first Saturday in January
Prince William County (antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Pulaski County (except on New River Unit of the Radford Army Ammunition Plant adjacent to the Town of Dublin and national forest lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Pulaski County (New River Unit of the Radford Army Ammunition Plant adjacent to the Town of Dublin)	Saturday prior to the second Monday in November through the first Saturday in January
Pulaski County (national forest lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Pulaski County (non-national forest lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Pulaski County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the~~

	~~first Saturday in January through the last Sunday in March~~
Rappahannock County	Saturday prior to the third Monday in November through the first Saturday in January
Rappahannock County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
~~Rappahannock County (disease focus zones defined by the department, antlerless deer only)~~	~~First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March~~
Richmond County	Saturday prior to the third Monday in November through the first Saturday in January
Roanoke County (private lands)	Saturday prior to the third Monday in November and for 28 consecutive days following
Roanoke County (public lands)	Saturday prior to the third Monday in November and for 14 consecutive days following
Rockbridge County	Saturday prior to the third Monday in November and for 14 consecutive days following
Rockingham County	Saturday prior to the third Monday in November and for 14 consecutive days following
Russell County	Saturday prior to the third Monday in November and for 14 consecutive days following
Scott County	Saturday prior to the third Monday in November and for 14 consecutive days following
Shenandoah County	Saturday prior to the third Monday in November and for 14 consecutive days following

Shenandoah County (non-national forest lands antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March
Smyth County	Saturday prior to the third Monday in November and for 14 consecutive days following
Southampton County	Saturday prior to the third Monday in November through the first Saturday in January
Spotsylvania County	Saturday prior to the third Monday in November through the first Saturday in January
Stafford County	Saturday prior to the third Monday in November through the first Saturday in January
Suffolk (City of) (east of Dismal Swamp Line)	October 1 through November 30
Suffolk (City of) (west of Dismal Swamp Line)	Saturday prior to the third Monday in November through the first Saturday in January
Surry County	Saturday prior to the third Monday in November through the first Saturday in January
Sussex County	Saturday prior to the third Monday in November through the first Saturday in January
Tazewell County	Saturday prior to the third Monday in November and for 14 consecutive days following
Virginia Beach (City of)	October 1 through November 30
Warren County	Saturday prior to the third Monday in November and for 14 consecutive days following
Warren (non-national forest lands antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March

Washington County	Saturday prior to the third Monday in November and for 14 consecutive days following
Westmoreland County	Saturday prior to the third Monday in November through the first Saturday in January
Wise County	Saturday prior to the third Monday in November and for 14 consecutive days following
Wythe County	Saturday prior to the third Monday in November and for 14 consecutive days following
York County	Saturday prior to the third Monday in November through the first Saturday in January
York County (private lands and antlerless deer only)	First Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March

B. Except as provided in subsection A of this section, ~~east of the Blue Ridge Mountains~~ deer may be hunted from the Saturday prior to the third Monday in November through the first Saturday in January, both dates inclusive, within the incorporated limits of any city or town that allows deer hunting.

~~C. Except as provided in subsection A of this section, west of the Blue Ridge Mountains deer may be hunted from the Saturday prior to the third Monday in November and for 14 consecutive days following within the incorporated limits of any city or town that allows deer hunting.~~

C. In addition to provisions of subsection A of this section, antlerless deer may be taken from the first Saturday in September through the Friday prior to the first Saturday in October and the Sunday following the first Saturday in January through the last Sunday in March, both dates inclusive, within any disease focus zone designated by the department.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

(i) During the past hunting season, additional detections of Chronic Wasting Disease (CWD) were made in Floyd and Montgomery counties and CWD was detected for the first time in Pulaski County. With the continued spread of CWD within Disease Management Area (DMA) 3, additional antlerless harvest pressure is needed to reduce the deer population

density and attempt to lower the risk for disease transmission among deer. The addition of the early antlerless-only firearms season will make seasons consistent with those in DMAs 1 and 2. In addition, the private land deer population indices in these four counties exceed population objectives in the Department's deer management plan.

(ii) The private land deer population indices in Bedford and York counties have exceeded population objectives in the Department's deer management plan for a number of years, despite full-season, either-sex deer hunting seasons and earn a buck requirement. Both counties continue to experience human population growth and suburban/exurban development and a high number of associated human-deer conflicts, such as vehicle collisions and residential conflicts. The addition of early and late antlerless-only seasons is the next step to address deer populations in these counties.

(iii) The private land deer population index in Roanoke County slightly exceeds the population objective in the Department's deer management plan, despite having full-season, either-sex deer hunting seasons and the earn a buck requirement for over a decade. The county continues to experience human population growth and suburban/exurban development and a high number of associated human-deer conflicts, such as vehicle collisions and residential conflicts. Providing two additional weeks of general firearms deer hunting is the next step to address deer populations in this county before considering early and/or late antlerless seasons. Unlike Roanoke County, Bedford County has had the four-week firearm season since 2019 and its population index remains much further above target than does Roanoke's.

(iv) By adding a new subsection at the end of this regulation, this proposal will maintain the authorization for the Department to create disease focus zones (DFZs), as needed, in current and future DMAs without having to reference them individually by county in regulation. DFZs, first provided for in this regulation in 2021, are defined in the DWR CWD Management Plan as a local expansion of antlerless hunting opportunities in a focused area around an outlier CWD detection, which is located more than 5 miles from the nearest detection. DFZs are defined using clear geographic boundaries and communicated before the hunting season through the annual hunting and trapping booklet and on the Department's website. The goals of expanded antlerless hunting opportunities in a DFZ are to slow disease transmission in the immediate vicinity of a detection and to increase testing opportunities for deer harvested in close proximity to an outlier CWD detection.

(v) This proposal will provide additional flexibility to cities and towns managing deer by creating a uniform general firearms season framework. This firearms season would overlap existing archery, firearms, and muzzleloader seasons that are currently available to cities and towns. This proposal does not require that cities or towns allow firearms deer hunting; however, it does provide for that option if it would be advantageous for deer management efforts.

4VAC15-90-80

Game: Deer: Muzzleloading gun hunting.

Summary:

The proposal is to provide for (i) full-season, either-sex deer hunting on private lands during both the early and late muzzleloading seasons in Smyth County; (ii) one additional day of either-sex deer hunting during the early muzzleloading season on private lands in Lee, Russell, Tazewell, and Wise counties; (iii) full-season, either-sex deer hunting on private lands during the late muzzleloading season in Craig, Giles, and Scott counties; and (iv) either-sex deer hunting during the last six days of the late muzzleloading season on private lands in Dickenson County.

Proposed language of amendment:

4VAC15-90-80. Muzzleloading gun hunting.

A. It shall be lawful to hunt deer during the early special muzzleloading season with muzzleloading guns from the Saturday prior to the first Monday in November through the Friday prior to the third Monday in November, both dates inclusive, in all cities, towns, and counties where deer hunting with a rifle or muzzleloading gun is permitted, except in the Cities of Chesapeake, Suffolk (east of the Dismal Swamp Line), and Virginia Beach.

B. It shall be lawful to hunt deer during the late special muzzleloading season with muzzleloading guns starting 21 consecutive days immediately prior to and on the first Saturday in January:

1. In all cities, towns, and counties west of the Blue Ridge Mountains (except Clarke County and on non-national forest lands in Frederick County);

2. East of the Blue Ridge Mountains in the Counties (including the cities and towns within) of Amherst (west of Business U.S. 29 from the James River to its intersection with U.S. 29 just south of the Town of Amherst continuing north on U.S. 29 to the Tye River), Bedford, Franklin, Henry, Nelson (west of Route 151), and Patrick;

3. On national forest lands in Frederick County; and

4. In the Cities of Chesapeake, Suffolk (east of the Dismal Swamp Line), and Virginia Beach.

C. Deer of either sex may be taken during the entire early special muzzleloading season east of the Blue Ridge Mountains unless otherwise noted in this subsection:

1. Deer of either sex may be taken on the second Saturday only of the early special muzzleloading season on state forest lands, state park lands (except Occoneechee State Park), department-owned lands (except on Merrimac Farm Wildlife Management Area), and Philpott Reservoir.

2. Antlered bucks only—no either-sex deer hunting days during the early special muzzleloading season on national forest lands in Amherst, Bedford, and Nelson Counties.

D. Deer of either sex may be taken on the second Saturday only during the early special muzzleloading season west of the Blue Ridge Mountains unless otherwise noted in this subsection.

1. Deer of either sex may be taken during the entire early special muzzleloading season in Clarke and Floyd Counties and on private lands in Augusta, Botetourt, Carroll, Frederick, Grayson, Montgomery, Page, Pulaski, Roanoke, Rockingham (east of Routes 613 and 731), Scott, Smyth, Shenandoah, Warren, and Wythe Counties.

2. Antlered bucks only—no either-sex deer hunting days during the early special muzzleloading season in Buchanan County; on federal ~~and department-managed~~ lands in Dickenson County; ~~Lee, Russell, Tazewell, and Wise Counties~~ ~~and~~ on department-owned lands in Russell County; on national forest lands in Alleghany, Bland, Craig, Frederick, Giles, Grayson, Lee, Montgomery, Page, Pulaski, Rockingham, Scott, Shenandoah, ~~and~~ Warren, and Wise Counties; and on national forest and department-owned lands in Augusta, Bath, Botetourt, Carroll, Highland (except Highland Wildlife Management Area), Roanoke, Rockbridge, Smyth, Tazewell, Washington, and Wythe Counties and on Channels State Forest, Grayson Highlands State Park, Hungry Mother State Park, and on private lands west of Routes 613 and 731 in Rockingham County.

E. Deer of either sex may be taken during the last six days of the late special muzzleloading season unless otherwise listed in this subsection:

1. Deer of either sex may be taken full season during the entire late special muzzleloading season in the Counties (including the cities and towns within) of Amherst (west of Business U.S. 29 from the James River to its intersection with U.S. 29 just south of the Town of Amherst continuing north on U.S. 29 to the Tye River, except on national forest lands), Bedford (except on national forest lands), Floyd, Franklin, Henry, Nelson (west of Route 151, except on national forest lands), and Patrick and on private lands in Augusta, Botetourt, Carroll, Craig, Giles, Grayson, Montgomery, Page, Pulaski, Roanoke, Rockingham (east of Routes 613 and 731), Scott, Smyth, Shenandoah, Warren, and Wythe Counties.

2. Deer of either sex may be taken the last day only during the late special muzzleloading season in Alleghany, Bath, ~~Dickenson,~~ Highland, Lee, Russell, Tazewell, and Wise Counties and on national forest lands in Amherst, Bedford, Bland, Craig, Frederick, Giles, Grayson, Montgomery, Nelson, Page, Pulaski, Rockingham, Scott, Shenandoah, and Warren Counties, and on national forest and department-owned lands in Augusta, Botetourt, Carroll, Roanoke, Rockbridge, Smyth, Washington, and Wythe Counties and on private lands west of Routes 613 and 731 in Rockingham County, Channels State Forest, Grayson Highlands State Park, and Hungry Mother State Park.

3. Antlered bucks only—no either-sex deer hunting days during the late special muzzleloading season in Buchanan County.

F. Deer of either sex may be taken full season during the special muzzleloading seasons within the incorporated limits of any city or town in the Commonwealth that allows deer hunting except in the Cities of Chesapeake, Suffolk, and Virginia Beach.

G. It shall be unlawful to hunt deer with dogs during any special season for hunting with muzzleloading guns, except that tracking dogs as described in § 29.1-516.1 of the Code of Virginia may be used.
H. Muzzleloading guns, for the purpose of this section, include:

1. Single shot muzzleloading rifles.40 caliber or larger, firing a single projectile or sabot (with a.35 caliber or larger projectile) where the projectile is loaded from the muzzle;

2. Muzzleloading shotguns (one or more barrels) not larger than 10 gauge where the projectiles are loaded from the muzzle;

3. Muzzleloading pistols (one or more barrels).45 caliber or larger, firing a single projectile or sabot (with a.35 caliber or larger projectile) per barrel where the propellant and projectile are loaded from the muzzle;

4. Muzzleloading revolvers.45 caliber or larger, firing a single projectile or sabot (with a.35 caliber or larger projectile) per cylinder where the propellant and projectile are loaded from the forward end of the cylinder.

I. It shall be unlawful to have in immediate possession any firearm other than a muzzleloading gun while hunting with a muzzleloading gun in a special muzzleloading season.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

(i) The private land deer population in Smyth County is currently above the desired deer population management objective in the Department's deer management plan. Providing additional either-sex deer hunting days during both the early and late muzzleloader seasons should assist in bringing the deer population back down to its desired level.

(ii) Although private land deer populations in Lee, Russell, Tazewell, and Wise are currently meeting objectives in the Department's deer management plan, they can support an incremental increase in antlerless harvest, which will also provide additional recreational opportunity. In addition, the Lee County Farm Bureau has requested additional either-sex hunting opportunities to address damage concerns. Because the deer population trend in Lee County is stable to slightly decreasing, it is deemed more appropriate to add either-sex days during a muzzleloader season than during the general firearms season.

(iii) The private land deer populations in Craig, Giles, and Scott counties are currently above the desired deer population management objective in the Department's deer management plan. The addition of these additional either-sex deer hunting days during the late muzzleloader season should assist in bringing the deer population back down to its desired level. Moreover, adding antlerless deer harvest opportunities in Craig and Giles counties is a proactive step with regards to chronic wasting disease in adjacent counties.

(iv) Although the private land deer population in Dickenson County is currently meeting the objective in the Department's deer management plan, continued increases in the population trend and complaints regarding deer damage necessitate an incremental increase in antlerless harvest, which will also provide additional recreational opportunity.

4VAC15-90-89

Game: Deer: Earn a buck.

Summary:

The proposal is to (i) add private lands in Augusta, Botetourt, and Page counties to the earn a buck regulation and (ii) establish a single requirement for all counties in earn a buck regarding the number of antlerless deer (one) that must have been taken before a hunter can take their second antlered deer of the season.

Proposed language of amendment:

4VAC15-90-89. Earn a buck.

A. For the purposes of this section, the term "license year" means the period between July 1 and June 30 of the following year.

B. Within a license year and within in each individual county listed in this subsection, a hunter must have taken at least one antlerless deer on private lands in that county before taking a second antlered deer on private lands in that county. In those counties listed in this subsection east of the Blue Ridge Mountains, a hunter must have taken at least two antlerless deer on private lands in that county before taking a third antlered deer on private lands in that county.

The counties subject to the provisions of this subsection are Accomack, Albemarle, Amherst (west of Route 29), Augusta, Bedford, Botetourt, Carroll, Clarke, Culpeper, Fauquier, Floyd, Franklin, Frederick, Grayson, Greene, Hanover, Henrico, James City, Madison, Montgomery, Orange, Page, Prince George, Pulaski, Rappahannock, Roanoke, Rockingham (east of Routes 613 and 731), Shenandoah, Stafford, Warren, ~~and~~ Wythe, and York.

~~C. Within a license year and within in each individual county listed in this subsection, a hunter must have taken at least two antlerless deer on private lands in that county before taking a second antlered deer on private lands in that county. A hunter also must have taken at least three antlerless deer on private lands in that county before taking a third antlered deer on private lands in that county.~~

~~The counties subject to the provisions of this subsection are James City and York.~~

~~D.~~C. Within a license year and within each individual county listed in this subsection, a hunter must have taken at least ~~two~~ one antlerless deer in that county before taking a second antlered deer in that county. A hunter must also have taken at least ~~three~~ two antlerless deer in that county before taking a third antlered deer in that county.

The counties subject to the provisions of this subsection are Arlington, Fairfax, Loudoun, and Prince William (except on Department of Defense lands).

~~E.~~D. Within a license year and within any city or town, except the cities of Chesapeake, Suffolk, and Virginia Beach, a hunter must have taken at least one antlerless deer in that city or town

before taking a second antlered deer in that city or town. In those cities and towns east of the Blue Ridge Mountains, a hunter must have taken at least two antlerless deer in that city or town before taking a third antlered deer in that city or town.

~~F.~~E. The Earn A Buck Program does not apply to the Cities of Chesapeake, Suffolk, and Virginia Beach.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

(i) Private land deer population indices for Augusta, Botetourt, and Page counties have exceeded population objectives in the Department's deer management plan despite having full-season, either-sex firearms regulations already in place. Adding the earn a buck requirement is the next step to increase the harvest of antlerless deer. In addition, establishing earn a buck in Page County will make it consistent with all the other counties in Disease Management Area 2 (DMA2).

(ii) The earn a buck requirement has resulted in increased antlerless harvest and reductions in deer populations in most areas where it has been in effect. However, there has been little to no measurable difference in deer harvest or population impacts in counties having the requirement that two antlerless deer (i.e., Arlington, Fairfax, James City, Loudoun, Prince William, and York) vs. one antlerless deer (i.e., 27 other counties) must have been taken before a hunter can take their second antlered deer of the season. This proposal would simplify and standardize this provision of the earn a buck regulation, requiring hunters in any locality with earn a buck to harvest only one antlerless deer prior to harvesting a second antlered deer.

4VAC15-90-90

Game: Deer: Bag limit, bonus deer permits and special antlerless provision for youth hunters.

Summary:

The proposal is to remove the antler point restriction from Augusta County.

Proposed language of amendment:

4VAC15-90-90. Bag limit, bonus deer permits and special antlerless provision for youth hunters.

A. The bag limit for deer east of the Blue Ridge Mountains (except on national forest lands in Amherst, Bedford, and Nelson Counties) is two per day, six per license year, three of which must be antlerless unless otherwise noted in this subsection.

1. The daily bag limit for deer is unlimited in the Counties, including the cities and towns within, of Arlington, Fairfax, Loudoun, and Prince William and in all the cities and towns that allow deer hunting (except in the Cities of Chesapeake, Suffolk, and Virginia Beach).

2. Only one deer per day may be taken on national forest, department-owned, and department-managed lands.

3. Only one elk per day may be taken.

B. The bag limit for deer west of the Blue Ridge Mountains and on national forest lands in Amherst, Bedford, and Nelson Counties is two per day, five per license year, three of which must be antlerless unless otherwise noted in this subsection.

1. The daily bag limit for deer is unlimited in all the cities and towns that allow deer hunting.

2. Only one deer per day may be taken on national forest, department-owned, and department-managed lands.

3. If a deer hunter kills two antlered bucks in a license year in Alleghany, ~~Augusta,~~ Bath, Highland, or Rockbridge County, at least one of the antlered bucks must have at least four antler points, one inch or longer, on one side of the antlers. This subdivision shall not apply to any county designated by the department within 25 miles of a confirmed detection of Chronic Wasting Disease.

4. Only one elk per day may be taken.

C. Except as noted in subsection E of this section, antlerless deer may be taken only during designated either-sex deer hunting days during the special archery seasons, special muzzleloading seasons, and the general firearms season.

D. Bonus deer permits shall be valid on private land in counties and cities where deer hunting is permitted (except Buchanan, Dickenson, and Wise Counties) during the special archery seasons, special muzzleloading seasons, and the general firearms season. Bonus deer permits shall be valid on public lands, including state parks, state forests, national wildlife refuges, military areas, etc., as authorized by the managing agency. Unless otherwise posted or authorized in writing for wildlife management areas by the department, or for national forest lands by the U.S. Forest Service, the use of bonus permits is prohibited on department-owned and national forest lands. Bonus deer permits shall be valid for antlerless deer only. Deer taken on bonus permits shall count against the daily bag limit but are in addition to the seasonal bag limit.

E. Deer hunters 15 years of age and younger, including those exempt from purchasing a hunting license and holders of an apprentice hunting license, when in compliance with all applicable laws and license requirements, may take one antlerless deer per license year on days other than designated either-sex deer hunting days during the special muzzleloading seasons or the general firearms season in all counties.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Chronic Wasting Disease (CWD) was detected in Madison County within 25 miles of Augusta County during fall 2022. As noted in subsection B.3 of this regulation, the antler point restriction "shall not apply to any county designated by the department within 25 miles of a confirmed detection of Chronic Wasting Disease." This 25-mile provision was adopted by the Board in 2019 to proactively reduce disease risks within a reasonable distance from known CWD positives. Data from across the eastern US clearly shows that CWD infection rates are the highest in older male age classes. Because antler point restrictions are designed to protect young antlered bucks and make the buck age structure older, maintaining antler point restrictions can amplify CWD transmission risks and be counter productive to controlling the spread of CWD across the landscape.

4VAC15-90-91

Game: Deer: General firearms season either-sex deer hunting days.

Summary:

The proposal is to change the general firearms either-sex deer hunting days for the counties/areas shown in the table below:

City/County/WMA	Change	Current	Proposed
Bland	Increase	2	3
Chesapeake	Increase	15	Full season
Chesterfield	Increase	15	Full season
Gloucester	Increase	8	15
King George	Increase	15	31
Lancaster	Increase	15	31
Northumberland	Increase	15	31
Nottoway	Increase	8	15
Richmond	Increase	15	31
Suffolk (east of the Dismal Swamp line)	Increase	15	Full season
Virginia Beach	Increase	15	Full season
Westmoreland	Increase	15	31
Public Land			
Bland (National forests)	Increase	2	3
Craig (National forests and Department-owned lands)	Increase	2	3
Giles (National forests)	Increase	2	3
Nelson (Tye River WMA)	New	NA	7
Sussex (Big Woods and Flippo-Gentry WMAs, Big Woods State Forest)	Increase	8	Full season
Wythe (National forests and Department-owned lands)	Increase	2	3

Proposed language of amendment:

4VAC15-90-91. General firearms season either-sex deer hunting days.

A. During the general firearms deer season, deer of either sex may be taken within:

Accomack County: full season.

Albemarle County: full season.

Alleghany County: the second Saturday and the last day.

-National forest lands: the last day.

Amelia County: the second and third Saturdays and the last 13 days.

-Amelia WMA: the second and third Saturdays and the last six days.

Amherst County (east of Business U.S. 29 from the James River to its intersection with U.S. 29 just south of the Town of Amherst continuing north on U.S. 29 to the Tye River): the second and third Saturdays and the last 29 days.

Amherst County (west of Business U.S. 29 from the James River to its intersection with U.S. 29 just south of the Town of Amherst continuing north on U.S. 29 to the Tye River): full season.

-National forest lands: the last day.

Appomattox County: the second and third Saturdays and the last six days.

-Appomattox-Buckingham State Forest: the second and third Saturdays.

-Featherfin WMA: the second and third Saturdays and the last 29 days.

Arlington County: full season.

Augusta County: full season.

-National forest and department-owned lands: the last day.

Bath County: the second Saturday and the last day.

-National forest and department-owned lands: the last day.

Bedford County: full season.

-National forest lands: the last day.

Bland County: the second Saturday and the last two days.

-National forest lands: the second Saturday and the last two days.

Botetourt County: full season.

-National forest and department-owned lands: the last day.

Brunswick County: the second and third Saturdays and the last six days.

Buchanan County: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Buckingham County: the second and third Saturdays and the last six days.

-Horsepen Lake WMA: the second and third Saturdays and the last six days.

-Appomattox-Buckingham State Forest: the second and third Saturdays.

-Featherfin WMA: the second and third Saturdays and the last 29 days.

Campbell County (east of Norfolk Southern Railroad): the second and third Saturdays and the last 29 days.
Campbell County (west of Norfolk Southern Railroad): full season.

Caroline County: the second and third Saturdays and the last six days.

-Mattaponi WMA: the second and third Saturdays and the last six days.

Carroll County: full season.

-National forest and department-owned lands: the second Saturday and the last day.

Charles City County: full season.

-Chickahominy WMA: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Charlotte County: the second and third Saturdays and the last six days.

Chesapeake (City of): ~~the second and third Saturdays and the last 13 days~~ full season.

-Cavalier WMA: the second and third Saturdays and the last 13 days.

Chesterfield County: ~~the second and third Saturdays and the last 13 days~~ full season.

Clarke County: full season.

Craig County: full season.

-National forest and department-owned lands: the second Saturday and the last two days.

Culpeper County: full season.

-Chester F. Phelps WMA: the second Saturday.

Cumberland County: the second and third Saturdays and the last 13 days.

-Cumberland State Forest: the second and third Saturdays.

Dickenson County: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Dinwiddie County: the second and third Saturdays and the last six days.

Essex County: the second and third Saturdays and the last six days.

Fairfax County: full season.

Fauquier County: full season.

-G. Richard Thompson WMA: the second and third Saturdays and the last 13 days.

-Chester F. Phelps WMA: the second Saturday.

Floyd County: full season.

Fluvanna County: second and third Saturdays and the last 29 days.

-Hardware River WMA: the second and third Saturdays and the last 13 days.

Franklin County: full season.

-Philpott Reservoir: the second Saturday and the last six days.

-Turkeycock Mountain WMA: the second Saturday and the last six days.

Frederick County: full season.

-National forest lands: the last day.

Giles County: full season.

-National forest lands: the second Saturday and the last two days.

Gloucester County: the second and third Saturdays and the last ~~six~~13 days.

Goochland County: full season.

Grayson County: full season.

-National forest lands and Grayson Highlands State Park: the last day.

Greene County: full season.

Greensville County: the second and third Saturdays and the last six days.

Halifax County: the second and third Saturdays and the last 13 days.

Hanover County: full season.

Henrico County: full season.

Henry County: the second and third Saturdays and the last 13 days.

-Fairystone Farms WMA, Fairystone State Park, and Philpott Reservoir: the second Saturday and the last six days.

-Turkeycock Mountain WMA: the second Saturday and the last six days.

Highland County: the second Saturday and the last day.

-National forest lands: the last day.

-Department-owned lands: the second Saturday and the last day.

Isle of Wight County: full season.

-Ragged Island WMA: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

James City County: full season.

King and Queen County: the second and third Saturdays and the last 13 days.

King George County: the second and third Saturdays and the last ~~13~~29 days.

King William County: the second and third Saturdays and the last 13 days.

Lancaster County: the second and third Saturdays and the last ~~13~~29 days.

Lee County: the second Saturday and the last two days.

-National forest lands: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Loudoun County: full season.

Louisa County: the second and third Saturdays and the last 29 days.

Lunenburg County: the second and third Saturdays and the last six days.

Madison County: full season.

-Rapidan WMA: the second and third Saturdays and the last 13 days.

Mathews County: the second and third Saturdays and the last six days.

Mecklenburg County: the second and third Saturdays and the last six days.

-Dick Cross WMA: the second and third Saturdays and the last six days.

Middlesex County: the second and third Saturdays and the last six days.

Montgomery County: full season.

-National forest lands: the second Saturday and the last day.

Nelson County (east of Route 151): the second and third Saturdays and the last 29 days.

-James River WMA and Tye River WMA: the second Saturday and the last six days.

Nelson County (west of Route 151): full season.

-National forest lands: the last day.

New Kent County: full season.

Northampton County: full season.

Northumberland County: the second and third Saturdays and the last ~~13~~29 days.

Nottoway County: the second and third Saturdays and the last ~~six~~13 days.

Orange County: full season.

Page County: full season.

-National forest lands: the last day.

Patrick County: the second and third Saturdays and the last 13 days.

-Fairystone Farms WMA, Fairystone State Park, and Philpott Reservoir: the second Saturday and the last six days.

Pittsylvania County (east of Norfolk Southern Railroad): the second and third Saturdays and the last 29 days.

-White Oak Mountain WMA: the second Saturday and the last three days.

Pittsylvania County (west of Norfolk Southern Railroad): full season.

Powhatan County: full season.

-Powhatan WMA: the second and third Saturdays and the last 13 days.

Prince Edward County: the second and third Saturdays and the last six days.

-Briery Creek WMA: the second and third Saturdays and the last six days.

-Featherfin WMA: the second and third Saturdays and the last 29 days.

-Prince Edward State Forest: the second and third Saturdays.

Prince George County: full season.

Prince William County: full season.

Pulaski County: full season.

-National forest lands: the second Saturday and the last day.

Rappahannock County: full season.

Richmond County: the second and third Saturdays and the last ~~13~~29 days.

Roanoke County: full season.

-National forest and department-owned lands: the last day.

Rockbridge County: the second Saturday and the last two days.

-National forest and department-owned lands: the last day.

Rockingham County: full season.

-National forest lands: the last day.

-Private lands west of Routes 613 and 731: the second Saturday and the last day.

Russell County: the second Saturday and the last two days.

-Department-owned lands and the Channels State Forest: the last day.

Scott County: the second Saturday and the last six days.

-National forest lands: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Shenandoah County: full season.

-National forest lands: the last day.

Smyth County: full season.

-National forest lands, department-owned lands, and Hungry Mother State Park: the last day.

Southampton County: full season.

Spotsylvania County: full season.

-Oakley Forest WMA: the second and third Saturdays and the last 13 days.

Stafford County: full season.

Suffolk ~~(east of the Dismal Swamp Line): the second and third Saturdays and the last 13 days.~~

~~Suffolk (west of the Dismal Swamp Line)~~: full season.

Surry County: full season.

-Carlisle and Stewart Tracts of the Hog Island WMA: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Sussex County: full season.

-Big Woods WMA ~~(including the Parkers Branch Tract)~~, Flippo-Gentry WMA, and Big Woods State Forest: ~~the second and third Saturdays and the last six days~~ full season.

Tazewell County: the second Saturday and the last two days.

-National forest and department-owned lands: the last day.

Virginia Beach (City of): ~~the second and third Saturdays and the last 13 days~~ full season.

Warren County: full season.

-National forest lands: the last day.

Washington County: the second Saturday and the last six days.

-National forest lands, department-owned lands, and the Channels State Forest: the last day.

Westmoreland County: the second and third Saturdays and the last ~~13~~29 days.

Wise County: antlered bucks only—no either-sex days. Only deer with antlers above the hairline may be taken.

Wythe County: full season.

-National forest and department-owned lands: the second Saturday and the last two days.

York County: full season.

B. Except as provided in the subsection A of this section, deer of either sex may be taken full season during the general firearms deer season within the incorporated limits of any city or town, state park, national wildlife refuge, or military installation that allows deer hunting or within any common interest community participating in the special urban archery season according to provisions of 4VAC15-90-70.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Private lands

Bland. The private land deer population index is currently above the desired deer population objective in the Department's deer management plan. Providing an additional either-sex deer hunting day should assist in bringing the deer population back down to the desired level.

Chesapeake, Suffolk (east of the Dismal Swamp line), and Virginia Beach. The proposed increase in firearms either-sex deer hunting days in these cities is a proactive change to address continued human population growth, urban/suburban development, and agricultural damage from deer. The private land deer population indices for these cities are currently within the deer population objective brackets; however, local staffs believe that additional either-sex deer hunting opportunities can and should be provided at this time.

Chesterfield. Chesterfield County has exhibited one of the fastest rates of human population growth and suburban development of any county in Virginia and consistently has one of the highest levels of human-deer conflicts reported through the Department's Wildlife Conflict Helpline. The county's private land deer population index has increased significantly over the last five years and has exceeded the deer population objective. Staff recommends increasing either-sex deer hunting days to prevent further growth in the deer population.

Gloucester. The proposed increase in firearms either-sex deer hunting days in Gloucester County is a proactive change to address continued human population growth, urban/suburban development, and agricultural damage from deer. The private land deer population index for this county is currently within the deer population objective bracket; however, local staffs believe that additional either-sex deer hunting opportunities can and should be provided at this time.

King George, Lancaster, Northumberland, Richmond, Westmoreland. The proposed increase in firearms either-sex deer hunting days in these counties is a proactive change to address continued human population growth, urban/suburban development, and agricultural damage from deer while providing for geographic consistency in deer hunting regulations on the Northern Neck. The private land deer population indices for these counties are currently within - or borderline above (Lancaster) - the deer population objective brackets; however, local staffs believe that additional either-sex deer hunting opportunities can and should be provided at this time.

Nottoway. The private land deer population index exceeds the desired deer population management objective in the Department's deer management plan. Providing additional either-sex deer hunting days should assist in bringing the deer population back down to the desired level.

Public lands

Bland, Craig, Giles, Wythe. The addition of an either-sex firearms deer hunting day on National Forest and department-owned lands in these counties can assist with meeting deer population objectives on adjacent private lands while increasing recreational opportunities for public land hunters.

Nelson. Staff recommends providing the same either-sex firearms deer hunting days on the new Tye River WMA as has been provided on the James River WMA.

Sussex. Local staffs recommend increasing either-sex firearms deer hunting days on Big Woods WMA, Flippo-Gentry WMA (formerly Parkers Branch Tract of Big Woods WMA), and Big Woods State Forest to distribute hunting pressure and reduce the potential for hunter conflicts. The more conservative either-sex day format in recent years appeared to concentrate deer hunting pressure and harvest rather than reducing it.

4VAC15-90-530

Game: Deer: Special elk hunting license, random drawing license program.

Summary:

The proposal is to omit the specific dates for deadlines associated with the elk lottery.

Proposed language of amendment:

4 VAC 15-90-530. Special elk hunting license, random drawing license program.

A. The dates for the annual application period to enter the random drawing for a special elk hunting license shall be ~~February 1 to March 30, both dates inclusive, unless extended by the director~~ published by the department annually and shall be no less than 30 days in duration. Individuals selected for special elk hunting licenses via the random drawing ~~will~~ shall be notified ~~by May 30~~ no less than 60 days prior to the start of the elk hunt, and special elk hunting licenses must be purchased from the department within 30 days of notification.

B. To enter the random drawing for a special elk hunting license, applicants shall

1. Complete the application for a special elk hunting license as provided by the department.
2. Pay a nonrefundable application fee.
3. Apply only once for each random drawing.

C. Nonresidents shall not comprise more than 10%, or one drawn applicant, whichever is greater, of all drawn applicants in any application pool for the random drawing license program.

D. Applicants who physically reside within the Elk Management Zone shall comprise no less than 10%, or a minimum of one, whichever is greater, of all drawn applicants in any application pool for the random drawing license program.

E. A special elk hunting license awarded through the Random Drawing License Program shall not be transferable.

F. An applicant drawn for a special elk hunting license may be rejected if it is determined that the applicant has been convicted of two or more wildlife violations within three years prior to the last date of the application period. In determining an applicant's eligibility, the director shall take into account the nature and severity of the violations.

G. The department will award unclaimed special elk hunting licenses to alternates who are drawn during the initial application and draw period in the order that the alternates are drawn.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Deadlines were omitted to allow the department more flexibility in refining the overall elk hunting lottery timeline. It is customary for such operational details to be decided on and carried out by the Department, rather than being defined in the authorizing regulation itself. Adequate time is needed for the department to incorporate the results of annual elk population surveys (typically conducted in late winter and overlapping the currently specified lottery dates) into the annual elk license allocation process. Further, the department is currently contracting with Virginia Tech researchers to test elk population survey techniques and methods. Final research results should be reported in 2024, and flexibility in setting the elk lottery dates for 2024 would allow the department to implement an elk lottery timeline that aligns with the research findings. Aligning the Department's elk hunt lottery timeline with the Virginia Tech research results and data collected from annual elk population surveys will ensure that the number of allotted elk licenses are maximized each year. The Department will publicize the deadlines associated with the lottery on an annual basis as far in advance as possible. Minimum durations for the application period and notification process are included to provide assurance that adequate time will be provided for hunters to apply for the lottery and, if selected, prepare for the hunt.

4VAC15-90-540

Game: Deer: Special elk hunting license, Landowner License Program.

Summary:

The proposal is to (i) remove the specific program deadlines; (ii) omit the 50 contiguous acre requirement, (iii) specify that applications will be evaluated based on criteria listed in the program guidance document; and (iv) replace the provision for requesting an either-sex special elk hunting license with a provision for landowners entering a landowner lottery for a special elk hunting license.

Proposed language of amendment:

4VAC15-90-540. Special elk hunting license, Landowner License Program.

A. Upon receipt of a valid Landowner License Program application from a landowner within the Elk Management Zone, the director or the director's designee shall verify the application materials and have sole discretion in enrolling the property in the Landowner License Program. ~~Applications must be received or postmarked by July 1 each year to be eligible for the Landowner License Program during that calendar year.~~ The application deadline shall be published by the department annually no less than 30 days prior to the deadline.

B. A valid Landowner License Program application shall include:

1. Landowner's name, home address, telephone number, and address of the property to be enrolled in the program.
2. A recorded survey or other legal documentation certifying the acreage and ownership of ~~that~~ the property to be enrolled ~~is greater than or equal to 50 contiguous acres~~.
3. Original signature of the landowner.
4. Only a single application per license year, per landowner.

C. Landowners enrolled in the Landowner License Program maintain the right to limit access to certain areas of the property for safety or privacy reasons~~, provided a minimum of 50 acres are open to elk hunting~~. Areas of limited access must be outlined in the initial application. Enrollment in the Landowner License Program does not preclude or limit in any way the landowner from allowing other hunting or other hunters on the property.

D. The department shall determine and make available to the public a program guidance document outlining how landowners enrolled in the Landowner License Program shall accrue points toward a special elk hunting license, the number of points necessary to be awarded such license, a list of criteria by which applications and associated properties will be evaluated for enrollment in the program, and other program requirements. The program guidance document will be published annually no less than 30 days prior to ~~June 1~~ the application deadline.

E. Landowners who accrue the necessary number of points, as defined in the program guidance document, on an enrolled property may enter a landowner lottery for a special elk hunting

license. ~~request one either-sex special elk hunting license from the department. A request for a special elk hunting license must be submitted prior to July 1 in the year the license is to be used.~~ Once ~~a request for~~ a special elk hunting license is awarded through the lottery, ~~made,~~ the landowner~~s~~ lose~~s~~ all accrued points. There is no time limit over which a landowner is required to accrue license points. Landowners shall not combine points from separate enrolled properties.

F. Landowners enrolled in the Landowner License Program shall not subdivide contiguous properties under the same ownership into multiple, smaller parcels for the purposes of this program.

G. License points cannot be sold or traded. License points are nontransferable if the property changes ownership, except that if the property is inherited from parents, grandparents, or children, resident or nonresident, license points may be transferred. The department may request documentation to certify the relationship between seller and purchaser as well as a copy of bill of sale.

H. Landowners receiving a special elk hunting license shall comply with all of the requirements established in this section as well as 4VAC15-90-510, 4VAC15-90-520, and § 29.1-305.01 of the Code of Virginia. Landowners who fail to comply with this chapter may forfeit any accrued license points and may not be eligible to accrue new license points.

I. A special elk hunting license awarded to the landowner shall only be used on the property enrolled with the department in the Landowner License Program.

J. A landowner may transfer the special elk hunting license to any person eligible to hunt in Virginia. The special elk hunting license may not be sold. Transfer of the special elk hunting license must be reported to the department no less than one month prior to the opening day of the elk hunting season during the year in which the special elk hunting license is ~~requested~~ awarded. To report a transfer to the department, the landowner shall provide the department with the hunter's:

1. Name;
2. Department customer identification number;
3. Address; and
4. Telephone number.

K. A landowner shall not charge a fee for hunters to hunt elk on properties enrolled in the Landowner License Program except as described in the program guidance document.

L. A special elk hunting license transferee may be rejected if it is determined that the transferee has been convicted of two or more wildlife violations, within three years prior to the last date of the application period. In determining the transferee's eligibility, the director shall take into account the nature and severity of the violations.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

(i) Deadlines were omitted to allow the Department more flexibility in refining the overall elk hunt lottery timeline. It is customary for such operational details to be decided on and carried out by the Department, rather than being defined in the authorizing regulation itself. After administering the inaugural elk hunt in 2022, it is apparent that the dates initially listed in this regulation may not align well with the annual timeline for assessing elk population levels that would allow the Department to maximize the number of special elk hunting licenses issued each year and to properly plan, communicate, and implement the various elements of the elk hunt.

(ii) The 50-contiguous acre minimum is proposed to be omitted because multiple landowners had ideal elk hunting properties for this past year's inaugural elk hunt that were less than 50 contiguous acres. Fifty acres appears to be arbitrary from a biological standpoint, and regional staffs would like to rely more on property-level features rather than a set acre minimum. This will benefit both landowners and public elk hunters. The landowners with parcels less than 50 acres from this past year's hunt were all directly adjacent to larger parcels that were enrolled in this program for 2022. Therefore, the smaller parcels would have contributed to a larger collective acreage available to hunters and enhanced public access to the adjoining larger parcels.

(iii) A specification that states Landowner License applications and associated properties will be evaluated based on a list of criteria outlined in the program guidance document was added for transparency in how landowners will be enrolled or not enrolled in the program. Examples of such criteria would include presence of elk or elk sign, availability of access points for hunters, and location of property relative to other lands available for elk hunting.

(iv) The provision for landowners requesting an either-sex special elk hunting license was replaced with a provision for landowners to enter a landowner lottery for a special elk hunting license for two reasons. First, instituting a lottery rather than processing "requests" will be a more equitable and transparent method of awarding special elk hunting licenses when the number of landowners interested in a license exceeds the number of available licenses. Second, "either-sex" was omitted to be more in line with the type of elk hunting licenses available at the time landowners are entering the lottery. For example, if antlered elk licenses are the only elk licenses being issued by the Department, then those will be the only option for elk licenses available through the landowner lottery.

Bear & Wild Turkey Regulations

4VAC15-50-11

Game: Bear: Open Season; Generally.

Summary:

The proposal is to add two weeks of general firearms season in 35 counties in southern and eastern Virginia and remove the 3-day early firearms season from 26 counties in northern and western Virginia.

Proposed language of amendment:

4VAC15-50-11. Open Season; Generally.

A. It shall be lawful to hunt bears in the following localities, including the cities and towns therein, during the following seasons:

Location	**Season**
Accomack County	Closed
Albemarle County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Alleghany County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Amelia County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Amherst County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Appomattox County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Arlington County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Augusta County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Bath County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Bedford County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Bland County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Botetourt County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.

Brunswick County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Buchanan County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Buckingham County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Campbell County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Caroline County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Carroll County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Charles City County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Charlotte County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Chesapeake (City of)	October 1 through the first Saturday in January, both dates inclusive.
Chesterfield County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Clarke County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Craig County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Culpeper County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Cumberland County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.

Dickenson County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Dinwiddie County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Essex County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Fairfax County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Fauquier County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Floyd County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Fluvanna County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Franklin County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Frederick County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Giles County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Gloucester County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Goochland County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Grayson County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.

Greene County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Greensville County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Halifax County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Hanover County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Henrico County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Henry County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Highland County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Isle of Wight County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
James City County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
King and Queen County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
King George County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
King William County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Lancaster County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Lee County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.

Loudoun County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Louisa County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Lunenburg County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Madison County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Mathews County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Mecklenburg County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Middlesex County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Montgomery County (southeast of I-81)	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Montgomery County (northwest of I-81)	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Nelson County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
New Kent County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Northampton County	Closed
Northumberland County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Nottoway County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Orange County	Fourth Monday in November through the first Saturday in January, both dates inclusive.

Page County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Patrick County	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Pittsylvania County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Powhatan County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Prince Edward County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Prince George County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Prince William County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Pulaski County (southeast of I-81)	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Pulaski County (northwest of I-81)	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Rappahannock County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Richmond County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Roanoke County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Rockbridge County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.

Rockingham County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Russell County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Scott County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Shenandoah County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Smyth County (southeast of I-81)	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Smyth County (northwest of I-81)	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Southampton County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Spotsylvania County	Fourth Monday in November through the first Saturday in January, both dates inclusive.
Stafford County	~~Monday following the last Saturday in September and for two days following; and t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Suffolk (City of)	October 1 through the first Saturday in January, both dates inclusive.
Surry County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Sussex County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Tazewell County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.

Virginia Beach (City of)	October 1 through the first Saturday in January, both dates inclusive.
Warren County	~~Monday following the last Saturday in September and for two days following; and~~ ~~t~~ The fourth Monday in November through the first Saturday in January, both dates inclusive.
Washington County (southeast of I-81)	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Washington County (northwest of I-81)	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Westmoreland County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.
Wise County	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
Wythe County (southeast of I-81)	Monday nearest December 2 through the first Saturday in January, both dates inclusive.
Wythe County (northwest of I-81)	Monday following the last Saturday in September and for two days following; and the fourth Monday in November through the first Saturday in January, both dates inclusive.
York County	Monday nearest December 2 ~~and for 19 days following.~~ through the first Saturday in January, both dates inclusive.

B. Notwithstanding provisions of subsection A of this section, bears may be hunted from the first Saturday in October through the first Saturday in January, both dates inclusive, within the incorporated limits of any town or city that allows bear hunting.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

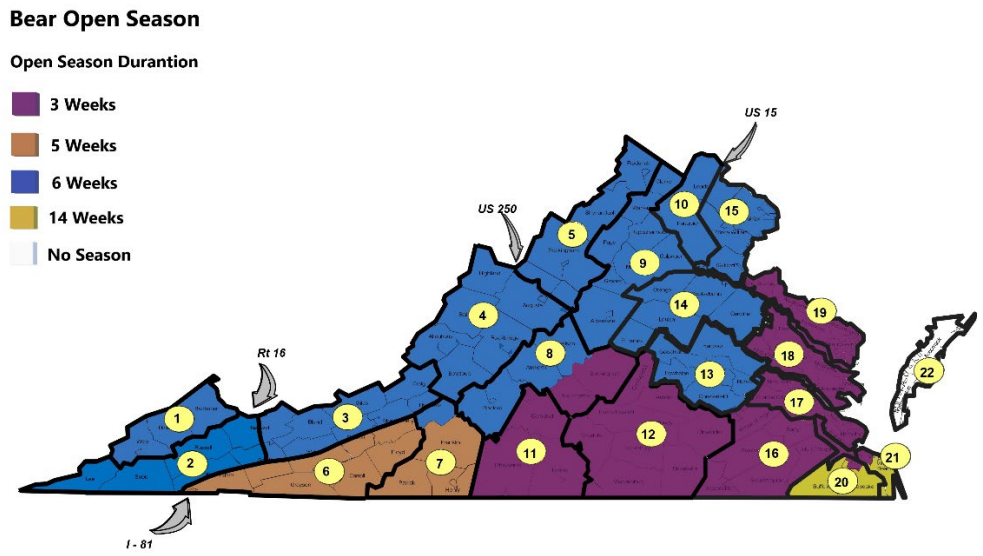
Rationale:

This proposal is designed to address both recent and longer-term black bear population trends to achieve objectives in the Black Bear Management Plan, which is under revision. Besides certain counties in southwestern Virginia, where the draft population objective is to slightly reduce bear populations, draft objectives for the rest of Virginia are to stabilize the bear population at 2020

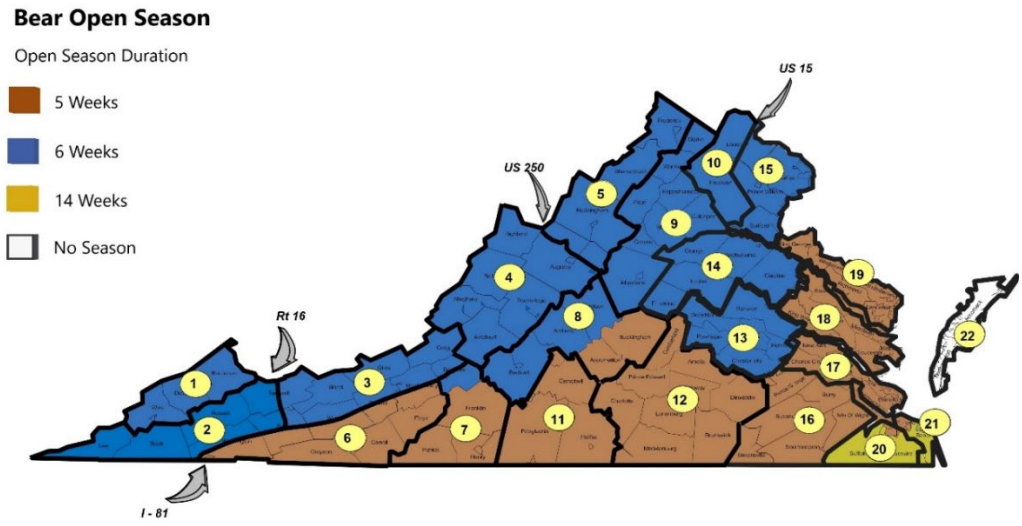
levels. Increasing black bear populations in several southern and eastern management zones supports stepwise approaches to increase bear harvest in order to stabilize bear populations. In contrast, recent and ongoing bear population declines observed in several western and northern management zones necessitate reductions in harvest. Specific changes are recommended in both the general firearms seasons (November and December) and early 3-day firearms seasons (September).

General firearms bear season

This proposal would change the general firearms bear seasons from those depicted on this map:



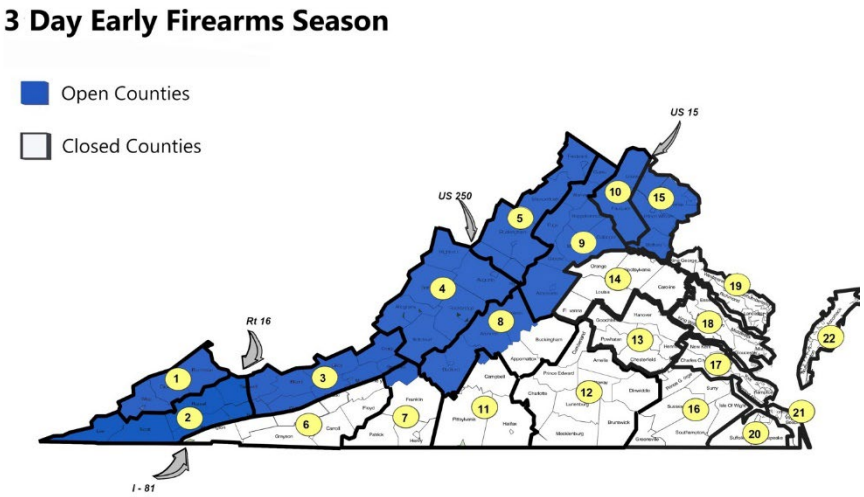
To the general firearms bear seasons depicted on the following map:



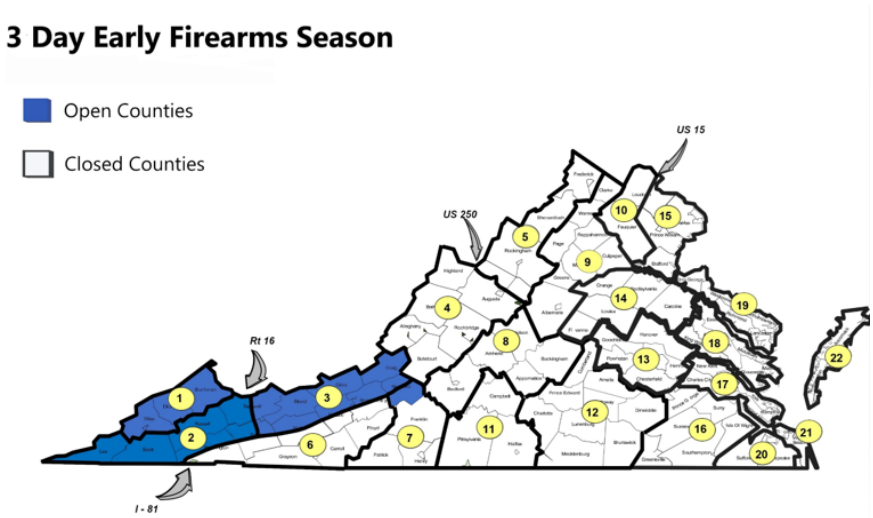
Two additional weeks of general bear firearms season are proposed for Zones 11, 12, 16, 17, 18, 19, and part of Zone 8 (Appomattox and Buckingham counties; see map above) to increase harvests and begin stabilizing bear populations. Bear populations across much of this area have demonstrated the greatest growth rate in the state over the last decade. Adding hunting opportunity at the end of the general firearms seasons will provide additional recreational opportunities for all types of hunters using different weapons and hunting methods.

3-day early bear firearms season

This proposal would change the 3-day early firearms bear seasons from those depicted on this map:



To the 3-day early firearms bear seasons depicted on the following map:



This proposal would remove the 3-day early firearms bear season in Zones 4, 5, 8, 9, 10, and 15. This 3-day season was established in 2017 to reduce bear populations in western and northern

zones according to interim bear population objectives (2017-2021). The intent has been to remove this early season once objectives were accomplished, as they have been over much of this area.

Harvest data and other information (conflict reports, constituent observations) suggest that bear populations in Zones 5, 9, and 10 have declined significantly in recent years. Previous objectives to reduce the bear population in these three zones have clearly been met and current populations are below the new draft objectives, which are to stabilize bear population at 2020 levels in these areas. In Zone 15, bear harvests during the 3-day season have been inconsequential, so it is recommended that the season be removed in this zone for geographic consistency in regulations.

The magnitude of population declines in Zones 5, 9, and 10 could be partially related to sarcoptic mange, a skin disease in bears. There is currently no evidence, in Virginia or elsewhere, that the disease limits bear populations over the long term; however, other states have observed cyclic outbreaks of mange that can impact bear populations locally for several years. The Department takes the problem of mange and its potential implications on black bears seriously as it continues to gather reports, conduct investigations, and collaborate with other states to determine long-term solutions and potential impacts on bear populations.

The proposal to remove the 3-day early firearms bear season in Zones 4 and 8 is made for two primary reasons. First, recent trends in harvest and other information (conflict reports, constituent observations) suggest that we have tentatively met previous objectives to reduce bear populations over much of this area. In addition, sarcoptic mange may already be playing some role as an additive bear mortality factor in certain parts of these zones. As mange continues to spread southward and eastward in Virginia, removing the 3-day early season in Zones 4 and 8 is a proactive measure to address potential population impacts over the next several years. With both factors in mind, the proposal will ease harvest pressure to ensure the bear population does not decline inordinately below the draft objectives, which are to stabilize bear population at 2020 levels in these areas.

4VAC15-240-31

Game: Turkey: Open season; certain counties and areas; four-week season.

Summary:

This proposal is to remove Charles City County from the list of counties which have a four week fall turkey season and add it to the regulation for a six week fall turkey season (4VAC15-240-32).

Proposed language of amendment:

4VAC15-240-31. Open season; certain counties and areas; four-week season.
It shall be lawful to hunt turkeys 14 days immediately before the Saturday prior to the first Monday in November, on Thanksgiving Day and the day before, and on the Monday closest to December 2 and for 12 days following in the Counties of Accomack, Amelia, ~~Charles City~~, Dinwiddie, Gloucester, Greensville, Isle of Wight, James City, Mathews, Middlesex, New Kent, Northampton, Powhatan, Prince George, Southampton, Surry, Sussex, and York (except on Camp Peary) and the City of Suffolk.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Current population trends and density estimates for Charles City County indicate a very high turkey density with a stable population trend. Staff believe the population can sustain an increased fall harvest opportunity based on the current population metrics. The remaining counties in this four week fall season grouping do not currently indicate population trends that would allow for additional fall harvest opportunities.

4VAC15-240-32

Game: Turkey: Open season; certain counties and areas; six-week season.

Summary:

This proposal is to add Charles City to the counties with a six week fall turkey season.

Proposed language of amendment:

4VAC15-240-32. Open season; certain counties and areas; six-week season.
It shall be lawful to hunt turkeys 14 days immediately before the Saturday prior to the first Monday in November; on Thanksgiving Day and the day before; on the Monday nearest December 2 and for 12 days following, both dates inclusive; and on the second Saturday in January and for 14 days following in the Counties of Amherst, Appomattox, Brunswick, Buchanan, Buckingham, Campbell, Charles City, Charlotte, Chesterfield, Cumberland, Floyd, Fluvanna, Frederick, Goochland, Halifax, Hanover, Henrico, Henry, Louisa, Lunenburg, Mecklenburg, Nottoway, Orange, Patrick, Pittsylvania, Prince Edward, Shenandoah, Spotsylvania, Tazewell, and Warren.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Current population trends and density estimates for Charles City County indicate a very high turkey density with a stable population trend. Staff believe the population can sustain an increased fall harvest opportunity based on the current population metrics.

4VAC15-240-40

Game: Turkey: Open season; spring season for bearded turkeys.

Summary:

This proposal is to allow the standard daily and season bag limit to apply to the youth and apprentice spring turkey hunting weekend.

Proposed language of amendment:

4VAC15-240-40. Open season; spring season for bearded turkeys.
A. Except as otherwise provided in this section, it shall be lawful to hunt bearded turkeys from the second Saturday in April and for 35 days following, both dates inclusive, from 1/2 hour before sunrise to 12:00 noon prevailing time during the first 16 days and from 1/2 hour before sunrise to sunset during the last 20 days of the spring season.

B. Turkey hunters 15 years of age and younger and holders of an apprentice hunting license may hunt on the first Saturday in April and the following calendar day from 1/2 hour before sunrise to sunset, when in compliance with applicable license requirements and when accompanied and directly supervised by an adult who has a valid Virginia hunting license on his person or an adult who is exempt from purchasing a hunting license. Adult hunters accompanying youth hunters or apprentice license holders on these days may assist with calling but they shall not carry or discharge weapons. ~~Youth and apprentice turkey hunters are limited on this weekend to one turkey per hunter.~~

C. Upon receipt of an application from an officer or other designated official representative of any nonprofit organization that has support for sportsmen with impaired mobility as one of its mission statements, the director may issue a permit to an officer or representative of the organization that allows sportsmen with impaired mobility to hunt bearded wild turkeys from 1/2 hour before sunrise to sunset from the 10th through 16th days of the spring season. Such authorization shall be valid only when hunting during an authorized event. All participants shall be in compliance with all requirements of law and regulation that apply during the spring season, and bearded turkeys killed during these events shall count toward daily and annual bag limits.

D. Bearded turkeys may be hunted by calling.

E. It shall be unlawful to use dogs or organized drives for the purpose of hunting.

F. It shall be unlawful to use or have in possession any shot larger than number 2 fine shot when hunting turkeys with a shotgun.

Staff Final Recommendation – Staff does not recommend adoption of the amendment at this time.

Rationale:

The youth and apprentice turkey hunting seasons were instituted to increase participation by new hunters without the competition from more experienced hunters. In 2014, the turkey season was expanded to include Sundays creating a youth and apprentice hunter weekend. However, the youth and apprentice season bag limits were maintained at 1 bird per hunter for the weekend as the effects of adding Sunday hunting were not known at the time, and there were concerns of over-harvesting turkeys early in the season. Subsequent monitoring indicates that additional harvest during the weekend season would not likely cause excessive harvests but would provide additional recreational benefit to new hunters. This proposal would allow a youth or apprentice hunter to harvest birds in accordance with the daily and season bag limits set by the Board in 4VAC15-240-70.

4VAC15-240-51

Game: Turkey: Youth and Apprentice fall turkey hunting weekend.

Summary:

This proposal is to allow the standard daily and season bag limit to apply to the youth and apprentice fall turkey hunting weekend.

Proposed language of amendment:

4VAC15-240-51. Youth and Apprentice fall turkey hunting weekend.
In counties, cities, and areas with a fall turkey season, hunters 15 years of age and younger and holders of an apprentice hunting license may hunt turkey on the second Saturday in October and the following calendar day when in compliance with applicable license requirements and when accompanied and directly supervised by an adult who has a valid Virginia hunting license on his person or is exempt from purchasing a hunting license. Adult hunters accompanying youth hunters or apprentice license holders on these days may assist with calling turkey but they shall not carry or discharge weapons. ~~Youth and apprentice turkey hunters are limited on this weekend to one turkey per hunter~~.

Staff Final Recommendation – Staff does not recommend adoption of the amendment at this time.

Rationale:

The youth and apprentice turkey hunting seasons were instituted to increase participation by new hunters without the stress of competition from experienced hunters. In 2014, the season was expanded to include Sundays creating a youth and apprentice hunting weekend. However, the youth and apprentice season bag limits were maintained at one bird per hunter per weekend as the effects of adding Sunday hunting were not known at the time and there were concerns of over-harvesting turkeys early in the season. Subsequent monitoring indicates that additional harvest during the weekend would not likely cause excessive harvests but would provide additional recreational benefit to new hunters. This proposal would allow a youth or apprentice hunter to harvest birds in accordance with the daily and season bag limits set by the Board in 4VAC15-240-70.

General Regulations

4VAC15-20-66

Definitions and Miscellaneous: In General: Admittance, parking, or other use fee at certain department-owned and department-managed facilities.

Summary:

This proposal aligns the regulation with the Code of Virginia (§ 29.1-113) after the Code was amended to remove mandatory fees at department boating access sites. The intent is to not charge a fee at department-owned or department-managed boat ramps.

Proposed language of amendment:

4VAC15-20-66. Admittance, parking, or other use fee at certain department-owned and department-managed facilities.

A. Pursuant to the authority of the board under § 29.1-103 (14) of the Code of Virginia and in accordance with § 29.1-113 of the Code of Virginia, a daily fee of $3.00 or an annual fee equal to the price of an annual basic state resident fishing or hunting license is established for admittance, parking, or other use at department-owned or department-managed lands ~~boat launch sites,~~ and public fishing lakes. Such fee shall not apply to (i) any person holding a valid hunting, trapping, or fishing license, or a current certificate of boat registration issued by the department; (ii) persons 16 years of age or younger; or (iii) ~~any person who is a passenger in but not the owner or operator of a paddlecraft or registered vessel.~~ the use of department-owned boat ramps.

B. Any person violating this section may be assessed a civil penalty of $50 in lieu of any criminal penalty.

C. The director may waive fees for any person, group, or organization whenever such action is deemed to be in the department's interest. Any or all facilities may be closed by the director without notice due to an emergency or natural disaster. Full refunds or credits may be issued whenever the closure prevents any use of the facility during the term of the permit. Partial refunds of fees may be made in the interest of providing better customer service.

D. The director may allow deviations from established fees in the form of discounts or special promotions for the purpose of stimulating visitation and use of departmental facilities.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

The intent of this change is to align our regulations with the Code of Virginia (§ 29.1-113). The Code was amended in 2022 and this proposed regulation amendment removes the access fee requirements from department-owned or department-managed boat ramps.

4VAC15-20-130
Definitions and Miscellaneous: In General; Endangered and threatened species; adoption of federal list; additional species enumerated.

Summary:

The proposal is to (i) update the date reference to the federal list of endangered and threatened wildlife species and (ii) update the Virginia List of Endangered and Threatened Species to remove the state threatened sickle darter and state threatened Atlantic pigtoe to reflect their status in Virginia more accurately and improve regulatory certainty.

Proposed language of amendment:

4VAC15-20-130. Endangered and threatened species; adoption of federal list; additional species enumerated.

A. The board hereby adopts the Federal Endangered and Threatened Species List, Endangered Species Act of December 28, 1973 (16 USC §§ 1531-1543), as amended as of ~~April 30, 2021~~ December 28, 2022, and declares all species listed thereon to be endangered or threatened species in the Commonwealth. Pursuant to subdivision 12 of § 29.1-103 of the Code of Virginia, the director of the department is hereby delegated authority to propose adoption of modifications and amendments to the Federal Endangered and Threatened Species List in accordance with the procedures of §§ 29.1-501 and 29.1-502 of the Code of Virginia.

B. In addition to the provisions of subsection A of this section, the following species are declared endangered or threatened in this Commonwealth, and are afforded the protection provided by Article 6 (§ 29.1-563 et seq.) of Chapter 5 of Title 29.1 of the Code of Virginia:

1. Fish:

Endangered

Dace, Clinch	Chrosomus sp. cf. saylori
Dace, Tennessee	Phoxinus tennesseensis
Darter, sharphead	Etheostoma acuticeps
Darter, variegate	Etheostoma variatum
Sunfish, blackbanded	Enneacanthus chaetodon

Threatened:

Darter, Carolina	Etheostoma collis
Darter, golden	Etheostoma denoncourti
Darter, greenfin	Etheostoma chlorobranchium

~~Darter, sickle~~	~~Percina willliamsi~~
Darter, western sand	Ammocrypta clara
Madtom, orangefin	Noturus gilberti
Paddlefish	Polyodon spathula
Shiner, emerald	Notropis atherinoides
Shiner, steelcolor	Cyprinella whipplei
Shiner, whitemouth	Notropis alborus

2. Amphibians:

Endangered:

Salamander, eastern tiger	Ambystoma tigrinum

Threatened:

Salamander, Mabee's	Ambystoma mabeei

3. Reptiles:

Endangered:

Rattlesnake, canebrake (Coastal Plain population of timber rattlesnake)	Crotalus horridus
Turtle, bog	Glyptemys muhlenbergii
Turtle, eastern chicken	Deirochelys reticularia reticularia

Threatened:

Lizard, eastern glass	Ophisaurus ventralis
Turtle, wood	Glyptemys insculpta

4. Birds:

Endangered:

Plover, Wilson's	Charadrius wilsonia
Rail, black	Laterallus jamaicensis
Woodpecker, red-cockaded	Dryobates borealis
Wren, Bewick's	Thryomanes bewickii bewickii

Threatened:

Falcon, peregrine	Falco peregrinus
Shrike, loggerhead	Lanius ludovicianus
Sparrow, Bachman's	Aimophila aestivalis

Sparrow, Henslow's	Ammodramus henslowii
Tern, gull-billed	Sterna nilotica

5. Mammals:

Endangered:

Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis
Bat, little brown	Myotis lucifugus
Bat, tri-colored	Perimyotis subflavus
Hare, snowshoe	Lepus americanus
Shrew, American water	Sorex palustris
Vole, rock	Microtus chrotorrhinus

6. Mollusks:

Endangered:

Coil, rubble	Helicodiscus lirellus
Coil, shaggy	Helicodiscus diadema
Deertoe	Truncilla truncata
Elephantear	Elliptio crassidens
Elimia, spider	Elimia arachnoidea
Floater, brook	Alasmidonta varicosa
Ghostsnail, thankless	Holsingeria unthanksensis
Heelsplitter, Tennessee	Lasmigona holstonia
Lilliput, purple	Toxolasma lividus
Mussel, slippershell	Alasmidonta viridis
Pigtoe, Ohio	Pleurobema cordatum
Pigtoe, pyramid	Pleurobema rubrum
Springsnail, Appalachian	Fontigens bottimeri
Springsnail (no common name)	Fontigens morrisoni
Supercoil, spirit	Paravitrea hera

Threatened:

Floater, green	Lasmigona subviridis
Papershell, fragile	Leptodea fragilis
~~Pigtoe, Atlantic~~	~~Fusconaia masoni~~

Pimpleback	Quadrula pustulosa pustulosa
Pistolgrip	Tritogonia verrucosa
Riversnail, spiny	Iofluvialis
Sandshell, black	Ligumia recta
Supercoil, brown	Paravitrea septadens

7. Arthropods:

Threatened:

Amphipod, Madison Cave	Stygobromus stegerorum
Pseudotremia, Ellett Valley	Pseudotremia cavernarum
Xystodesmid, Laurel Creek	Sigmoria whiteheadi

C. It shall be unlawful to take, transport, process, sell, or offer for sale within the Commonwealth any threatened or endangered species of fish or wildlife except as authorized by law.

D. The incidental take of certain species may occur in certain circumstances and with the implementation of certain conservation practices as described in this subsection:

Species	Location	Allowable Circumstances	Required Conservation Measures	Expected Incidental Take
Little brown bat Tri-colored bat	Statewide	Human health risk – need for removal of individual animals from human-habited structures.	Between May 15 and August 31, no exclusion of bats from maternity colonies, except for human health concerns. department-permitted nuisance wildlife control operator with department-recognized certification in techniques associated with removal of bats. Use of exclusion devices that allow individual animals to escape. Manual collection of individual animals incapable of sustaining themselves; transport to	Little to no direct lethal taking expected.

			a willing and appropriately permitted wildlife rehabilitator.	
		Public safety or property damage risk – need for tree removal, application of prescribed fire, or other land management actions affecting known roosts; removal of animals from known roosts.	Hibernacula: no tree removal, use of prescribed fire, or other land management action within a 250-foot radius buffer area from December 1 through April 30. Between September 1 and November 30, increase the buffer to a 1/4-mile radius with the following conditions: for timber harvests greater than 20 acres, retain snags and wolf trees (if not presenting public safety or property risk) and small tree groups up to 15 trees of 3-inch diameter at breast height (dbh) or greater, one tree group per 20 acres. Otherwise, document the need (public safety, property damage risk) for tree removal during this period and verify that no known roost trees exist in the buffer area. Tree removal and prescribed fire are permitted outside of these dates. Known roost trees: no tree removal, use of	Little to no direct lethal taking expected.

			prescribed fire, or other land management action within a 150-foot radius buffer area from June 1 through July 31, if possible. Otherwise, document public safety or property damage risk. department-permitted nuisance wildlife control operator with department-recognized certification in techniques associated with removal of bats. Use of exclusion devices that allow individual animals to escape. Manual collection of individual animals incapable of sustaining themselves; transport to a willing and appropriately permitted wildlife rehabilitator.	

<u>Staff Final Recommendation</u> – Staff recommends adoption of the amendments as final in the form they were proposed.

<u>Rationale:</u>

Adoption of the updated and modified federal list of endangered and threatened wildlife species: Maintaining the currency of the Board's adoption of the federal list is essential to clarifying the state and federal status of each affected species, ensuring compliance with our Cooperative Agreements with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding interagency management of these species and maintaining regulatory certainty about the status of the species in Virginia.

Removal of the sickle darter and Atlantic pigtoe as threatened species: On December 16, 2021, the U.S. Fish and Wildlife Service officially added the Atlantic pigtoe, a freshwater mussel

species found in Virginia's Atlantic slope drainage, as a threatened species to the federal list of endangered and threatened species. On December 7, 2022, the U.S. Fish and Wildlife Service officially added the sickle darter, a freshwater fish species found in Virginia's Upper Tennessee River drainage, as a threatened species to the federal list of endangered and threatened species. The intent of 4 VAC 15-20-130 is for the Board to designate as state endangered or threatened those species that do not already appear on the federal list. Since these species are now on the federal list, the proposal is to remove them from the state list.

4VAC15-40-195

Game: In General: Visiting traps, generally; visiting completely submerged, body-gripping traps; use of remote trap check systems.

Summary:

The proposed updates remote trap check system requirements to incorporate the use of certain types of camera-based systems.

Proposed language of amendment:

4VAC15-40-195. Visiting traps, generally; visiting completely submerged, body-gripping traps; use of remote trap check systems.

A. Except as provided in subsections B and C of this section, it shall be unlawful to fail to visit all traps once each day and remove all animals caught.

B. Body-gripping traps that are completely submerged by water must be visited at least once every 72 hours.

C. Remote trap checking systems may be used in lieu of a physical trap visit when such systems (i) have a control unit or remote camera that reports trap status to a centralized application ~~database~~ at least once every 24 hours; (ii) ~~have notifications alarms that report~~ provide notifications of trap closures or activity at the trap site and system health issues within one hour of detection via email or ~~and~~ text-based messaging systems; and (iii) have on-demand ~~control unit testing~~ capabilities for determining ~~trap status,~~ signal strength~~,~~ and battery condition via remote system check-in. If the control unit reports a trap closure or the camera sends a photo with an animal in a trap, the user is required to physically visit the trap within 24 hours of the time the trap was reported closed, or the photo was received. If the control unit or camera fails to report its current status within a 24-hour check-in period or reports a system health issue, the user is required to physically check the trap within 24 hours of the last ~~time an open trap signal was received~~ communication with the device.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

In 2015, a provision was added to allow certain types of remote trap check systems to be used in lieu of a physical trap check. Since that time, there have been considerable technological advances in these systems, particularly among camera-based trap monitoring systems. These camera-based systems do not fit cleanly into the current language describing allowable systems, despite being more versatile and widely available. Electronic trap check and camera systems conforming to standards proposed in this regulation ensure that trap status is reliably determined and allows for quicker detection and removal of animals in traps.

4VAC15-40-276

Game: In General: Sale of small game animals and parts.

Summary:

This proposal allows the sale of non-meat turkey parts in accordance with regulation.

Proposed language of amendment:

4VAC15-40-276. Sale of wild turkey and small game animals and parts.

It shall be lawful for any person to purchase or sell skins, pelts, skulls, bones, teeth, claws, feet, spurs, tails, hair, feathers, taxidermy mounts, and other nonmeat parts of legally taken and possessed rabbits, squirrels, bobwhite quail, ruffed grouse, ~~and~~ pheasants, and wild turkey.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

This proposal would allow individuals to offer for sale wild turkey taxidermy mounts, feathers, feet, spurs, etc. and align the sale of wild turkey parts with those of small game animals and cervids (4VAC15-90-280). Currently, turkey parts are only allowed to be sold under § 29.1-521 for the purpose of creating "turkey callers," which has led to ambiguity as there is no clear definition within code.

4VAC15-40-285

Game: In General: Unauthorized feeding of cervids.

Summary:

The proposal is to prohibit feeding of cervids in cities and towns within designated counties that are within 25 miles of a confirmed detection of Chronic Wasting Disease.

Proposed language of amendment:

4VAC15-40-285. Unauthorized feeding of cervids.

A. It shall be unlawful for any person to place or distribute food, salt, minerals, or similar substances to feed or attract cervids (i) at any time in the Counties (including the cities and towns within) of Buchanan, Dickenson, Wise, and in any county (including the cities and towns within) designated by the department within 25 miles of a confirmed detection of Chronic Wasting Disease; (ii) during any deer or elk season within any county, city, or town that allows deer or elk hunting; and (iii) from September 1 through the first Saturday in January, both dates inclusive, elsewhere in the Commonwealth.

B. Any food, salt, minerals, or similar substances placed or distributed to feed or attract cervids prior to September 1 must be completely removed by September 1, and any area where food, salt, minerals, or similar substances were placed or distributed to feed or attract cervids shall be considered to be baited for 10 days following the complete removal of the items listed in this subsection.

C. Upon written notification by department personnel, no person shall continue to place or distribute any food, salt, mineral, or similar substances for any purpose if the placement of these materials results in the attraction of or feeding of cervids. After such notification, such person shall be in violation of this section if the placing, distribution, or presence of such food, salt, minerals, or similar substances continues.

D. No part of this regulation shall be construed to restrict bona fide agronomic plantings (including wildlife food plots), bona fide distribution of food to livestock, or wildlife management activities conducted or authorized by the department.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

It was an oversight to exclude cities and towns in the year-round prohibition on feeding cervids within proximity to Chronic Wasting Disease detections. Feeding deer in cities and towns represent similar risks as feeding deer within the counties that surround them. CWD is an infectious disease of cervids that spreads readily through animal-to-animal contact and environmental contamination by the disease agent. Because CWD transmission can be enhanced when deer are concentrated at artificial feeding sites, it is critical to prevent the placement of food, minerals, or salt in an expansive area surrounding an area known to be infected with the disease.

4VAC15-40-290 (New)

Game: General: Validating tags and reporting bear, deer, elk, turkey, or bobcat.

Summary:

The proposal is to combine regulations for validating tags and reporting the harvests of bears, deer, elk, turkeys, and bobcats, replacing and repealing 4 VAC 15-50-81, 4 VAC 15-50-91, 4 VAC 15-70-70, 4 VAC 15-90-231, 4 VAC 15-90-241, 4 VAC 15-240-81, 4 VAC 15-240-91. This new regulation will also add a requirement to report gray fox harvest and incorporate the prohibition on providing false information when reporting game harvests, replacing and repealing 4 VAC 15-40-300.

Proposed language of amendment:

4VAC15-40-290. Validating tags and reporting bear, deer, elk, turkey, or bobcat.

A. If a hunter holds a license or permit to kill a bear, deer, elk, or turkey:

1. The hunter killing a bear, deer, elk, or turkey shall, before removing the carcass from the place of kill, validate an appropriate tag on their special license for hunting bear, special license for hunting deer and turkey, special elk hunting license, bonus deer permit, or special permit by completely removing the designated notch area from the paper tag or by electronically notching a tag and reporting the bear, deer, elk, or turkey using the department's mobile harvest reporting application. Place of kill shall be defined as the location where the animal or bird is first reduced to possession. It shall be unlawful for any person to validate (notch) a paper tag prior to the killing of a bear, deer, elk, or turkey. A paper tag that is mistakenly validated (notched) prior to the killing of a bear, deer, elk, or turkey must be immediately voided by the licensee or permittee by writing in ink the word "VOID" on the line provided on the license or special permit tag. All electronically notched tags are permanent and cannot be voided.

2. Upon killing a bear, deer, elk, or turkey and validating (notching) a paper license tag, bonus deer permit or special permit, as provided in subsection A of this section, the hunter shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's electronic harvest reporting system. At such time, the person making the report will be given a confirmation number. The successful hunter shall then immediately record the confirmation number in ink on the line provided on the paper tag that was validated (notched) in the field.

3. After the harvest of a bear, deer, elk, or turkey is reported, no written documentation is required as long as the hunter who killed the animal or bird is in possession of the carcass. If the reported carcass is left unattended or transferred to the possession of another individual, written documentation that includes the successful hunter's full name, the date the animal or

bird was killed, and the confirmation number must be created and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.

B. If a hunter is exempt from license requirements or holds a license authorization number as prescribed by the Code of Virginia (§ 29.1-301, 29.1-327, 29.1-339) and has killed a bear, deer, elk, or turkey:

1. The hunter shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's electronic harvest reporting system. At such time, the person making the report will be given a confirmation number. The hunter shall immediately create written documentation including the hunter's full name, the date the animal or bird was killed, and the confirmation number. This written documentation must be kept in possession with the carcass until the carcass is processed. If the carcass is transferred to the possession of another individual, the written documentation must be transferred with the carcass to the individual and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.

C. Any hunter or trapper who kills a bobcat shall report the kill within 24 hours through the department's electronic harvest reporting system. At such time, the person reporting the kill will be furnished with a confirmation number. The hunter or trapper shall immediately record this confirmation number in a location where it can later be retrieved to prove compliance with reporting requirements or to request a department seal. Any bobcat received by a taxidermist for mounting or tanning shall have written documentation securely attached to the carcass that includes the full name of the hunter or trapper, date of kill, and the harvest confirmation number.

D. Any hunter or trapper who kills a gray fox shall report the kill within 24 hours through the department's electronic harvest reporting system. At such time, the person reporting the kill will be furnished with a confirmation number. The hunter or trapper shall immediately record this confirmation number in a location where it can later be retrieved to prove compliance with checking requirements. Any gray fox received by a taxidermist for mounting or tanning shall have written documentation securely attached to the carcass that includes the full name of the hunter or trapper, date of kill, and the harvest confirmation number.

E. It shall be unlawful for any person to destroy the identity of the sex of any bear, deer, elk, or turkey killed until the harvest is reported as required by this section. Successful hunters may dismember the carcass to pack it out from the place of kill as long as they do not destroy the identity of the sex and all the parts of the carcass are present when the animal or bird is reported.

F. Processed carcass parts of a bear, deer, elk, or turkey killed legally in Virginia may be transported. However, upon request of any authorized law-enforcement officer, sufficient verbal

or written information necessary to properly establish legal possession must be furnished immediately.

G. Upon killing a bear, deer, elk, or turkey within an area designated by the department for disease management and on days designated by the department, the hunter shall present the carcass at or submit carcass parts or samples as directed by the department to a location designated by the department for the purposes of disease surveillance or biological monitoring.

H. A premolar tooth must be removed by the hunter after reporting the harvest of a bear through the department's electronic harvest reporting system. The premolar shall be placed in an envelope furnished by the department and labeled with the hunter's full name, confirmation number, date of kill, and the sex of the harvested bear. This envelope with premolar and accompanying information must be mailed or delivered to the department no later than 14 days after the close of the bear harvest season.

I. Any bear, deer, elk, or turkey found in the possession of any person that has not been reported as required by this section shall be forfeited to the Commonwealth to be disposed of as provided by law.

J. It shall be unlawful to provide false statements or record false information when tagging or reporting the harvest of any wild animal or bird to the department, any agent of the department, or any taxidermist.

~~**4VAC15-40-300. Falsifying harvest information prohibited.**~~

~~It shall be unlawful to provide false statements or record false information when tagging, checking, or reporting the harvest of any wild animal to the department, any agent of the department, or any taxidermist.~~

~~**4VAC15-50-81. Validating tags and reporting bear and tooth submission by licensee or permittee.**~~

~~A. Any person killing a bear shall, before removing the carcass from the place of kill, validate an appropriate tag on their special license for hunting bear or special permit by completely removing the designated notch area from the tag or by electronically notching a tag and reporting the bear using the department's mobile harvest reporting application. Place of kill shall be defined as the location where the animal is first reduced to possession. It shall be unlawful for any person to validate (notch) a bear tag from any special license for hunting bear or special permit prior to the killing of a bear. A bear tag that is mistakenly validated (notched) prior to the killing of a bear must be immediately voided by the licensee or permittee by writing, in ink, the word "VOID" on the line provided on the license tag. All electronically notched tags are permanent and cannot be voided.~~
~~B. Upon killing a bear and validating (notching) a license tag or special permit, as provided in subsection A of this section, the licensee shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's automated harvest reporting system. At such time, the person reporting the carcass will be given a confirmation number from the automated reporting system.~~

The successful hunter shall then immediately record the confirmation number, in ink, on the line provided on the tag that was validated (notched) in the field. If checked at an authorized bear check station, the black bear check card must be kept in possession with the carcass until the carcass is processed. After the kill is reported, no written documentation is required as long as the hunter who killed the animal is in possession of the carcass. If the reported carcass is left unattended or transferred to the possession of another individual, written documentation including the successful hunter's full name, the date the animal was killed, and the confirmation number must be created and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass. Processed carcass parts of a bear killed legally in Virginia may be transported; however, upon request of any authorized law-enforcement officer, sufficient verbal or written information necessary to properly establish legal possession must be furnished immediately.

C. A premolar tooth must be removed by the hunter immediately after reporting the kill through the department's automated harvest reporting system. The premolar shall be placed in an envelope furnished by the department and labeled with the hunter's full name, check confirmation number, date of kill, and the sex of the harvested bear. This envelope with premolar and accompanying information must be mailed or delivered to the department no later than 14 days after the close of the bear harvest season.

D. It shall be unlawful for any person to destroy the identity of the sex of any bear killed unless and until the license tag or special permit is validated (notched) and reported as required by this section. Successful bear hunters are allowed to dismember the carcass to pack it out from the place of kill, after an appropriate license tag has been validated (notched) as required in subsection A of this section, as long as they do not destroy the identity of the sex, and all the parts of the carcass are present when the bear is reported through the automated harvest reporting system. Any bear found in the possession of any person without a validated (notched) license tag or documentation that the bear has been reported through the department's automated harvest reporting system as required by this section shall be forfeited to the Commonwealth to be disposed of as provided by law.

4VAC15-50-91. Reporting bear and tooth submission by persons exempt from license requirements or holding a license authorization number.

A. Upon killing a bear, any person (i) exempt from license requirements as prescribed in § 29.1-301 of the Code of Virginia, (ii) issued a complimentary license as prescribed in § 29.1-339 of the Code of Virginia, (iii) holding a permanent license issued pursuant to § 29.1-301 E of the Code of Virginia, or (iv) the holder of a Virginia license authorization number issued by a telephone or electronic media agent pursuant to § 29.1-327 B of the Code of Virginia shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's automated harvest reporting system. At such time, the person reporting the carcass shall be given a confirmation number from the automated reporting system. After the kill is reported using the automated harvest reporting system, the successful hunter shall immediately create written documentation including the successful hunter's full name, the date the animal was killed, and the confirmation number. This written documentation must be kept in possession with the carcass until the carcass is processed. If the automated harvest reported carcass is transferred to the possession of another individual, the written documentation must be transferred with the carcass to the individual and

kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass. Processed carcass parts of a black bear killed legally in Virginia may be transported; however, upon request of any authorized law enforcement officer, sufficient verbal or written information necessary to properly establish legal possession must be furnished immediately.

B. A premolar tooth must be removed by the hunter immediately after reporting the kill through the department's automated harvest reporting system. The premolar shall be placed in an envelope furnished by the department and labeled with the hunter's full name, check confirmation number, date of kill, and the sex of the harvested bear. This envelope with premolar and accompanying information must be mailed or delivered to the department no later than 14 days after the close of the bear harvest season.

C. It shall be unlawful for any person to destroy the identity of the sex of any bear killed until the bear is reported as required by this section. Successful bear hunters are allowed to dismember the carcass to pack it out from the place of kill as long as they do not destroy the identity of the sex and all the parts of the carcass are present when the bear is reported through the automated harvest reporting system. Any bear that has not been reported through the department's automated harvest reporting system as required by this section, found in the possession of any person exempt from the license requirements or holding a license authorization number shall be forfeited to the Commonwealth to be disposed of as provided by law.

4VAC15-70-70. Checking requirements.

Any hunter or trapper who kills a bobcat shall report the kill within 24 hours through the department's automated harvest reporting system. At such time, the person reporting the kill will be furnished with a confirmation number. The hunter or trapper shall immediately record this confirmation number in a location where it can later be retrieved to prove compliance with checking requirements or to request a department seal. Any bobcat received by a taxidermist for mounting or tanning shall have written documentation securely attached to the carcass that includes the full name of the hunter or trapper, date of kill, and the harvest confirmation number.

4VAC15-90-231. Validating tags and reporting deer by licensee or permittee.

A. Any person killing a deer shall, before removing the carcass from the place of kill, validate an appropriate tag on his special license for hunting deer and turkey, bonus deer permit, or special permit by completely removing the designated notch area from the tag or by electronically notching a tag and reporting the deer using the department's mobile harvest reporting application. Place of kill shall be defined as the location where the animal is first reduced to possession. It shall be unlawful for any person to validate (notch) a deer tag from any special license for hunting deer and turkey, bonus deer permit, or special permit prior to the killing of a deer. A deer tag that is mistakenly validated (notched) prior to the killing of a deer must be immediately voided by the licensee or permittee by writing in ink the word "VOID" on the line provided on the license tag. All electronically notched tags are permanent and cannot be voided.

B. Upon killing a deer and validating (notching) a license tag, bonus deer permit or special permit, as provided in subsection A of this section, the licensee or permittee shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's automated harvest reporting

system. At such time, the person reporting the carcass will be given a confirmation number. The successful hunter shall then immediately record the confirmation number in ink on the line provided on the tag that was validated (notched) in the field. I

C. After the kill is reported, no written documentation is required as long as the hunter who killed the animal is in possession of the carcass. If the reported carcass is left unattended or transferred to the possession of another individual, written documentation that includes the successful hunter's full name, the date the animal was killed, and the confirmation number must be created and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.

D. It shall be unlawful for any person to destroy the identity of the sex of any deer killed unless and until the license tag, bonus deer permit, or special permit is validated (notched) and reported as required by this section. Successful deer hunters are allowed to dismember the carcass to pack it out from the place of kill, after an appropriate license tag has been validated (notched) as required in subsection A of this section, as long as they do not destroy the identity of the sex and all the parts of the carcass are present when the deer is reported.

E. Processed carcass parts of a deer killed legally in Virginia may be transported. However, upon request of any authorized law-enforcement officer, sufficient verbal or written information necessary to properly establish legal possession must be furnished immediately.

F. Any deer found in the possession of any person without a validated (notched) license tag or documentation that the deer has been reported as required by this section shall be forfeited to the Commonwealth to be disposed of as provided by law.

G. Upon killing a deer within an area designated by the department for deer disease management and on days designated by the department, the licensee or permittee shall present the carcass, or submit carcass parts or samples as directed by the department, to a location designated by the department for the purposes of disease surveillance or biological monitoring.

4VAC15-90-241. Reporting deer by persons exempt from license requirement or holding a license authorization number.

A. Upon killing a deer, any person (i) exempt from license requirement as prescribed in § 29.1-301 of the Code of Virginia, (ii) issued a complimentary license as prescribed in § 29.1-339 of the Code of Virginia, (iii) holding a permanent license issued pursuant to § 29.1-301 E of the Code of Virginia, or (iv) holding a Virginia license authorization number issued by a telephone or electronic media agent pursuant to § 29.1-327 B of the Code of Virginia shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's automated harvest reporting system. At such time, the person reporting the carcass shall be given a confirmation number. The successful hunter shall immediately create written documentation including the successful hunter's full name, the date the animal was killed, and the confirmation number. This written documentation must be kept in possession with the carcass until the carcass is processed. If the carcass is transferred to the possession of another individual, the written documentation must be transferred with the carcass to the individual and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.

B. It shall be unlawful for any person to destroy the identity (sex) of any deer killed until the deer is reported as required by this section. Successful deer hunters are allowed to dismember the

carcass to pack it out from the place of kill as long as they do not destroy the identity of the sex and all the parts of the carcass are present when the deer is reported.
C. Processed carcass parts of a deer killed legally in Virginia may be transported; however, upon request of any authorized law-enforcement officer, sufficient verbal or written information necessary to properly establish legal possession must be furnished immediately.
D. Any deer that has not been reported as required by this section found in the possession of any person exempt from license requirements or holding a license authorization number shall be forfeited to the Commonwealth to be disposed of as provided by law.
E. Upon killing a deer within an area designated by the department for deer disease management and on days designated by the department, the hunter shall present the carcass at or submit carcass parts or samples as directed by the department to a location designated by the department for the purposes of deer disease surveillance or biological monitoring.

4VAC15-240-81. Validating tags and reporting turkey by licensee.

A. Any person killing a turkey shall, before removing the carcass from the place of kill, validate an appropriate tag on his special license for hunting deer and turkey by completely removing the designated notch area from the tag or by electronically notching a tag and reporting the turkey using the department's mobile harvest reporting application. Place of kill shall be defined as the location where the animal is first reduced to possession. It shall be unlawful for any person to validate (notch) a turkey tag from any special license for hunting deer and turkey prior to the killing of a turkey. A turkey tag that is mistakenly validated (notched) prior to the killing of a turkey must be immediately voided by the licensee by writing, in ink, the word "VOID" on the line provided on the tag. All electronically notched tags are permanent and cannot be voided.
B. Upon killing a turkey and validating (notching) a license tag, as provided above, the licensee shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever occurs first, and without unnecessary delay, report the kill through the department's automated harvest reporting system. The person reporting the carcass will be given a confirmation number from the automated harvest reporting system. The successful hunter shall then immediately record the confirmation number, in ink, on the line provided on the license tag that was validated (notched) in the field. If reported using the automated harvest reporting system, no check card is required as long as the hunter who killed the turkey is in possession of the carcass. If the automated harvest reported carcass is left unattended or transferred to the possession of another individual, written documentation including the successful hunter's full name, the date the turkey was killed, and the confirmation number must be created and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.
C. It shall be unlawful for any person to destroy the identity of the sex of any turkey killed unless and until the license tag is validated (notched) and reported by using the automated harvest reporting system as required by this section. Any turkey found in the possession of any person without a validated (notched) license tag or documentation that the turkey has been reported by using the automated harvest reporting system as required by this section shall be forfeited to the Commonwealth to be disposed of as provided by law.

~~**4VAC15-240-91. Reporting turkey by persons exempt from license requirement or holding a license authorization number.**~~

~~A. Upon killing a turkey, any person exempt from the license requirement as described in § 29.1-301 of the Code of Virginia, or issued a complimentary license as prescribed in § 29.1-339, or the holder of a permanent license issued pursuant to § 29.1-301 E, or the holder of a Virginia license authorization number issued by a telephone or electronic media agent pursuant to § 29.1-327 B shall, upon vehicle transport of the carcass or at the conclusion of legal hunting hours, whichever comes first, and without unnecessary delay, report his kill through the department's automated harvest reporting system. The person reporting the carcass shall be given a confirmation number from the automated harvest reporting system. No check card is required as long as the hunter who killed the turkey is in possession of the carcass. If the automated harvest reported carcass is left unattended or transferred to the possession of another individual, written documentation including the successful hunter's full name, the date the turkey was killed, and the confirmation number must be created and kept in possession with the carcass until the carcass is processed. If the automated harvest reported carcass is transferred to the possession of another individual, the written documentation must be transferred with the carcass to the individual and kept in possession with the carcass until the carcass is processed. If the carcass is left unattended, this written documentation must be securely attached to the carcass.~~
~~B. It shall be unlawful for any person to destroy the identity of the sex of any turkey killed until the turkey is reported by using the automated harvest reporting system as required by this section. Any turkey that has not been reported by using the automated harvest reporting system as required by this section found in the possession of any person exempt from license requirements or holding a license authorization number shall be forfeited to the Commonwealth to be disposed of as provided by law.~~

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

This proposal will remove redundancies in regulation concerning validating tags and reporting the harvests of bears, deer, elk, turkeys, and bobcats. This new regulation, which also incorporates the prohibition on providing false information when reporting game harvests, would replace the following 8 regulations: 4 VAC 15-40-300, 4 VAC 15-50-81, 4 VAC 15-50-91, 4 VAC 15-70-70, 4 VAC 15-90-231, 4 VAC 15-90-241, 4 VAC 15-240-81, 4 VAC 15-240-91. The new reporting requirement for gray fox harvest is designed to obtain better information for managing this species in the future. Population trend information for gray foxes suggests that populations have been slowly declining for the past 20 years.

4VAC15-90-500

Game: Deer: Elk hunting outside the Elk Management Zone.

Summary:

The proposal is to replace the reference to the regulation *4VAC15-90-231. Validating tags and reporting deer by licensee or permittee* and *4VAC15-90-241. Reporting deer by persons exempt from license requirement or holding a license authorization number* to the new proposed regulation that combines validating tags and reporting the harvests of certain game and furbearing species 4VAC15-40-290.

Proposed language of amendment:

4VAC15-90-500. Elk hunting outside the Elk Management Zone.

A. Open season. Except as otherwise provided by 4VAC15-90-510, it shall be lawful to hunt elk of either sex during (i) the general firearms deer seasons as prescribed by 4VAC15-90-10 and 4VAC15-90-23, (ii) the special archery seasons as prescribed by 4VAC15-90-70, and (iii) the special muzzleloading seasons as prescribed by 4VAC15-90-80 with bag limits as prescribed in 4VAC15-90-90.

B. Upon killing an elk. Any licensed or permitted hunter shall validate a tag on that hunter's special license for hunting deer and turkey or bonus deer permit and check the elk in accordance with ~~4VAC15-90-231~~ 4VAC15-40-290. Upon receiving a confirmation number, the hunter must call the department to schedule an inspection of the carcass and the site of kill for the collection of biological samples.

C. Checking elk by persons exempt from license requirements or holding a license authorization number. Upon killing an elk, any person (i) exempt from license requirement as prescribed in § 29.1-301 of the Code of Virginia, (ii) issued a complimentary license as prescribed in § 29.1-339 of the Code of Virginia, (iii) holding a permanent license issued pursuant to § 29.1-301 E, or (iv) holding a Virginia license authorization number issued by a telephone or electronic media agent pursuant to § 29.1-327 B of the Code of Virginia shall check the elk in accordance with ~~4VAC15-90-241~~ 4VAC15-40-290. Upon receiving a confirmation number, the hunter must call the department to schedule an inspection of the carcass and the site of kill for the collection of biological samples.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

This proposal updates the reference to the new regulation that is being proposed for validating tags and reporting the harvests of certain game and furbearing species.

4VAC15-90-510

Game: Deer: Elk hunting within the Elk Management Zone.

Summary:

The proposal is to replace the reference to the regulation *4VAC15-90-231. Validating tags and reporting deer by licensee or permittee* to the new proposed regulation that combines validating tags and reporting the harvests of certain game and furbearing species 4VAC15-40-290.

Proposed language of amendment:

4VAC15-90-510. Elk hunting within the Elk Management Zone.

A. It shall be lawful to hunt elk within the Elk Management Zone from the second Saturday in October through the following Friday, both dates inclusive.

B. The seasonal bag limit for elk shall be one per season as prescribed on the special elk hunting license. The department shall determine the number and type of special elk hunting licenses distributed within a season and license year.

C. Except as provided in 4VAC15-90-540 or 4VAC15-90-550 individuals selected to purchase a special elk hunting license shall not be eligible to receive a subsequent special elk hunting license for a period of three years.

D. All licensed elk hunters and persons accompanying elk hunters are required to wear or display a blaze color as described in § 29.1-530.1 of the Code of Virginia.

E. Upon killing an elk, any licensed hunter shall validate the tag on the hunter's special elk hunting license and report the elk in accordance with procedures outlined in ~~4VAC15-90-231~~ 4VAC15-40-290. Upon receiving a confirmation number, the hunter must call the department to schedule an inspection of the carcass and the site of kill for the collection of biological samples.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

This proposal updates the reference to a new regulation that is being proposed for validation of tags and reporting of certain game and furbearing species.

Furbearer & Small Game Regulations

4VAC15-110-20

Game: Fox: Part II: Hunting with guns.

Summary:

The proposal is to establish separate hunting seasons for red fox and gray fox, maintaining the current season for red fox and establishing a season for gray fox in 4VAC15-110-25.

Proposed language of amendment:

4VAC15-110-20. Hunting with firearms. Open season for red fox.

Except as otherwise provided ~~by local legislation~~ and with the specific exceptions provided in the sections appearing in this chapter, it shall be lawful to hunt red foxes with firearms from November 1 through the last day in February, both dates inclusive.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Population trend information for gray foxes suggest that populations have been slowly declining for the past 20 years. In areas where populations are currently at low levels, harvest by humans may be suppressing population growth or contributing towards further declines. Since most gray foxes are harvested by hunters (versus trappers), this proposal is intended to provide a meaningful reduction in hunter harvest that may have positive population impacts. Hunter survey information suggests that most hunters who kill a gray fox do so opportunistically while hunting other species. By eliminating hunter harvest of gray foxes during the months of November and December when most hunters are afield (during deer seasons), gray fox populations may benefit.

4VAC15-110-25 (New)

Game: Fox: Part II: Hunting with guns.

Summary:

The proposal is to establish a gray fox hunting season from January 1 through the last day of February.

Proposed language of amendment:

4VAC15-110-25. Hunting with firearms. Open season for gray fox.

Except as otherwise provided and with the specific exceptions provided in the sections appearing in this chapter, it shall be lawful to hunt gray foxes with firearms from January 1 through the last day in February, both dates inclusive.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Population trend information for gray foxes suggest that populations have been slowly declining for the past 20 years. In areas where populations are currently at low levels, harvest by humans may be suppressing population growth or contributing towards further declines. Since most gray foxes are harvested by hunters (versus trappers), this proposal is intended to provide a meaningful reduction in hunter harvest that may have positive population impacts. Hunter survey information suggests that most hunters who kill a gray fox do so opportunistically while hunting other species. By eliminating hunter harvest of gray foxes during the months of November and December when most hunters are afield (during deer seasons), gray fox populations may benefit.

4VAC15-110-35 (New)

Game: Fox: Part II: Hunting with guns.

Summary:

The proposal is to establish a daily bag limit for hunting gray fox.

Proposed language of amendment:

4VAC15-110-35. Bag limit.

The bag limit for hunting gray fox shall be one per hunting party, individual or organized, taken between noon of one day and noon the following day.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Population trend information for gray foxes suggest that populations have been slowly declining for the past 20 years. In areas where populations are currently at low levels, harvest by humans may be suppressing population growth or contributing towards further declines. Since most gray foxes are harvested by hunters (versus trappers), this proposal is intended to provide a meaningful reduction in hunter harvest that may have positive population impacts. Although the average number of gray foxes killed per hunter per day is usually low, the potential exists to kill multiple animals per day, especially when using electronic calls. Gray foxes are very susceptible to harvest with electronic calls and are much more likely to approach within close gunshot range than red foxes. Significant numbers of gray foxes could be killed in a short period of time where populations exist. This proposal would be expected to reduce gray fox harvest and the potential for removing too many foxes from disjunct habitat patches that may not be easily recolonized.

4VAC15-110-80

Game: Fox: Part IV: Miscellaneous.

Summary:

The proposal is to add a damage or threat to human health or safety requirement to the current provision that allows landowners to kill or have killed gray foxes on their own land at any time.

Proposed language of amendment:

4VAC15-110-80. Killing by landowner.

A landowner may kill or have killed red foxes at any time on his or her own land. Provided further that a landowner may kill or have killed gray foxes at any time on his or her own land, but only when they are causing damage to crops or property, or are posing a threat to human health or safety.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Population trend information for gray foxes suggests that populations have been slowly declining for the past 20 years. In areas where populations are currently at low levels, harvest by humans may be suppressing population growth or contributing towards further declines. The regulation as it currently exists provides a continuous open season for hunting and trapping both red and gray foxes on private lands, with no requirement of damage or a human health/safety issue. This proposal will reduce the number of gray foxes killed outside of the hunting season when no damage or human health issues exist. Compared to red foxes, gray foxes are involved in relatively few agricultural damage or nuisance issues. The current provision that allows landowners to kill or have killed red foxes will remain unchanged.

4VAC15-230-60

Game: Fox Squirrel: Open season; first Saturday in September through January 31.

Summary:

The proposal is to add Henry County to the list of counties open for hunting fox squirrels.

Proposed language of the amendment:

4VAC15-230-60. Fox squirrel, open season; first Saturday in September through January 31.

It shall be lawful to hunt fox squirrel from the first Saturday in September through January 31, both dates inclusive, in the counties of Albemarle, Alleghany, Augusta, Bath, Bedford, Bland, Botetourt, Buchanan, Carroll, Clarke, Craig, Culpeper, Dickenson, Fauquier, Floyd, Franklin, Frederick, Giles, Grayson, Greene, Henry, Highland, Lee, Loudon, Madison, Montgomery, Orange, Page, Patrick, Prince William, Pulaski, Rappahannock, Roanoke, Rockbridge, Rockingham, Russell, Scott, Shenandoah, Smyth, Tazewell, Washington, Warren, Wise and Wythe.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

The counties bordering Henry County to the west (Patrick) and to the north (Franklin) have been open for fox squirrel hunting since 2009. Sightings of fox squirrels have increased in Henry County based on a three-year fox squirrel sighting survey conducted by DWR and observational information from landowners, squirrel hunters and others. Opening the season should have no adverse effect on Henry County's fox squirrel population while providing additional fox squirrel hunting opportunity.

Waterfowl & Waterfowl Blind Regulations

4VAC15-260-85 (New)

Game: Waterfowl and Waterfowl Blinds: Non-riparian stationary blinds adjacent to certain department-owned properties.

Summary:

The proposal is to prohibit non-riparian stationary blinds on the public waters adjacent to any department Wildlife Management Area or Wildlife Conservation Site. This will provide more equitable public waterfowl hunting opportunities on the public waters within and adjacent to these properties.

Proposed language of amendment:

4 VAC 15-260-85. Non-riparian stationary blinds adjacent to certain department-owned properties.

A. Non-riparian stationary waterfowl blinds shall not be erected or licensed on the shores or in the public waters adjacent to any department Wildlife Management Area or Wildlife Conservation Site[~~, unless otherwise specified in code or regulation~~].

B. [~~Floating~~ Subject to 4VAC15-40-100, 4VAC15-40-110, 4VAC15-40-130, 4VAC15-260-90, and 4VAC15-260-115, floating] waterfowl blinds shall be permitted on the public waters adjacent to any department Wildlife Management Area or Wildlife Conservation Site[~~, unless otherwise specified in code or regulation~~]. Additionally, as permitted in Section §29.1-351 of the Code of Virginia, the distance restrictions set forth in Licenses for Waterfowl Blinds and for Hunting Waterfowl, sections
§§ 29.1-340 to 29.1-351.1 of the Code of Virginia shall not apply to floating waterfowl blinds being used on the public waters adjacent to any department Wildlife Management Areas or Wildlife Conservation Sites.

C. For purposes of this regulation, adjacent waters are defined as all water from mean low tide to 600 yards offshore.

D. Any person who holds a 2022-23 non-riparian stationary waterfowl blind license in the areas specified in Section A is permitted to renew their license for each of their blinds for the 2023-24 waterfowl hunting seasons. In any case, licenses for these blinds will expire no later than August 15, 2024. Per §29.1-347, blind structures must be removed when the license expires or when the license holder no longer intends to use the blind, whichever occurs first.

E. This section shall not abridge the privileges prescribed for landowners and their lessees and permittees in §§ 29.1-344 and 29.1-347 of the Code of Virginia.

E. This regulation shall not apply to the blinds and public waters in the City of Virginia Beach.

~~**4VAC15-260-60. Blinds adjacent to Chickahominy Wildlife Management Area.**~~

~~No license shall be issued for stationary waterfowl blinds on Morris Creek and the Chickahominy River in Charles City County adjacent to the Chickahominy Wildlife Management Area.~~

~~**4VAC15-260-70. Blinds on Game Farm Marsh Wildlife Management Area.**~~

~~No stationary waterfowl blinds shall be licensed, and no stationary or floating blind license shall be required for hunting waterfowl on the Game Farm Marsh Wildlife Management Area, or in, or on, the public waters of the Chickahominy River, north of the New Kent-Charles City County line adjacent thereto; provided, however, that this section shall not abridge the privileges prescribed for landowners, and their lessees and permittees, in §§ 29.1-344 and 29.1-347 of the Code of Virginia.~~

~~**4VAC15-260-75. Blinds adjacent to the Ware Creek Wildlife Management Area.**~~

~~Except for blinds built or maintained by the department, no stationary waterfowl blinds shall be licensed on the public waters of Philbates and Ware Creeks, or on the York River within 1000 yards of the Ware Creek Wildlife Management Area. Waterfowl hunting within 500 yards of the wildlife management area property will be permitted only at locations and during times designated by the department. However, this section shall not abridge the privileges prescribed for landowners and their lessees and permittees in §§ 29.1-344 and 29.1-347 of the Code of Virginia.~~

~~**4VAC15-260-80. Blinds adjacent to Ragged Island Wildlife Management Area.**~~

~~No license shall be issued for stationary waterfowl blinds in the adjacent waters to mid-channel of Kings Creek and Ragged Island Creek or in the adjacent waters of the James River and Batten Bay within 1000 yards of the Ragged Island Wildlife Management Area in Isle of Wight County.~~

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Non-riparian stationary blinds in waters adjacent to public lands prevent float blind hunting within 500 yards in all directions (a 1000-yard diameter), significantly reducing public waterfowl hunting opportunity in these public waters. This proposal provides more equitable opportunity and uniformity in the use of the public waters for waterfowl hunting off the shores of department Wildlife Management Areas and Wildlife Conservation Sites. It would also improve the Department's ability to manage hunter access on these properties.

The proposal provides uniformity in regulatory structure and would apply to new department Wildlife Management Areas and Wildlife Conservation Sites. A number of existing WMAs have waterfowl blind regulations established when those properties were acquired, but minor regulation differences create confusion among waterfowl hunters. These existing regulations could be repealed (4VAC15-260-60, 4VAC15-260-70, 4VAC15-260-75, and 4VAC15-260-80

for Game Farm Marsh, Chickahominy, Ware Creek, and Ragged Island WMAs), standardizing and simplifying waterfowl blind regulations across all department properties.

There is roughly 50 miles of shoreline around current DWR properties that could provide more equitable public hunting opportunities if this proposal were adopted.
Currently, there are currently 5 to 7 non-riparian blind licenses in areas adjacent to existing DWR properties. This proposal would allow those licensees to retain their license for one additional waterfowl hunting season (the 2023-2024 season) prior to having those licenses expire.

4VAC15-260-86 (New)

Game: Waterfowl and Waterfowl Blinds: Non-riparian stationary blinds adjacent to select National Wildlife Refuges.

Summary:

The proposal is to prohibit non-riparian stationary blinds adjacent to select National Wildlife Refuges managed by the U.S. Fish and Wildlife Service. This will provide more equitable public waterfowl hunting opportunity adjacent to these properties.

Proposed language of amendment:

4 VAC 15-260-86. Non-riparian stationary blinds adjacent to select National Wildlife Refuges.

A. Non-riparian stationary waterfowl blinds shall not be licensed or erected on the shores of or in the public waters adjacent to designated National Wildlife Refuges (identified below)[, ~~unless otherwise specified in code or regulation~~].

1. James River NWR
2. Plum Tree Island NWR
3. Occoquan Bay NWR
4. Featherstone NWR

B. Floating waterfowl blinds shall be permitted on the public waters adjacent to the specified refuges[, ~~unless otherwise specified in code or regulation~~]. Additionally, as permitted in Section §29.1-351 of the Code of Virginia, the distance restrictions set forth in Licenses for Waterfowl Blinds and for Hunting Waterfowl, sections §§ 29.1-340 to 29.1-351.1 of the Code of Virginia shall not apply to floating waterfowl blinds being used on the public waters adjacent to the specified refuges.

C. For purposes of this regulation, adjacent waters are defined as all water from mean low tide to 600 yards offshore.

D. Any person who holds a 2022-23 non-riparian stationary waterfowl blind license in the areas specified in Section A is permitted to renew their license for each of their blinds for the 2023-24 and 2024-25 waterfowl hunting seasons. In any case, licenses for these blinds will expire no later than August 15, 2025. Per §29.1-347, blind structures must be removed when the license expires or when the license holder no longer intends to use the blind, whichever occurs first.

E. This section shall not abridge the privileges prescribed for landowners and their lessees and permittees in §§ 29.1-344 and 29.1-347-of the Code of Virginia.

<u>Staff Final Recommendation</u> – Staff recommends adoption of the amendments as final in the form they were proposed.

<u>Rationale:</u>

Non-riparian stationary blinds in waters adjacent to public lands prevent float blind hunting within 500 yards in all directions (a 1000-yard diameter). This significantly reduces public waterfowl hunting opportunity in these public waters. The USFWS has recently attempted to open additional lands for public waterfowl hunting, but non-riparian blinds in those areas have restricted their ability to provide these opportunities. This proposal provides more equitable opportunity and uniformity in the use of the public waters for waterfowl hunting off the shores of these selected National Wildlife Refuges. Additionally, this proposal would improve the ability of the U.S. Fish and Wildlife Service and the Department to manage hunter access on these properties.

There is roughly 18 miles of shoreline around these National Wildlife Refuge properties that could provide more equitable public hunting opportunities if this proposal were adopted. Approximately 40 non-riparian blind licenses are located along the shoreline adjacent to the specified refuges. This proposal would allow those licensees to retain their license for two additional waterfowl hunting seasons (the 2023-2024 and 2024-2025 seasons) prior to having those licenses expire.

4VAC15-260-120

Game: Waterfowl and Waterfowl Blinds: Special sea duck season area.

Summary:

This proposal eliminates the requirement that Virginia's "Special Sea Duck Area" only exists when federal migratory waterfowl regulations allow a "Special Sea Duck Hunting Season". It would also revise the Special Sea Duck Area description to clarify where it is legal to pursue crippled sea ducks (and other waterfowl) under power.

Proposed language of amendment:

4VAC15-260-120. Special sea duck ~~season~~ area.

~~Whenever federal migratory waterfowl regulations permit a special season for taking scoter, eider and long-tailed (formerly old-squaw) ducks within an area designated as a special sea duck hunting area under regulations adopted by the board, such~~ The special sea duck ~~hunting~~ area shall be designated and delineated as follows: ~~Those waters at a distance greater than 800 yards from any shore, island or emergent vegetation in the following area:~~ The ocean waters of Virginia, the tidal waters of Northampton and Accomack counties up to the first highway bridge, and the Chesapeake Bay and each of its tributaries up to the first highway bridge. Back Bay and its tributaries are not included in the special sea duck hunting area.

Staff Final Recommendation – Staff recommends adoption of the amendments as final in the form they were proposed.

Rationale:

Sea ducks were once considered "underharvested", and federal regulations allowed them to be hunted during the regular duck season, and also during an extended "Special Sea Duck Season". This extended season had to be conducted in a state specified "Special Sea Duck Hunting Area". One unique aspect of this federal "Special Sea Duck Season" was that crippled sea ducks could be pursued while a boat was under power, which is illegal for all other waterfowl hunting seasons. Sea ducks can dive and swim underwater for several minutes, so this provision was allowed as a conservation measure to help retrieve crippled birds which would otherwise be lost.

Sea duck numbers have declined, and federal migratory waterfowl regulations have recently eliminated the "Special Sea Duck Season". However, sea ducks can still be taken during the regular duck hunting season. In addition, "Special Sea Duck Areas" have been retained under federal regulations as a conservation measure for recovering crippled birds.

Under the current regulation in Virginia, the Special Sea Duck Area is only applicable when federal regulations permit a Special Sea Duck Hunting Season. Therefore, the Special Sea Duck Hunting Area in Virginia is no longer applicable, and the ability to pursue crippled birds under power is no longer available. This proposal will remove the nexus to the federal regulation and establish a separate Special Sea Duck Area. It will also revise the area description to clarify where crippled waterfowl could be retrieved while a boat is under power.

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES

BOATING DIVISION BOATING REGULATION

Board Final Action 2023

Virginia Administrative Code

4VAC15-390. Watercraft: Safe and Reasonable Operation of Vessels
Chapter 420. Watercraft: Navigation Lights and Shapes

Summary: The proposed amendment comes as a result of a change to the Inland Navigation Rules found in 33 CFR, Chapter 1, Subchapter E, Part 83 through 86 and as established by the U.S. Coast Guard which is where our Virginia Administrative Code requirements are derived from. Because of a previous field preemption that was inserted and subsequently removed it was discovered that by incorporating the CFR by reference, it would mitigate any issues of confusion between the two and would simply allow officers to enforce the CFR by reference.

Rationale: This change will make the regulations easier to understand and enforce, it would mitigate the need for wording changes when or if the CFR changes, and it would remove 22 regulations sections from the Administrative Code under 4VAC15-390 and 420 as per the Governor's initiative to reduce regulations.

4VAC15-390. Watercraft: Safe and Reasonable Operation of Vessels

4VAC15-390-10. Applicability.

The following sections in this chapter apply to the operation and sound signals of "vessels" as defined in § 29.1-700 of the Code of Virginia on the Waters of the Commonwealth~~,~~. ~~both public and private.~~ Vessels complying with the ~~international rules of navigation~~ Inland Navigation Rules *found in 33 CFR, Chapter 1, Subchapter E, Part 83 (DHS Delegation No. 017000170.1, Revision No. 01.2. September 6, 2022) and Part 84 through 86 (DHS Delegation No. 00170.1. July 2, 2104) and as established by the U.S. Coast Guard* are considered to be in compliance with the requirements of this chapter.

Statutory Authority
§§ 29.1-501, 29.1-502, 29.1-701, and 29.1-735 of the Code of Virginia.
Historical Notes
Derived from VR325-04-3 § 1, eff. July 1, 1973; amended, Virginia Register Volume 19, Issue 5, eff. January 1, 2003.

4VAC15-390-11 through 70. Watercraft: Safe and Reasonable Operation of Vessels

Repeal the following seven (7) sections:

~~Section 11 Definitions~~
~~Section 20 Motorboats approaching head and head~~
~~Section 30 Motorboats crossing~~
~~Section 40 Overtaking another vessel~~
~~Section 50 Responsibility between vessels~~
~~Section 60 Sailing vessels approaching one another~~
~~Section 70 Duty of vessel required to keep out of way; duty of other vessel~~

4VAC15-390. Watercraft: Safe and Reasonable Operation of Vessels

4VAC14-390-80. Watercraft Duty to slacken speed to avoid damage by motorboat's wake (No Amendments)

4VAC15-390-85. Operators to give right-of-way and reduce speed.

Every motorboat, when approaching or passing within 200 feet of any law-enforcement vessel or emergency services vessel that is displaying flashing blue, ~~or~~ red*, or public safety* lights shall slow to no wake speed so that the effect of the wake does not disturb the activities of law-enforcement personnel or emergency services personnel. Where the operator of a motorboat fails to comply with the provisions of this section and such failure endangers the life or limb of any person or endangers or damages vessels, the operator shall be guilty of a Class 3 misdemeanor. Upon conviction, the operator shall additionally be required to complete and pass a National Association of State Boating Law Administrators approved safe boating course as required in § 29.1-746 of the Code of Virginia.

Statutory Authority
§§ 29.1-701 and 29.1-735 of the Code of Virginia.
Historical Notes
Derived from Virginia Register Volume 39, Issue 9, eff. January 1, 2023.

4VAC15-390-90 through 140. Watercraft: Safe and Reasonable Operation of Vessels

Repeal the following five (5) regulation sections:

~~Section 90 Duty where operator's vision obscured.~~
~~Section 100 Operation in narrow channel~~
~~Section 110 Departure from regulations to avoid immediate danger~~
~~Section 120 Regulations not to exonerate operator from neglect~~
~~Section 130 Standard whistle and horn signals~~

4VAC15-390-150 and 160. Watercraft: Safe and Reasonable Operation of Vessels

Section 140 Riding on decks and gunwales (no amendments)
Section 150 Safe speed (no amendments)
Section 160 Penalties (no amendments)

Chapter 420. Watercraft: Navigation Lights and Shapes

4VAC15-420-10. Application. (PROPOSED)

The navigation lights requirements in this chapter shall be complied with in all weather and from sunset to sunrise on The Waters of the Commonwealth. During such times no other lights shall be exhibited, except such lights as cannot be mistaken for the lights specified in this chapter or do not impair their visibility or distinctive character or interfere with the keeping of a proper lookout. The lights prescribed by this chapter shall, if carried, also be exhibited from sunrise to sunset in restricted visibility and may be exhibited in all other circumstances when it is deemed necessary. The lights specified in this chapter shall comply with *the Inland Navigation Rules found in 33 CFR, Chapter 1, Subchapter E, Part 83(DHS Delegation No. 017000170.1, Revision No. 01.2. September 6, 2022) and Part 84 through 86 (DHS Delegation No. 00170.1. July 2, 2104) and as established by the U.S. Coast Guard* ~~U.S. Coast Guard specifications.~~

Statutory Authority
§§ 29.1-501, 29.1-502, 29.1-701, and 29.1-735 of the Code of Virginia.
Historical Notes
Derived from Virginia Register Volume 19, Issue 5, eff. January 1, 2003.

Chapter 420. Watercraft: Navigation Lights and Shapes

4VAC15-420-20 through 110. Watercraft: Navigation Lights and Shapes

Repeal the following ten (10) regulation sections:

~~Section 20 Definitions~~
~~Section 30 Visibility of lights~~
~~Section 40 Power-driven vessels underway~~
~~Section 50 Towing and pushing~~
~~Section 60 Sailing vessels underway and vessels under oars~~
~~Section 70 Vessels fishing with apparatus that restricts maneuverability~~
~~Section 80 Vessels not under command or restricted in their ability to maneuver~~
~~Section 90 Pilot vessels~~
~~Section 100 Anchored vessels and vessels aground~~
~~Section 110 Seaplanes~~

4VAC15-420. Watercraft: Navigation Lights and Shapes

Section 120 Penalties (no amendments)

VIRGINIA WILDLIFE CORRIDOR ACTION PLAN

VIRGINIA DWR

DCR Virginia Department of Conservation & Recreation

VDOT Virginia Department of Transportation

VIRGINIA DEPARTMENT OF FORESTRY

FINAL

MARCH 2023

VIRGINIA WILDLIFE CORRIDOR ACTION PLAN

Making Roads Safer for People and Wildlife

FINAL

MARCH 2023

Virginia Department of Wildlife Resources
Virginia Department of Transportation
Virginia Department of Conservation and Recreation
Virginia Department of Forestry

Executive Summary

Virginia is one of the first states in the eastern U.S. to create a *Wildlife Corridor Action Plan* (Plan) with a clear emphasis on protecting vital wildlife habitat corridors and reducing wildlife-vehicle conflicts, such as collisions, to promote driver safety. Wildlife corridors connect fragmented habitats separated by human activities or infrastructure; this habitat connectivity is vital to the long-term sustainability of wildlife biodiversity. When road infrastructure fragments wildlife habitats, some species of wildlife may need to move across roads to reach suitable habitats for fulfilling their food, water, shelter, and mating requirements. Wildlife-vehicle conflicts can occur, resulting in driver safety risks due to direct collisions with the animals or crashes from avoidance maneuvers, as well as wildlife population impacts such as significant mortality and barriers to dispersal. More than 60,000 known deer-vehicle collisions have occurred annually in Virginia since 2015, costing the Commonwealth and its citizens approximately $533 million each year.

To make roads safer for drivers and wildlife, wildlife crash countermeasures are more frequently being integrated into road transportation projects across the nation. For example, one measure is called a wildlife crossing, which is typically a road underpass or overpass specifically designed so wildlife can cross under or over a road. Benefits of integrating wildlife crash countermeasures into roads include safe wildlife passage, wildlife biodiversity resilience, improved driver safety, and reduced costs.

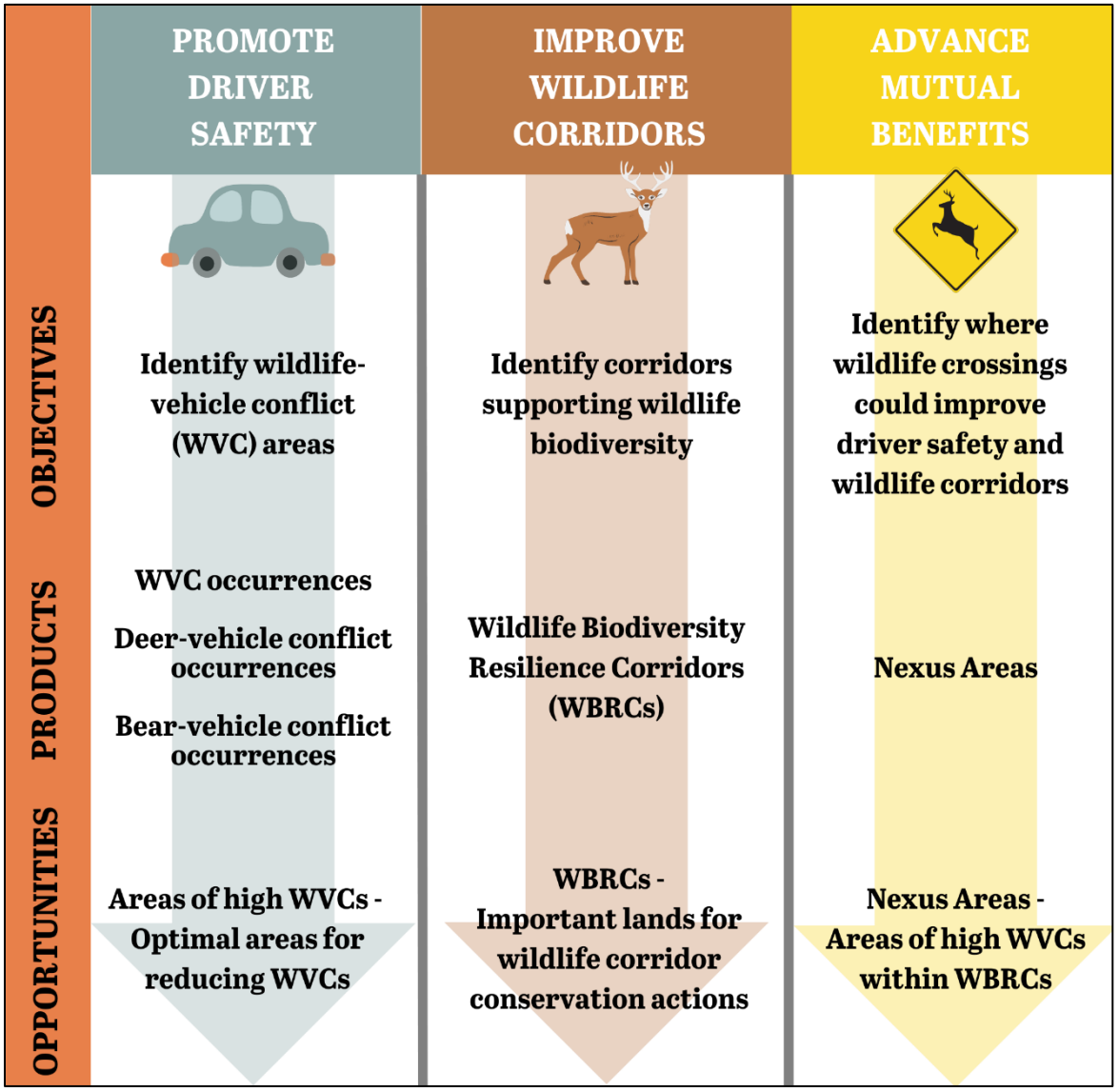
To create this *Wildlife Corridor Action* Plan for the Commonwealth, the Virginia General Assembly enacted § 29.1-578 and § 29.1-579 to establish a collaborative leadership team comprised of the Virginia Department of Wildlife Resources, the Virginia Department of Transportation, the Virginia Department of Conservation and Recreation, and the Virginia Department of Forestry. Pursuant to § 29.1-579, the intentions of this legislation for a *Wildlife Corridor Action Plan* are as follows:

- ***Intent #1***: Identify wildlife habitat corridors comprised of high quality habitats for priority species and ecosystem health using the best available data;
- ***Intent #2***: Identify existing or planned human barriers to wildlife movement along such corridors;
- ***Intent #3***: Identify areas of high risk for wildlife-vehicle conflicts;
- ***Intent #4***: Prioritize and recommend wildlife crossing projects intended to promote driver safety and wildlife habitat connectivity;
- ***Intent #5***: Provide a public portal to host this Plan, data, and maps; and
- ***Intent #6***: Update this Plan every four years.

Based on these intents, the leadership team developed a conceptual framework for this first Plan iteration centered on the following three themes:

- Promote Driver Safety
- Improve Wildlife Corridor Connectivity
- Advance Mutual Benefits

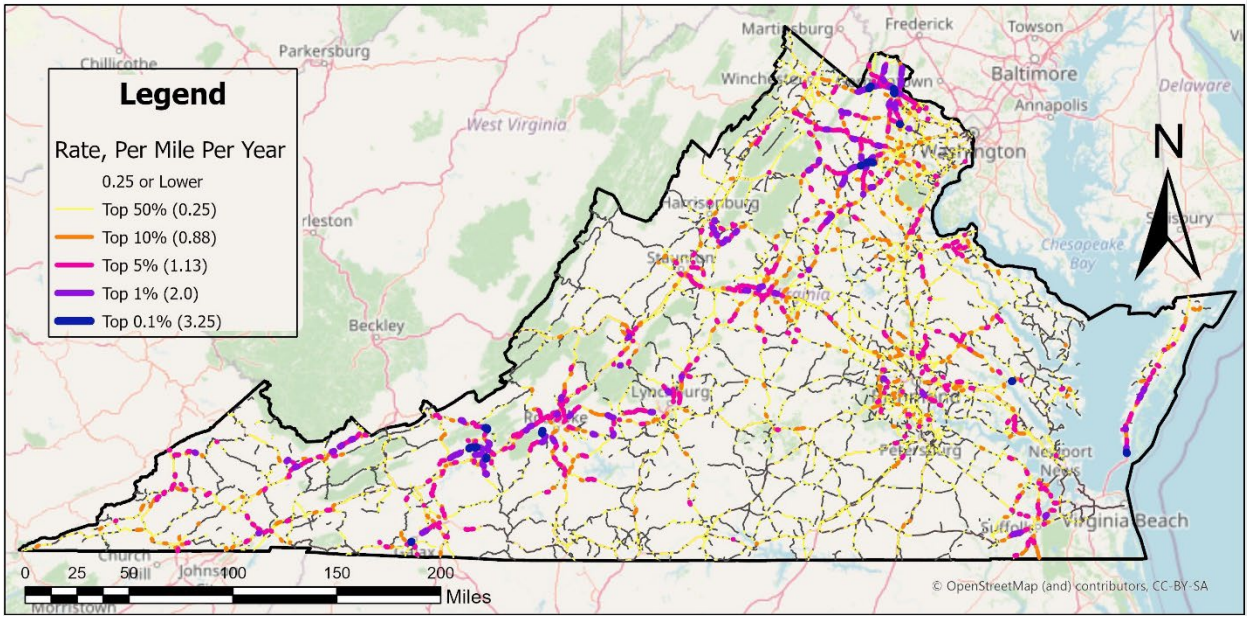
Objectives, products, and opportunities were then designed, developed, and identified, respectively, to align with these themes (see figure below).



Conceptual framework for the Wildlife Corridor Action Plan.

Promoting Driver Safety

To identify road segments experiencing high occurrences of wildlife-vehicle conflicts (see below figure), a geospatial analysis was performed using a subset of data from two databases, Virginia Roads and Virginia Smart Roads. These data collectively offer the most comprehensive statewide data on wildlife-vehicle conflicts that are currently available for Virginia. The data are particularly relevant for collisions with white-tailed deer and black bear, due to how these two species are associated with more costly and injurious collisions for drivers.



Reported wildlife-vehicle occurrence rates per one-mile road segments.

This Plan acknowledges the following about wildlife-vehicle conflicts and driver safety:

- This Plan defines *Areas of High Wildlife-Vehicle Conflicts* as important areas to further evaluate for whether wildlife crash countermeasures are warranted for driver safety.

- Potential wildlife crash countermeasures discussed in this Plan include wildlife crossings (such as enhancing existing underpasses), wildlife advisory messages on Changeable Message Signs, and animal detection driver warning systems.

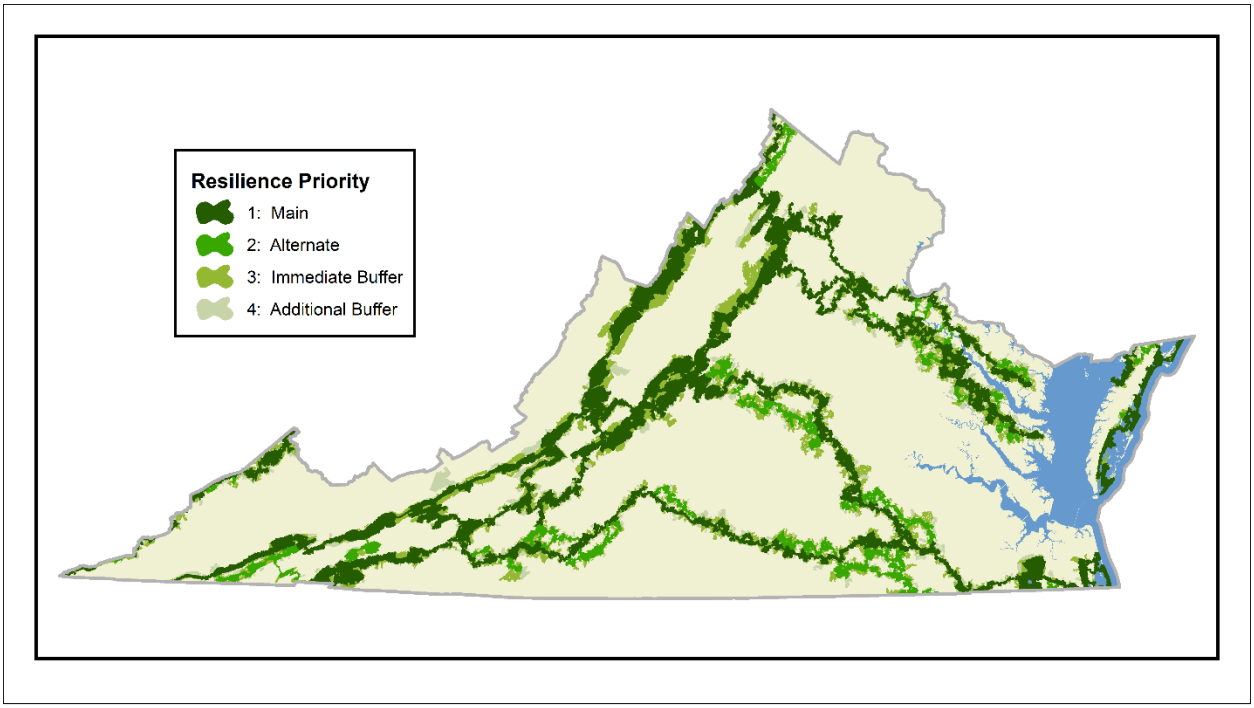
- The Plan encourages, but does not require, consideration of countermeasures early in the transportation planning process for specific types of projects such as the construction of new roads, widening or significant realignment of existing roadways, and bridge and culvert replacements.

- The Plan acknowledges the need for additional monitoring data of wildlife crash countermeasures to assess effectiveness and inform cost-benefit analyses.

- Future updates to the Plan will incorporate a road risk predictability model to identify segments of roads that are at the highest risk of large mammal collisions.

Improving Wildlife Corridors

Leveraging the Commonwealth's ConserveVirginia and Virginia Natural Landscape Assessment conservation planning tools, as well as other data sources, high priority wildlife corridors were identified and designated as the state's *Wildlife Biodiversity Resilience Corridors* (see below figure).



Wildlife Biodiversity Resilience Corridors are comprised of high quality habitats supporting native biodiversity.

The Plan acknowledges the following about improving wildlife corridors:

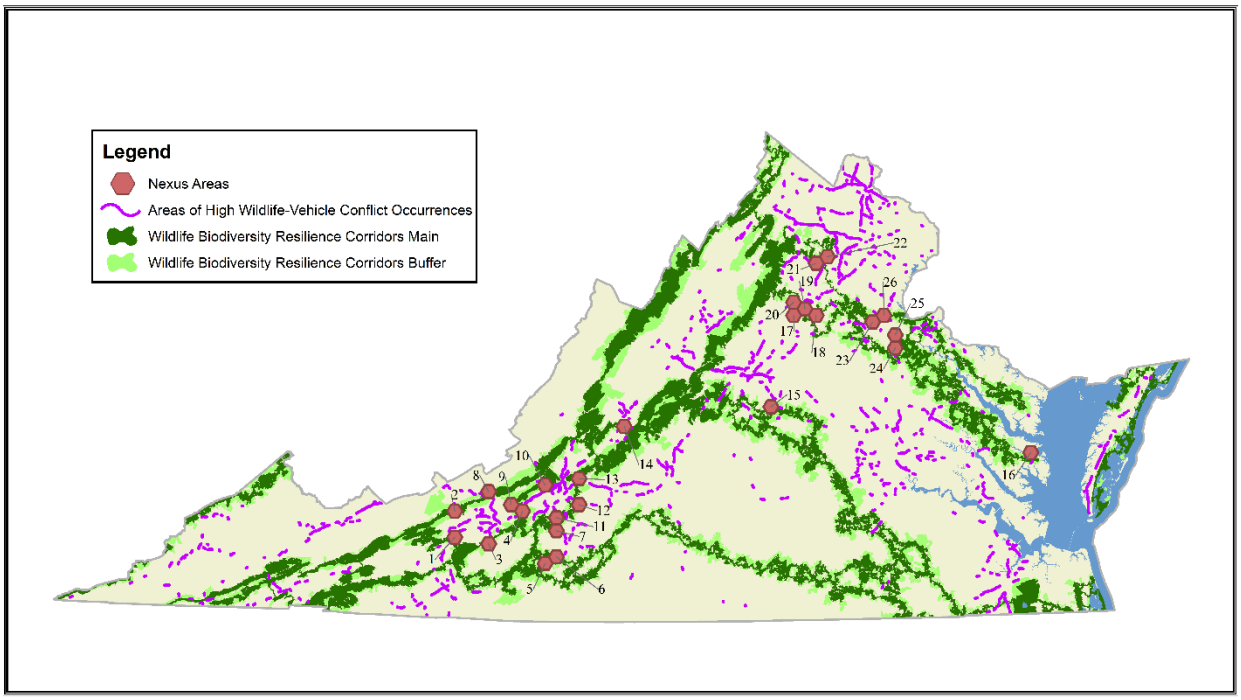
- For the Wildlife Biodiversity Resilience Corridors, further assessment could identify opportunities for conserving, enhancing, and restoring connectivity within these important wildlife corridors, through actions such as land protection strategies, habitat restoration, and wildlife crash countermeasures along roads.

- These Wildlife Biodiversity Resilience Corridors likely do not fully represent all habitat corridors that may be important to specific federally-protected species, state-protected species, and Species of Greatest Conservation Need, as well as for other species of interest.

- Although these statewide wildlife corridors are providing benefits to aquatic resources, a future analysis is needed to identify barriers to aquatic organism passage for identifying aquatic corridor connectivity priorities. Future enhancements to barriers, such as stream culverts, could provide multiple benefits for aquatic organisms, wildlife, and driver safety.

Advancing Mutual Benefits

By spatially overlaying the Areas of High Wildlife-Vehicle Conflicts and the Wildlife Biodiversity Resilience Corridors, 26 *Nexus Areas* were identified (see figure below); these Nexus Areas are coarse scale (25 square-mile areas), and, importantly, they represent opportunities where wildlife crash countermeasures could provide both driver safety and wildlife corridor conservation benefits.



Nexus Areas may be opportunities where wildlife crossing enhancements could improve both driver safety and wildlife corridors.

The Plan acknowledges the following about advancing mutual benefits in relation to these Nexus Areas:

- The Nexus Areas may be particularly important opportunities for seeking competitive federal grant funds, such as under the Wildlife Crossings Pilot Program of the Infrastructure Investment and Jobs Act, which prioritizes proposed projects that will both reduce wildlife-vehicle collisions and improve wildlife corridors.

- Site-specific assessments within the Nexus Areas are required to target the specific road sites that are problematic. Additional field data collection (such as wildlife camera or movement studies, collection of route-specific police report or carcass removal data, or an inventory of existing culverts and bridges) will be required to determine if wildlife crash countermeasures are warranted. Feasibility studies then may be required to assess the practicality for implementing countermeasures such as wildlife crossings.

- Due to the likelihood of limited funding opportunities, a process needs to be developed to prioritize countermeasure projects.

- Given that updating this Plan will be an iterative process as new data and information become available, these Nexus Areas could be refined over time. Additional road sites may also be identified as important opportunities for wildlife crossing enhancements.

Recommendations for Future Actions

To realize a vision of safer roads for wildlife and for people, the *Wildlife Corridor Action Plan* leadership team recommends the following 15 actions to refine and implement this Plan, organized by the intentions of the legislation:

***Intent #1:* Identify Wildlife Corridors**

- ❖ Identify at-risk terrestrial and aquatic species and other species of interest not sufficiently addressed by the Wildlife Biodiversity Resilience Corridors.

- ❖ Identify important habitat corridors for these at-risk terrestrial and aquatic species and other species of interest.

***Intent #2:* Identify Human Barriers to Wildlife Movement**

- ❖ For aquatic corridor connectivity, conduct analyses to identify road-associated infrastructure and other types of human barriers impeding aquatic organism passage.

- For the Wildlife Biodiversity Resilience Corridors, identify and analyze non-road barriers (e.g., land uses) impacting corridor connectivity.

Intent #3: **Identify Wildlife-Vehicle Conflict Areas**

- Improve and standardize road data collection methods for wildlife-vehicle conflicts and wildlife carcasses.
- For at-risk species and other species of interest, identify wildlife crossing concern areas.
- Develop predictive models to identify site-specific road segments at high risk of deer- and bear-vehicle collisions.

Intent #4: **Prioritize Wildlife Crossing Projects**

- Develop step-down or companion plans, tiering off this Plan, to fully address the habitat corridor and wildlife crossing needs for at-risk species and other species of interest.
- For Areas of High Wildlife-Vehicle Conflict Occurrences, further evaluation is required to identify specific sites where wildlife crossing enhancement projects are warranted and will be feasible.
- For Wildlife Biodiversity Resilience Corridors, evaluate further to identify specific areas that are priorities for land protection, habitat restoration, and/or wildlife crossings to support wildlife corridor connectivity.
- For Nexus Areas, develop a process on how to prioritize wildlife crossing enhancement projects for limited funding opportunities.
- Develop cost-benefit analyses and valuing of wildlife crossings.
- Develop a framework for regional-level and local-level analyses and where efforts to establish targeted partnerships should be focused to identify project opportunities.

Intent #5: **Provide a Public Data Portal**

- To support planning at multiple spatial scales (e.g., state, regional, and local), develop a geospatial viewer application that is inclusive of relevant planning data that are spatially scalable.

Intent #6: **Update Plan Every Four Years**

- Establish a state interagency coordinating body and/or technical advisory committee to ensure progress on updating and implementing this Plan. If the legislative intentions

pursuant to § 29.1-579 are to be fully accomplished, establishing this coordinating body is a critical action, and it will require additional staff and funding resources.

This first Plan iteration offers conservation and transportation planners a foundation for how to jointly prioritize wildlife corridor conservation efforts with wildlife-vehicle conflict reduction measures. Although data gaps and challenges remain, the Commonwealth of Virginia now has established a strong basis to strategically direct state and federal resources for the mutually compatible benefits of promoting driver safety and improving wildlife corridor connectivity.

Visit the website for the Virginia Wildlife Corridor Action Plan

https://dwr.virginia.gov/wildlife/corridors/

Acknowledgments

The leadership of the Virginia Safe Wildlife Corridors Collaborative, Senator David Marsden, and Delegate David Bulova supported Senate Bill 1004 / House Bill 1695, enacted in 2020 (§ 29.1-578 and § 29.1-579), which directed the creation of this *Wildlife Corridor Action Plan*.

The leadership team members from each department for this *Wildlife Corridor Action Plan* are as follows:

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Joe Weber, Biodiversity Task Team

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The Virginia Tech Transportation Institute conducted extensive analyses of statewide wildlife-vehicle conflict data in support of Chapter 3 *Wildlife-Vehicle Conflict in Virginia*. The Virginia Safe Wildlife Corridors Collaborative (administered by Wild Virginia), Virginia Transportation Research Council (the research section of VDOT), and Fort Belvoir graciously provided inputs for Appendix D *Wildlife Crossing Case Studies in Virginia*.

Cover photos: Shutterstock and Virginia Transportation Research Council

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List of Abbreviations

Aquatic Organism Passage (AOP)
Biodiversity Action Plan (BAP)
Changeable Message Sign (CMS)
Department of Motor Vehicles (DMV)
Federal Highway Administration (FHWA)
Great Dismal Swamp National Wildlife Refuge (GDSNWR)
Highway Maintenance Management System (HMMS)
Infrastructure Investment and Jobs Act (IIJA)
Innovation and Technology Transportation Fund (ITTF)
Natural Land Network (NLN)
Optimized Hot Spot Analysis (OHSA)
Species of Greatest Conservation Need (SGCN)
Subject Matter Expert (SME)
Virginia Department of Conservation and Recreation (VDCR)
Virginia Department of Forestry (VDOF)
Virginia Department of Transportation (VDOT)
Virginia Department of Wildlife Resources (VDWR)
Virginia Natural Landscape Assessment (VaNLA)
Virginia Transportation Research Council (VTRC)
Wildlife Biodiversity Resilience Corridor (WBRC)
Wildlife Corridor Action Plan (WCAP)
Wildlife Crossing Concern Area (WCCA)
Wildlife-Vehicle Conflict (WVC)

Definitions

Aquatic organism passage – The ability of fish and other aquatic organisms to migrate and swim freely upstream and downstream in a water body through or beneath human infrastructure such as culverts, bridges, diversions, dams, etc.

Barrier effect – The combined effect of traffic mortality, physical barriers, and avoidance, which together reduce the likelihood and success of wildlife being able to cross a roadway.

Biodiversity – The biological variety of life on Earth, including all species, their genetic variation, and their assemblages in communities and ecosystems, as well as the processes linking ecosystems and species.

Corridor – Physical linkage or connection between habitat patches within a landscape.

Connectivity – The state of structural landscape features being connected, enabling access between places via a continuous route of travel.

Deer-vehicle collision – A wildlife-vehicle conflict that involves a deer and results in a collision.

Ecoregion – An ecologically and geographically defined region in which biodiversity tends to be distinct from other regions.

Habitat – The type of site (vegetation, soils, etc.) where an organism or population naturally occurs—including a mosaic of components required for the survival of a species.

Habitat fragmentation – Subdivision and reduction of the habitat area available to a given species caused directly by habitat loss (e.g., land use conversion) or indirectly by habitat isolation (e.g., barriers preventing movement between habitat patches).

Habitat patch – A discrete area with a definite shape and spatial configuration used by a species for breeding, foraging, cover, or other purpose.

Human-caused barrier – A road, culvert, fence, wall, commercial or residential development, or other human-made structure that has the potential to affect the natural movement of wildlife across a landscape.

Nexus Area – An area within Virginia where high wildlife-vehicle conflicts (as described within Chapter 2 *Wildlife-Vehicle Conflict*) occurs within or adjacent to a Wildlife Biodiversity Resilience Corridor (as described within Chapter 3 *Wildlife Biodiversity Resilience Corridors*).

Node – A small piece of habitat that acts as a stepping stone and greatly facilitates movement of species across habitat patches.

Resilience – The capacity of ecosystems to retain their integrity, functions, and services to continue supporting biodiversity as land use and environmental conditions change over time.

Representativity – The measure of whether a given area contains habitat / biotope types, species assemblages, ecological processes or other natural features that are characteristic of the larger region.

Wildlife – All species of wild animals, wild birds, and freshwater fish in the public waters of the Commonwealth of Virginia (Code of Virginia § 29.1-100).

Wildlife Biodiversity Resilience Corridor – A wildlife corridor designed from the landscape-scale perspective for the movement of native species and to allow species temporal distribution shifts across the Commonwealth as the climate changes and the surrounding landscape becomes more developed. Wildlife Biodiversity Resilience Corridors are a product of this Plan.

Wildlife corridor – An area connecting fragmented wildlife habitats separated by human activities or infrastructure.

Wildlife crash countermeasure – A measure intended to reduce or eliminate a conflict between wildlife and a vehicle. Three types of countermeasures are: (1) wildlife crossings, including enhancing existing underpasses with fencing and other features; (2) wildlife advisory messages on Changeable Message Signs; and (3) animal detection driver warning systems.

Wildlife crossing – Road infrastructure overpasses or underpasses used by wildlife to cross above or beneath a road.

Wildlife Crossing Concern Area – An area within Virginia identified by Subject Matter Experts (SMEs) as potentially experiencing unacceptable levels of wildlife mortality on roads, based on these experts' observations, which may be causing detrimental population impacts to specific wildlife species or taxonomic groups. These areas need further study to first determine the wildlife mortality level and, if found to be unacceptable, to then determine whether wildlife crash countermeasures are warranted. Wildlife Crossing Concern Areas are listed within Appendix D.

Wildlife-vehicle conflict – Any adverse incident that involves a moving vehicle and a wild animal; this may or may not include a wildlife-vehicle collision where the animal and vehicle make physical contact.

Chapter 1
Introduction

"Habitat connectivity, in the form of large cores of intact habitat and corridors connecting them, is critical to ensuring a sustainable future for Virginia."

~ Wild Virginia

The interest in wildlife corridors management has been growing nationally as conservation practitioners continue to evolve strategies to abate the detrimental effects of habitat loss and habitat fragmentation on species. The premise of wildlife corridors is that they connect fragmented habitat patches separated by human activities, land uses, and infrastructure, and this habitat connectivity is vital to the long-term sustainability of wildlife biodiversity. Many wildlife species need to move across the landscape to locate food, optimize breeding opportunities, and seek different habitats for seasonal shelter needs.

Roads are human-built infrastructure that impact habitats used by many wildlife species. Initially, road construction causes habitat loss, degradation, and fragmentation. Vehicle collisions with wildlife exacerbate the habitat fragmentation effects of roads for some species through direct wildlife mortality and impeding genetic exchange within a wildlife population.

Wildlife-Vehicle Conflict
Any adverse incident that involves a moving vehicle and a wild animal; this may or may not include a wildlife-vehicle collision where the animal and vehicle make physical contact.

Wildlife Crash Countermeasure
A measure intended to reduce or eliminate a conflict between wildlife and a vehicle.

Wildlife Crossing
A type of wildlife crash countermeasure that is a road overpass or underpass used by wildlife to cross above or beneath a road.

These collisions and other forms of wildlife-vehicle conflicts (WVC) pose a well-documented risk to the safety of drivers and can cause significant vehicular property damage. Though human injuries and fatalities resulting from actual collisions between motorists and wildlife are considered infrequent, they do occur and can include crashes from avoidance maneuvers. Virginia is one of the higher-risk states in the country when it comes to collisions involving white-tailed deer (*Odocoileus virginianus*), the most common wildlife species identified during WVC events in the Commonwealth. Virginia ranks 15th in the country in wildlife-vehicle collisions, experiencing 10,000 serious human injuries and 200 fatalities due to wildlife-vehicle collisions every year (State Farm Mutual Automobile Insurance Company 2022; Wild Virginia 2021). The

number of deer-vehicle collisions in Virginia increased 25% from 2005 to 2017, and more than 60,000 have occurred per year since 2015, costing approximately $533 million in damages annually (Donaldson and Elliott 2021). These numbers are expected to grow in the future as land development and road infrastructure footprints continue to expand across Virginia.

To make roads safer for drivers and wildlife, wildlife crash countermeasures, in particular wildlife crossings, are a critical strategy that is being integrated into road transportation design and modification projects with greater frequencies across the nation. Benefits of wildlife crash countermeasures are:

- *Improved Driver Safety*: Countermeasures are effective at promoting driver safety by reducing the rate of WVC events.
- *Reduced WVC Costs*: The average cost of a deer-vehicle collision in Virginia is $41,000; an elk crash is estimated at $80,000.
- *Safe Wildlife Passage*: Wildlife crash countermeasures, such as wildlife crossings, are effective at reducing wildlife mortality on roads and supporting wildlife habitat connectivity (Ament et al. 2021).
- *Biodiversity Resilience*: Protecting wildlife corridors positions the Commonwealth's biodiversity to be more resilient from key threats, in particular changing climates.
- *Supporting Virginia's Economy*: According to Wild Virginia (2021), "The outdoor recreation industry generates $1.2 billion in state and local tax revenue in Virginia each year, driven in part by activities dependent on healthy wildlife populations, such as fishing, birdwatching, and hunting. Enhancing habitat for native wildlife through wildlife corridors will help sustain the state's natural resources that are central to the

Figure 1-1. Wildlife crash countermeasure benefits for a transportation project in Southwest Virginia. (C. Hayes/Wild Virginia)

197,000 jobs and $6.5 billion in wage and salaries generated by outdoor recreation in Virginia."

Virginia Wildlife Corridor Action Plan

Virginia is one of the first states in the eastern U.S. to create a *Wildlife Corridor Action Plan* (WCAP or Plan) with a clear emphasis on reducing wildlife-vehicle conflict to promote driver safety and protecting vital wildlife corridors. Along with seven states across the U.S. that have passed wildlife corridor protection bills associated with roadways in recent years (New Hampshire, New Mexico, Oregon, Washington, Wyoming, Utah, and Nevada), the Virginia General Assembly enacted § 29.1-578 and § 29.1-579 of the Code of Virginia (see Appendix A) in 2020 to establish a collaborative leadership team comprised of the Virginia Department of Wildlife Resources (VDWR), the Virginia Department of Transportation (VDOT), and the Virginia Department of Conservation and Recreation (VDCR) to create this Plan. In 2021, § 29.1-579 was amended to add the Virginia Department of Forestry (VDOF) to the collaboration and provide additional guidance on implementation of the Plan once it was completed. In addition, § 29.1-579 requires for this Plan to be updated every four years.

Pursuant to § 29.1-579, the intentions of this legislation for a *Wildlife Corridor Action Plan* are as follows:

- ***Intent #1:*** Identify wildlife habitat corridors comprised of high quality habitats for priority species (including federally-protected and state-protected species and at-risk species), and ecosystem health using the best available data;

- ***Intent #2:*** Identify existing or planned human barriers to wildlife movement along such corridors;

- ***Intent #3:*** Identify areas of high risk for WVCs;

- ***Intent #4:*** Prioritize and recommend wildlife crossing projects intended to promote driver safety and wildlife habitat connectivity, with descriptions of projects and wildlife crossing infrastructures or mitigation techniques recommended by this Plan;

- ***Intent #5:*** Provide a public portal to host this Plan, data, and maps; and

- ***Intent #6:*** Update Plan every four years.

Based on these intents, the leadership team developed a conceptual framework for this first Plan iteration centered on the following three themes: promote driver safety; improve wildlife

corridor connectivity; and advance mutual benefits (Figure 1-2). Objectives, products, and opportunities were then designed, developed, and identified, respectively, to align with these themes (see Table 1-1).

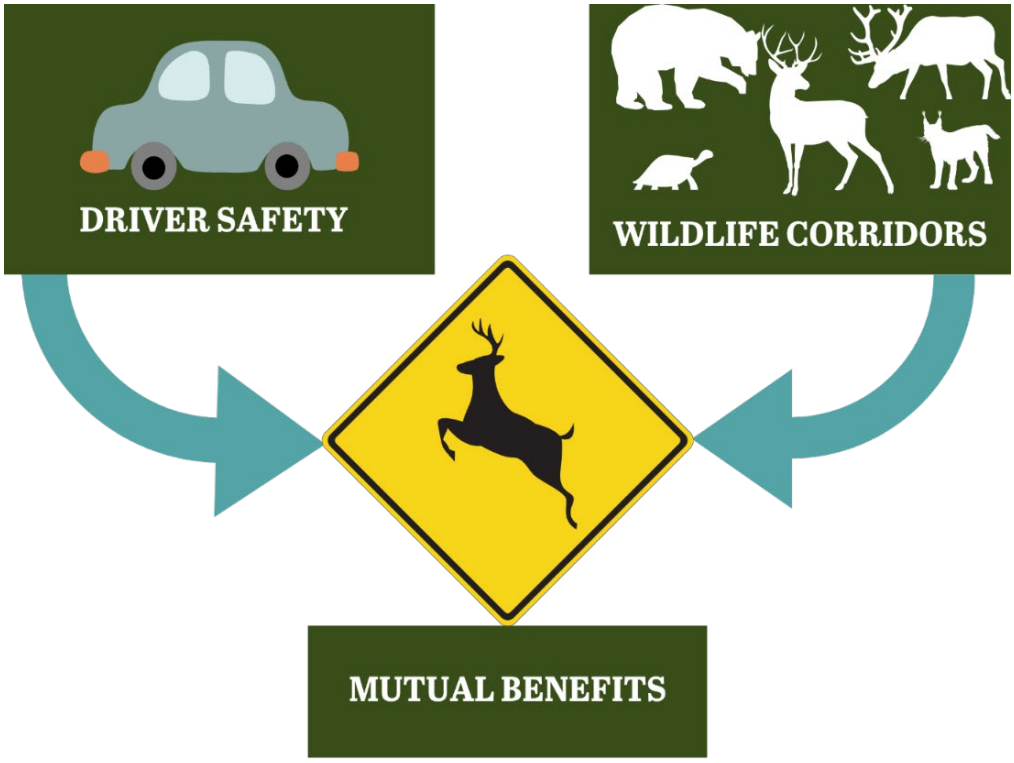

Figure 1-2. Three themes guiding the development of the Wildlife Corridor Action Plan.

For this first Plan iteration, Table 1-2 outlines the approach for how the leadership team addressed the legislative intentions, including when an intent that could not be fully addressed. For example, it was not feasible to develop a prioritized list of wildlife crossing enhancement projects, per Intent #4, due to data limitations and gaps; instead, opportunity areas were identified for further evaluation. Table 1-2 also includes the data sources, data gaps and plan limitations, and the recommended actions that can be pursued to update this Plan for future iterations; these components are further discussed in subsequent chapters.

Table 1-1. Conceptual framework for the Wildlife Corridor Action Plan.

Theme	Objective	Products	Opportunities
Promote Driver Safety	Support driver safety by identifying wildlife-vehicle conflict (WVC) areas	▪ WVC occurrences ▪ Deer-vehicle conflict occurrences ▪ Bear-vehicle conflict occurrences	*Areas of High WVC Occurrences:* Optimal areas for reducing wildlife-vehicle conflicts
Improve Wildlife Corridors	Identify wildlife corridors supporting the long-term resiliency of wildlife biodiversity	▪ Wildlife Biodiversity Resilience Corridors	*Wildlife Biodiversity Resilience Corridors:* Important lands for wildlife corridor conservation actions
Advance Mutual Benefits	Identify where wildlife crossings could improve both driver safety and wildlife corridor connectivity	▪ Nexus Areas[1]	*Nexus Areas:* Optimal areas to improve both driver safety and wildlife corridor connectivity

[1] Areas of High WVC Occurrences that occur within Wildlife Biodiversity Resilience Corridors.

Table 1-2. Detailed overview of how the Wildlife Corridor Action Plan addresses the legislative intentions (§ 29.1-579).[1]

Legislative Intent	Theme	Plan Focus	Approach	Primary Data Sources	Plan Limitations / Data Gaps	Recommended Future Actions
Intent #1 **Identify Wildlife Corridors**	**Improve Wildlife Corridors**	Wildlife Biodiversity Resilience Corridors (WBRC) were selected as the corridor type to design, to benefit the wildlife biodiversity of Virginia.	WBRCs were designed by identifying connected patches of natural lands that have high quality habitat, ecological integrity, support biodiversity (including priority and at-risk species), span across Virginia's ecoregions, and will support climate resiliency for wildlife species.	Virginia Natural Landscape Assessment ConserveVirginia See Chapter 3 for more sources	Important habitat corridors for regional/local planning needs, at-risk terrestrial and aquatic species (federally-protected species, state-protected species, and Species of Greatest Conservation Need [SGCN]), and other species of interest (e.g., elk, amphibians, and reptiles) were likely not fully represented within the WBRCs.	1.1. Identify at-risk terrestrial and aquatic species and other species of interest whose corridor needs are not sufficiently addressed by the WBRCs. 1.2. Identify important habitat corridors for the at-risk terrestrial and aquatic species and other species of interest. *Also see Action #5.1 below for supporting regional and local planning needs for wildlife corridors.*
Intent #2 **Identify Human Barriers to Wildlife Movement**	**Improve Wildlife Corridors** **Promote Driver Safety**	Roads were the exclusive focus to analyze as a human barrier to terrestrial wildlife movement.	Roadways were selected for wildlife-vehicle conflict (WVC) analyses by using the Functional Classification System to focus on Interstates, U.S. Highways, Other Freeways and Expressways, Principal and Minor Arterials and Major Collectors. Minor Collectors and Local classifications were omitted. The roadways also were filtered by a minimum speed of 45 miles per hour.	Virginia Roads layer Virginia Roads Centerlines and base maps	Road and other barriers to aquatic organism passage (AOP), such as culverts and dams, were not addressed. Other land uses causing barriers for wildlife corridor connectivity (e.g., urban and suburban development, intensive agriculture) were not addressed. The legislation also identifies electrical lines and pipelines as potential barriers; however this potential is often best addressed during the siting phase for this infrastructure.	2.1. For aquatic corridor connectivity, conduct AOP analyses to identify road-associated infrastructure and other types of human barriers impeding corridor connectivity. 2.2. For the WBRCs, identify and analyze non-road human barriers (e.g., land uses) impacting corridor connectivity.
Intent #3 **Identify Wildlife-Vehicle Conflict Areas**	**Promote Driver Safety**	Virginia Roads and Virginia Smart Roads databases (collision data compiled by the Virginia State Police) were identified as the best available data for WVC analyses.	Wildlife-vehicle conflict data (61,688 collisions) from 2013-2020 were analyzed. WVC occurrence rates (per mile per year) were calculated and visualized. Road segments experiencing the highest WVC occurrence rates were identified. Due to their large body sizes and population numbers, deer and bear likely result in higher risks to driver safety, as compared with smaller wildlife species. Deer-vehicle conflicts comprised 75% of the collision data. Bear-vehicle conflicts comprised approximately 2.3% of the collision data.	Virginia Roads Virginia Smart Roads	The police-reported WVC data represent only a portion of actual WVCs. Wildlife crash and carcass removal data collection standards lack standardization in the state and nationally. Insufficient data were available to assess WVC impacts for species other than deer and bear.	3.1. Improve and standardize road data collection methods for WVCs and wildlife carcasses. 3.2. Develop predictive models to identify site-specific road segments at higher risk of deer- and bear-vehicle collisions. 3.3. For the at-risk species and other species of interest identified in Action #1.1 above, identify wildlife crossing concern areas.
Intent #4 **Prioritize Wildlife Crossing Projects**	**Promote Driver Safety** **Improve Wildlife Corridor**	A prioritized list of wildlife crossing enhancement projects was **not feasible** in this first Plan iteration, due to data limitations and	Three types of opportunity areas were identified for evaluating whether future wildlife crossing enhancements (or other conservation measures) are warranted and feasible. These opportunity areas include the following: ▪ *Areas of High WVC Occurrences*—Optimizes a focus	Road segments with high WVC occurrences WBRCs	Site-specific data were not available to identify specific sites where wildlife crossing projects are warranted and will be feasible. Cost-benefit analyses and valuing of wildlife crossings are needed to	4.1. Areas of High WVC Occurrences: Further evaluation is required to identify specific sites where wildlife crossing enhancement projects are warranted and will be feasible. Considerations include the following: ▪ Develop methodology to identify specific road segments where wildlife crossings would be beneficial for driver safety. ▪ Develop a process to prioritize potential crossing projects from

Legislative Intent	Theme	Plan Focus	Approach	Primary Data Sources	Plan Limitations / Data Gaps	Recommended Future Actions
Intent #4 continued from prior page	**Advance Mutual Benefits**	gaps. This Plan instead defines opportunity areas that need further evaluation before site-specific projects can be identified and prioritized. It provides a strategic framework that will be the basis for finer-scale analyses and can also inform local jurisdiction planning decisions.	on promoting driver safety ▪ *WBRCs*—Optimizes a focus on wildlife corridor conservation and connectivity ▪ *Nexus Areas*—By overlaying the Areas of High WVC Occurrences onto the WBRCs, 26 Nexus Areas were identified. These Nexus Areas may provide optimal opportunities to both promote driver safety and improve wildlife corridor connectivity.		support effectively prioritizing wildlife crossing opportunities for funding. The Plan does not identify potential wildlife crossing needs for at-risk species and other species of interest. Optimal road sites (i.e., the Nexus Areas where both driver safety and corridors can be improved) for wildlife crossing enhancements may be revised in future Plan iterations as more information and data become available.	a driver safety perspective. 4.2. WBRCs: Further evaluation is required to identify specific areas within WBRCs that are priorities for land protection, habitat restoration, and/or wildlife crossings to support wildlife corridor connectivity. 4.3. Nexus Areas: In addition to the above considerations for Actions #4.1 and #4.2, develop a process on how to prioritize wildlife crossing enhancement projects for limited funding opportunities. 4.4. Step-down or companion plans, tiering from this Plan, will be necessary to fully address the habitat corridor and wildlife crossing needs for at-risk terrestrial wildlife and aquatic species and other species of interest. 4.5. Develop cost-benefit analyses and valuing of wildlife crossings. 4.6. Develop a framework for regional-level and local-level analyses and where efforts to establish targeted partnerships should be focused to identify project opportunities.
Intent #5 **Provide Public Data Portal**	**Supports All**	A website has been provided to host the plan, maps, and data.	Visit the website at: https://dwr.virginia.gov/wildlife/corridors/	n/a	Not all of the data used in this Plan are available for public download at this website. Links to DWR Wildlife Information GIS data and viewable layers of the WBRC data are provided.	5.1. To support planning for wildlife corridor connectivity at multiple spatial scales (e.g., state, regional, and local), develop a user-friendly geospatial viewer application that is inclusive of relevant planning data that are spatially scalable.
Intent #6 **Update Plan Every Four Years**	**Supports All**	Update this WCAP every four years as part of an iterative process. Updated Plans likely will include revisions to the opportunity areas and should include recommended priorities for wildlife crossing enhancement projects.		n/a	For Plan updates and implementation, staff and funding resources need to be identified.	6.1. Establish a state interagency coordinating body and/or technical advisory committee to ensure progress on updating and implementing this Plan. If the legislative intentions pursuant to § 29.1-579 are to be fully accomplished, establishing this coordinating body is a critical action, and it will require additional staff and funding resources. Initial tasks may include the following: ▪ Identify staff and funding resources ▪ Prioritize the Recommended Future Actions ▪ Develop a timeline for which actions can be accomplished before the next Plan update ▪ Establish working groups to implement each Recommended Future Action ▪ Guide the Plan update in four years

[1] Print this table on 11x17-inch paper. Acronyms used in this table: AOP = aquatic organism passage; SGCN = Species of Greatest Conservation Need; WBRC = Wildlife Biodiversity Resilience Corridor; WVC = wildlife-vehicle conflict

Plan Assumptions

For the development of this Plan, the leadership team defined the following fundamental assumptions:

- *Species Size Matters for Driver Safety in Wildlife-Vehicle Conflicts*
  Large wildlife species are more likely to cause WVCs that threaten driver safety, as compared to smaller species.

- *This Plan's WVC Analysis is Most Relevant for Large Terrestrial Mammals*
  Due to how the available WVC data (as discussed in Chapter 2) provide limited specificity for involved species, the WVC analysis within this Plan is most relevant for large terrestrial mammals, specifically for white-tailed deer and black bear (*Ursus americanus*). Elk (*Cervus canadensis*) are another large terrestrial mammal that can pose a driver safety risk and are relatively new to the modern Virginia landscape. However, this species has a limited distribution within Southwest Virginia, and sufficient data were not available during the development of this Plan to assess elk-vehicle conflict risk. For a new highway project in Southwest Virginia, a separate research study is underway to address the risk of elk-vehicle conflicts for that future highway (see Appendix B *Wildlife Crossing Case Studies*).

- *Wildlife Corridor Needs in Virginia Are Not Similar to Those in the Western U.S.*
  Unlike many state wildlife corridor initiatives in the western U.S., this Plan is not centered on large terrestrial mammals that seasonally range long distances. The historic large mammal species that may have had long-distance seasonal movements were bison (*Bison bison*) and elk; these species were historically extirpated and no other large-bodied mammals in Virginia have long-range movements. Even the recently reestablished elk population in Virginia is not showing inclinations for seasonal long-range movements, but rather move within a general home range, likely based on local food resource availability. Although Virginia may not have large mammals that range long distances, numerous bird, bat, insect, and fish species do migrate over long distances or have seasonal movements. However, these smaller species are assumed to pose a less significant threat to driver safety than large mammals.

- *Biodiversity and Resilience are "Built" into the Wildlife Corridors*
  As Chapter 3 demonstrates, the statewide wildlife corridors presented in this Plan were developed with the intent of identifying coarse-scale corridors comprised of high quality habitats that directly benefit a broad range of the terrestrial biodiversity of Virginia, as well as providing benefits to aquatic resources. In addition, the spatial data analyses driving the corridor identification were designed to promote long-term ecosystem resilience as land use and environmental conditions change over time.

- *This Plan will be Iterative*
  Pursuant to § 29.1-579, the *Wildlife Corridor Action Plan* is an iterative plan that will be updated every four years. This first iteration offers state, regional, and local conservation and transportation planners, across both governmental and non-governmental sectors, a foundation for how to jointly prioritize wildlife corridor conservation efforts with WVC reduction measures to advance mutual benefits for both of these critical goals. Importantly, components of this Plan (specifically, spatial data products developed for Chapter 2 and Chapter 3) can also be utilized separately from one another to support an organization's planning efforts for habitat corridor connectivity and/or transportation safety within Virginia. Although data gaps and challenges remain, this Plan offers a strong basis for strategically directing state resources toward protecting wildlife corridors and helping to keep drivers safe.

Plan Structure

The content of this Plan is structured as follows:

- Chapter 2 *Wildlife-Vehicle Conflicts* – This chapter discusses the causes and impacts of WVCs, presents statewide WVC analyses (including areas of high WVC rates), and describes potential solutions on how to improve driver safety through wildlife crash countermeasures.

- Chapter 3 *Wildlife Biodiversity Resilience Corridors* – This chapter describes the methodology used to identify important, coarse-scale wildlife corridors in Virginia.

- Chapter 4 *Opportunities for Further Evaluation* – This chapter recommends opportunity areas across Virginia for further evaluation based on three themes (Promote Driver Safety; Improve Wildlife Corridors; Advance Mutual Benefits), depending on what the user of the Plan is trying to accomplish. It also provides a list of potential federal funding sources for wildlife corridor conservation and wildlife crossings.

- Chapter 5 *Plan Recommendations* – The final chapter details limitations and data gaps for this Plan and recommends future actions for refining this Plan and supporting the Plan's transition into implementation actions.

- Appendices – The appendices include the WCAP legislation, additional details regarding the Virginia Natural Landscape Assessment (which was the basis for the wildlife corridors identified for this Plan), a list of wildlife crossing concern areas assembled by expert wildlife biologists, and wildlife crossing case studies in Virginia.

Chapter 2
Wildlife-Vehicle Conflict

Background

One of the primary goals of the *Wildlife Corridor Action Plan* is to improve road safety for citizens through reductions in WVCs. Strategies for reducing such collisions, i.e., wildlife crash countermeasures, are primarily addressed through appropriate considerations during transportation project planning and design. The identification of wildlife corridors and other areas of high rates of WVCs is critical to understanding where wildlife crash countermeasures would be most effective.

Figure 2-1. Black bear with cubs at the edge of a highway. (VDOT)

This chapter will discuss the causes and impacts of WVCs and it will identify potential solutions on how to improve driver safety through wildlife crash countermeasures that reduce the number of collisions between vehicles and large animals, such as white-tailed deer, black bear, and elk. Collisions with large mammals present a safety risk to the traveling public and cause the most damage to roadway infrastructure and vehicles.

In addition to increased roadway safety for the traveling public, implementation of wildlife crash countermeasures, as discussed herein, can provide multiple ecological benefits. For example, wildlife crash countermeasures can connect habitats at a local scale that are currently fragmented by existing infrastructure, and result in greater and more sustainable ecosystem integrity. Countermeasures can also retain or improve intact ecosystems at a landscape scale when developing infrastructure projects at a new location.

Note on Terminology

Various terminology is used in the literature when referring to an incident that involves a moving vehicle and an animal on a roadway. Commonly used terms include animal-vehicle collision, wildlife-vehicle collision, deer-vehicle collision, animal strike, animal-vehicle crash, animal-vehicle encounters, and others. “Conflict” as opposed to “collision” is used herein to include the

many animal-related safety incidents that may occur such as how animals on a roadway can result in a vehicle collision with other vehicles or fixed objects. Please reference the Definitions section of this Plan for key terminology used and referenced in this chapter.

Scope of the Wildlife-Vehicle Conflict Problem

Figure 2-2. Deer along a roadway at night. (VTRC 2022)

Research has shown that roads have a negative impact on wildlife, which is obvious to those traveling the vast network of highways in the United States. Motorists across the U.S. risk collisions with wildlife of all types and sizes, resulting in a broad range of consequences for both the motorists and animals. Though human injuries and fatalities resulting from actual collisions between motorists and wildlife are relatively infrequent, they do occur and can include crashes from avoidance maneuvers. More commonly, WVCs result in vehicular damage, which can occur from direct impact and secondary motor vehicle crashes. Other results can include travel delays, unsightly carcasses on the roadway, and even emotional trauma. WVCs frequently require the assistance of law enforcement personnel, emergency services, tow vehicles, and road maintenance crews for potential repairs and carcass removal (FHWA 2022).

Across the U.S., the number of WVCs has risen by 50% over the past 15 years, even while the total number of crashes has remained relatively stable over that time (Fleming 2022). This growing statistic can increase stress on species' populations and impacts a driver's well-being on the roadway. Given that many wildlife-vehicle collisions are not reported to law enforcement or insurers, the Federal Highway Administration (FHWA) estimates between 1 million and 2 million wildlife-vehicle collision incidents occur in the U.S. every year. These collisions result in 26,000 human injuries and 200 human fatalities at an annual cost to Americans of $8 billion dollars (Huijser et al. 2015.)

Virginia is one of the higher-risk states in the country when it comes to collisions involving white-tailed deer. Virginia ranks 15th in the country in wildlife vehicle collisions, according to data from State Farm Insurance (State Farm Mutual Automobile Insurance Company 2022). November is the worst month for collisions, followed by October and December (The Wildlife Center of Virginia, n.d.); these months typically correspond with the mating season for white-tailed deer. Deer-vehicle collisions in Virginia increased 25% from 2005 to 2017, and more than 60,000 have

occurred per year since 2015 (Donaldson and Elliott 2021). These numbers are expected to grow as development expands.

Identifying High Risk Wildlife-Vehicle Conflict Areas

The large number of WVCs and the variety of environmental factors influencing wildlife movements and driver decisions characterize WVCs as complex and challenging to predict. However, numerous studies have been conducted to understand the relationships between drivers, animals, and the environment. These studies have identified the following factors as commonly influencing WVC locations and rates: the proximity to forest, topography, road width, seasonal differences, and movement based on mating seasons. Independent of species, traffic volume, the distance to urban areas, and roadway infrastructure are not clearly assignable as influencing or non-influencing factors. Various data sets to use in WVC analyses can include carcass removal by transportation staff and crash data, typically available through the Department of Motor Vehicles (DMV) or state police. Proper data collection and the quality of reliable data sets are integral to fully understanding and effectively addressing WVCs and driver protection.

Figure 2-3. Typical sign to warn drivers of areas of frequent deer crossings. (VTRC)

Factors that Influence Wildlife-Vehicle Conflicts

An important component of driver safety is the effect of traffic on WVCs. Traffic characteristics such as volume, speed, and timing can greatly affect the frequency of WVCs, although the relationships between traffic characteristics and wildlife crossing attempts are nonetheless complex. Additional variables influencing this complex relationship are daily and seasonal patterns in both traffic and in animal movements (Ament et al. 2021).

Wildlife Ecological Impacts from Roads and Traffic

Loss of Habitat
Decrease in Habitat Quality
Barriers to Movement
Road Mortality

Extremely high traffic volumes often serve as barriers to animal movement, while lower volumes may increase rates of WVCs as animals attempt to move across roads during intervals when vehicles are sparse or absent. As traffic volumes increase, roadways can become greater barriers to the movement of wildlife, either directly through WVCs or as a result of animal avoidance of the road and nearby habitat. The volume of traffic that constitutes a complete barrier to wildlife movement varies by species, landscape, and other variables. While the barrier effects increase with the number of vehicles, wildlife crossing structures and fencing can greatly reduce this barrier effect by providing a means of safe passages across highways, helping ensure stable local and regional wildlife populations (Ament et al. 2021). Especially high rates of safe passage are found on road segments containing bridges and large drainage structures such as large pipes and culverts, which allow safe passage of wildlife and high levels of habitat connectivity (Meese et al. 2009).

Ungulates (i.e., hooved animals) such as white-tailed deer tend to be attracted to roads due to the presence of forage along roadsides, medians, and interchange loops. Most large-bodied mammals are more inclined to approach roads and to use crossing structures where desirable vegetation is present, particularly where there is an interface with forested areas that serve as cover from predators. Thus, in wildlife crash countermeasures assessments, the habitat preferences, including sources of both food and cover, must be carefully considered within and along the right-of-way. Roads with sharp curves, undulations in the road surface, and thick roadside vegetation reduce a driver's line of sight, increase driver response time, and may increase the risk of collision should an animal appear on the roadway (Meese et al. 2009). Transportation planners must consider how roadway dynamics such as roadway shape, vegetation in the right-of-way, and nearby habitats all affect WVCs.

Analytical Approach to Identify Wildlife-Vehicle Conflict Areas

To identify the occurrence rate of WVCs along specified Virginia roadways, a geospatial analysis was performed using available statewide datasets—more specifically, deer and bear collisions were analyzed to create a statewide map of WVC occurrences and then areas were classified into WVC occurrence rate categories. Several datasets were sourced and compiled in ArcMap, and later using ArcGIS Pro, to complete the analysis and create a layer of WVC occurrence rates across along roadways.

Data were sourced from two VDOT databases: Virginia Roads and Virginia Smart Roads. These datasets are compiled using police-reported collisions, provided by the Virginia DMV. These reports are created by police at the time of the crash when the damage to the vehicle or other property is estimated to be a minimum of $1,500 (Oleynik and Brich 2017). The dataset used from Virginia Smart Roads (CrashData_Basic) provided data from 2014 to 2020, and the dataset from Virginia Roads (CrashData_2013) provided data from the year 2013. These reports provide relevant data such as the time and date, type of collision, and severity of damage, among other collision information.

The datasets were merged, creating a layer that contained all collisions involving an animal between 2013 to 2020 (61,688 crashes in total). This means that, for every crash in the resultant dataset, a deer or other animal either directly collided with the vehicle(s) or caused a vehicle to collide with another vehicle or object as a result of the driver avoiding or attempting to avoid the animal. Based on the definition of a WVC, all these collision types were included in the analysis.

Additional datasets used included Virginia Road Centerlines, a Virginia border outline, and a base map (OpenStreetMap) to assist in spatially locating the WVCs. The Virginia Roads layer was simplified to only include roads classified as Interstate, U.S. Highway, and Primary State Route (and ultimately filtered by Functional Classification).

Assumptions of the Analysis

While this is the most comprehensive dataset in Virginia for accurately depicting WVC occurrence rates, there are some limitations of the dataset. Although the data are accurate in the reporting of each event, the number of WVCs that are reported by police has been observed to be much lower than actual reported deer collisions. In a study observing carcasses removed along roadways in Virginia, the actual number of deer-vehicle collisions were found to be between four and nine times greater than those reported to the police (Donaldson 2017).

Carcass removal data may serve as an alternative WVC information source that may supplement existing data to assess the number of WVCs more accurately. The Virginia Transportation Research Council (VTRC), the research division of VDOT, is currently conducting a pilot study to test an application for use by interstate contractors to document carcass removals. Police report data should not be discounted as a data source, however, as it provides useful crash severity information that carcass removal data does not.

It also should be noted that, while the focus of this *Wildlife Corridor Action Plan* is on identifying WVC areas, the source data may have included incidents that involved livestock and domestic animals, located outside or inside the vehicle. The police-reported WVC dataset contains crashes in which an animal was involved, but deer is the primary animal specified. Of the main collision types, deer comprise 75% of the data, other animals comprise 6%, and the remaining 19% are undetermined whether each point involves a wild animal; these collisions could have involved domestic pets or livestock. However, it should be assumed that if included in this analysis, domestic animals make up a small percentage of these points and do not heavily influence the final layer. After the analysis of the entire dataset, the data were filtered to produce maps that depict deer and bear WVCs (with the assistance of data provided by Virginia DMV) to provide information on the large wildlife species that are most associated with WVCs resulting in driver safety risk and vehicular damages.

Analysis, Point Density, and Limitations of Use

Using the WVC dataset, a statewide heat map was created (Figure 2-4) that shows point densities of WVC occurrences. Based on this heat map, the multiple observable "hotspots" distributed over the state illustrate that WVCs in Virginia are spatially clustered and are not random.

However, there are some limitations to this type of analysis. While the heat map generally indicates where WVC hotspots are located on a broad scale, it is difficult to evaluate on a smaller, local scale. If users wish to use a similar method for a local-level analysis, it is possible to use the same methodology (with the same aforementioned data sources), but with a smaller geographical boundary, such as a county or city border.

If a user wishes to compare WVC occurrences in a localized area, the results are less informative, as the current layer bases the WVC occurrence rates on the average across the entire state. If the statewide map is used for local-level evaluations this way, it could contribute to overlooking WVC hotspots and opportunities for wildlife crash countermeasures implementation. For example, the statewide map is less useful if county planners wish to find the top 10% WVC hotspots to evaluate opportunities for countermeasures in their county. For local-level analyses, it is recommended to first classify all road segments in the area against each other instead of using the statewide map.

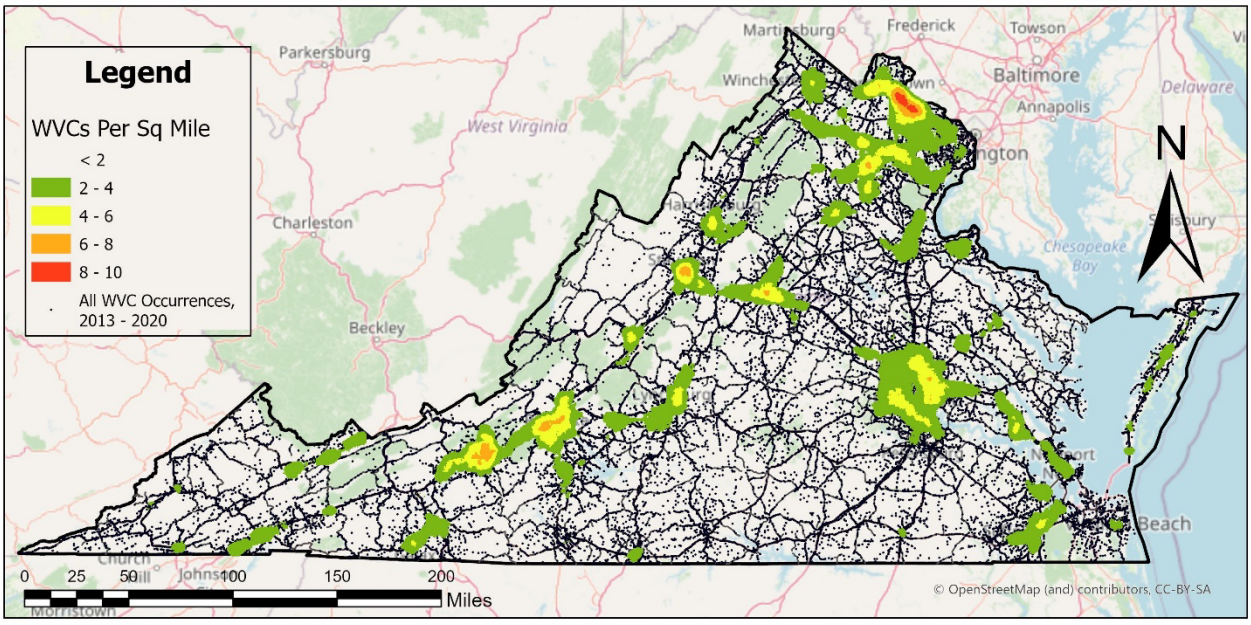

Figure 2-4. Point density map showing reported WVC occurrence density in Virginia for the years 2013 to 2020.

Wildlife-Vehicle Conflict Occurrence Rates by Roadway Segments

Further analyses of WVCs in Virginia included the creation of an interactive, scalable environment, in which the viewer can focus on certain areas and compare them to other areas of the entire state simultaneously. A layer was then created to determine the areas of highest concern across the state based on segments for a focused set of roadways.

The main roadways used in the analysis were determined by using the Functional Classification System of roadways and a minimum speed limit of 45 miles per hour. The Functional Classifications of concern included Interstates, Other Freeways and Expressways, Arterials (both Other Principal and Minor), and Major Collectors. The two remaining classifications, defined as Minor Collectors and Local, were omitted from the analysis. The roadways were also filtered by a minimum speed limit of 45 miles per hour. These road classes were selected to aid with the analysis of road segments and to provide consistency with considerations made during road safety project development. In this layer (Figure 2-5), out of 105,700 total miles of road centerline length in Virginia, nearly 14,300 miles (~13.5%) of roadways were analyzed. The roadways in the resultant layer were then segmented and then combined with the WVC data.

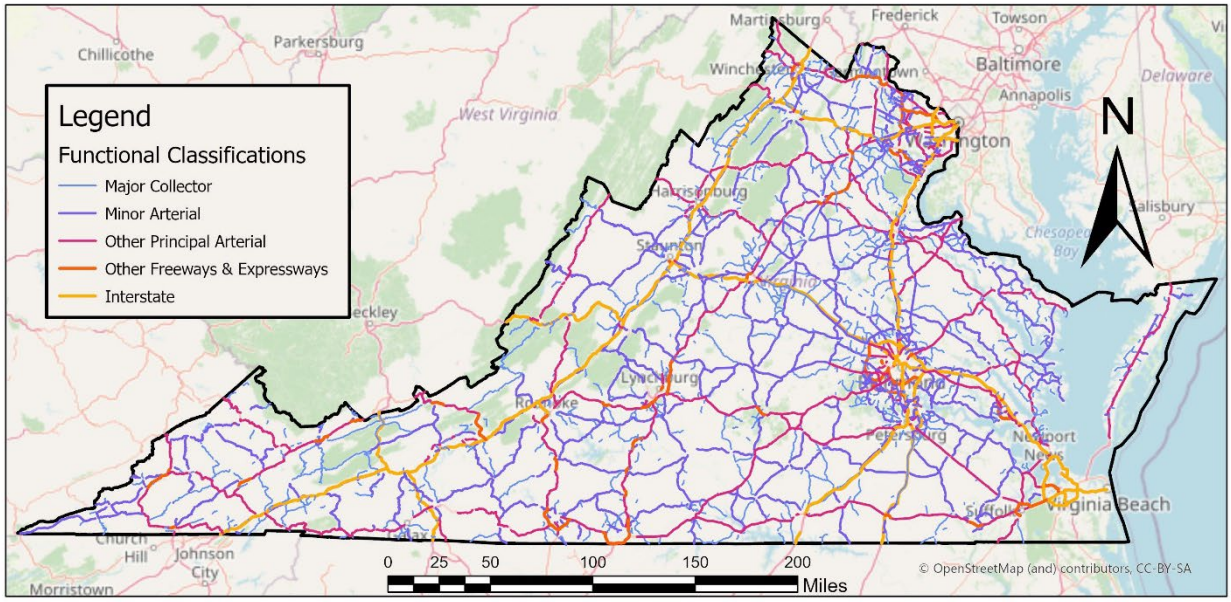

Figure 2-5. Roadways analyzed for segmenting purposes, filtered by the Functional Classifications (listed in legend) and a minimum speed limit of 45 mph.

The roadway classifications were then used to visualize areas by WVC occurrence rates (Figure 2-6) with the top percentage of segments used to visualize occurrence rates. For the WCAP, using the calculated weight value (WVCs per mile per year), the top percentage of segments were used to visualize occurrence rates. The classifications used were the top 0.1%, 1%, 5%, 10%, and 50% of each segment using their weighted value (number of WVCs per mile per year). The values

associated with these percentages were calculated using the total of 15,734 road segments and defining the minimum value for each percentage range. The minimum WVC values are parenthetically provided for each percentage classification within Figure 2-6. For example, a weighted value of at least 3.25 WVCs per mile per year was required to be considered in the top 0.1% of all segments (Figure 2-6).

Optimized Hot Spot Analysis

To confirm the analytical findings of the statewide WVC point densities and WVC occurrence rates by road segments, tools such as Optimized Hot Spot Analysis (OHSA) were used to create an objective view of areas where clustering occurs (Figure 2-7). For this analysis, a 350-hectare (approximately 1.35 square miles) cell size was used. This value is based on other studies that identified this as the least conservative area of deer home range estimates (Oden-Plants 2019). Despite the animal-related crashes comprising more than just deer, deer collisions make up over 75% of the data, and therefore conflicts which involve deer are the major influencers of the results. Square cells were created with sides equaling 1,870.83 meters (approx. 1.16 miles) to create the 350-hectare area.

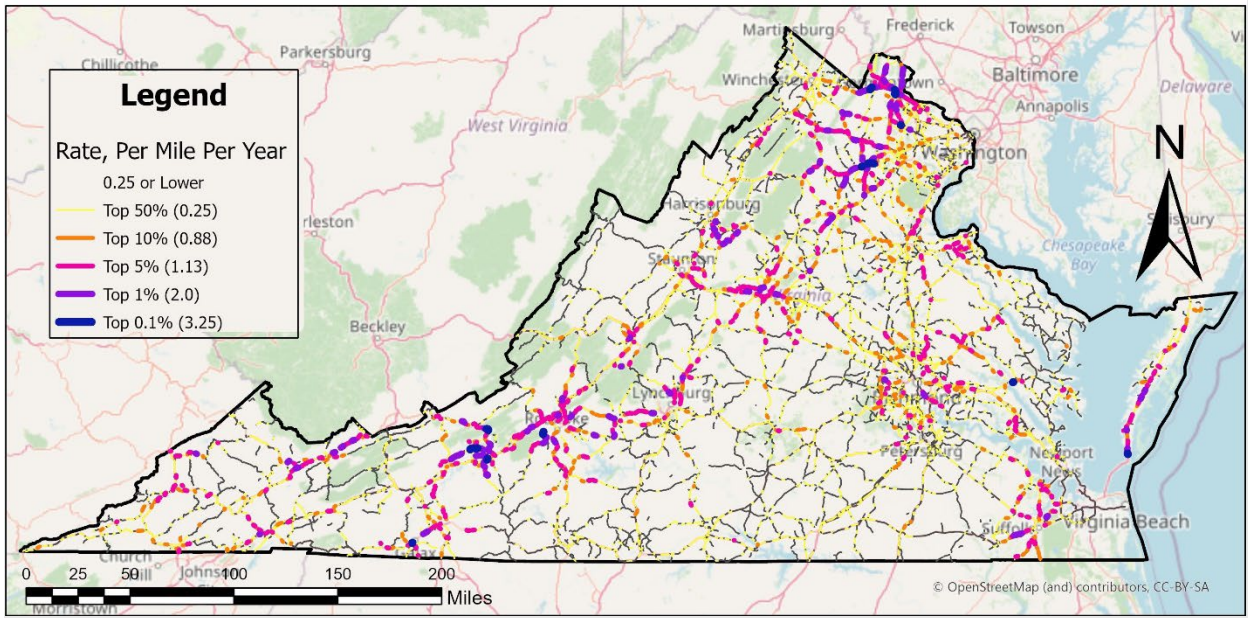

Figure 2-6. Reported WVC occurrence rates per road segment (based on data from 2013 to 2020), classified by top percent categories for all road segments analyzed. The parenthetical value for each classification rate states the minimum number of WVCs per road segment/year.

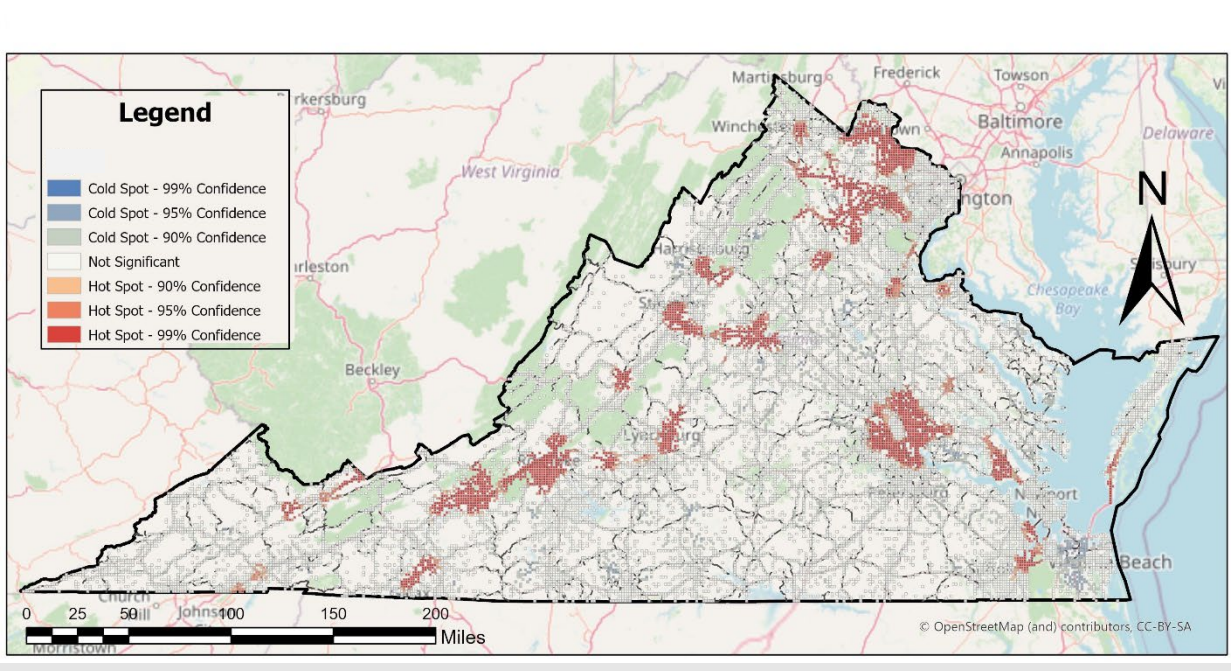

Figure 2-7. Optimized Hot Spot Analysis of WVC occurrences for the years of 2013 to 2020.

When the OHSA layer is overlaid on the WVC point density and road segmenting layers, the OHSA results support the findings from the other two analyses. Areas of high WVC occurrence in both previous analyses (i.e., the analyses of WVC point densities and WVC occurrence rates by road segments) match the areas where the OHSA tool determined a 99% confidence that a hotspot is occurring at that location.

Highway Maintenance Management System Dataset

Other datasets were examined to further understand WVC areas within Virginia, in particular to understand the primary large wildlife species involved in WVCs, i.e., deer and bear. For example, the Highway Maintenance Management System (HMMS) is a database that compiles reports of numerous issues along VDOT-maintained roadways, including reports of carcasses. However, due to this dataset being a crowd-sourced reporting system of animal carcasses, and not a true representation of carcass removal (or the precise location of the carcass), it is not recommended to utilize this dataset as a standalone layer to analyze WVCs in Virginia. However, this database was used in this study as an additional method to identify potential concern areas for WVCs. Figure 2-8 shows the HMMS data for deer and bear carcass observations (reported as per mile per year rates by road segments). For example, a user focusing their review on a certain area could use the statewide OHSA layer and compare it to the HMMS carcass layer to see if a similar carcass removal problem exists in the same area where a collision hotspot is shown.

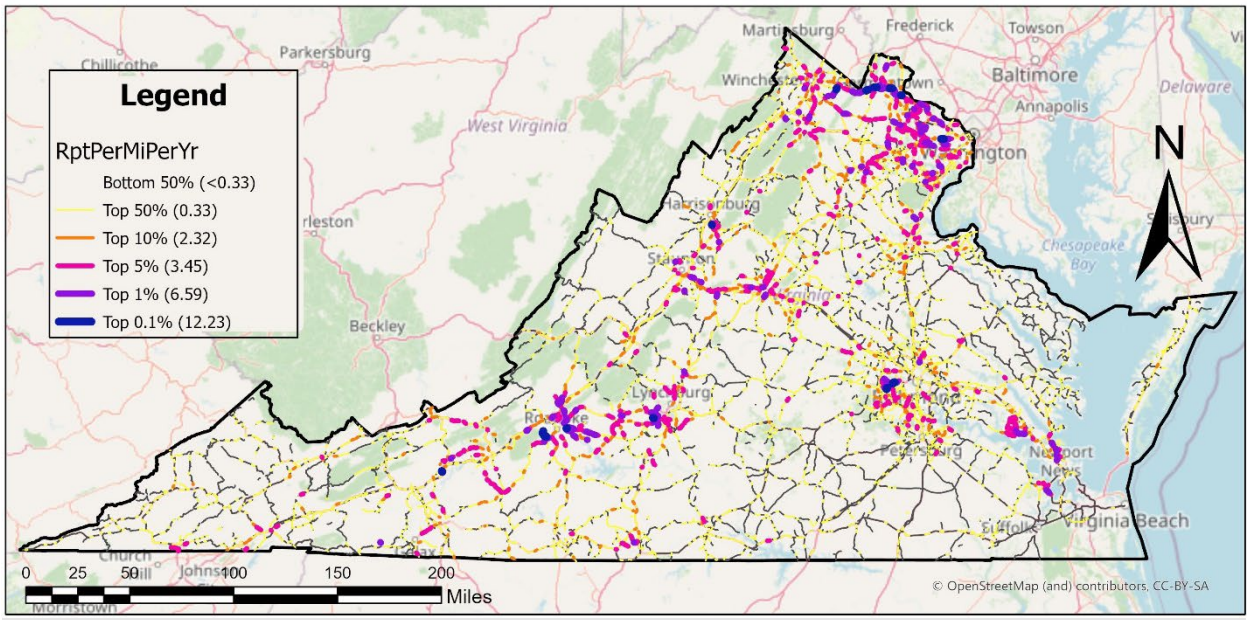

Figure 2-8. HMMS deer and bear carcass reports by road segments, 9/29/2018 to 12/7/2021. RptPerMiPerYr = Reports, Per Mile Per Year.

Filtering Police-Reported Crashes by Animal Type

Since a primary goal of this *Wildlife Corridor Action Plan* is to identify WVC areas of concern, and in particular WVC areas primarily driven by deer and bears, the subsequent sections describe the data filtered by these species. The WVC datasets were joined with the segmented road layer to identify the top percentages of segments across the state.

- ***Deer Wildlife-Vehicle Conflicts***

  The primary dataset was filtered by selecting only deer collisions, which comprised 75% of the data records from 2013-2020 (46,296 records in total; Figure 2-9). This only includes crashes in which the deer was the main collision event; by definition, there may be many deer-vehicle conflicts not included in this layer; instances in which a deer is not a contributing factor to the collision, or a secondary event listed within the collision report, are not included in this layer.

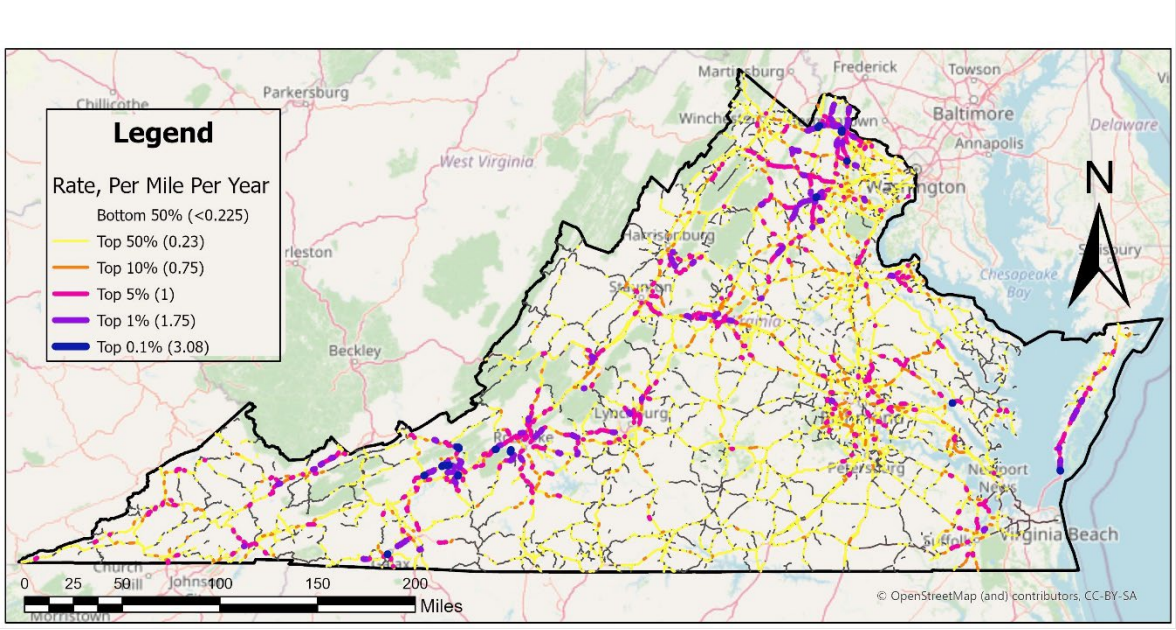

Figure 2-9. Reported deer crash rate segments for the years of 2013 to 2020. Layer created by filtering the police report dataset by deer collisions and joining with generated road segments.

- *Bear Wildlife-Vehicle Conflicts*

  Bear-related WVCs were identified by selecting for the "bear" keyword in the comments field of the (DMV-compiled) police reports for the years of 2012 to 2021, resulting in 1,421 total occurrence points (Figure 2-10). Of the total 1,132 possible points between the years of 2013 to 2020, only 949 (83.8%) had an associated data point from the primary dataset. Therefore, not all points had an associated animal-related crash. However, because we cannot reference the contents of the comments section, we cannot not rule out the possibility that these other data points were associated with bears. The entire dataset provided by the DMV was therefore used to create and analyze for the creation and analysis of this layer.

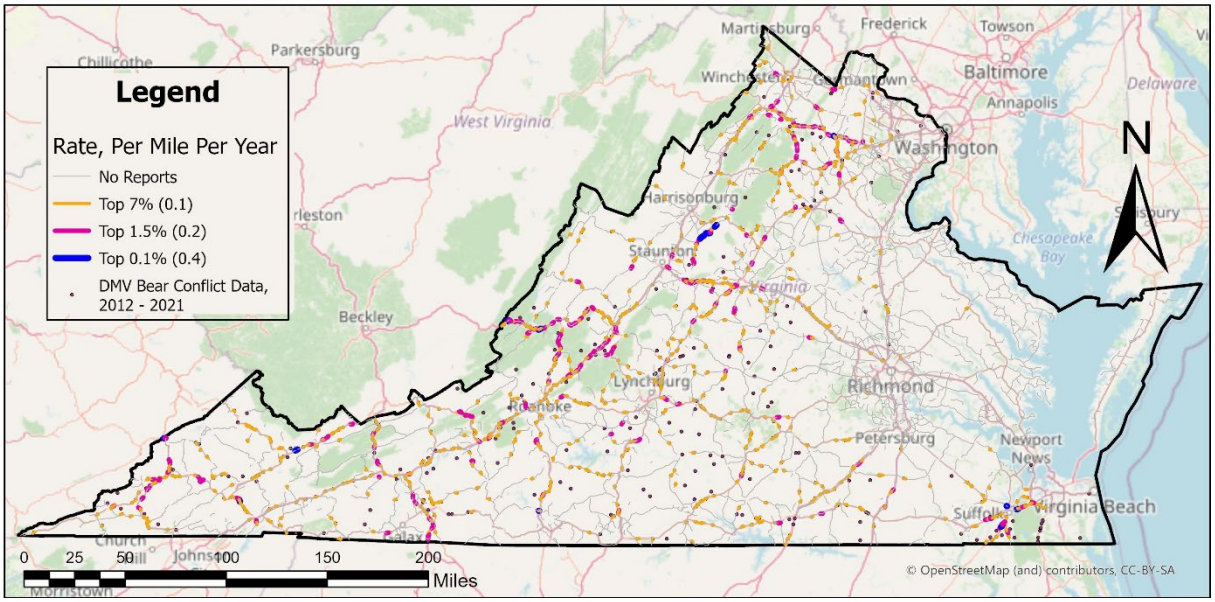

Figure 2-10. Reported bear-related crash segments for the years of 2012 to 2021. Bear-related dataset sourced from DMV joined with generated road segments.

- *Other Animal and Remaining Animal-related Crashes*

  Since the data can be filtered by crash type and DMV personnel provided data that involved bear in the reports, a standalone layer was created from the remaining (i.e., non-bear and non-deer) crashes in the primary datasets (Figure 2-11). This layer includes collision events that involve other animals, fixed objects, vehicle-to-vehicle collisions, and non-collisions (rollovers/lane departures). Because the deer crashes layer displays only collisions where deer were the main event, it is possible that deer conflicts may remain in this layer, as they could have been a contributing factor to the collision. This layer appears to suggest more randomized occurrences, which could be due to the remainder of collisions likely involving proportionately more domesticated animals than the unfiltered dataset.

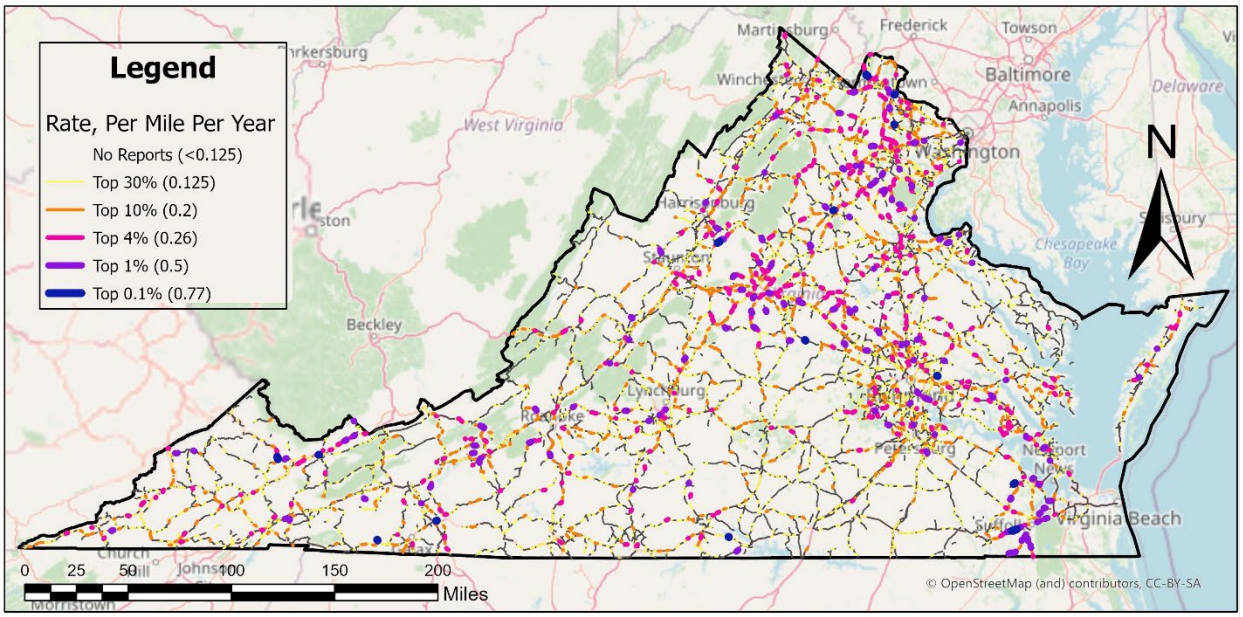

Figure 2-11. Crash rates for other animals (after removing deer collisions and bear-related crashes) for the years of 2013 to 2020. Crash data sourced from DMV joined with generated road segments.

Driver Safety Recommendations

Types of Wildlife Crash Countermeasures to Improve Driver Safety

The VDOT guidance document called the *Large Animal Crash Countermeasures in Virginia: Technical Guidance and Best Management Practices* (Donaldson 2022) provides information on selecting and implementing effective wildlife crash countermeasures for large animal-vehicle collisions. Some of the measures included in the guidelines (wildlife crossings, in particular) can also be effective for smaller wildlife species. The document discusses three primary measures that have been shown to be effective at reducing collisions with large mammals and associated costs from property damage, motorist injury/mortality and animal carcass disposal. These countermeasures include: (1) wildlife crossings, including enhancing existing underpasses with fencing and other features, (2) wildlife advisory messages on Changeable Message Signs (CMS), and (3) animal detection driver warning systems (Donaldson 2022).

- *Wildlife Crossings and Enhancing Existing Structures*

  Wildlife crossings are overpasses or underpasses used by wildlife to cross above or beneath a roadway. These structures are the most effective method of reducing WVCs while also providing a means for wildlife to access habitat on the other side of a road. Studies have found that a structure's openness ratio, defined as the structure's (height x width)/length is important for medium- and large-bodied mammals. A relatively large

openness ratio (i.e., >0.75) may enhance a structure's use by a large animal by allowing sight through a crossing structure as well as providing more natural light conditions (Caltrans 2007). When combined with fencing, which restricts wildlife access to the road and helps guide them toward the crossing, these structures have been found to reduce wildlife collisions by more than 90%. Extending fencing between multiple suitable underpass structures can be expected to result in a significant wildlife crash reduction along the entire length of the fenced road segment (Donaldson and Elliott 2021). Fencing should include jump-outs or escape ramps (Figure 2-12). These features are often constructed of earthen materials but can also consist of shorter sections of specially designed fencing that allows wildlife trapped within the roadway to escape the fenced section.

Figure 2-12. A wildlife jump-out located along I-64 in Virginia. (Donaldson and Elliott 2021)

Existing road segments that have been identified as having high occurrences of wildlife-vehicle collisions can be reviewed for the presence of existing underpasses already suitable for wildlife crossings or existing underpasses that can be enhanced to provide wildlife passage. Many wildlife crossing enhancements can be implemented relatively inexpensively in relation to the overall project budget. Incorporating wildlife passage design elements into maintenance projects, roadway improvement or widening projects, culvert or bridge replacements, or by adding directional wildlife fencing to existing suitable underpass structures may be possible. However, the costs to implement and monitor these types of wildlife passage enhancements should be considered in relation to the overall project budget. Where wildlife crossing construction (or substantial

enhancements to existing underpass infrastructure) are considered, the land uses, protection status, and property ownership of the surrounding lands must be evaluated. For example, areas where future development is expected to occur should not be candidate locations for wildlife crossings unless there are protected habitats that will enable wildlife access to the crossing structures (FHWA 2022).

Figure 2-13. Bridge underpass along I-81 north of Buchanan used as a wildlife crossing. (VTRC 2022)

While not specifically safety-related countermeasures, the following measures are other wildlife crossing enhancements to consider for bridge, large culvert, and roadway transportation projects that can provide wildlife passage benefits for multiple species, including for smaller terrestrial and aquatic species:

- Create an underpass trail or passage bench habitat to encourage wildlife passage. Trails should be level, have a minimum width of three feet, and be set above drainage outfalls to prevent washout.
- Reduce riprap/large cobbles that are not conducive to wildlife passage.
- Increase the ease of access to and through bridges and large culverts. This includes contouring or modifying the approaches to an underpass and the slope beneath bridge underpasses.
- Keep structure approaches free of material such as storm debris build-up and thick vegetation.
- Create a flat, natural bottom to arch pipes and concrete box culverts.
- For existing culverts that are not already countersunk, add topsoil or other natural substrate to the culvert floor to improve footing and encourage use by wildlife.
- Create natural or artificial light. For many wildlife species, including deer, more open and well-lit structures will be used more readily than dark, tunnel-like culverts. The addition of grating at the top of the underpass can increase the

natural light inside of a culvert to encourage wildlife use. Artificial light sources can also be installed in dark culverts when grating is not an option.

- For aquatic organism passage, ensure that the inflow and outflow elevations of culverts are designed to allow passage.

❖ *Wildlife Advisory Messages on Changeable Message Signs*

The purpose of CMS, also known as dynamic message signs, is to increase driver safety by calling attention to unexpected conditions. The aim is to increase driver alertness and often to reduce driver speed. Studies suggest that drivers can reduce the chance of a collision with wildlife by reducing speed and remaining alert in areas with abundant wildlife (VTRC 2022). In general, reducing speed has been found to decrease the number of crashes, reducing both the severity of property damage and injuries, and allowing drivers to more successfully correct in avoidance maneuvers. Several studies have found lower numbers of animal crashes in areas with lower speeds (VTRC 2022). While research shows mixed results, some studies, including an evaluation on I-64 in Virginia, have found that seasonal messages alerting drivers to an increased risk of wildlife crashes can be an effective measure of crash reduction. To reduce the likelihood of driver habituation to the messages, the warnings should be displayed only during those times of year and times of day when the risk of large animal crashes are greatest. This information is included in VDOT's Changeable Message Signs policy (IIM-OD-13.03), which states that messages should be displayed in high risk areas only in October through December between the hours of 5:00 PM and 9:00 AM, provided there are no higher priority messages to be displayed (VDOT 2019).

Figure 2-14. Typical changeable message sign to warn drivers of high risk of deer collision. (Johnogroat Journal)

❖ *Animal Detection Driver Warning Systems*

Animal detection systems are designed to sense large animals as they approach the roadway and are intended to warn drivers about their presence. Most animal detection systems contain either above-ground area cover sensors, break-the-beam sensors, or thermal detection devices. These sensor systems work similarly in that the system is

activated when an animal's body blocks or reduces the signal. Once detection is verified, a warning system, such as a flashing warning light or a changeable message board that communicates with the detection cable, can alert drivers to be prepared to encounter a large animal, resulting in an increased awareness and reduction in vehicle speed and stopping distance. Buried cable detection systems offer several advantages over above-ground detection technologies when environmental variables such as snowfall or high vegetation blocks a beam, and site-specific characteristics such as topography and road curvature are considered (FHWA 2022).

Although studies show mixed results with regard to their effectiveness, in some areas these systems have been shown to reduce wildlife crashes by more than 90% (FHWA 2022). They seem to be most effective at the ends of fencing associated with wildlife crossings. The VDOT applications of these systems will be considered experimental until more information on their effectiveness can be determined (VTRC 2022).

Planning for Wildlife Crash Countermeasures in Transportation Projects

The transportation project development process offers a critical opportunity for incorporating wildlife crash countermeasures. The need for these countermeasures should be identified early in the planning process to ensure that adequate project funding is available and that any countermeasure designs do not conflict with other project design aspects. Specifically, the inclusion of wildlife crash countermeasures should be identified during the scoping and project initiation phase and then re-evaluated at the preliminary design phase (Figure 2-15).

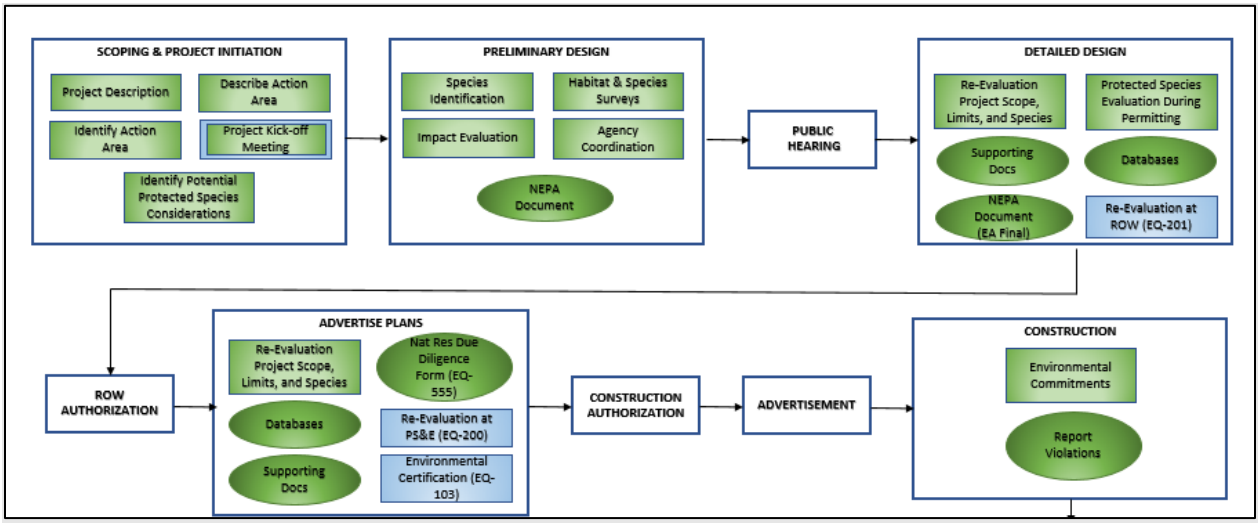

Figure 2-15. Overview of the transportation project development process. The consideration of wildlife crash countermeasures should be started at the project scoping phase and re-evaluated at preliminary design.

The primary types of transportation projects that should be evaluated for potential opportunities for incorporating wildlife enhancements to improve driver safety while also benefiting safe wildlife passage and habitat connectivity, include, but are not limited to:

- New roadway alignments;
- Road widening or lane additions to existing roadways;
- Significant realignment of existing roadways; and
- Bridge and culvert replacements.

The identification of intersection points of elevated WVC occurrence rates with proposed transportation projects early during project development can increase the successful implementation of wildlife crash countermeasures.

Best Practices

The following are best practices to identify wildlife crash countermeasures early during transportation planning and project development:

- Consider whether a proposed roadway project will create or worsen a barrier to habitats and wildlife movement corridors or provide an enhancement opportunity to improve wildlife connectivity and/or driver safety.
- Identify adjacent underpasses (e.g., bridge and culverts) where cost considerations for wildlife passage enhancements could be added during early project scoping. For example, in the vicinity of a high WVC occurrence area, identify if there are existing bridge or culvert structures within a 0.50- to 1-mile buffer where directional fencing could be installed to guide wildlife to an existing undercrossing.
- Consider existing investments, adjacent land uses, land protection status and the compatibility of those designations with promoting safe wildlife passage.
- Identify focal species for the planning efforts focused on habitat connectivity and safe wildlife passage. Consider whether additional site-specific wildlife movement or road mortality data are required before the appropriate type and location of wildlife enhancement can be identified.
- Include potential project costs for any long-term monitoring, data collection, and reporting of wildlife mitigation to support cost-benefit analyses and decision making. Add these potential costs into project cost estimating sheets.
- Identify stakeholders and collaborate with key partners to align project efforts for consistency.

Project Cost Implications

The cost for wildlife crash countermeasures can vary widely depending on site conditions; therefore, it is critical to weigh the costs and benefits of implementing wildlife crash countermeasures in relation to the overall project scope and budget. As an example, VDOT targeted a section of I-64 near the Afton Mountain area (Augusta and Nelson counties) for safety and mobility improvements because of a high number of vehicle crashes and traffic stoppages. This east-west segment of I-64 has an annual average daily traffic volume of 27,000 and 49,000 vehicles. Deer-vehicle collisions were the third most frequent police-reported type of crash along this section.

To provide VDOT with mitigation options to reduce deer-vehicle conflicts, VTRC researchers conducted a study that evaluated the activity and behavior of white-tailed deer and other wildlife near two existing unfenced underpasses along I-64. As a result of monitoring data collection, the study recommended the installation of up to 1 mile of 8-feet-high exclusionary fencing along eastbound and westbound lanes at both underpass locations (Donaldson and Elliott 2021). The costs for the directional deer fencing materials and installation ranged from $12 to $29 per linear foot. When all costs associated with site preparation, traffic control (during installation), fencing materials, and long-term maintenance of the study area were factored in, the total cost was estimated to be $265,000 per site (Donaldson and Elliott 2021). However, the fencing installation resulted in an average savings per site of $2,348,415 due to deer crash reductions, predominantly in the form of property damage savings to drivers, realizing a 1.8-year return on investment (Donaldson and Elliott 2021). The results of the study highlighted that the overall cost-benefit of installation of wildlife crash countermeasures not only improved driver safety improvements (as measured by reductions in property damage, injuries, and fatalities), but also resulted in considerable cost savings.

Conclusions

Data Collection Standards. As with any transportation safety improvement project, evaluating the effectiveness of wildlife crash countermeasures will help justify the countermeasure costs and will provide information regarding whether similar improvements should be conducted on other road segments. The need for national data collection standards, including for carcass retrieval data and standardized methods, have been identified. The FHWA has indicated one challenge for monitoring the effectiveness of wildlife-vehicle crash mitigation is the lack of reliable standardized and spatially precise data on the location of WVCs and animal carcass removal (Huijser et al. 2008). Additionally, crash and carcass data collection are largely focused on large mammals and typically do not represent the impact of road mortality to other at-risk species including smaller terrestrial wildlife species, federally protected species, or species designated as Species of Greatest Conservation Need (SGCN) in Virginia's State Wildlife Action Plan. The urgent need for standardized data focused on wildlife-vehicle collision locations has

accelerated recently across the U.S. with the passage of the Infrastructure Investment and Jobs Act (IIJA). Among other funding programs in IIJA in which wildlife crash countermeasures may be eligible, IIJA includes a $350 million Wildlife Crossing Grant Program to fund the construction of wildlife road crossings, provided there are data to support and guide the decisions. As funding opportunities are pursued when appropriate, the accuracy of crash and carcass removal data is a major factor.. As more research and monitoring data on wildlife movements are collected, this information will direct where and how to maximize returns on investments in transportation infrastructure projects to benefit both humans and wildlife.

Cost-Benefit Analyses. Long-term monitoring data of wildlife crash countermeasures will provide critical information for evaluating the cost-benefit analyses of these structures. The long-term maintenance needs (e.g., fencing material repairs/replacement following storm damage, vegetation removal from culvert passage openings, level of effort of DOT maintenance staff to perform long-term maintenance, possible lane closure costs) of crossing structures has not been well studied or evaluated. Having more substantial long-term monitoring and maintenance costs will add to the realization of the value of installing wildlife crash countermeasures over time. Additionally, a standard set of metrics (e.g., reduction in wildlife carcasses, reduction in wildlife-vehicle collisions, etc.) to collect as pre- and post-monitoring project data would add to the cost-benefit analyses to installing wildlife crash countermeasures (Huijser et al. 2008).

Development of Wildlife-Vehicle Conflict Risk Predictive Models. The next logical step that could build from the WVC information provided here would be to develop a WVC risk analysis that would identify segments of roads that are at the highest risk of large mammal collisions. The road risk model could be developed using metrics of various road, traffic, and environmental factors such as: road right-of-way width; road curvature; Annual Average Daily Traffic or comparable traffic data; time of day or season of large mammal collision; and surrounding environment including land cover type, slope, and topography.

Chapter 3
Wildlife Biodiversity Resilience Corridors

Background

The Code of Virginia (§ 29.1-578 and § 29.1-579) requires that this Plan identify wildlife habitat corridors. The legislation also infers that these corridors should be comprised of high quality habitats for priority species and ecosystem health, including habitats for at-risk species and Critical Habitat (i.e., for species afforded protection under the federal Endangered Species Act, Critical Habitat are areas that are designated as essential for the conservation of the species).

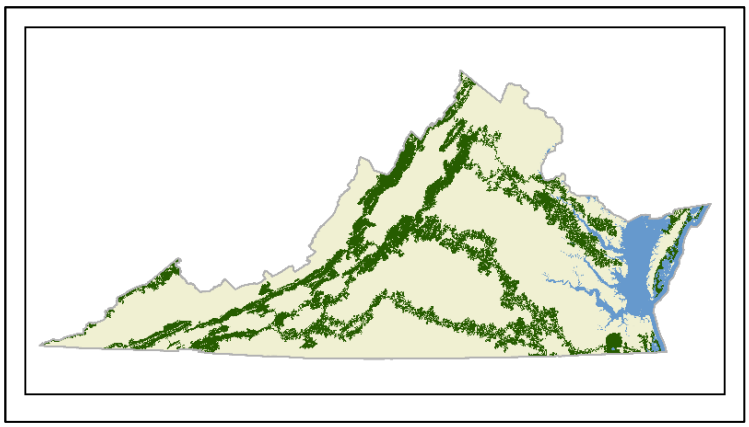

Figure 3-1. Wildlife Biodiversity Resilience Corridors in Virginia.

The WCAP Biodiversity Task Team determined that the best available planning tools to serve as the foundation of wildlife habitat corridor identification, for the purpose of this Plan, are the Virginia Natural Landscape Assessment (VaNLA) and ConserveVirginia. These two conservation tools are maintained by the VDCR to guide land conservation within the Commonwealth, prioritizing for significant biodiversity, ecosystem health, high quality habitats, at-risk species, and species protected under state and federal laws.

This chapter describes the methodology used to identify the high priority wildlife corridors in Virginia and presents these corridors as Wildlife Biodiversity Resilience Corridors (WBRCs). The inclusion of the "biodiversity" and "resilience" terms for these corridors is intentional. Biodiversity is the biological variety of life on Earth, including all species, their genetic variation, and their assemblages in communities and ecosystems. Resilience, as it pertains to this Plan, refers to the capacity of ecosystems to retain their ecological integrity, functions, and services to continue supporting biodiversity as land use and environmental conditions change over time, e.g., such as from climate change. Thus, in this Plan, with the use of VaNLA and ConserveVirginia as the foundational tools, it results in identifying corridors that support conserving Virginia's native biodiversity and habitats for long-term sustainability.

Habitat Connectivity and Corridors

Habitat loss, be it from shifts in natural communities, degradation, or destruction, is one of the greatest threats to biodiversity (Brooks et al. 2002). While some habitat is lost to species through natural causes, the vast majority of habitat loss is directly linked to human activities at local and global levels. At the local level, conversion of natural lands to residential and commercial development is the primary mechanism by which habitat is lost permanently in Virginia. Furthermore, human-caused barriers like roads and dams can prevent organisms from moving through the landscape to access suitable habitats when their local habitats have been degraded or destroyed. In addition, human-caused barriers to habitat connectivity will exacerbate the effects of global climate variability and change on Virginia's native biodiversity. For example, climate change can cause loss of biodiversity when species do not have enough time to adapt to new conditions, when they cannot find refugia within which to survive periods of unfavorable conditions, or when they do not have the ability to move through connected landscapes to find suitable habitat. Preserving and restoring the connectivity of continuous, high quality natural lands and waters throughout the Commonwealth of Virginia will attenuate some of the negative impacts from anthropogenic barriers, such as developed lands, roads, and dams, as well as support the adaptive ability of species shifting their distributions as the climate changes.

Without proper planning, the conversion of natural lands to residential and commercial development can occur in decentralized and scattered patterns, consuming a substantial amount of land and causing unnecessary habitat fragmentation of the landscape. Such has been the case in Virginia in recent decades. The consequences include not only lost habitat and natural corridors, but also the degradation of important ecosystem services that keep our air and water clean, assist in climate regulation, and reduce the impacts of natural disasters. Ecosystem services often are overlooked as landscapes are developed largely because traditional economic analyses that incorporate the financial benefits of development usually do not include the financial benefits of ecosystem services. Studies have estimated that ecosystem services contribute as much or more to the global economy as do marketplace processes (Costanza et al. 1997) and that they can result in a return on investment in excess of 100 to 1 when natural lands are conserved (Balmford et al. 2002).

Loss of habitat connectivity can have significant impacts on species. Habitat fragmentation results in loss of interior forested habitat, facilitates colonization by invasive species, and introduces new predator/prey relationships along a habitat corridor and within adjacent habitats. Depending upon the surrounding landscape, habitat fragmentation also can result in ecological similarities to actual islands surrounded by water. Populations of a species in isolated habitat patches may experience decreased genetic exchange with populations in other habitat fragments, which can lead to inbreeding and eventually local population extinctions. Even seemingly healthy populations in isolated habitat patches can experience increased vulnerability to local extinctions caused by catastrophic weather events, sudden disease outbreaks or

excessive predation. When a local extinction of a species occurs, isolated habitat patches are less likely to be recolonized when there are anthropogenic or even natural barriers in the landscape.

A network of natural lands, i.e., an interconnected system of habitat corridors and patches, with road enhancements that allow wildlife to cross safely, can attenuate the negative consequences of habitat fragmentation. Landscape corridors—strips of natural habitat that connect patches of similar habitat—have been shown to increase exchange of animals among patches and to facilitate dispersal of pollens and seeds (Tewksbury et al. 2002). Studies have concluded that landscape corridors are valuable conservation tools (Bier and Noses 1998) that are necessary for conservation of biodiversity (Damschen et al. 2006). Short and wide corridors are better than those that are long and narrow, and width is positively correlated with abundance and species richness of birds, mammals, and invertebrates (Lindenmayer and Franklin 2002). Corridors should also make use of nodes, small pieces of habitat that act as stepping stones and greatly facilitate movement of species populations among patches.

Identifying Wildlife Biodiversity Resilience Corridors

Existing conservation planning tools developed for Virginia were the foundation for the statewide WBRCs identified in this Plan. The Virginia Department of Conservation and Recreation has developed several landscape-level tools for conservation of networks of habitat for at-risk and endangered species, to support high biodiversity, and to support distribution shifts of species that are affected by climate change. The VaNLA, which is in its third decade of use, falls under the umbrella of Virginia ConservationVision (https://www.dcr.virginia.gov/natural-heritage/vaconvision). Virginia's land conservation atlas contains nine tools that can be used to target land conservation for a variety of values. The VaNLA is a landscape-scale, geospatial analysis for identifying, prioritizing, and connecting important natural lands. ConserveVirginia, which was first released in 2019 and codified into law in 2021 (§ 10.1-104.6:1), is the Commonwealth's land conservation strategy focused on only the most important areas to conserve for a variety of values important to citizens. The products of each of these tools will be described below for a full understanding of why and how they were used in this Plan to identify the WBRCs.

The VaNLA uses land cover data to identify natural habitats called Ecological Cores, which are large patches of natural land with at least 100 acres (40.5 hectares) of continuous interior wildlife habitat (Figure 3-2). Interior wildlife habitat begins 100 meters (328 feet) inward from edges caused by fragmenting features, such as roads, utility corridors, and other developed lands, and the 100-meter-wide edge zones are added back to the interior areas to create Ecological Cores. Smaller features called Habitat Fragments, with 10 to 99 acres (4 to 40.5 hectares) of interior wildlife habitat, are also included in the VaNLA because they support other VaNLA features and because they are important in localities with few large patches of natural land.

The predominant land cover in Ecological Cores statewide is forest, but marshes, beaches, and dunes are significant components where they are abundant and meet minimum size requirements. Ecological Cores are prioritized by ecological integrity ranks (from C1: Outstanding Ecological Integrity to C5: General Ecological Integrity) to reflect the wide range of important benefits and ecosystem services they provide, including biodiversity conservation, wildlife habitat, aesthetic values, recreational opportunities, and protections for air and water quality. Specifically, the variables used to prioritize the ecological integrity of Ecological Cores in the VaNLA, and to represent biodiversity, include the following:

- Important habitats for imperiled species and SGCN, as identified in Nature's Network (source: North Atlantic Landscape Conservation Cooperative);
- Threatened and Endangered Species Waters (source: VDWR); and

Wildlife Biodiversity Resilience Corridor Data Sources

Virginia Natural Landscape Assessment
https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla

ConserveVirginia
https://www.dcr.virginia.gov/conservevirginia/

Nature's Network
http://www.naturesnetwork.org/

Threatened and Endangered Species Waters
https://vafwis.dgif.virginia.gov/fwis/

Natural Heritage Conservation Sites and Stream Conservation Units
https://www.dcr.virginia.gov/natural-heritage/nhdeinfo

National Wetlands Inventory
https://www.fws.gov/program/national-wetlands-inventory

Derived Indices of Habitat Diversity and Integrity
- Topographic Relief
- Size and Depth
- Anthropogenic Isolation
- Interior Forest Streams

Derived Impedance Surface
https://www.natureserve.org/products/modeling-landscape-condition
(included Landscape Condition)

- Natural Heritage Conservation Sites and Stream Conservation Units (source: VDCR).

Additional variables that addressed habitat diversity and resilience within the VaNLA include the following: variety of natural wetlands, topographic variability, degree of anthropogenic isolation, length of interior streams, maximum depth, and total size. (Full descriptions of these variables can be found in Appendix C.)

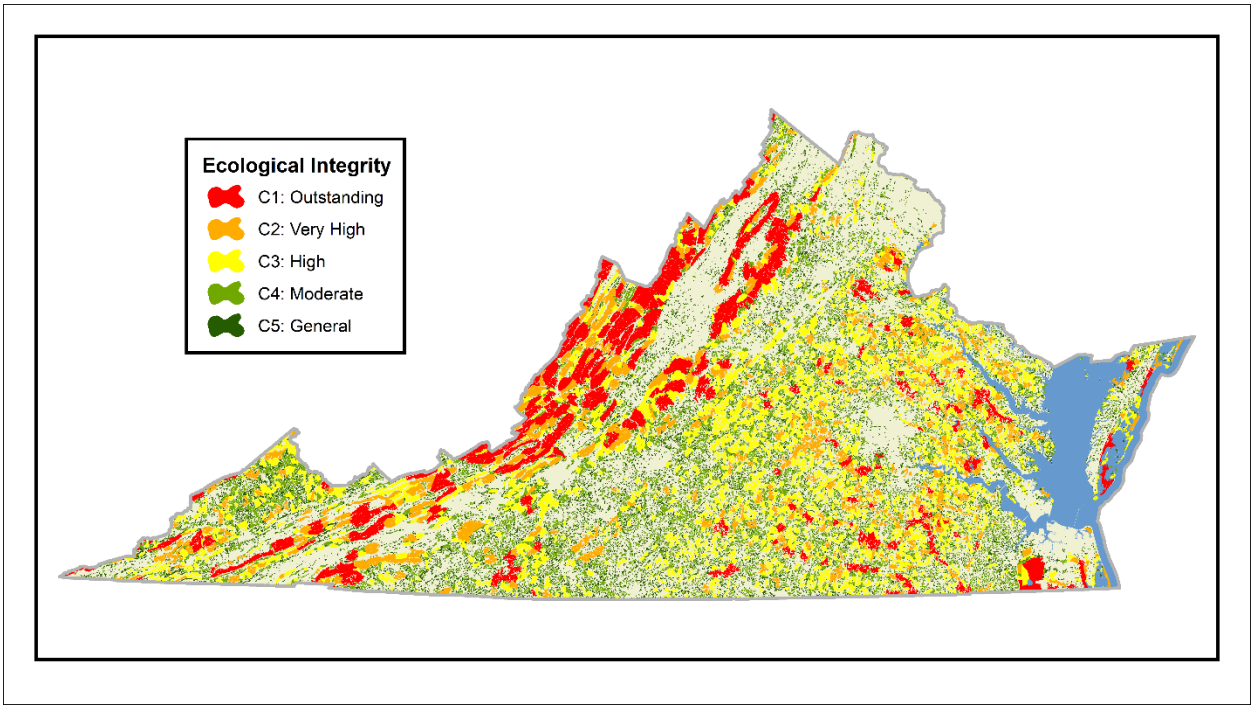

Figure 3-2. Ecological Cores of the Virginia Natural Landscape Assessment ranked by ecological integrity. (VDCR)

The VaNLA connects the highest priority Ecological Cores, i.e., those classified as having Outstanding Ecological Integrity (C1) or Very High Ecological Integrity (C2), to form the backbone of a statewide network known as the Natural Land Network (NLN) (Figure 3-3). This was done via creation of an impedance model that represented resistance to movement of wildlife and plant propagules (e.g., seeds) through the landscape. This model started with current land cover and reduced impedances cumulatively for riparian habitat, interior habitat, high biodiversity, land protection, core rank, and management for biodiversity. Impedances were increased cumulatively for lands that were too close to urban development or coincident with major roads (except where suitable underpasses existed), expansive open water, extensively flooded lands, steep slopes, or excessively narrow strips of natural land. Although largely redundant to variables already included, NatureServe's Landscape Condition model was incorporated into the latest version of the impedance model (https://www.natureserve.org/products/modeling-landscape-condition).

Using the impedance model, hundreds of routes of least resistance between pairs of highest ranked Ecological Cores were identified. The model guided corridors as much as possible through

public and private natural lands with biological significance, ecological value, and protections from natural and anthropogenic disturbances. Where major roadways were intersected, and where possible, the model funneled corridors to existing bridge underpasses and large box culverts associated with riparian habitats to improve corridor viability by potentially providing safer passages for wildlife.

The model also guided corridors through lower-ranked Ecological Cores and Habitat Fragments (i.e., C3, C4, and C5), which were all eventually integrated into the NLN to provide additional habitats, resilience, and increased suitability for sensitive species. The centerline paths were reviewed over aerial photography while referencing environmental data to make sure they traversed the widest-possible, most-diverse, and best-condition natural lands. As a result of this review, many paths were deleted where better routes existed, and many others were edited to improve them. The final centerline paths were expanded to a total width of 300 meters, thereby including 100 meters of interior habitat along their entire length and 100 meters of buffer on each side, to enhance the integrity and resilience of the natural corridors.

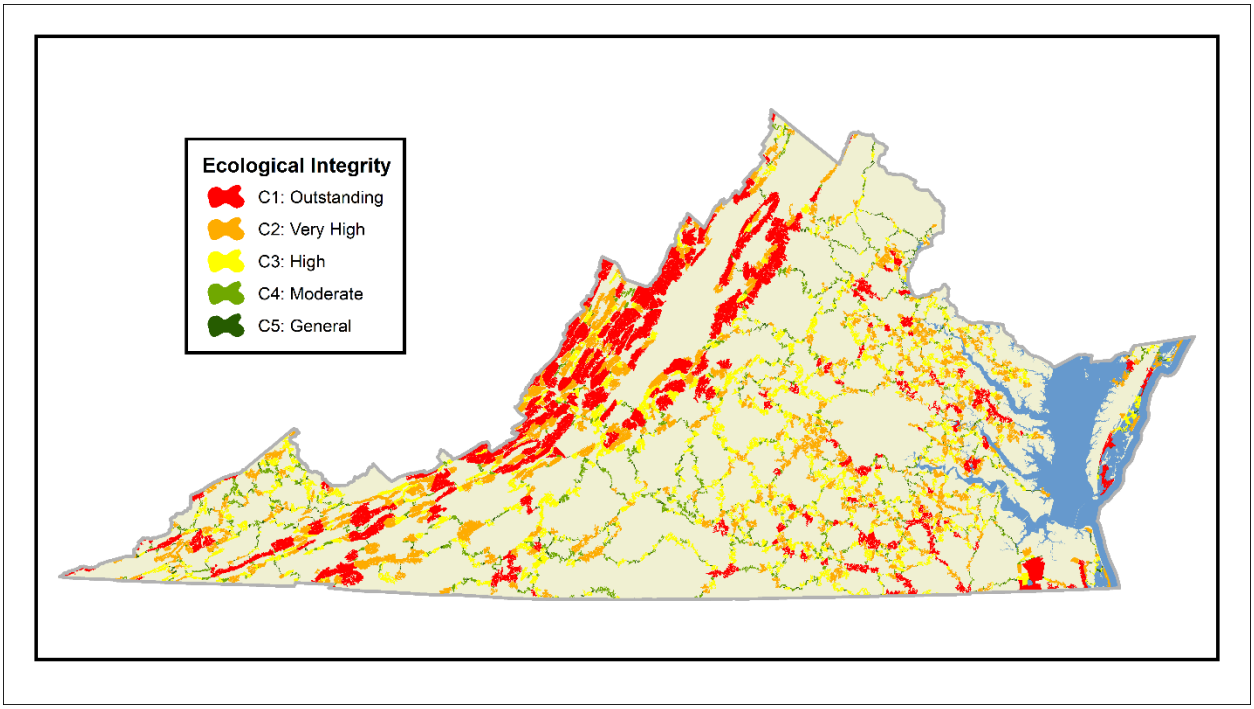

Figure 3-3. The Natural Lands Network is a subset of the Virginia Natural Landscape Assessment that shows connections between all the highest ranked Ecological Cores (C1 and C2). These corridors of natural land also include lower-ranked cores that intersect them. (VDCR)

Along with the VaNLA, ConserveVirginia has become a key tool in guiding state investments to ensure the best conservation outcomes. Priority components of the VaNLA were selected and enhanced for natural resilience to develop an input for the Natural Habitat and Ecosystem Diversity category of ConserveVirginia. With strong consideration of the concept of representativity (measure of whether a given area contains habitat / biotope types, species assemblages, ecological processes or other natural features that are characteristic of the larger

region), a subset of the corridors from the NLN were selected to identify connections among ecoregions and enhanced to create the Resilience Corridors (Figure 3-4), which is a layer within the Natural Habitat and Ecosystem Diversity category of ConserveVirginia. (The five major ecoregions of Virginia are connected via the Resilience Corridors: Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge, and Appalachian Plateau.)

Along with the NLN, the goal of the Resilience Corridors is to keep biodiverse and representative natural lands in Virginia connected to allow distribution shifts by species populations over generations as the climate changes and the landscape becomes more developed. These corridors could facilitate distribution shifts between elevations or latitudes, which will be especially important as the climate changes. Since the highest priority Ecological Cores are the foundation of the Resilience Corridors, they already represent areas of high biodiversity, high intactness relative to surrounding areas, and high environmental diversity, meaning they have high resilience and provide a great variety of refugia within which species could persist over time. Resilience Corridors are provided with alternate routes where they pass through pinch points and other vulnerable areas, and they were widened by additions of adjacent Ecological Cores and Habitat Fragments that provide extra habitat and buffer to increase functionality and long-term viability. The idea is to provide a variety of connected and intact habitats within Resilience Corridors so that species populations could shift within suitable habitats with minimal traverses through marginal or unsuitable lands. Some Resilience Corridors identify potential connectivity for aquatic, wetland, riparian, terrestrial, interior, and even ecotonal species, all within the same corridors. Since Resilience Corridors were developed from ecologically important natural lands currently on the landscape, they are likely already functioning as corridors for a wide range of species.

The ConserveVirginia Resilience Corridors, as described above, were adopted for this Plan as shown in Figure 3-4, with a modification to finalize Virginia's WBRCs. The members of the WCAP Biodiversity Task Team agreed that additional connectivity needed to be identified for northern Virginia, despite much of that area having been converted to farmland and residential and commercial development. The two upper peninsulas of Virginia, on either side of the Rappahannock River, were selected for this addition due to the following reasons: the NLN identified viable connections there; the Rappahannock River contains important habitats for anadromous fish and rare aquatic organisms; water quality in the Rappahannock River and the Chesapeake Bay is vital for healthy ecosystems, and forests are the best land cover in Virginia for maintaining water quality; and this region is threatened by sprawling development. Thus, additional corridors along the Rappahannock River watershed were developed using the same methodology as for the ConserveVirginia Resilience Corridors and added to those features to create the final statewide WBRCs (Figure 3-5) for this Plan.

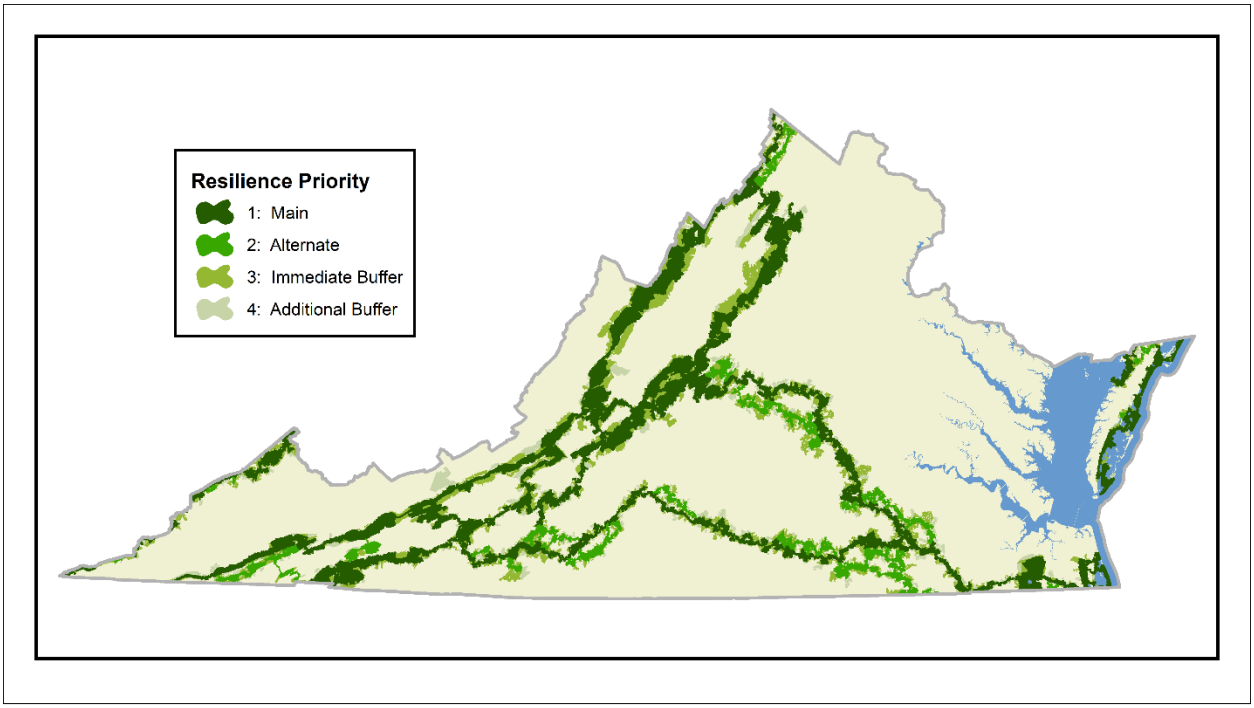

Figure 3-4. ConserveVirginia Resilience Corridors ranked by priority, where priorities 1 and 2 are based directly on the NLN and priorities 3 and 4 are buffers of proximate Ecological Cores and Habitat Fragments. (VDCR)

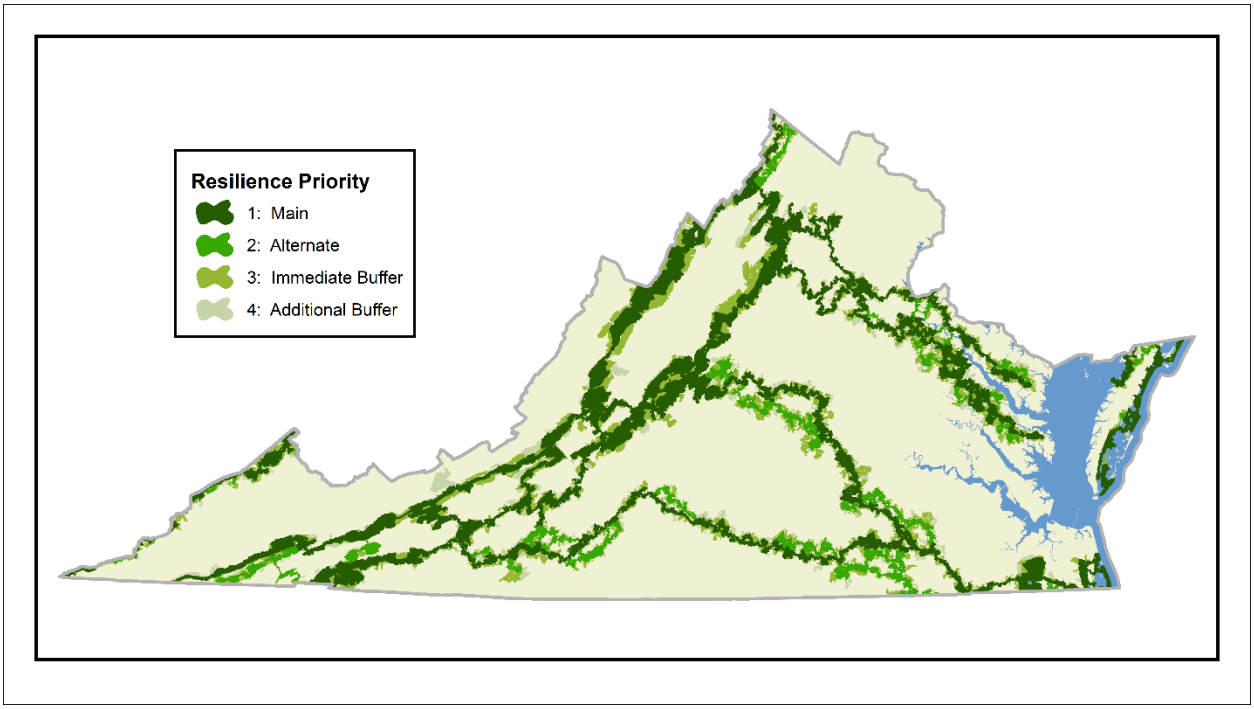

Figure 3-5. The Wildlife Biodiversity Resilience Corridors ranked by priority. These Wildlife Biodiversity Resilience Corridors include a new set of corridors for the upper peninsulas, on either side of the Rappahannock River, that were developed using the same methodology as for the ConserveVirginia Resilience Corridors.

Conclusions

These statewide WBRCs were designed with a focus on terrestrial habitat connectivity for native biodiversity resilience; however, there are two types of additional habitat corridors that need to be identified during future WCAP iterations:

1. Aquatic Organism Passage (AOP): Although the WBRCs likely are providing benefits to aquatic resources, a future analysis is needed to identify AOP barriers (e.g., culverts and dams) and to target habitat connectivity priorities for AOP needs. Existing national, state, and regional data sets relevant to AOP barriers have been developed (by various organizations) with different methodologies; additional work is needed to normalize these data across the Commonwealth to identify aquatic habitat corridor priorities for this Plan.

2. At-risk Species and Other Species of Interest: The WBRCs likely do not fully represent all habitat corridors that may be important to at-risk species (federally-protected species, state-protected species, and SGCN) or other species of interest (e.g., elk, small- to medium-sized mammals, amphibians, and reptiles). Species-specific wildlife corridors will need to be identified for priority species.

In addition, it should be noted that the WBRCs are not fully representative of every natural habitat type within Virginia due to the historical influences and patterns of human land uses across our landscapes. For example, for the lands west of the Coastal Plain, *high quality natural* open habitats (e.g., fire-dependent grassland and scrub-shrub habitats) may be particularly under-represented in the WBRCs since these habitats were more prevalent in pre-European settlement times (before fire suppression policies). In modern times, open lands largely are the result of human land uses (agricultural fields, mowed fields, and lawns), and thus they would not be classified as natural lands within the VaNLA, even though these lands can provide habitat value to certain wildlife species. However, within the Coastal Plain, natural open habitats are well-represented due to, in part, how marshes constitute significant expanses of the Ecological Cores within the WBRCs.

Finally, although these WBRCs constitute important, coarse-scale wildlife corridors in Virginia based on the best available data at this time, this does not preclude the need for identifying, protecting, and restoring additional habitat corridors at finer spatial scales across the Commonwealth. For local or regional planning initiatives, organizations can use the Natural Lands Network of VaNLA (see Figure 3-3 in Chapter 3) to identify additional habitat corridors at finer spatial scales than the WBRCs.

Chapter 4
Opportunities for Further Evaluation

Background

This chapter identifies areas across Virginia that may be opportunities for future wildlife crash countermeasures and other conservation measures. These opportunities are as follows:

- Promote Driver Safety: *Areas of High Wildlife-Vehicle Conflict Occurrences*
- Improve Wildlife Corridor Connectivity: *Wildlife Biodiversity Resilience Corridors*
- Advance Mutual Benefits: *Nexus Areas*

WHERE CAN I FIND THESE DATA PRODUCTS?

Visit the website:
https://dwr.virginia.gov/wildlife/corridors/

These opportunities are available as data product downloads from the VDWR website (see inset box to the right). Note that for most of these opportunities, further evaluation of specific sites is necessary to determine whether wildlife crossing and other crash countermeasures are warranted.

Opportunities to Improve Driver Safety: Areas of High Wildlife-Vehicle Conflict Occurrences

In Chapter 2, WVC occurrence rates per road segment were analyzed and then presented in Figure 2-6, with the road segments classified by WVC occurrence rate categories. Based on this WVC analysis, the WCAP leadership team identified areas experiencing the highest WVC occurrences. This includes road segments within the top 0.1%, 1%, 5% and 10% WVC occurrence rate categories, as shown in Figure 4-1. Wildlife-vehicle conflict occurrence rates in these road segments are 0.88 to 5.27 reported conflicts per mile per year.

For organizations and agencies focused on transportation and promoting driver safety, a reasonable course of action is to further evaluate the Areas of High WVC Occurrences shown in Figure 4-1, starting with the road segments showing the highest WVC occurrence rates (top 0.1%) if funding is limited, to determine where wildlife crash countermeasures are warranted and feasible. For example, Chapter 2 (*Wildlife-Vehicle Conflict*) demonstrates that areas within northern Virginia experience some of the highest rates of WVCs in the Commonwealth; these WVC locations in northern Virginia and other locations experiencing high rates of WVCs likely

should be examined further to identify priority opportunities for wildlife crossing road modifications. Additional analysis is needed to develop a prioritization framework for road segments experiencing high rates of WVCs, wildlife enhancement opportunity areas, and the prioritization of wildlife crossing projects.

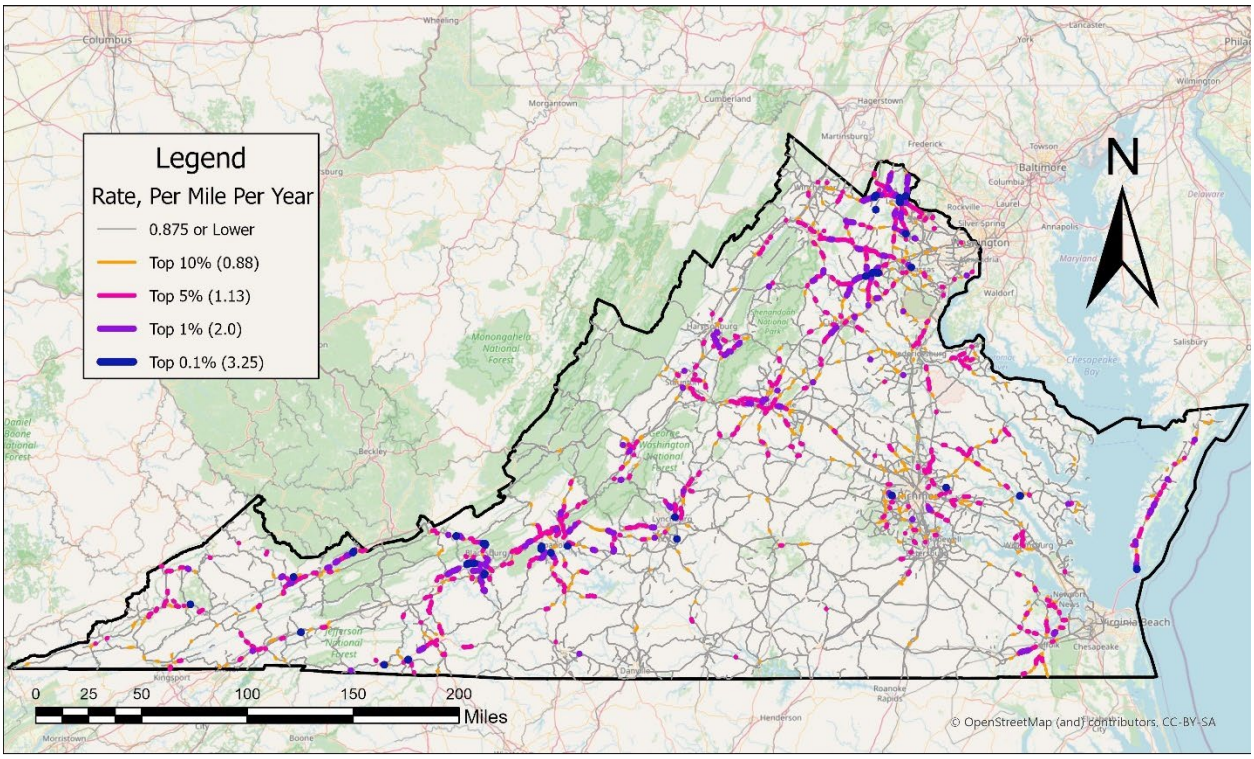

Figure 4-1. Areas of High Wildlife-Vehicle Conflict Occurrences (2013-2020) are classified by the top 0.1%, 1%, 5% and 10% occurrence rates. The parenthetical values state the minimum number of WVCs per mile per year.

Opportunities to Improve Wildlife Corridor Connectivity: Wildlife Biodiversity Resilience Corridors

As discussed in Chapter 3, the WBRCs (see Figure 4-2) constitute statewide coarse-scale wildlife corridors of natural lands that currently exist, based on the best available data at this time. For conservation organizations and agencies, the WBRCs represent opportunities for conserving, enhancing, and restoring connectivity within these important wildlife corridors, through actions such as land protection strategies, habitat restoration, and wildlife crash countermeasures along roads. Within these WBRCs, these conservation measures ideally should begin with the central portions that were based on the Natural Lands Network of the VaNLA, as described in Chapter 3. These are the areas attributed to “Priority 1” in Figure 3-4. Conservation actions also can be pursued, as opportunities arise, within the alternate corridor routes, which are attributed to

"Priority 2," and the additional Ecological Cores and Habitat Fragments within 100 meters or 500 meters of the first two priorities (attributed to "Priority 3" and "Priority 4," respectively).

In addition, identification of these WBRCs does not preclude the need for identifying, protecting, and restoring additional habitat corridors at finer spatial scales across the Commonwealth. For example, the Natural Lands Network of the VaNLA (see Figure 3-3 in Chapter 3) can be used to identify additional habitat corridors that may be relevant for local or regional conservation planning initiatives. This in turn could aid with decision-making on land conservation investment and prioritization strategies to benefit wildlife corridor connectivity. Furthermore, additional work likely is needed to define habitat corridors for at-risk species (federally-protected species, state-protected species, and SGCN) and other species of interest (e.g., elk, amphibians, and reptiles) whose important corridors were not fully represented within the WBRCs; these species-specific corridors will provide key information to define Wildlife Crossing Concern Areas for these types of species. (See Appendix D for more information about Wildlife Crossing Concern Areas and an initial list of these areas from VDWR biologists.)

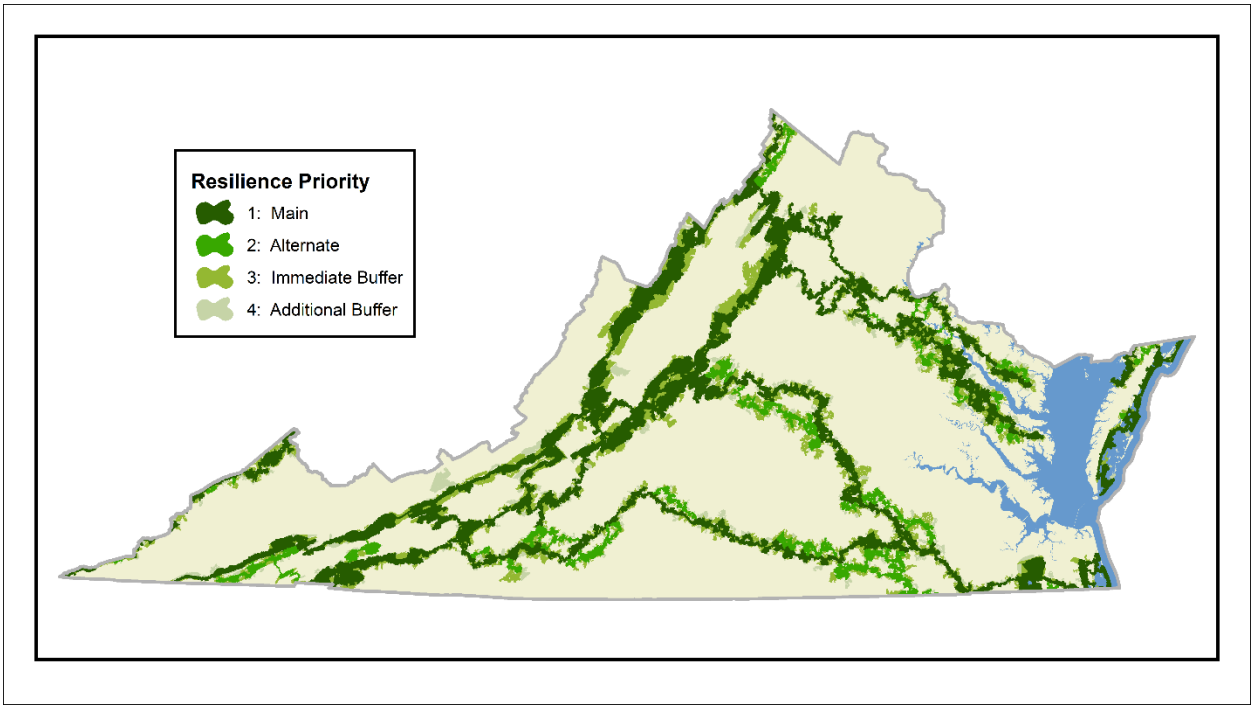

Figure 4-2. Wildlife Biodiversity Resilience Corridors.

Opportunities for Advancing Mutual Benefits: Nexus Areas

Nexus Areas represent opportunities where wildlife crossings and crash countermeasures could provide both driver safety and wildlife corridor conservation benefits. That is, these Nexus Areas

are associated with a WBRC (as defined within Chapter 3) and at least one Area of High WVC Occurrences (see above section).

Nexus Areas were identified by a GIS analysis of the intersection of the WBRCs and the Areas of High WVC Occurrences. Specifically, the WBRC dataset was divided into two sets of feature types, "Corridor" and "Buffer," with the former set comprised of corridors that corresponded directly to the Natural Lands Network (see Figure 3-3 in Chapter 3) and the latter set containing Ecological Cores and Habitat Fragments in close proximity to features in the "Corridor" set (see Figure 3-5 in Chapter 3). The WBRC data were then spatially overlaid with the Areas of High WVC Occurrences data in GIS, and then the available spatial information was summarized within 25-square mile hexagons. The spatial overlay also involved performing spatial summary processes and table joins to assemble relevant attribute information. This analysis resulted in the identification of 26 Nexus Areas across the state (Figure 4-3); available attribute information for these Nexus Areas is provided in Table 4-1.

For these Nexus areas, additional desktop analyses and site-specific assessments are required to understand the factors driving WVCs on the associated roads, target specific road sites that are problematic, and identify wildlife crossing enhancement opportunities. Feasibility studies at these road sites will be required to assess the options and practicalities for wildlife crossing modifications. For Nexus areas, additional analysis is needed to develop a process on how to prioritize wildlife enhancement projects while taking into consideration limited funding opportunities.

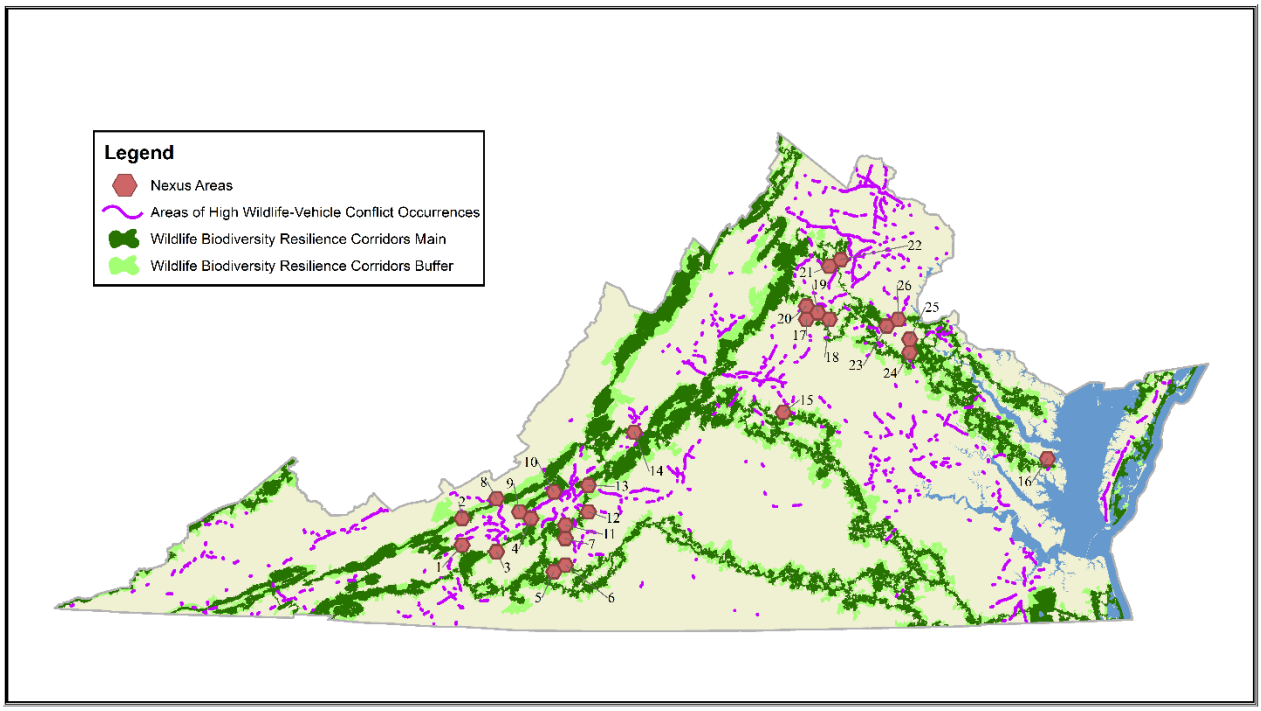

Figure 4-3. Nexus Areas, as defined by an intersection of the Wildlife Biodiversity Resilience Corridors and the Areas of High Wildlife-Vehicle Conflict Occurrences. The numbers correspond to the Nexus Area column in Table 4-1.

Table 4-1. Attributes associated with the Nexus Areas.

Nexus Area #	County / City	Road Attributes within Nexus Area	
		Associated Roads[1]	Intersects Bridge or Box Culvert[2]
1	Pulaski County	R-VA IS00081NB	NO
		R-VA IS00081SB	NO
		R-VA SR00099EB	NO
		R-VA077SC00611EB	NO
2	Pulaski County, Giles County	R-VA SR00100NB	NO
3	Floyd County, Montgomery County	R-VA SR00008NB	NO
4	Montgomery County, Roanoke County	R-VA IS00081SB	NO
		R-VA US00011NB	NO
		R-VA US00011SB	YES
5	Franklin County	R-VA SR00040EB	NO
6	Franklin County	R-VA SR00040EB	NO
7	Franklin County	R-VA US00220NB	NO
		R-VA US00220SB	YES

Nexus Area #	County / City	Road Attributes within Nexus Area	
		Associated Roads[1]	Intersects Bridge or Box Culvert[2]
8	Giles County, Montgomery County, Craig County	R-VA US00460EB	NO
		R-VA US00460WB	NO
9	Montgomery County	R-VA IS00081SB	YES
10	Salem City, Roanoke County, Botetourt County	R-VA IS00081NB	NO
		R-VA IS00081SB	NO
		R-VA IS00581NB	NO
		R-VA SR00311NB	YES
11	Franklin County, Roanoke County	R-VA US00220NB	NO
		R-VA US00220SB	YES
12	Franklin County, Bedford County	R-VA SR00024EB	NO
		R-VA SR00024WB	NO
13	Botetourt County, Bedford County	R-VA US00460EB	NO
		R-VA US00460WB	NO
14	Rockbridge County	R-VA IS00081SB	YES
15	Fluvanna County	R-VA SR00006EB	NO
16	Gloucester County, Mathews County, Middlesex County	R-VA SR00003EB	NO
		R-VA SR00198EB	NO
17	Madison County, Culpeper County	R-VA US00015NB	NO
18	Orange County, Culpeper County	R-VA US00522NB	YES
19	Madison County, Culpeper County	R-VA US00015NB	NO
20	Madison County, Culpeper County	R-VA US00029SB	YES
		R-VA023SC00633NB	NO
21	Rappahannock County, Culpeper County, Fauquier County	R-VA SR00229NB	NO
		R-VA US00211EB	NO
		R-VA US00211WB	NO
22	Fauquier County, Culpeper County	R-VA SR00229NB	NO
		R-VA US00211EB	NO
		R-VA US00211WB	NO
23	Spotsylvania County, Fredericksburg City, Stafford County	R-VA IS00095NB	YES
24	Caroline County	R-VA SR00002NB	NO
25	Spotsylvania County, Caroline County, Stafford County, King George County	R-VA SR00002NB	NO
26	Fredericksburg City, Stafford County	R-VA IS00095NB	YES
		R-VA IS00095SB	NO
		R-VA US00001NB	NO

[1] Associated roads are defined as the roads within the roads (top 10% road segments experiencing the highest WVC occurrence rates) and are identified by VDOT codes.

[2] Available spatial data indicate that a bridge or box culvert is associated with this road. This may provide a cost-effective opportunity to modify this infrastructure to improve wildlife corridor connectivity.

Funding Opportunities

The Nexus Areas may be particularly important opportunities for seeking competitive federal grant funds, such as under the Wildlife Crossings Pilot Program of the Infrastructure Investment and Jobs Act, which is focused on funding projects that both reduce wildlife-vehicle collisions and improve terrestrial and aquatic habitat connectivity. Furthermore, Table 4-2 outlines some additional federal funding opportunities for wildlife crossing and corridor enhancement projects.

Conclusions

Further investigation of specific Areas of High WVC Occurrences and Nexus Areas is required to understand the factors driving WVCs on the associated roads, target specific road sites that are problematic, and identify potential wildlife crossing and countermeasure opportunities. For example, an assessment of wildlife use along roads (e.g., through field studies of wildlife movements and/or carcasses proximate to roads) often may be required to target the specific road sites that may benefit from wildlife crossings and countermeasures. In addition, feasibility studies at these road sites would be required to assess the options and practicalities for wildlife crossing modifications. For the lands within the WBRCs, the wildlife corridor connectivity opportunities will also need further analysis, to target and prioritize sites that would benefit from conservation actions. Step-down or companion plans, tiering from this Plan, will be needed to fully address the habitat corridor and wildlife crossing needs for at-risk terrestrial and aquatic species and other species of interest. These additional analyses and plans will provide a framework for the development of targeted partnerships at local and regional-scales and the identification of on-the-ground, project opportunity areas.

Table 4-2. Sample federal grant programs available for funding wildlife crossing and corridor enhancement projects nationwide.

Federal Discretionary Grants		
Bipartisan Infrastructure Law (FY 22-26)		
Program Title	**Amount**	**Eligible Wildlife-related Enhancements**
Wildlife Crossings Pilot Program (23 USC Section 171)	$350 Million over 5 years	Projects and research to reduce wildlife-vehicle collisions while improving terrestrial and aquatic connectivity.
Rebuilding American Infrastructure with Sustainability & Equity (RAISE)	$7.5 billion	Wildlife related highway and bridge projects eligible under Title 23 USC Programs, and projects to improve aquatic connectivity by replacing or rehabbing culverts.
Bridge Investment Program (23 USC Section 124)	$12.5 billion over 5 years	Up to 5% annually may go to projects to replace or rehab culverts to improve flood control and habitat connectivity for aquatic species.
National Culvert Removal, Replacement, and Restoration Program (Culvert AOP Program, 49 USC Section 6703)	$1 billion over 5 years	Projects to replace, remove, repair culverts or weirs to restore anadromous fish passage.
Non-federal Programs		
Non-federal funding sources for wildlife crossings also need to be identified; such funds can serve as non-federal match for the federal grant programs listed above. For example, the Virginia Safe Wildlife Corridors Collaborative has proposed legislation to the Virginia General Assembly to appropriate approximately $5 million in state funds for wildlife crossings.		

Chapter 5
Plan Recommendations

Virginia's *Wildlife Corridor Action Plan* provides a strategic framework that will be expanded upon in future iterations, which are required to occur on four-year cycles. This first iteration includes statewide analyses focused on identifying areas with high occurrences of WVCs and identifying important wildlife corridors, with a key result being the overlap of these two areas (Nexus Areas). From an end user perspective, this Plan also offers three thematic pathways for decision-making for where future wildlife crossings and corridor enhancements may be warranted (Figure 5-1).

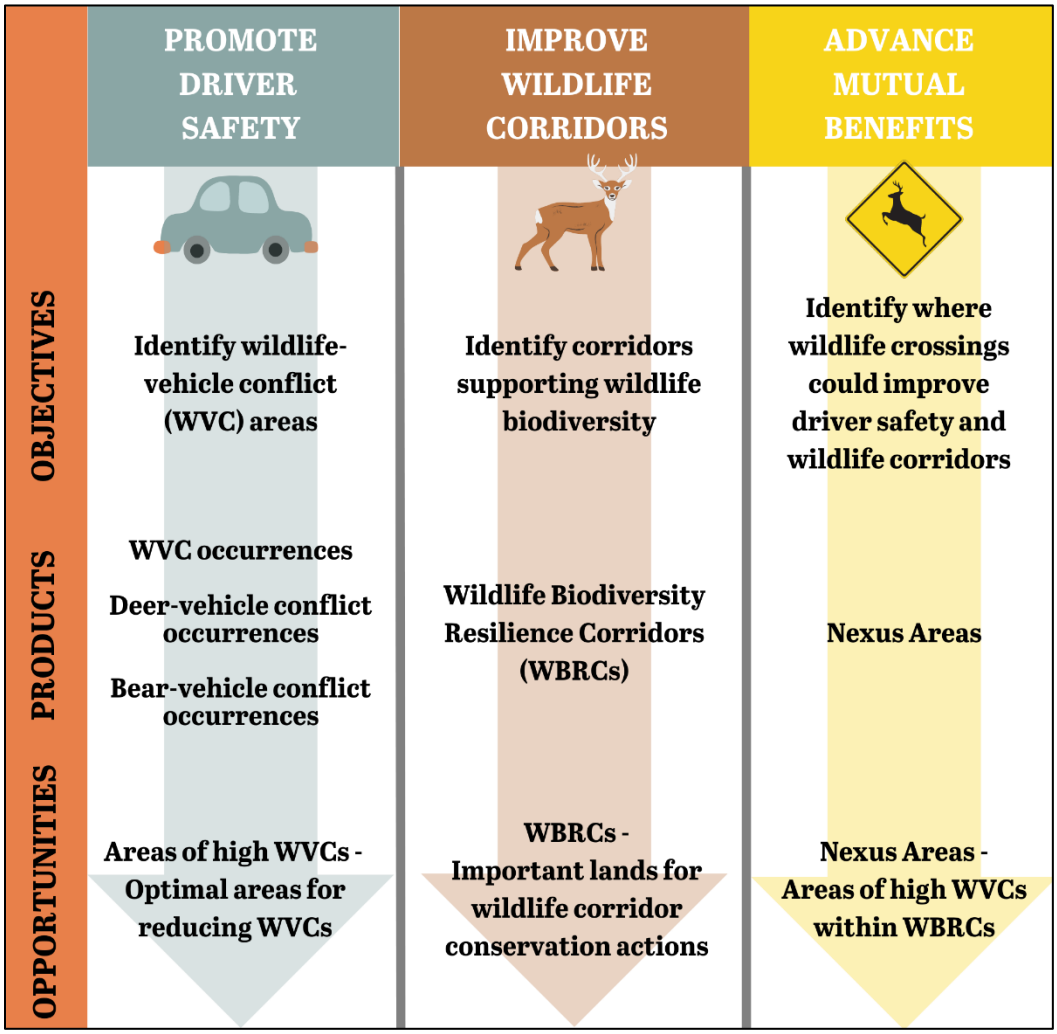

Figure 5-1. The conceptual framework for the Wildlife Corridor Action Plan provides three decision-making pathways to identify where future wildlife crossings and corridor enhancements may be warranted.

To lay a foundation for how this current Plan iteration can be improved and moved into on-the-ground implementation actions, the leadership team defined this Plan's limitations and data gaps and provided a list of future actions in the two sections below.

Plan Limitations and Data Gaps

Although this Plan constitutes Virginia's first *Wildlife Corridor Action Plan*, several limitations and data gaps remain to identify additional important wildlife corridors and specific road segments for wildlife crash countermeasures. These Plan limitations and data gaps are detailed in Table 5-1; they directly provide the justification for the recommendations for future actions (see below).

Future Actions

As a "road map" to identifying site-specific wildlife crossing project priorities, 15 actions are recommended (see Table 5-2); these will form the basis for future iterations of this Plan. To ensure progress on implementing these actions, it is highly recommended that a state interagency coordinating body and/or technical advisory committee is established to address key needs such as identifying dedicated staff and funding resources.

Table 5-1. Limitations and data gaps for the Wildlife Corridor Action Plan.[1]

Legislative Intent	Theme	Plan Limitations / Data Gaps
Intent #1: **Identify Wildlife Corridors**	**Improve Wildlife Corridors**	➢ ***Important habitat corridors for regional/local planning needs, at-risk terrestrial and aquatic species, and other species of interest were likely not fully represented within the Wildlife Biodiversity Resilience Corridors (WBRC).*** ▪ This Plan, with its WBRCs, does not presume to map important habitat corridors that may be more relevant for regional planning commissions or localities, at-risk species (federally-protected species, state-protected species, and Species of Greatest Conservation Need [SGCN]), or other species of interest (e.g., elk, small- to medium-sized mammals, amphibians, and reptiles). ▪ For example, although this Plan will be helpful for regional and local planning needs, the complexities of wildlife corridor planning (and of wildlife-vehicle conflict [WVC] analyses) will require additional data, partners, and expertise to complement this Plan's spatial data products to successfully address problematic WVC locations relevant to a planning authority's jurisdiction. ▪ For at-risk species and other species of interest, species-specific wildlife corridors may need to be identified to complement the WBRCs presented in this Plan.
Intent #2: **Identify Human Barriers to Wildlife Movement**	**Improve Wildlife Corridors** **Promote Driver Safety**	➢ ***Road barriers and other human barriers to aquatic organism passage (AOP) were not addressed****.* ▪ This Plan identifies WBRCs that are directly relevant to the habitat connectivity for terrestrial wildlife species. Although the natural lands of these WBRCs do provide benefits to aquatic resources, this Plan does not sufficiently analyze potential barriers for aquatic organism passage, such as culverts and dams. Existing national, state, and regional data sets relevant to AOP barriers have been developed (by various organizations) with different methodologies; additional work is needed to normalize these data across the Commonwealth to thus identify aquatic habitat corridor priorities, as well as opportunities for restoring connectivity for AOP. Additionally, not all barrier types and road stream crossings in Virginia have been assessed using a standardized AOP barrier assessment methodology. ▪ If identified early during the project scoping and cost estimating phase, road stream crossings represent key opportunities to integrate fish and wildlife passage improvements as part of future culvert, bridge, or transportation projects.

Legislative Intent	Theme	Plan Limitations / Data Gaps
Intent #2 continued from prior page		➢ ***Other human land uses potentially causing barriers for terrestrial wildlife corridor connectivity were not addressed*.** ▪ The legislation (§ 29.1-579) also identifies electrical transmission lines and pipelines as potential barriers to wildlife movement along habitat corridors; additional analysis will be required to assess whether any current powerlines and pipelines may be detrimentally impacting wildlife corridors. (However, the more effective timeframe to minimize fragmentation of habitat corridors by powerlines and pipelines is during the project planning phase, particularly during project siting.)
Intent #3: **Identify Wildlife Vehicle Conflict Areas**	**Promote Driver Safety**	➢ ***The police-reported WVC data represent a portion of actual WVCs occurring across the state.*** ▪ Reporting is limited to collisions with >$1500 in damages, so data are not collected for minor WVCs. ▪ Actual numbers of deer-vehicle collisions may be four to nine times greater than those reported to the police (Donaldson 2017). ▪ Road wildlife carcass data could augment the police-reported WVC data, but there is no comprehensive statewide dataset. ▪ Predictive models may also be necessary to augment WVC data gaps. For example, a predictive model likely is needed to identify road segments that are at higher risk of large mammal collisions. This road risk model could be developed using the following road, traffic, and environmental metrics including, but not limited to the following: road right-of-way width; road curvature; Annual Average Daily Traffic or comparable traffic data; time of day or season of large mammal collision; and surrounding environment including land cover type, slope, and topography. ➢ ***Wildlife crash and carcass removal data collection standards lack reliable standardization.*** ▪ The Federal Highway Administration has indicated one challenge for reducing WVCs is the lack of reliable standardized and spatially precise data on the location of WVCs and animal carcass removal (Huijser et al. 2008). This is a challenge and data gap identified on a national level across many state DOTs and is not specific to Virginia. In the development of this Plan, the leadership team directly experienced this challenge. It also should be noted that one future outcome of the Infrastructure Investment and Jobs Act is the development of a standardized methodology and template for states to voluntarily use in collecting and reporting WVC and animal carcass data (Paul et al. 2021). (In the future, citizen science applications may support collecting species-specific carcass data associated with roads, though public safety may be a limiting factor for the use of such citizen science applications.)

Legislative Intent	Theme	Plan Limitations / Data Gaps
Intent #3 continued from prior page		➢ ***Insufficient data for understanding WVC impacts for species other than deer and bear.*** ▪ The best available statewide WVC datasets were most relevant for understanding WVCs involving large mammals, in particular deer and bear. Although deer and bear logically pose greater risk to driver safety as compared to many other species, roads likely serve as a habitat connectivity barrier to other species such as federally-protected species, state-protected species, SGCN, elk, small- to medium-sized mammals, reptiles and amphibians, and various bird species (e.g., marsh birds that may fly low over roads along marsh habitats). In addition, WVCs often occur due to driver behavior and swerving to avoid hitting these smaller animals. Unfortunately, current state WVC and wildlife carcass data collection methods do not provide the specificity to consistently identify species beyond deer and bear.
Intent #4: **Prioritize Wildlife Crossing Projects**	**Promote Driver Safety** **Improve Wildlife Corridors** **Advance Mutual Benefits**	➢ ***Site-specific data were not available to identify specific sites where wildlife crossing projects are warranted and will be feasible.*** ▪ This Plan defines opportunity areas (Areas of High WVC Occurrences, WBRCs, and Nexus Areas) that need further evaluation before site-specific projects can be identified and prioritized. ▪ Additional desktop analyses and site-specific assessments are required to understand the factors driving WVCs within the opportunity areas, target specific road sites that are problematic, and identify wildlife crossing opportunities. ▪ Feasibility studies at these specific road sites will also be required to assess the options and practicalities for wildlife crossing modifications. ➢ ***Cost-benefit analyses and valuing of wildlife crossings are needed to support effectively prioritizing wildlife crossing opportunities for funding.*** ▪ On a national level, the lack of comprehensive data along with other confounding factors pose a difficulty to quantifying the ecological value of a wildlife crossing and other connectivity enhancements. To quantify pre-construction versus post-construction wildlife values, functional or ecosystem-based metrics would require extensive biological data for focal species and are only available for a limited number of species and locations. Pre- and post-construction monitoring data of a wildlife crossing can provide critical information for evaluating the cost-benefit of implementing and constructing these structures, although often long-term monitoring data are not available.

Legislative Intent	Theme	Plan Limitations / Data Gaps
Intent #4 continued from prior page		➢ ***This Plan does not comprehensively identify potential wildlife crossing needs for at-risk species and other species of interest.*** ▪ Due to how additional planning and analyses are required to identify important habitat corridors and areas of WVCs for at-risk species and other species of interest (including elk), it is not feasible yet to identify priority wildlife crossing sites for these species. ➢ ***Optimal road sites for wildlife crossing enhancements may be revised in future Plan iterations as more information and data become available.*** ▪ This current Plan iteration suggests that the Nexus Areas (where both driver safety and corridors can be improved) offer optimal opportunity areas to evaluate for wildlife crossing enhancements. However, completion of the Future Actions (identified in this Plan) will improve the selection and prioritization of wildlife crossing projects for implementation.
***Intent #5*: Provide a Public Data Portal**	**Supports All**	➢ ***The multiple data sources used for this Plan are not easily accessible at one online data portal.*** ▪ A website has been provided to host the Plan and links to the data sources used in this Plan (https://dwr.virginia.gov/wildlife/corridors/). However, not all of the data sources are available for download, and instead are only viewable. If all of the data were located at one online location within a geospatial viewer application, this could be more useful to conservation and transportation practitioners.
***Intent #6:* Update Plan Every Four Years**	**Supports All**	➢ ***For Plan updates and implementation, dedicated staff and funding resources need to be identified.*** ▪ Limited progress will be made on implementing the Future Actions (see Table 5-3) unless dedicated staff and funds are obligated.

[1] Acronyms used in this table: AOP = aquatic organism passage; SGCN = Species of Greatest Conservation Need; WBRC = Wildlife Biodiversity Resilience Corridor; WVC = wildlife-vehicle conflict

Table 5-2. Recommended future actions for the Virginia Wildlife Corridor Action Plan.[1]

Legislative Intent	Recommended Future Actions
Intent #1: **Identify Wildlife Corridors**	1.1. Identify at-risk terrestrial and aquatic species and other species of interest whose habitat corridor needs are not sufficiently addressed by the Wildlife Biodiversity Resilience Corridors (WBRC) (e.g., federally-protected species, state-protected species, Species of Greatest Conservation Need [SGCN], elk, small- to medium-sized mammals, amphibians, reptiles, and various bird species such as marsh birds). 1.2. Identify important habitat corridors for these at-risk terrestrial and aquatic species and other species of interest.
Intent #2: **Identify Human Barriers to Wildlife Movement**	2.1. For aquatic corridor connectivity, conduct aquatic organism passage (AOP) analyses to identify road-associated infrastructure and other types of human barriers impeding corridor connectivity. 2.2. For the WBRCs, identify and analyze non-road barriers (e.g., land uses) impacting corridor connectivity.
Intent #3: **Identify Wildlife Vehicle Conflicts Areas**	3.1. Improve and standardize road data collection methods for wildlife-vehicle conflicts (WVC) and wildlife carcasses. 3.2. Develop predictive models to identify site-specific road segments at higher risk of deer- and bear-vehicle collisions. 3.3. For the at-risk species and other species of interest (e.g., elk) that are identified through completing Action #1.1, identify wildlife crossing concern areas.
Intent #4: **Prioritize Wildlife Crossing Projects**	4.1. Areas of High WVC Occurrences: Further evaluation is required to identify specific sites where wildlife crossing enhancement projects are warranted and will be feasible. Considerations include the following: ▪ Develop methodology to identify specific road segments where wildlife crossings would be beneficial for driver safety. ▪ Develop a process to prioritize potential crossing projects from a driver safety perspective. 4.2. WBRCs: Further evaluation is required to identify specific areas within WBRCs that are priorities for land protection, habitat restoration, and/or wildlife crossings to support wildlife habitat corridor connectivity. 4.3. Nexus Areas: In addition to the above considerations for Actions #4.1 and #4.2, develop a process on how to prioritize wildlife crossing enhancement projects for limited funding opportunities.

Legislative Intent	Recommended Future Actions
Intent #4 continued from prior page	4.4. Step-down or companion plans, tiering from this Plan, will be necessary to fully address the habitat corridor and wildlife crossing needs for at-risk terrestrial and aquatic species and other species of interest (e.g., federally-protected species, state-protected species, SGCN, elk, small- to medium-sized mammals, amphibians, reptiles, and various bird species such as marsh birds). 4.5. Develop cost-benefit analyses and valuing of wildlife crossings. 4.6. Develop a framework for regional-level and local-level analyses and where efforts to establish targeted partnerships should be focused to identify project opportunities.
***Intent #5*: Provide a Public Data Portal**	5.1. To support planning for wildlife corridor connectivity at multiple spatial scales (e.g., state, regional, and local), develop a geospatial viewer application that is inclusive of relevant planning data that are spatially scalable.
***Intent #6:* Update Plan Every Four Years**	6.1. Establish a state interagency coordinating body and/or technical advisory committee to ensure progress on updating and implementing this Plan. If the legislative intentions pursuant to § 29.1-579 are to be fully accomplished, establishing this coordinating body is a critical action, and it will require additional staff and funding resources. Initial tasks may include the following: ▪ Identify staffing and funding resources ▪ Prioritize the Recommended Future Actions ▪ Develop a timeline for which actions can be accomplished before the next Plan update ▪ Establish working groups as needed ▪ Guide the Plan update in four years

[1] Acronyms used in this table: AOP = aquatic organism passage; SGCN = Species of Greatest Conservation Need; VDCR = Virginia Department of Conservation and Recreation; VDOF = Virginia Department of Forestry; VDOT = Virginia Department of Transportation; VDWR = Virginia Department of Wildlife Resources; WBRC = Wildlife Biodiversity Resilience Corridor; WVC = wildlife-vehicle conflict

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Appendix A. Wildlife Corridor Action Plan Legislation

Code of Virginia
Title 29.1. Wildlife, Inland Fisheries and Boating
Chapter 5. Wildlife and Fish Laws

§ 29.1-578. Definitions
As used in this article, unless the context requires a different meaning:

"Human-caused barrier" means a road, culvert, fence, wall, commercial or residential development, or other human-made structure that has the potential to affect the natural movement of fish or wildlife across a landscape.

"Plan" means the Wildlife Corridor Action Plan established pursuant to this article.

"Wildlife corridor" means an area connecting fragmented wildlife habitats separated by human activities or infrastructure.

§ 29.1-579. Wildlife Corridor Action Plan; adoption
A. The Department [of Wildlife Resources], in collaboration with the Department of Transportation, the Department of Forestry, and the Department of Conservation and Recreation, shall create a Wildlife Corridor Action Plan.

B. The Plan shall:

1. Identify wildlife corridors, existing or planned barriers to movement along such corridors, and areas with a high risk of wildlife-vehicle collisions. The Plan shall list habitat that is identified as of high quality for priority species and ecosystem health; migration routes of native, game, and migratory species using the best available science and Department surveys, including landscape scale data from the ConserveVirginia database or a similar land conservation strategy database maintained by the Department of Conservation and Recreation; lands containing a high prevalence of existing human barriers, including roads, dams, power lines, and pipelines; areas identified as of high risk of wildlife-vehicle collisions; habitat identified by the Department as being occupied by rare or at-risk species; and habitat identified as Critical Habitat under the federal Endangered Species Act of 1973, P.L. 93-205, as amended.

2. Prioritize and recommend wildlife crossing projects intended to promote driver safety and wildlife connectivity. The Plan shall describe each such project and include descriptions of wildlife crossing infrastructure or other mitigation techniques recommended to meet Plan goals.

3. Contain maps utilizing the ConserveVirginia public portal, or a similar land conservation strategy public portal maintained by the Department of Conservation and Recreation, and other relevant state databases that detail high-priority areas for wildlife corridor infrastructure and any other information necessary to meet the goals of the Plan.

C. The Secretary of Natural Resources and the Secretary of Transportation shall jointly submit the Plan to the Chairs of the House Committee on Agriculture, Chesapeake and Natural Resources and the Senate Committee on Agriculture, Conservation and Natural Resources no later than September 1, 2022, and shall jointly submit an updated version of the Plan every four years thereafter.

D. The Department shall assist state agencies and political subdivisions, and by request any federal agency, in considering and incorporating, where applicable, wildlife corridors and the recommendations of the Plan when developing any governmental strategic plan, map, or action. The Department shall publish the plan and any subsequent updates on its website.

Appendix B. Wildlife Crossing Case Studies

Four case studies of current, planned, and proposed wildlife crossing sites in Virginia are described that represent existing or under development projects. These case studies are the following:

- Southwestern Virginia Elk and U.S. Route 121/U.S. Route 460 Transportation Project
- Southern Albemarle Mountains Wildlife Connectivity Project
- Fort Belvoir Wildlife Crossings
- Wildlife Crossing Opportunities near the Great Dismal Swamp National Wildlife Refuge

These case studies represent some of the first wildlife crossings that were installed or currently under design in Virginia. Lessons learned from these case studies will be leveraged for future state wildlife crossing efforts.

Case Study: Southwestern Virginia Elk and U.S. Route 121/VA 460 Transportation Project

Background

Elk along U.S. Route 121/VA Route 460 Corridor Q transportation project. (Braiden Quinlan/Virginia Tech)

A research study is underway in Virginia is addressing driver safety and habitat connectivity across a new highway. North American elk are known to occur along the 14.2-mile U.S. Route 121/VA 460 project area (also known as Poplar Creek Phase B or Corridor Q) in Buchanan County in southwestern Virginia. The driver safety risk from potential collisions with elk are apparent with Corridor Q, a portion of which has either been constructed, is presently under construction, or will soon be under construction.

Corridor Q intersects a Wildlife Biodiversity Resilience Corridor (as described in Chapter 3 of this Plan). In addition, According to VDCR's Natural Heritage Data Explorer (www.vanhde.org), the Route 121/460 Corridor Q project is within the Natural Lands Network; the area is categorized as having moderate to high ecological integrity and much of Corridor Q is located in a habitat ecosystem diversity area.

Because of the potential for risks to driver safety and impacts to the elk population within an area classified as a Wildlife Biodiversity Resilience Corridor, a collaborative research effort between VTRC (the research division of VDOT) and VDWR is currently underway to address these concerns. The purpose of the study is to: (1) determine suitable locations and designs for a series of wildlife crossing structures connected by fencing; (2) evaluate site-specific wildlife crossing and fencing construction costs and the crash reductions needed to offset those costs; and (3) determine the most suitable federal funding programs. While elk are the primary focus of the evaluation, minimizing wildlife crash risk and maintaining habitat connectivity would also benefit multiple wildlife species in the area.

Elk in Virginia

Historically, elk were found throughout the U.S., including Virginia. Elk were extirpated from the eastern U.S. by the late 1800s, as a result of unregulated market hunting and habitat loss. Elk habitat in Virginia primarily consists of mature tree stands and open lands created by the reclamation of former surface coal mines. These areas provide food resources and preferred habitat for not only the elk herd, but also various other wildlife species. During 1997 to 2002,

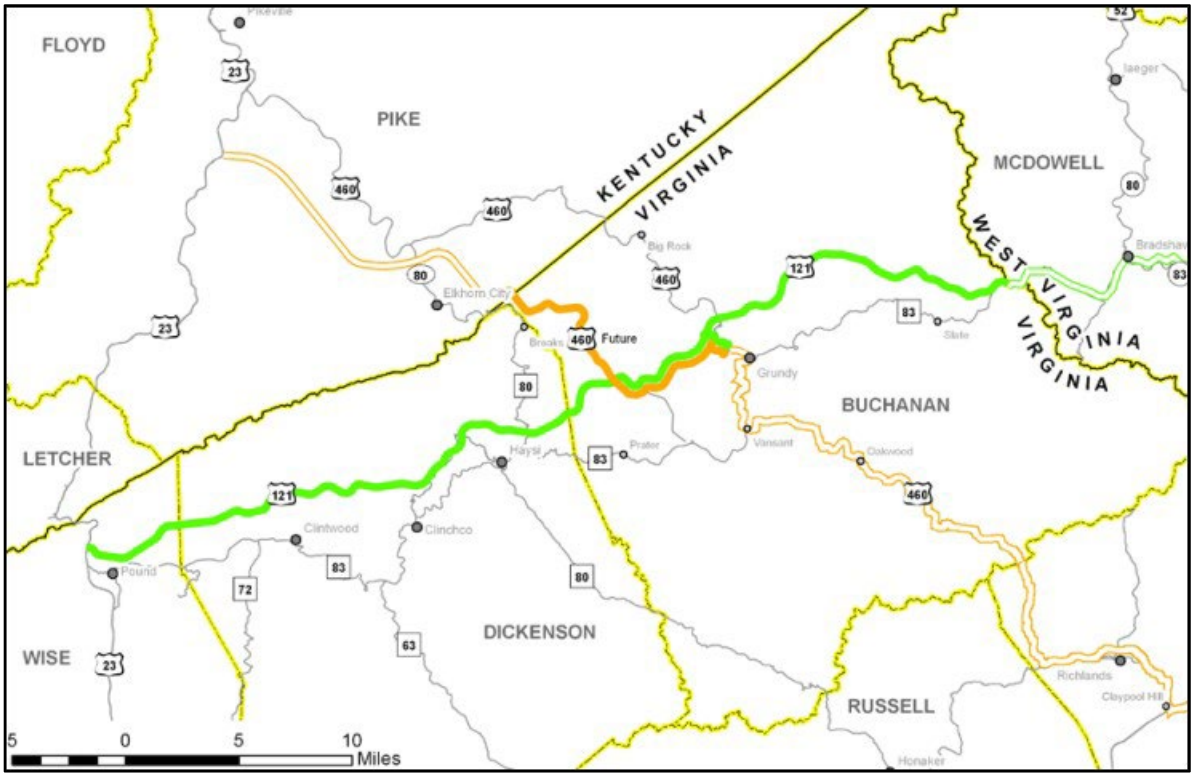
more than 1,500 elk were reintroduced into eastern Kentucky, resulting in some elk moving over into Virginia. A growing interest in elk in Virginia prompted the development of a plan for elk restoration, and in 2009, the Board of Game and Inland Fisheries (now the Board of Wildlife Resources) directed VDWR to develop a plan to restore and manage a population of elk (Donaldson and Rosenberger 2022).

From 2012 to 2014, a total of 75 elk were relocated from southeastern Kentucky onto a reclaimed mine site in Buchanan County, Virginia. Currently, elk are managed in a designated Elk Management Zone largely spanning three counties: Buchanan, Dickenson, and Wise. By September 2020, Virginia's restored elk herd was estimated at more than 250 individuals (VDWR website https://dwr.virginia.gov/wildlife/elk/). For the first time since the restoration, VDWR started GPS-collaring elk in 2019 and has continued through 2023. Virginia Tech and VDWR initiated a research project in 2020 to use mark re-capture methods to determine elk population size, a significant portion of which overlaps with the Corridor Q project. Additional objectives of the research are to determine seasonal resource use and home ranges of elk that were collared during the restoration and in more recent years.

Corridor Q Transportation Project

Corridor Q of the Appalachian Development Highway System traverses portions of Kentucky, Virginia, and West Virginia, generally following the existing Route 460 corridor, with some sections on new locations off of existing Route 460. U.S. Route 121 is a new highway that would generally parallel the VA 83 corridor from U.S. Route 23 in the Town of Pound, Virginia to the West Virginia state line. In October 2010, the Appalachian Regional Commission approved the realignment of 13.1 miles of Corridor Q that follows Route 460 in Buchanan County between the Kentucky-Virginia state line and the Town of Grundy to coincide with (i.e., overlap or follow the same alignment as) the Route 460 Connector, Section IIIA of US Route 121, and a portion of Section IIIB of U.S. Route 121 (U.S. Route 121/Route 460 [Corridor Q] Section IIIB [Poplar Creek] - Phase B Environmental Assessment, September 20, 2021).

Within the region where elk reside, VDWR biologists have documented four elk-vehicle crashes prior to the 2012 elk reintroductions (these were elk from Kentucky that had moved into Virginia) and four crashes after the elk reintroductions. For Corridor Q, the abundance of high quality habitat for elk along and surrounding Corridor Q may present a risk to driver safety when the road opens to traffic. Elk are frequently seen grazing on the portions of the Corridor Q roadside that have been planted with grasses and forbs to control erosion during construction. Other factors that may influence elk-vehicle conflict risk include a high speed limit, lack of lighting, and undulating contours.



Route 121/460 Corridor Q Project, Regional Connectivity map. Colored lines: orange line = Corridor Q Project; green line = Under development Route 121.

Benefits to Local Economies

The newly established elk population has been an important draw to the area and elk-viewing tourism is becoming increasingly popular. Additionally, VDWR held its first elk hunt during October 2022 and expects elk hunting opportunities to increase as the elk population continues to grow. Tourists and hunters visiting Buchanan County positively contribute to the local economy through lodging, food, gasoline, and other local businesses. Buchanan County Tourism, Buchanan County Chamber of Commerce, and Southern Gap Outdoor Adventures feature elk in their logos, indicating the importance of the elk population to the area.

Corridor Q is being constructed as part of an initiative to promote economic development in underserved communities. This intended benefit of Corridor Q can be fully realized with the implementation of elk crash countermeasures, which are proven to reduce the risk of elk-related crashes while also providing elk and other wildlife a safe means of moving through the landscape. When designed and located properly, wildlife crossings, in conjunction with wildlife fencing, are the most consistently effective measure at reducing WVCs and maintaining habitat connectivity across a road.

Identifying Opportunities to Improve Driver Safety and Maintain Habitat Connectivity

As stated above, a research study is underway between VTRC and VDWR to identify suitable locations and designs for wildlife crossing structures and associated fencing to reduce risks to driver safety and improve elk habitat connectivity along Corridor Q (which would also maintain the habitat connectivity of the Wildlife Biodiversity Resilience Corridor that Corridor Q intersects). To identify suitable structure locations, road segments along the corridor will be evaluated based on elk distribution and habitat use (determined from GPS data from collared female elk), terrain, land ownership, and human activity. The study will also include a detailed cost-benefit analysis to compare the costs of wildlife crossings with the expected savings from prevented crashes with elk and deer (Donaldson and Rosenberger 2022).

In addition, the Virginia Tech Transportation Institute is evaluating the feasibility of the supplemental use of animal detection driver warning systems along Corridor Q. Animal detection driver warning systems are designed to sense large animals along the roadway and warn drivers about their presence. Some studies have demonstrated high wildlife crash reduction rates with the strategic use of these systems at discrete crash hotspots and at fence ends. Animal detection systems typically include above-ground area-cover sensors, break-the-beam sensors, or thermal detectors that are installed along the roadside to detect wildlife as they approach the pavement. Once detection is verified, a warning system (such as a flashing warning sign or a changeable message sign that wirelessly communicates with the detection cable) can be used to alert drivers to the danger. Any resulting reductions in vehicle speed (and associated reductions in stopping distance) decreases the risk of a collision (Donaldson and Rosenberger 2022). Because VDOT currently considers these systems experimental, any installation of these systems would be evaluated as pilot applications.

Typical message sign connected to an animal detection system to warn drivers of elk along the road. (komonews)

As part of the research study, the research team is identifying federal funding programs for which the prioritized solutions may be eligible under the Infrastructure Investment and Jobs Act. These include, but are not limited to, the following programs:

- Wildlife Crossing Pilot Program
- Surface Transportation Block Grant Program
- Bridge Investment Program
- Nationally Significant Freight & Highway Program (INFRA)
- Federal Lands, Federal Lands Access, and Tribal Transportation Programs
- Highway Safety Improvement Program
- Transportation Alternatives Program

In the event that wildlife crossing construction is pursued, a parallel effort has been initiated to coordinate stakeholder involvement for the purpose of gathering support for federal funding applications. The list of stakeholders can be viewed at: https://vswcc.weebly.com/elkandcorridorq.html.

In conclusion, this case study demonstrates a clear nexus between driver safety objectives, management of a newly established elk population, and preserving the conservation value of a Wildlife Biodiversity Resilience Corridor. Engaging key partners and stakeholders will be integral in increasing the likelihood of successful implementation.

Elk along Corridor Q project. (Braiden Quinlan/Virginia Tech)

Case Study: Southern Albemarle Mountains Wildlife Connectivity Project

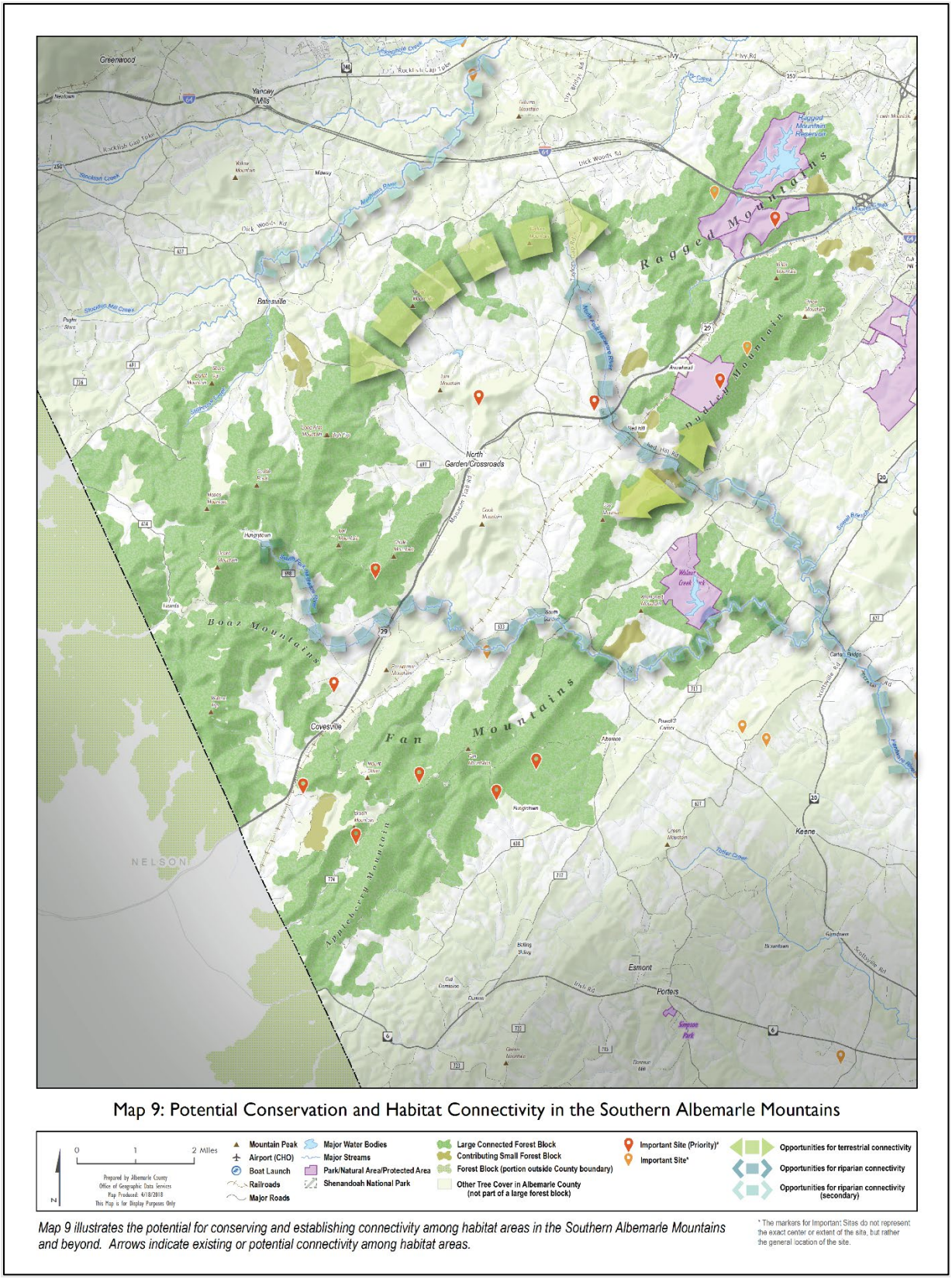
Background

The Southern Albemarle Mountains in Albemarle County have large, intact forest blocks with high ecological integrity and are identified as a Conservation Focus Area in the county's Biodiversity Action Plan (BAP, Albemarle County 2018). Route 29 south of Charlottesville bisects this area and was identified in the BAP as a likely barrier to wildlife movement. County staff and the VTRC have been studying several underpasses (bridges and culverts) to assess their current usage by wildlife and to identify potential enhancements that may improve connectivity and facilitate the movement of wildlife through these structures, benefitting both wildlife and driver safety, known as the Southern Albemarle Mountains Wildlife Connectivity Project. This case study serves as an example that demonstrates the potential benefits of early communication efforts and partnering between VDOT and a municipality to determine potential wildlife enhancements based on the evaluation of existing underpasses. The case study also serves as an example of how a local city or county municipality may be able to use the *Wildlife Corridor Action Plan* as a planning tool within their own long-range, comprehensive planning process.

Albemarle County's Biodiversity Action Plan is the most recent milestone in a long history of the county's commitment to protecting natural resources and biological diversity. The BAP was completed in June of 2018, and a goal related to its implementation has since been incorporated into Albemarle County's Comprehensive Plan. The BAP includes extensive spatial analyses aimed at identifying priority resource protection areas and opportunities for landscape connectivity, to help inform recommendations for natural resource management and protection. The spatial analysis identified three primary Conservation Focus Areas within the county, one of which is the Southern Albemarle Mountains. The analysis identified the Hardware River, which lies within the Southern Albemarle Mountains, as an important connectivity opportunity.

Goal 1 and Goal 5 of the BAP specifically address the importance of preserving habitat connectivity and important wildlife habitat linkages in the County:

- GOAL 1: Recognize the importance of the three Conservation Focus Areas. Prioritize conservation of the land and resources within them and, where possible, connections among them.
- GOAL 5: Minimize or reduce habitat fragmentation county-wide and maintain habitat connectivity.



Southern Albemarle Mountains GIS connectivity analysis done to identify important connectivity sites. Arrows indicate existing or potential connectivity among habitat areas (Albemarle County Biodiversity Action Plan 2018).

Specifically, the BAP also identifies a recommendation to "investigate a Route 29 underpass in southern Albemarle County to better connect eastern and western portions of the Southern Albemarle Mountains Important Site, a conservation priority area." This recommendation was, in part, the impetus for the development of the Southern Albemarle Mountains Wildlife Connectivity Project.

Since February 2021, the County's Natural Resource Program has been collecting wildlife data using trail cameras to identify the type of wildlife using underpasses and frequency of successful crossings under Route 29. Five underpasses have been regularly monitored with cameras using similar monitoring methods performed for the I-64 underpass and wildlife fencing study due to the success of that fencing project. The I-64 underpass and wildlife fencing study used trail cameras to determine wildlife use of two existing structures. Wildlife activity was monitored at the underpasses and along the roadside both before and after the installation of wildlife fencing to guide wildlife to the structures and prevent them from crossing the highway. The I-64 wildlife fencing resulted in an average deer crash reduction of 92% and an increase in wildlife use of the structures of up to 400%.

After initial site assessment and data collection for the Southern Albemarle Mountains Wildlife Connectivity Project, the County Natural Resources Program is focusing on three (3) priority underpasses along Route 29 that may have opportunities for future wildlife connectivity enhancements:

1. North Fork Hardware River - Bridge
2. South Fork Hardware River – Triple concrete box culvert
3. Cove Creek – Double concrete box culvert

A second part of the project has involved recruiting and training citizen scientists through the local chapter of Virginia Master Naturalists to help collect animal carcass data along this stretch of Route 29. Although police reports and anecdotal data have shown a high incidence of wildlife-vehicle collisions along this roadway over the years, the frequency and specific location of collisions is still largely unknown. Identification of these wildlife-vehicle collision "hotspots" may help inform the Southern Albemarle Mountains Wildlife Connectivity Project by identifying which of the monitored underpasses may be a higher priority for future implementation of connectivity enhancements. Since September of 2021, the volunteers have been piloting the use of Roadkill Observation and Data System field application and data dashboard customization (from the Center for Large Landscapes Conservation) for its potential utility on a broader scale in Virginia.

North Fork Hardware River Bridge, doe and fawn using bridge path. (Albemarle County)

South Fork Hardware River box culvert, bobcat. (Albemarle County)

Two bucks using the Cove Creek double box culvert. (Albemarle County)

Cove Creek double box culvert, coyote. (Albemarle County)

Based on preliminary results from the camera monitoring, several potential wildlife enhancements have been identified for the three culvert and bridge structures listed above including, but not limited to:

- Contour the slope beneath the bridge to create a functional trail for wildlife use. This would create a more well-established and functional path for wildlife under the bridge.
- Improve the access for wildlife at the entrances of the bridge and culverts by targeted vegetation and debris removal.
- Add directional wildlife fencing to one or more of the existing structures.
- Remove sediment within structures, which will increase structure height and encourage wildlife use.
- Consider feasibility for future structure replacement.
- Install interior structure lighting to encourage wildlife use.

County staff have begun initial outreach and coordination efforts with the VDOT Culpeper District and Charlottesville Residency, which oversee road and structure maintenance along this section of Route 29, to discuss the potential for wildlife enhancement opportunities. Identifying and connecting key stakeholders early in the planning process could identify early project integration opportunities, potential site design constraints, and better leverage of funding for future wildlife crossing enhancements such as large animal crash reduction measures.

Case Study: Fort Belvoir Wildlife Crossings—First in Virginia

Background

In 1995, the U.S. Army installed the first wildlife crossings in Virginia at Fort Belvoir in Fairfax County to mitigate concerns over wildlife-vehicle conflict and diminished wildlife movement across roads. At a cost of approximately $1 million, Fort Belvoir constructed two box culverts specifically designed for large- to medium-sized wildlife species to cross roads safely, incorporating critical design features such as natural lighting (grate skylight between lanes) and natural substrate. Both structures, on the Fairfax County Parkway, connected sensitive natural areas in the county between Huntley Meadows Park and Accotink Bay Wildlife Refuge (part of Fort Belvoir). This case study of the first wildlife crossing project in Virginia can help inform future wildlife crossing infrastructure needs in urban landscapes.

On Fairfax County Parkway, the larger box culvert is located just to the northwest of John J Kingman Road. It is 20 feet wide, 15 feet tall, and 192 feet long with an open bottom and a small stream running through it. The second culvert on this parkway is approximately 0.25 miles to the east of the first one. It is 10 feet wide, 6 feet tall, and 105 feet long with a concrete bottom. Both culverts include a metal grate in the ceiling that spans the median between the roads above, to allow in natural light. Fencing at both sites is minimal (approximately 100 feet) or non-existent.

Wildlife crossing underpasses installed along Fairfax County Parkway by Fort Belvoir. This larger box culvert on the parkway is near John J Kingman Road; Right: The smaller box culvert on the parkway is approximately 0.25 miles to the east of the larger one.

Effectiveness of the Fort Belvoir Wildlife Crossings

Deer exiting a culvert.

VTRC and the Army conducted two separate studies to assess the effectiveness of these two underpasses as wildlife crossings (Donaldson 2005; U.S. Army 2016). The VTRC study (Donaldson 2005) and Army study (U.S. Army 2016) used camera monitoring to document wildlife use during two time periods that were approximately 10 years apart. Both studies verified that deer were using the larger box culvert with high frequency. In total, 15 wildlife species utilized this larger underpass, including various birds, coyotes (*Canis latrans*), red foxes (*Vulpes vulpes*), groundhogs (*Marmota monax*), opossums (*Didelphis virginiana*), raccoon (*Procyon lotor*), and gray squirrel (*Sciurus carolinensis*) (Donaldson 2005; U.S. Army 2016). For the smaller culvert, deer were infrequently detected as using this underpass, though medium-sized wildlife such as raccoons were frequently photographed traversing it (Donaldson 2005); in total, 10 species used this culvert (U.S. Army 2016).

Great blue heron entering a culvert.

These studies demonstrate strong evidence for the use of well-designed wildlife crossings. The VTRC report concluded structures that are properly sized and located receive heavy use by wildlife, thus reducing potential wildlife-vehicle conflict. Underpasses with 12 feet or greater in height were best at facilitating deer passage, though that metric alone is not enough to contribute to the success of a structure. Donaldson (2005) also recommended that an openness factor of minimally 0.25 (see Donaldson 2005 for how this metric is calculated) may be required to promote wildlife use of these types of underpasses.

Conclusions

From 1995 to 2004 (the culverts were installed in 1995), there were only five documented deer-vehicle collisions centered within a 2.5-mile road segment where the culverts of this case study are located (source: Virginia's Highway Traffic Records Information System and Fairfax County

police records). Fencing is minimal, or absent, along the roads adjacent to both culverts. Since research suggests fencing extending from underpass openings greatly reduces wildlife-vehicle conflicts along roadways (Transportation Research Board 2002; Hedlund 2003; Donaldson 2005; and McCollester 2009), installation of roadside fencing to funnel wildlife to these culverts may also assist in reducing WVCs.

In comparing the larger culvert to the smaller culvert, there may be room for improvement in future designs for similar structures. The difference in substrates (larger culvert had a natural stream bed and vegetated dry substrate and the smaller culvert had a concrete bottom) may have played a role in how a greater number of animals and diversity of species utilized the larger culvert; substrate condition also was a factor suggested by the Transportation Research Board (2002) as an important consideration for wildlife crossings. In addition, Donaldson (2005) implicated that the height and openness of underpasses such as box culverts may play a role in individuals and species utilizing these types of wildlife crossings.

This case study highlights the need to connect patches of habitat with wildlife crossings specifically designed for a number of targeted species, to not only reduce wildlife-vehicle conflicts, but also enhance the local ecology. As more observational data becomes available through new and continued research, there is likely room for improvements to these existing structures.

Case Study: Wildlife Crossings near the Great Dismal Swamp National Wildlife Refuge

Project Description

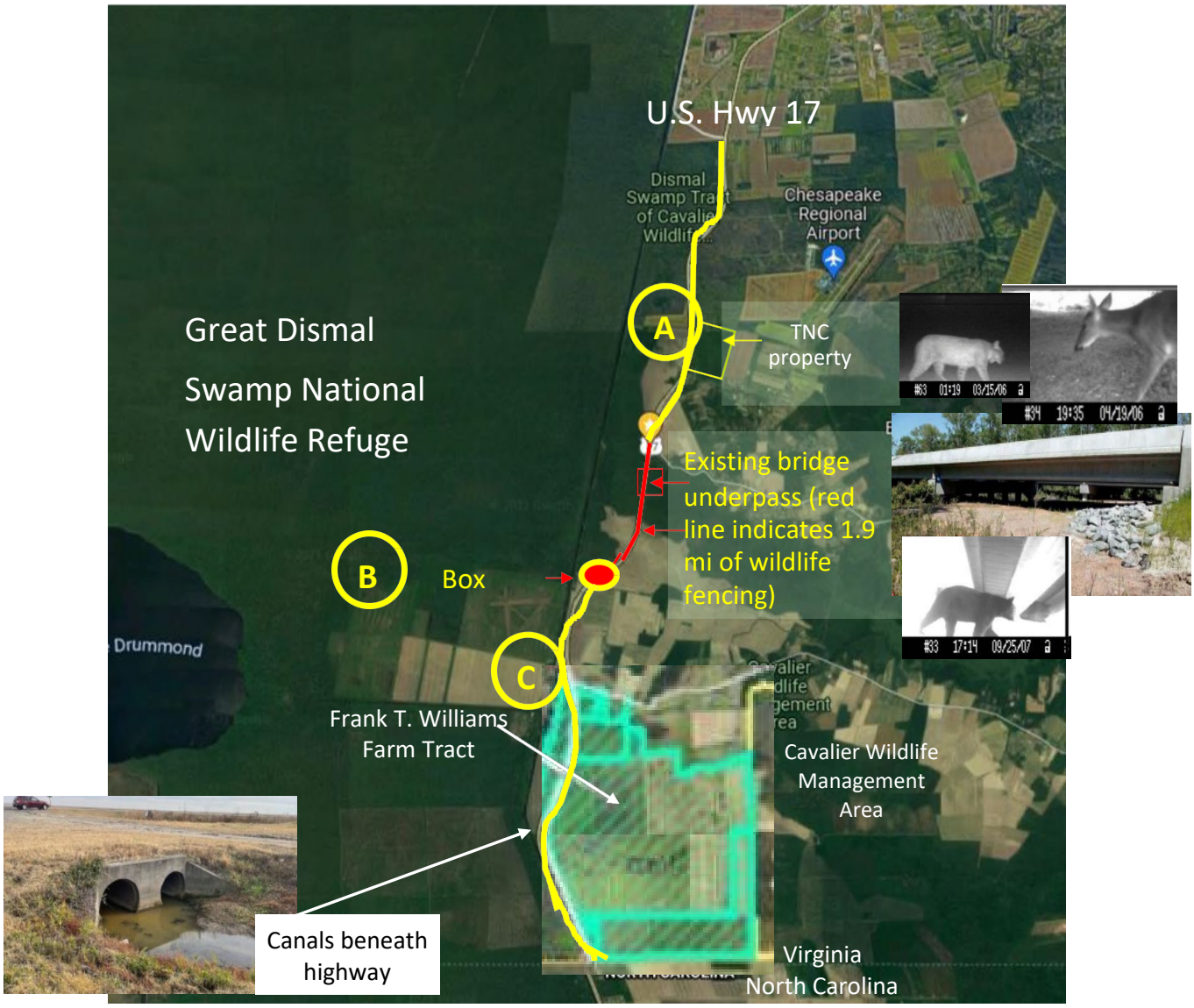
The Great Dismal Swamp National Wildlife Refuge (GDSNWR) is a 111,000-acre refuge that is home to a variety of wildlife. It includes one of the largest black bear populations on the U.S. East Coast and harbors 40 other species of mammals, 59 species of reptiles and amphibians, and more than 200 species of birds, many of which are uncommon or rare throughout Virginia. U.S. Highway 17 crosses the paleochannel (ancient water channel that has been filled with younger sediment) of the Northwest River, which consists of a riparian corridor that extends southeast from the GDSNWR. This riparian corridor contains wetland habitat (a swamp and saturated wetlands) that holds significant value in terms of its hydrologic functions and its plant and wildlife populations.

Throughout the planning and design of U.S. 17, VDOT coordinated with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and technical experts in the region to design measures to minimize impacts to the area's natural resources. Measures included the construction of a vehicular bridge that measures 984 feet long, 81 feet across, and approximately 8 feet high. The primary purpose of the bridge was to span a wetland in the riparian corridor, but the project also included the construction of earthen berms beneath the far ends of the bridges to provide areas of dry crossing for wildlife. These berms were primarily intended for black bears that travel to and from GDSNWR. Vegetation was also planted up to the underpass entrances to encourage wildlife use. The Virginia Department of Transportation constructed 1.9 miles of 10-foot-high wildlife fencing that tie into the bridge underpass to encourage wildlife use. Nearly 1.5 miles of this fencing extends south of the bridge.

Further Opportunities to Reduce Risks to Driver Safety and Connect Wildlife Habitat

A camera monitoring study (Donaldson and Schaus 2009) found that the existing bridge underpass is very successful at facilitating passage by a dozen terrestrial species, including black bear and deer. However, there continue to be regular collisions with these species along the sections of unmitigated highway that border the GDSNWR. The 10-mile segment of U.S. Highway 17 in the map below (highlighted in yellow) represents additional potential wildlife crossing project areas. Any wildlife crossings in this area would help connect the GDSNWR to other patches of habitat for wildlife (including black bear) along the eastern coast of Virginia and North Carolina.

The following describes areas marked A, B, and C in the map below. To determine more precise locations of and costs for wildlife crossing projects within the highlighted road segments, further scoping is required.



A: North of existing wildlife crossing. This road segment borders GDSNWR and the Bear Garden Wildlife Conservation Site (indicated in the map as "Dismal Swamp Tract of Cavalier Wildlife Management Area" but recently renamed as the Bear Garden Wildlife Conservation Site). There are regular wildlife crashes with deer and black bear along this road section.

B: Existing double box culvert. This is the location of an existing double box culvert 1.8 miles south of the wildlife crossing. The culvert openings are 10 feet by 6 feet, and the structure extends 197 feet in length. The culvert is partially filled with water. A monitoring study verified that the structure is unusable by most terrestrial wildlife species, and the dimensions are unlikely to be large enough to accommodate deer and bear (Donaldson and Schaus 2009). However, the fencing from the existing wildlife crossing extends to this culvert, and if this existing structure is replaced with a larger structure, it can be designed to facilitate both water and wildlife passage.

C: **South of existing wildlife crossing**. Most of this road segment is adjacent to a property that is characterized by the locality as a Unique Economic Development Opportunity Area. This area lies between the GDSNWR and the Cavalier Wildlife Management Area (VDWR). A wildlife crossing in this area is an ideal location to facilitate wildlife movement between the GDSNWR and high quality habitat areas to the east and southeast of U.S. 17. Small canals extend beneath U.S. 17 along this road segment and may provide opportunities for enlarging the existing small drainage culverts for the dual purpose of facilitating water and wildlife passage.

As a potential wildlife crossing alternative to the above recommendations, another area may be along U.S. 58, a high bear crash area that cuts through the northern end of the Great Dismal Swamp NWR (illustrated below).

Appendix C. Virginia Natural Lands Assessment Ecological Integrity Prioritization Variables

Most Important Habitats
This field contains the total area of intersection between each Ecological Core or Habitat Fragment and important habitats for imperiled species and Species of Greatest Conservation Need as identified by the North Atlantic Landscape Conservation Cooperative, of which the Virginia Department of Wildlife Resources was a member.

Variety of Unmodified Wetlands
This field contains the variety of unmodified wetlands per Ecological Core or Habitat Fragment. Unmodified wetlands were based on USFWS National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

Topographic Relief Index
This field contains the standard deviation of elevation values from 1-arc second, USGS Digital Elevation Models per Ecological Core or Habitat Fragment.

Anthropogenic Isolation Index
This field contains a measure of anthropogenic core isolation, which was calculated by dividing the proximity zone of each Ecological Core or Habitat Fragment by its area. Open water was not used as an isolation feature for this variable.

Length of Streams in Interior Forest
This field contains the total length of streams within interior forest per Ecological Core or Habitat Fragment. High-resolution flow lines from the USGS National Hydrography Dataset were used for the streams data source.

Total Area
This field contains the total area of each Ecological Core or Habitat Fragment in square meters.

Maximum Depth
This field contains the maximum depth of each Ecological Core or Habitat Fragment. This value represents the maximum distance (meters) to the deepest part of the feature measured from all edges.

Conservation Site Biodiversity Rank Index
This field contains the Conservation Site Biodiversity Rank Index value for each Ecological Core or Habitat Fragment. The index was developed by summing the products of biodiversity rank factors and biodiversity rank weights for each feature. The biodiversity rank factors resulted from dividing conservation site intersections with each feature by the total area of the intersecting conservation sites with the same biodiversity rank. The biodiversity rank weights were 50, 40, 30, 20, and 10 for B1, B2, B3, B4, and B5 ranked conservation sites, respectively. The Conservation Sites dataset was developed by the Department of Conservation and Recreation, Division of Natural Heritage.

Steam Conservation Units and Threatened and Endangered Waters Index

This field contains the Stream Conservation Units (SCU) and Threatened and Endangered (T&E) Waters Index value for each Ecological Core or Habitat Fragment. The index was developed by summing the products of biodiversity rank factors and biodiversity rank weights for each feature. The T&E Waters were buffered to the same width (5 meters) as SCUs and assigned biodiversity ranks before they were merged. The biodiversity rank factors resulted from dividing T&E-SCU waterway intersections with each feature by the total area of the intersecting T&E-SCU waterway with the same biodiversity rank. The biodiversity rank weights were 50, 40, 30, 20, and 10 for B1, B2, B3, B4, and B5 ranked conservation sites, respectively. The T&E Waters dataset was developed by the Department of Wildlife Resources. The SCU dataset was developed by the Department of Conservation and Recreation, Division of Natural Heritage.

Appendix D. Wildlife Crossing Concern Areas

The high risk WVC areas and Nexus Areas presented in Chapter 4 are associated with statewide WVC data that are most relevant for large mammals, in particular for white-tailed deer and black bear; thus, these areas likely are not fully representative of significant WVC impacts on habitat connectivity for smaller terrestrial wildlife species and aquatic organisms, including Species of Greatest Conservation Need (SGCN) identified in Virginia's Wildlife Action Plan. Due to these inherent limitations of the statewide WVC datasets, VDWR SMEs identified several road-associated sites for some federally and state-listed species and SGCN. These sites are termed Wildlife Crossing Concern Areas (WCCA) and are potentially experiencing road-based wildlife mortality at a level that may be causing detrimental population impacts to specific wildlife species or taxonomic groups. These WCCAs are described in the table below. Although only six sites are described in this table, it is probable that other WCCAs exist throughout the state. Further study is required to identify the location of additional WCCAs.

Since limited or no WVC data exist for WCCAs, further study is required to determine whether the associated roads are problematic from a driver safety perspective and/or for wildlife habitat connectivity, and if so, to then identify potential wildlife crossing opportunities.

Wildlife Crossing Concern Areas identified by VDWR subject matter experts.

Concern Area General Location	Species or Taxonomic Group	Associated Road(s)	Description
Accomack County, Eastern Shore	Birds and Reptiles	Chincoteague Causeway; Saxis Wildlife Management Area Road	Subject matter experts from the Virginia Department of Wildlife Resources routinely observe wildlife carcasses along these two roads. The Chincoteague Causeway and Saxis WMA Road traverse within/along important saltmarsh habitats on the Eastern Shore that are rich with biodiversity, such as a variety of waterbirds (seabirds, rails, wading birds, and shorebirds), reptiles (e.g., diamondback terrapin [*Malaclemys terrapin terrapin*; Tier IIa SGCN[1]]), and migratory and resident passerines. These saltmarshes provide critical breeding and non-breeding habitat for these species, encompass essential fish habitat, and support a robust shellfish industry in the region.
South of Virginia Beach	Reptiles and Amphibians	Pungo Ferry Road; Indian River Road	These roads bisect significant wetland habitats and VDWR SMEs frequently observe numerous roadkill of reptiles and amphibians. These animals frequently move between the wetland habitat patches fragmented by these two roads as the animals traverse

Concern Area General Location	Species or Taxonomic Group	Associated Road(s)	Description
			across the larger complex of natural habitats in this region. In addition, reptiles also are attracted to these roads to bask in the sunlight for thermoregulation.
Augusta and Nelson Counties, Afton Mountain	Allegheny Woodrat	Interstate 64	Interstate 64 across Afton Mountain fragments habitat for a population of the Allegheny woodrat (*Neotoma magister*), a Tier IVa SGCN. This habitat fragmentation is resulting in a population break (and a genetic flow impedance) between woodrats north and south of I-64 on Afton Mountain.
Wise and Scott Counties	Yellow-Spotted Woodland Salamander	Route 619 (Wise and Scott Counties); Route 630 (Wise County)	The yellow-spotted woodland salamander (*Plethodon pauleyi*) is a newly described species known to inhabit sandstone and forest habitats in known roadside areas. Some occupied locations are no more than 5-6 feet from the road edge. Subject matter experts from the Virginia Department of Wildlife Resources state that further study is necessary to understand whether WVCs may be detrimentally impacting this species.
City of Newport News and Yorktown	Amphibians and Reptiles	Fort Eustis Boulevard/Route 105	Fort Eustis Boulevard (Route 105) in Newport News/Yorktown bisects a significant Coastal Plain pond complex (vernal pools) and is a known barrier to movement between available and occupied state threatened Mabee's salamander (*Ambystoma mabeei*) breeding ponds. It may be a likely movement barrier for other species of conservation concern, e.g., spotted turtle (*Clemmys guttata*; Tier IIIa SGCN) and Eastern box turtle (*Terrapene carolina carolina*; Tier IIIa SGCN).
Tennessee River Basin	Aquatic SGCN[1]	Roads within/adjacent to Critical Habitat designation	The Tennessee River Basin is one of the most biologically diverse watersheds in North America and is home to at least 270 species of fish and over 100 species of freshwater mussels. In Virginia, this basin includes the Powell River, Clinch River, and Forks of the Holston (North, Middle, and South) River. These waters are known to support numerous federal- and state-listed mussels, representing some of Virginia's most imperiled species and overlain by federal Critical Habitat designation. As such, the Tennessee River Basin is the target of several conservation efforts supported by the VDWR, the USFWS, and other conservation partners. It is important to acknowledge the unique nature of this system and to ensure that wildlife passage, particularly aquatic organism passage, is a consideration of any road infrastructure plans in this region.

[1] SGCN = Species of Greatest Conservation Need as identified within the Virginia Wildlife Action Plan; SGCN Tiers I-IV are not a legal status (Tier levels are defined here); SGCN Conservation Opportunity Rankings (a, b, c) are also not a legal status (Ranks are defined here).