Fish and Wildlife Board Meeting Minutes

Wednesday, February 21, 2024

The Vermont Fish and Wildlife Board held an in-person meeting at 5:00 pm on Wednesday, February 21, 2024, at the National Life Dewey Conference Room, 1 National Life Drive, Montpelier, VT 05620. A recording of the meeting is available on the department's YouTube channel.

Agenda

1. Approval of Previous Meeting Minutes (January 17, 2024)
2. Public Comments (Limited to 2-minutes per speaker)
3. Petition Regarding Youth Hunt of a Lifetime for Moose
4. Department Recommendation on Petition Regarding the Use of UAS (Thermal Drone) to Assist with the Locating of Injured Game
5. 2024 Migratory Game Bird Season Preview – Preliminary Approval
6. 2024 Moose Season Recommendation – Preliminary Approval
7. Presentation on Wildlife Rehab in Vermont (agenda item removed at the beginning of the meeting)
8. Commissioner's Update

Board Members Present: Brian Bailey, Michael Bancroft (Acting Chair), Nicholas Burnham, Allison Frazier, Neal Hogan, Michael Kolsun, Paul Noel, Robert Patterson, Martin Van Buren

Virtual: David Deen, Brad Ferland, Bryan McCarthy, Jay Sweeny

Absent: Jamie Dragon

Department Staff Present: Commissioner Christopher Herrick, Wildlife Director John Austin, Game Warden Major Sean Fowler, Wildlife Management Program Manager David Sausville, Migratory Game Bird Project Leader Andrew Bouton, Deer and Moose Project Leader Nick Fortin, Game Warden Lieutenant Robert Currier, Game Warden Jeremy Schmid, Senior Game Warden Ethan Coffey, Principal Assistant Abigail Connolly

Virtual: General Counsel Catherine Gjessing, Director of Outreach Alison Thomas, Information Specialist John Hall

Members of the Public Present: Justin Lindholm, Molly Cook, David Laskey, Rod Coronado, Yelena Synkova, Maria Heitmann, Nancy Fitzpatrick, Josh Ainsworth, Bob Galvin

Virtual: Josie Daigle, Brian O'Gorman, Gabe Tempesta, Mark Green

The meeting was called to order at 5:00 pm

Approval of Previous Meeting Minutes

Board Member Patterson moved to approve the January 17, 2024 meeting minutes. Board Member Hogan seconded the motion. The Board voted to approve the minutes (13-0).

Public Comment Period

Justin Lindholm, Mendon, regarding legislative bill S.258
David Laskey, Moretown, regarding the youth hunt of a lifetime for moose petition
Rod Coronado, Orange, regarding legislative bill S.258
Brian O'Gorman, Readsboro Falls, regarding set backs for trapping

The recording of the public comments and the meeting can be viewed here.

Petition Regarding Youth Hunt of a Lifetime for Moose

David Laskey presented the petition regarding youth hunt of a lifetime for moose. The petition can be seen below. The Board Members asked questions and discussed the success rate of youth hunt of a lifetime hunters, the age of the hunters, the board's authority to update the season, the timing of the rulemaking process, and the hunting methods used. Board Member Frazier moved to task the department with reviewing the petition and to come back to the Board with recommendations on how to proceed. Board Member Kolsun seconded the motion. The Board voted to approve the motion (13-0).

Department Recommendation on Petition Regarding the Use of UAS (Thermal Drone) to Assist with the Locating of Injured Game

David Sausville presented the department's recommendation on the petition regarding the use of UAS (thermal drone) to assist with the locating of injured game. The recommendation can be seen below. The department recommended that the Board not enact a regulation that allows the use of thermal drones to aid in the recovery of wounded game animals. The proposal seemed well intentioned and could increase the recovery rate of wounded game animals, but the technology also presents significant concerns from a law enforcement and ethical hunting perspective. While the department generally supports new methods to assist with and improve recovery efforts, the enforcement and ethical concerns outweigh the benefits at this time. The Board Members asked questions and discussed the costs for thermal drone services, whether hunters can carry thermals, and whether thermal drones could be used for population surveys. Board Member Bailey moved to deny the use of UAS (thermal drone) to assist with the locating of wounded game animals. Board Member Van Buren seconded the motion. The Board voted to approve the motion (12-1), with Board Member Kolsun voting no.

2024 Migratory Game Bird Season Preview – Preliminary Approval

Andrew Bouton presented the 2024 migratory game bird hunting seasons and bag limit recommendations. The presentation and recommendations are included below. The Board Members asked questions and discussed bag limits for resident Canada geese, what a conservation order is, public hearing attendance, the bag limit for eastern mallards, the waterfowl survey, and the impact of flooding in 2023. The Board voted by straw vote to accept the 2024 migratory bird hunting season recommendations from the department. Next, the department will post the seasons online and hold public hearings in March 2024 before the Board's final vote in April 2024.

The Board recessed at 6:30 pm and returned at 6:50 pm.

2024 Moose Season Recommendation – Preliminary Approval

Nick Fortin presented the 2024 moose season recommendation. The presentation and recommendations are included below. The Board Members asked questions and discussed moose population/density, how hunter effort is measured, how the ovulation rate is measured, the effect of logging on moose habitat, collared moose data, liver fluke, and the Conte Refuge. The Board voted by straw vote to accept the 2024 moose season recommendation. Next, the department will post the presentation and recommendation online and hold public hearings in March 2024 before the Board's final vote in April 2024.

Commissioner's Update

Commissioner Herrick gave an update on the department's budget and answered Board questions on the decision to close Salisbury Fish Hatchery. Commissioner Herrick updated the Board on Senate Bill S.258. Commissioner Herrick thanked Board Members Michael Kolsun and Bryan McCarthy for their service to the Board. Their terms end February 2024.

Motion To Adjourn:

The Board voted to adjourn the meeting at approximately 8:10 pm.

VERMONT
FISH & WILDLIFE
CONSERVATION GROUP

www.vtfwcg.org

February 12, 2024

Re: Hunt of a Lifetime Moose Season

Commissioner Herrick and VT Fish & Wildlife Board,

We are writing to propose a change to the current timing and rules around the youth hunt of a lifetime for moose. We would like the board to consider allowing these youth hunters, many of whom have mobility challenges, to hunt with a rifle during the moose rut, which usually coincides with the moose archery season.

The statute that establishes the Special Opportunity Permits (10 V.S.A. § 4255(j)) requires that these permit holders comply with statutes and Board rules. To our knowledge, there are no statutes relating to moose hunting regulations, so changes fall within the purview of the Fish and Wildlife Board. SOP permit holders can already choose which season they'd like to hunt, but current Board rules (10 App. V.S.A. § 33) very specifically state that no one hunting during archery season can take a moose by firearm. That would need to be changed to allow moose to be called in as part of the experience for these young hunters who typically hunt with a firearm.

We are happy to leave the details and specific changes required to the board and Department staff, but think that this experience will be greatly improved for these young hunters if their season dates were altered.

Submitted by the Board of the VT Fish and Wildlife Conservation Group, on behalf of our members,
VTFWCG
PO Box 207, East Charleston, VT 05833

Recommendation Related to a Petition to Allow the Use of Thermal Drones to Recover Game Animals

to the

Vermont Fish and Wildlife Board

Vermont Fish and Wildlife Department
Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3208
802-828-1000

February 21, 2024

Petition to allow the use of UAS (thermal drone) to assist with the locating of wounded game animals

Recommendation

Summary of Issues for Consideration:

August 17, 2023, Josh Ainsworth Petitioned for the Department to:

(1) Pass a regulation that will allow the use of thermal drones to assist with the recovery of wounded game animals

(2) Only authorize FAA Part 107 s UAS commercial drone pilots to complete this work, under Title 10 App 20

Department Recommendation:

The Department recommends that the Board not enact a regulation that allows the use of thermal drones to aid in the recovery of wounded game animals. The proposal seems well intentioned and could increase the recovery rate of wounded game animals, but the technology also presents significant concerns from a law enforcement and ethical hunting perspective. While the Department generally supports new methods to assist with and improve recovery efforts, our enforcement and ethical concerns outweigh the benefits at this time.

Department Response to Proposal:

Comment/Question**: "I would like to petition the F&W board to discuss the moving forward with legislative change to Title 10 App 20, specifically the use of a UAS (thermal drone) to assist with the locating of shot game in Vermont. As stated in previous emails and taking into consideration the concerns of Fish & Game/Law Enforcement, my proposal would only authorize FAA Part 107 UAS commercial drone pilots to do this work. If attending a monthly meeting is possible to discuss my ideas, I would greatly appreciate that. Thank you and I look forward to hearing from you**."

Response:

1) While the Department generally supports alternative methods of recovering wounded game animals and helping hunters recover game, there are many potential challenges this new recovery method would create.

2) Survey results in the National Deer Association's 2024 Deer Report indicate that only 10 states currently allow the use of drones for game recovery.

3) Currently, Board rules (10 App. V.S.A. § 20) prevent the use of aerial drones to aid in taking of wildlife. The definition of take and taking is very broad and covers all aspects of hunting, including pursuing game. Based on this, recovery is included in the definition of take and taking because the hunter does not know the animal is dead.

4) This would require a legislative change to Title 10 VSA 4701 which says game can only be taken by gun, bow, crossbow, and dogs (unless prohibited by regulation). Using drones would constitute taking (pursuing) – to view a full definition of taking see 10 V.S.A. § 4001.

Other Information to Consider:

The Department's concerns include:

- Drone use to recover game is not common across the country, there are only a few states where it is legal, and many of those states do not prohibit drone use for hunting.
- The recovery method could be useful but there are a lot of gray areas, such as "inventorying" local deer herds while hunting in the area
- Difficult to maintain line of sight with the drone in Vermont
- How would you know when the animal or drone has crossed onto posted property. There is a reasonable expectation of privacy. Leashed dog handlers will find posted signs.
- Require increased permitting or training
- Not affecting fate of animal, it is affecting recovery rates
- How to word it, no firearms allowed? No hunting for 24-hours after drone use?
- What if the wound is not fatal? Most deer wounded by hunters do not die from the wound. If the animal is not dead the hunter would have to stop the hunt, to make sure the drone would not aid in the taking of game. Compared to leashed dog trackers, which are permitted, and allowed to put down animals, even after legal light.
- Or the hunter claims they wounded it even though they missed, to get a location on the "big one"
- Currently not a lot of complaints regarding leashed tracking dogs
- If approved, would we mimic leashed tracking dog regulations

- As for the issue of fees/tips, leashed dog trackers are not allowed to request compensation. With thousands of dollars invested in technology are the drone pilots going to want a fee?
- The Department is afraid there are many areas of drone use ripe for abuse

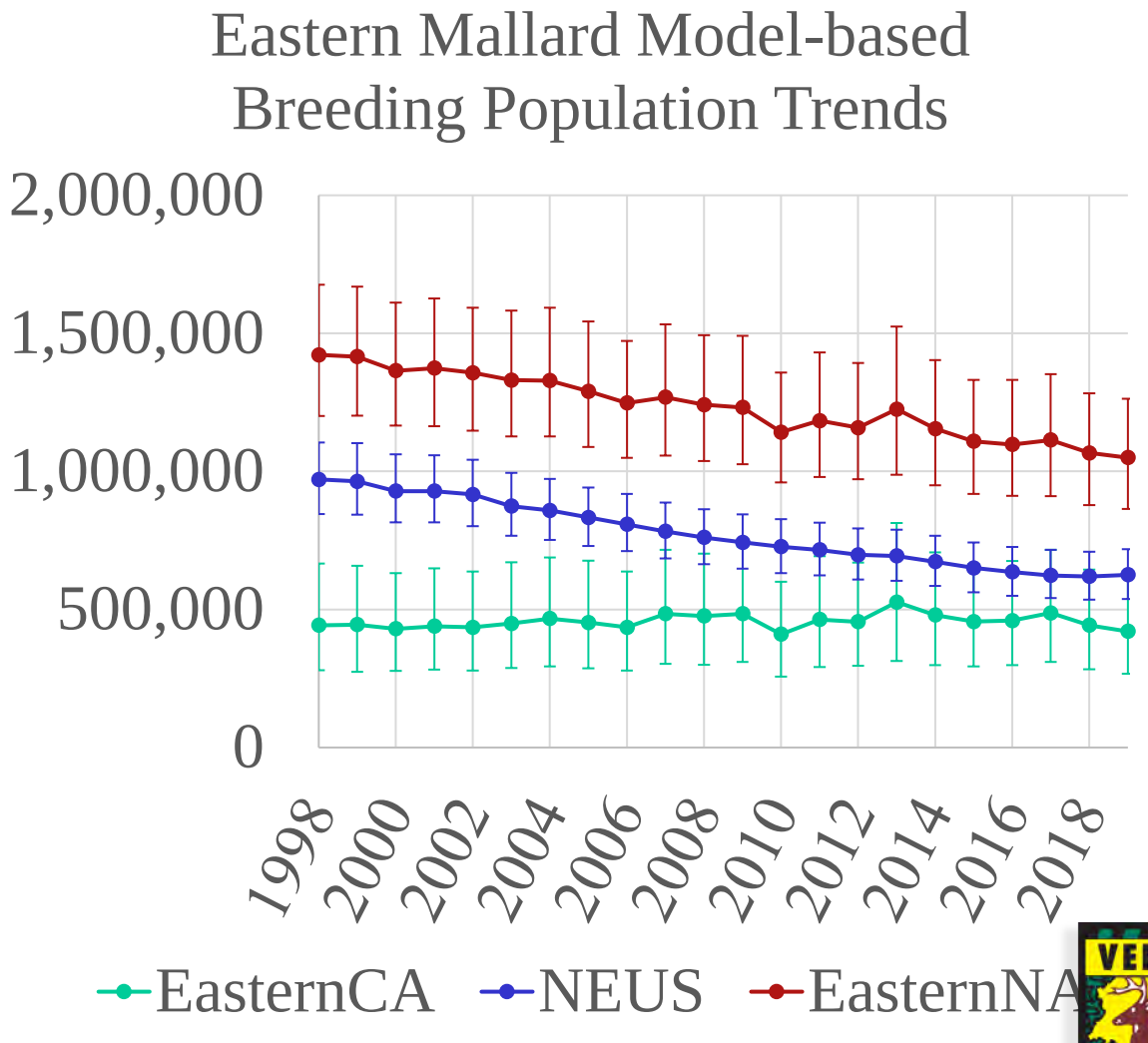
Potential positives in the Department's view:

- Anyway we can help hunters recover game is good
- Need more recovery options for hunters

2024 Migratory Game Bird Hunting Seasons and Bag Limit Recommendations

What is happening with eastern mallards?

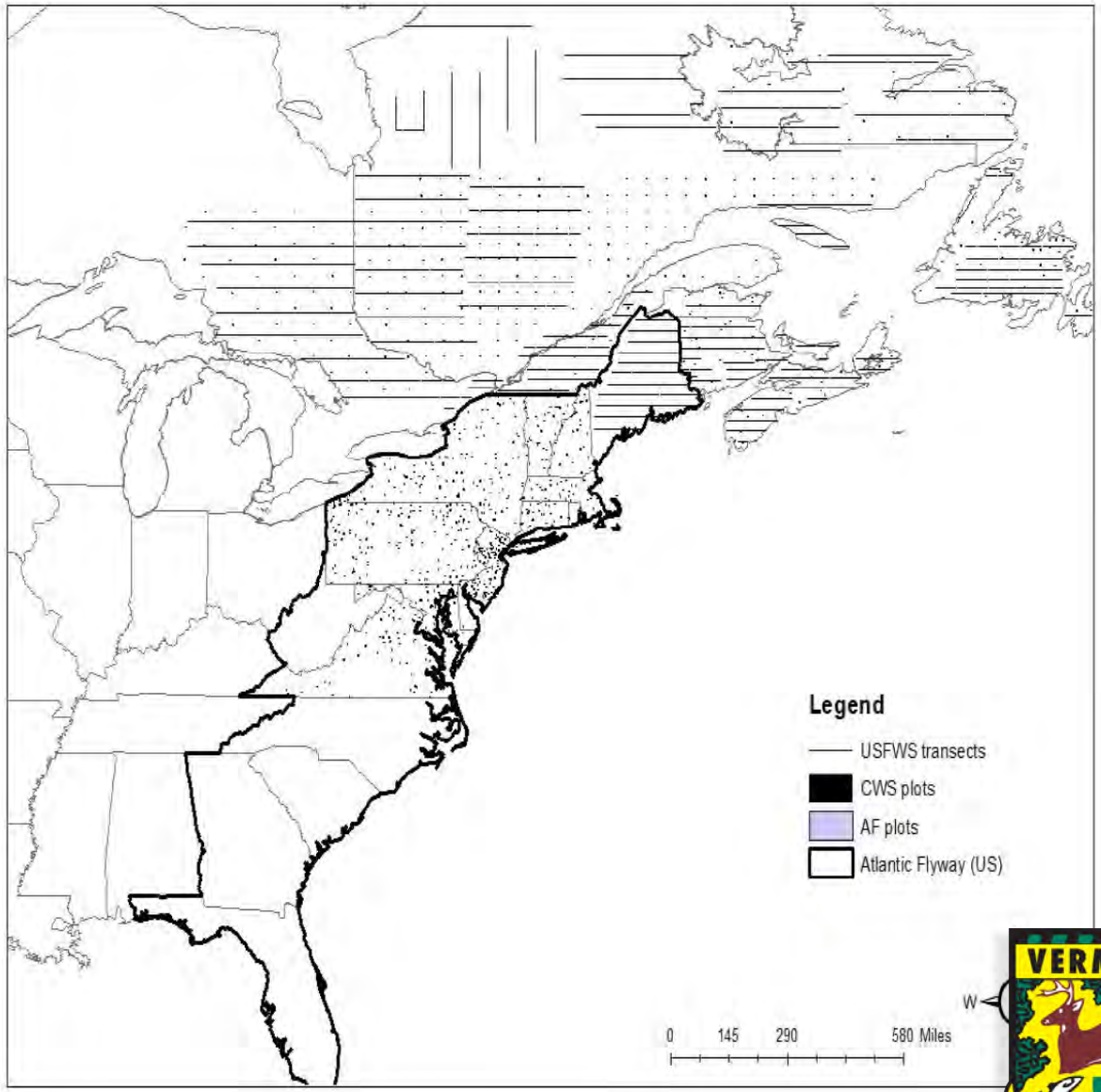
- 36% decline from 1998-2018 in the Northeast US
- Overall, decline ~1.1% per year since 1998



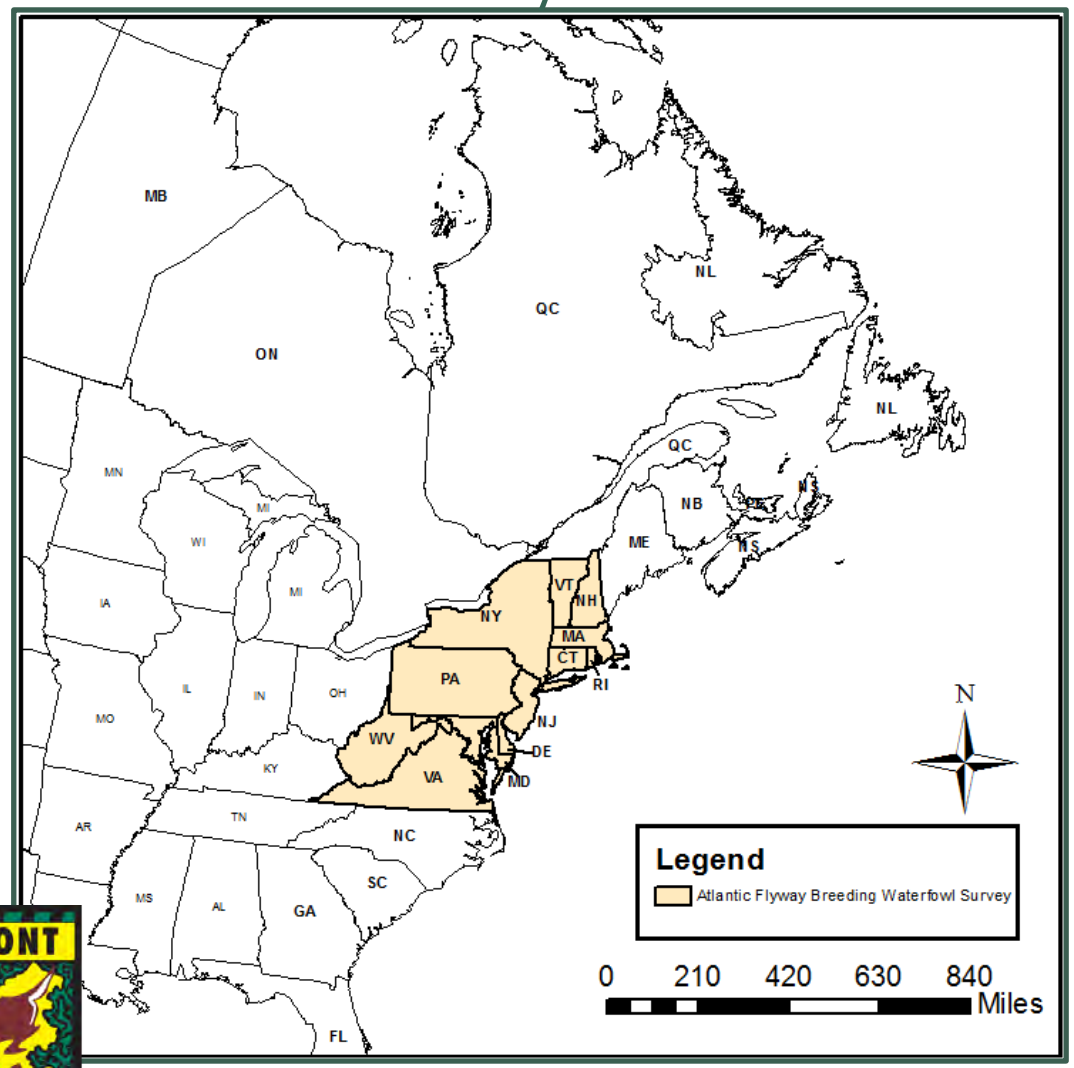
What is happening with eastern mallards?

- Breeding surveys provide the best estimate of waterfowl abundance

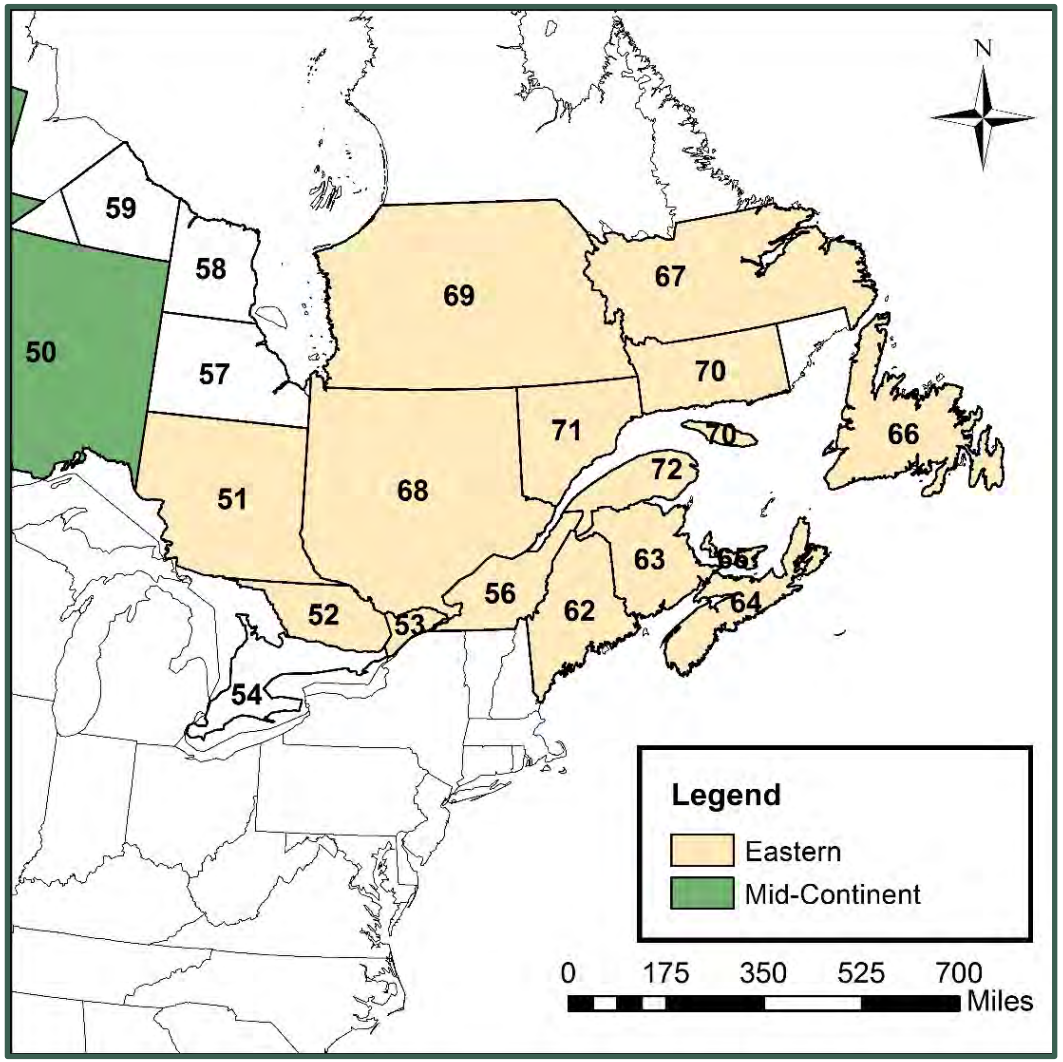
- Eastern Mallards are those that breed in Eastern Canada and the Northeast United States



Atlantic Flyway Breeding Waterfowl Survey Area



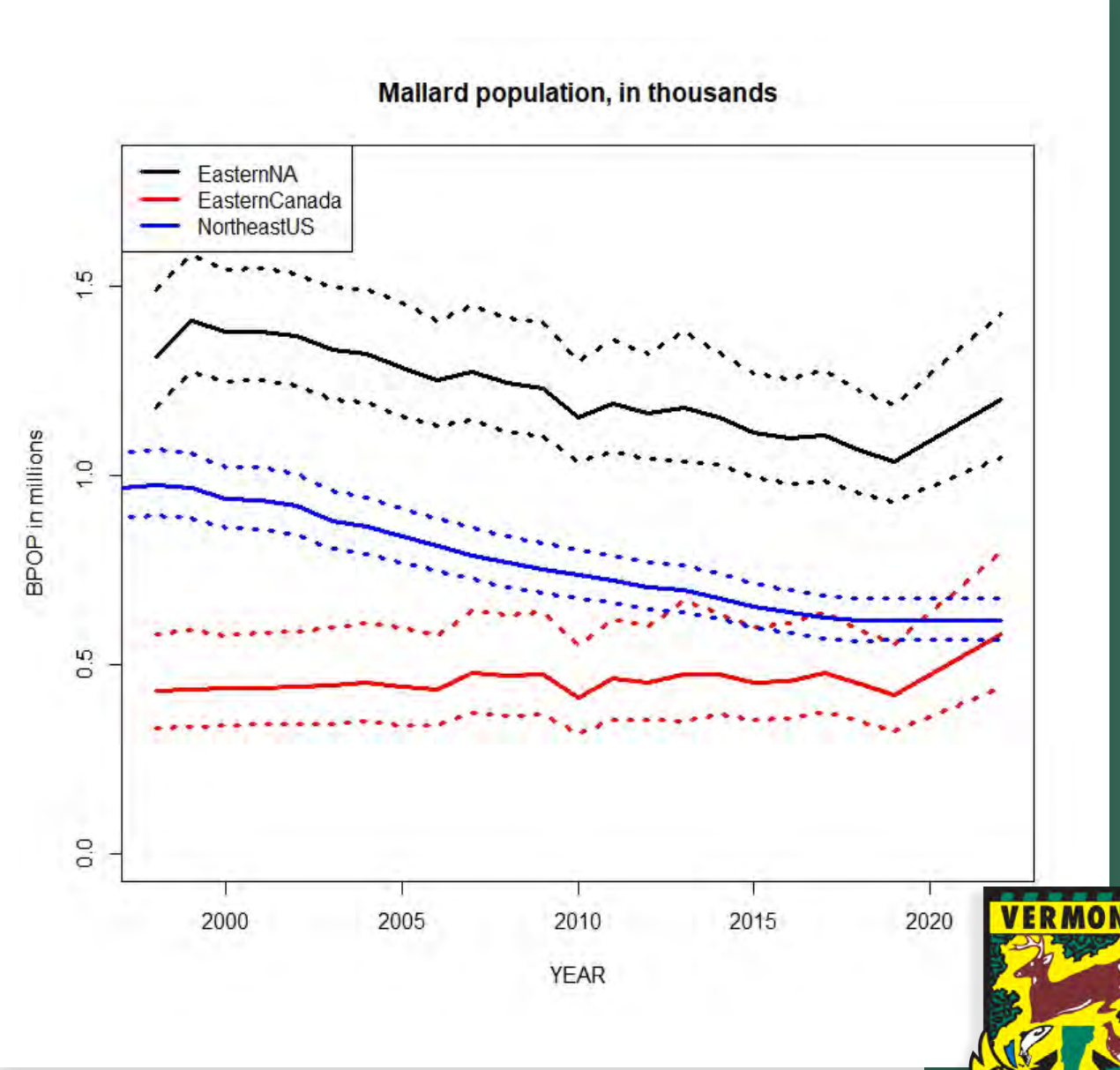
Eastern Survey Area



VERMONT FISH & WILDLIFE

Status and bag limits

- 2022 Breeding population = 1.2 million
- Although only a slight increase was observed, we were able to return to a liberal mallard bag limit for 2023-2024



Eastern Mallard Research Collaborative

- Marking >1,200 female mallards over 4 years
- 22 collaborating agencies
- Over 610 transmitters and >400 geolocators in 2023

Eastern Mallard Study Partners

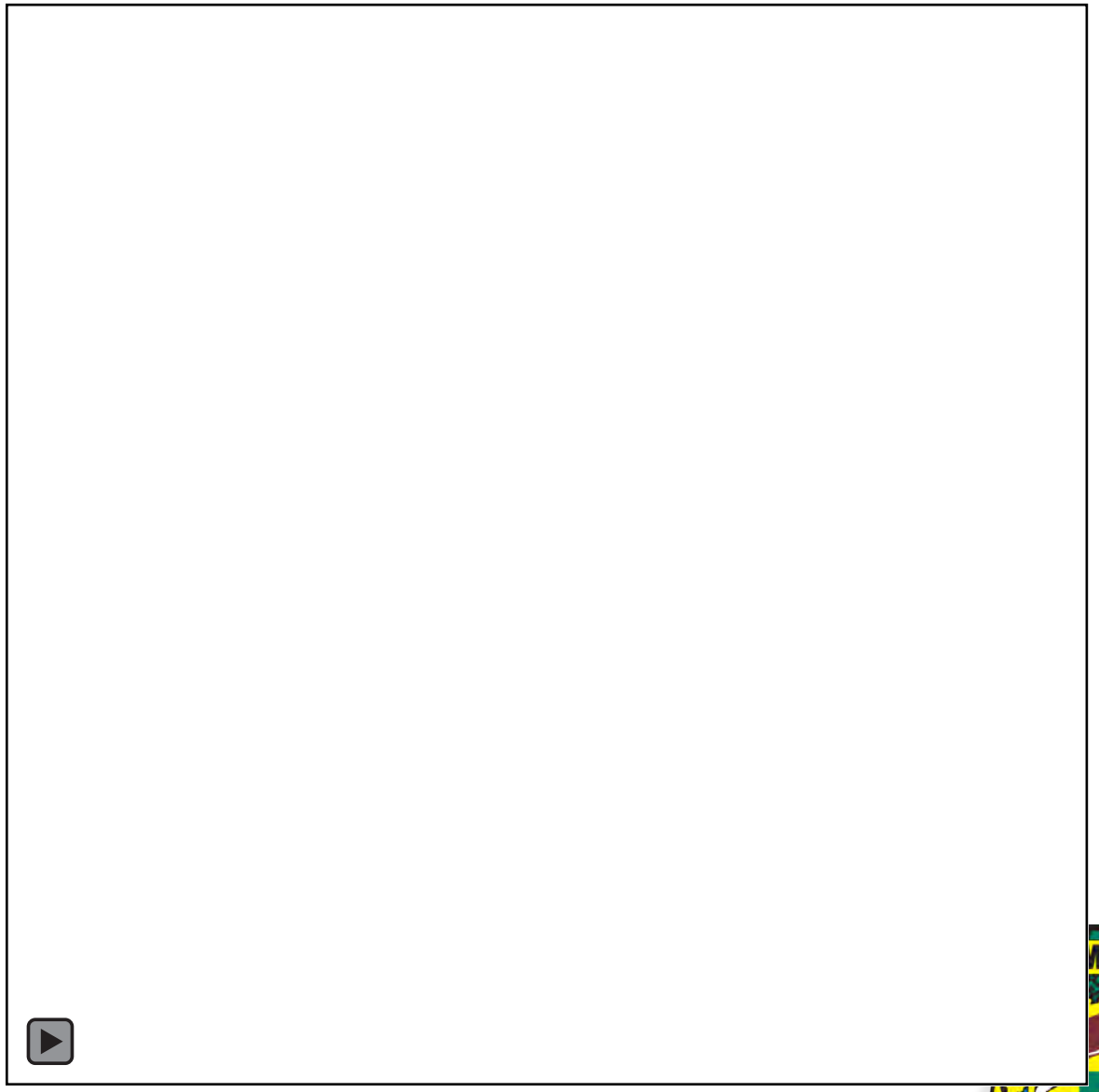
Eastern Mallard Research

- Vermont
  - 2022: 8 Transmitters
  - 2023: 13 Transmitters and 16 Geolocators
  - 2024 (so far): 1 Transmitter and 6 Geolocators

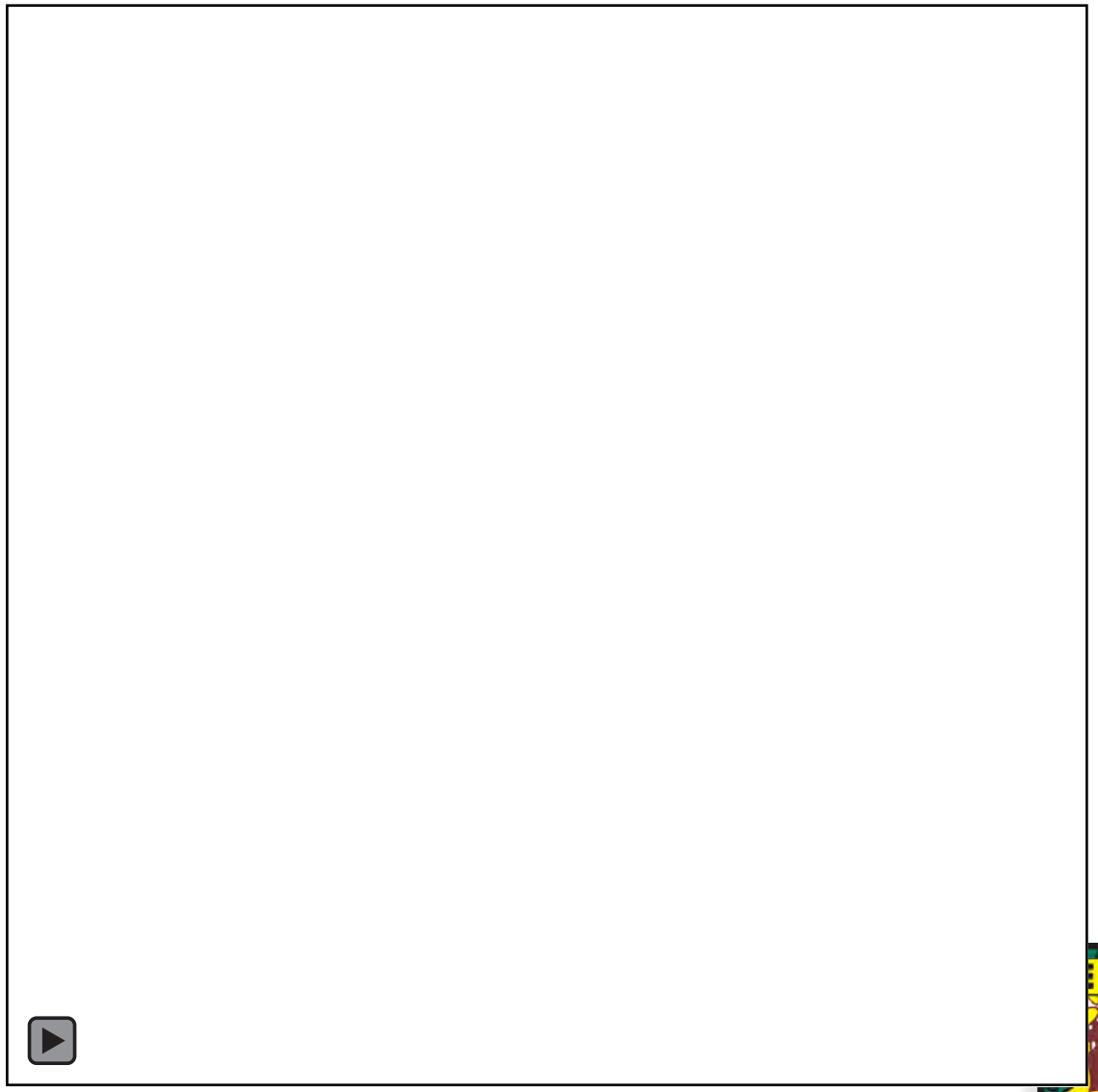
Eastern Mallard Research

- Objectives:
  1. Understand breeding, survival, and habitat usage of eastern mallards
  2. Quantify and compare female mallard movements and habitat use throughout the annual cycle for mallards in eastern Canada vs. the Northeast United States
  3. Understand eastern mallard movement timing as it relates to population surveys and banding efforts
  4. Assess competition between black ducks and mallards (linking to a sister project with ~450 units on black ducks)
  5. Understand the fate of broods
  6. Identify priority habitat for conservation or management actions

2022 Fall Mallard Movements



Nesting Mallard in Adirondacks

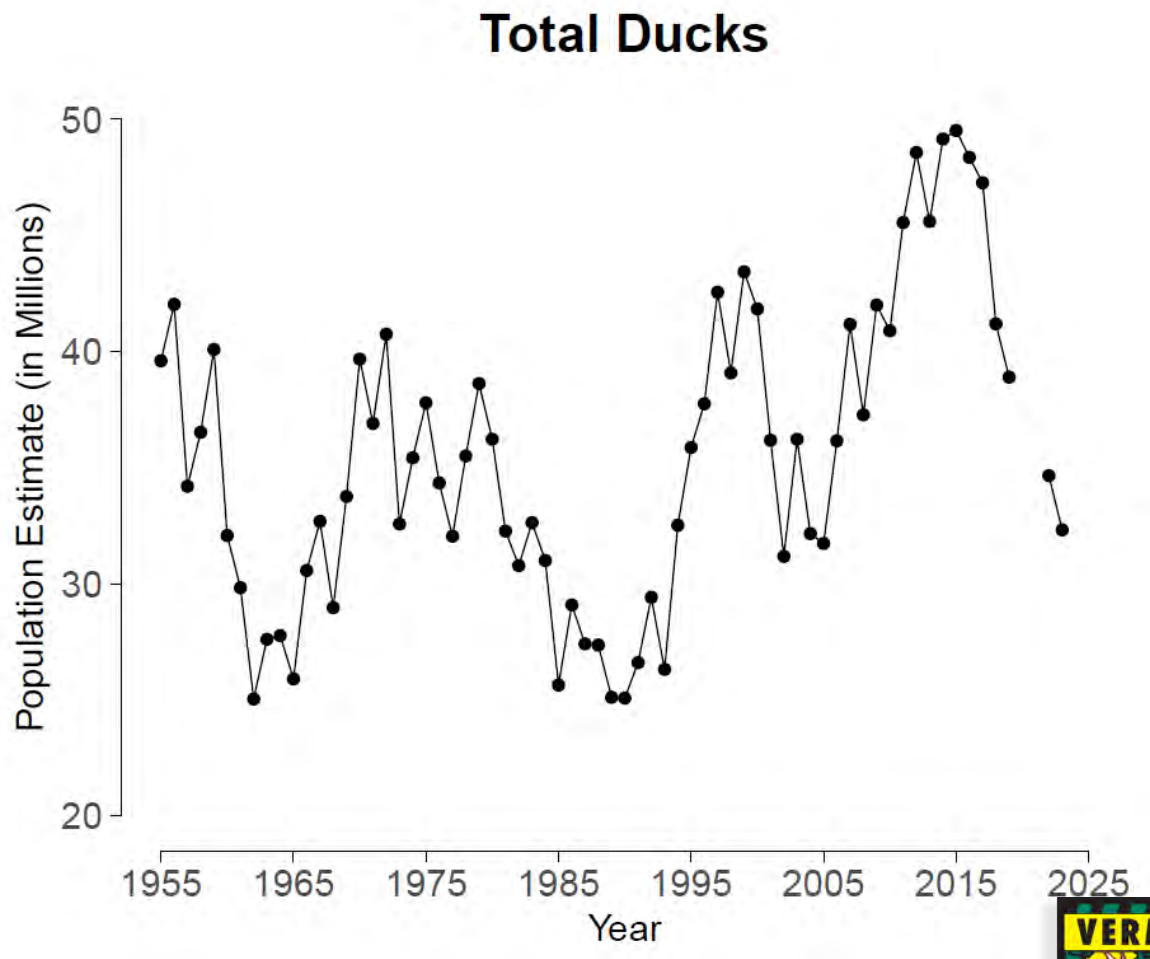


Avian influenza in Vermont

- Is still around and does not look like it is going away like past strains
- In the last 3 months:
  - 1 backyard flock depopulated
  - 3 reported die offs of Canada Geese awaiting results
  - 2 red-tailed hawks and 1 bobcat awaiting confirmation

Duck Breeding Populations in Eastern Survey Areas

- 2023 breeding habitat conditions ranged from fair to excellent
- Mallard breeding pop. in AF decreased by 4% from 2022 and remains 6% below long-term avg.
- Total duck breeding pop. est. Decreased by 7% from 2022 and is 9% below the long-term avg. in the traditional survey area.



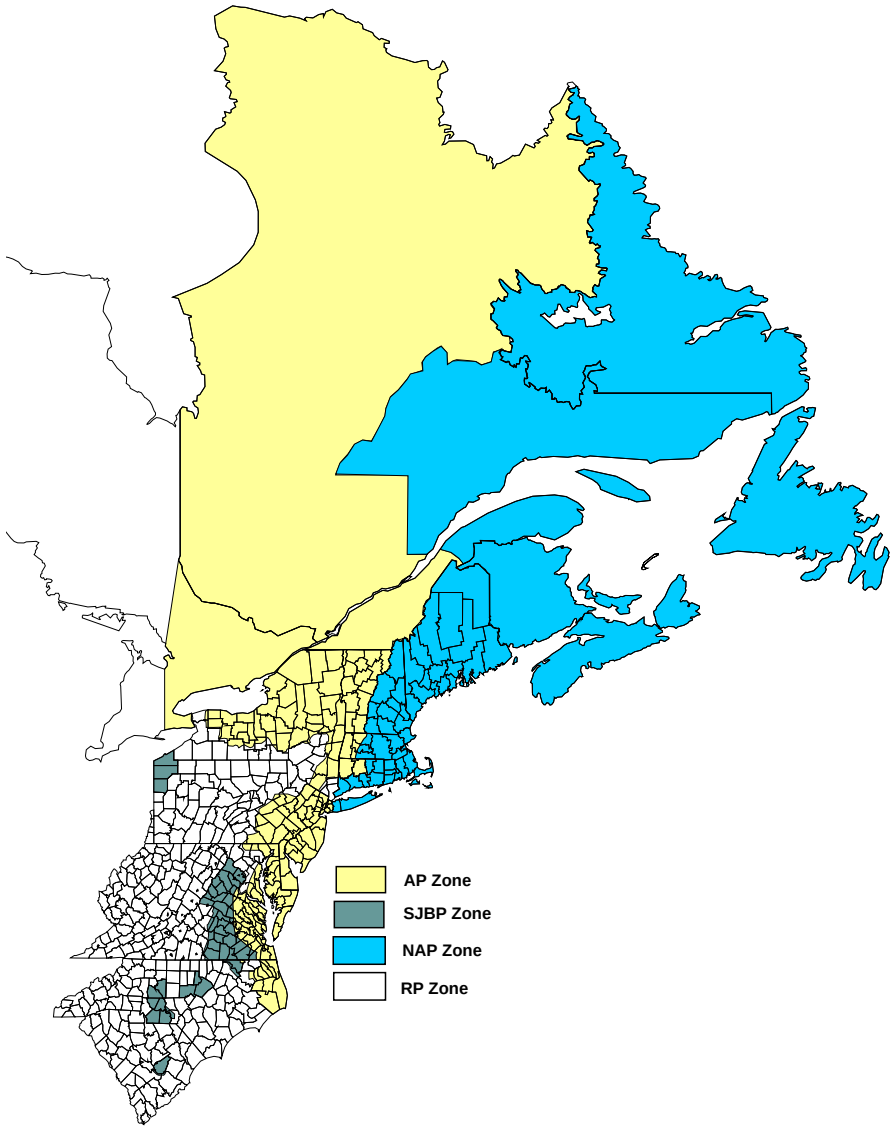
Vermont Waterfowl Production 2023

- Wood duck breeding population 5,021
- Mallard breeding population 22,945
- Banding efforts and survey results indicated that the resident goose population is down
- Good brood rearing cover in early spring. We got heavy rains in mid summer which flooded a lot of lowland areas, opening up a lot of areas for ducks to utilize during brood rearing and fall migration
- Fall duck banding was successful at 3 banding sites (over 900 total new bands)

Canada Goose Harvest Zones in the Atlantic Flyway

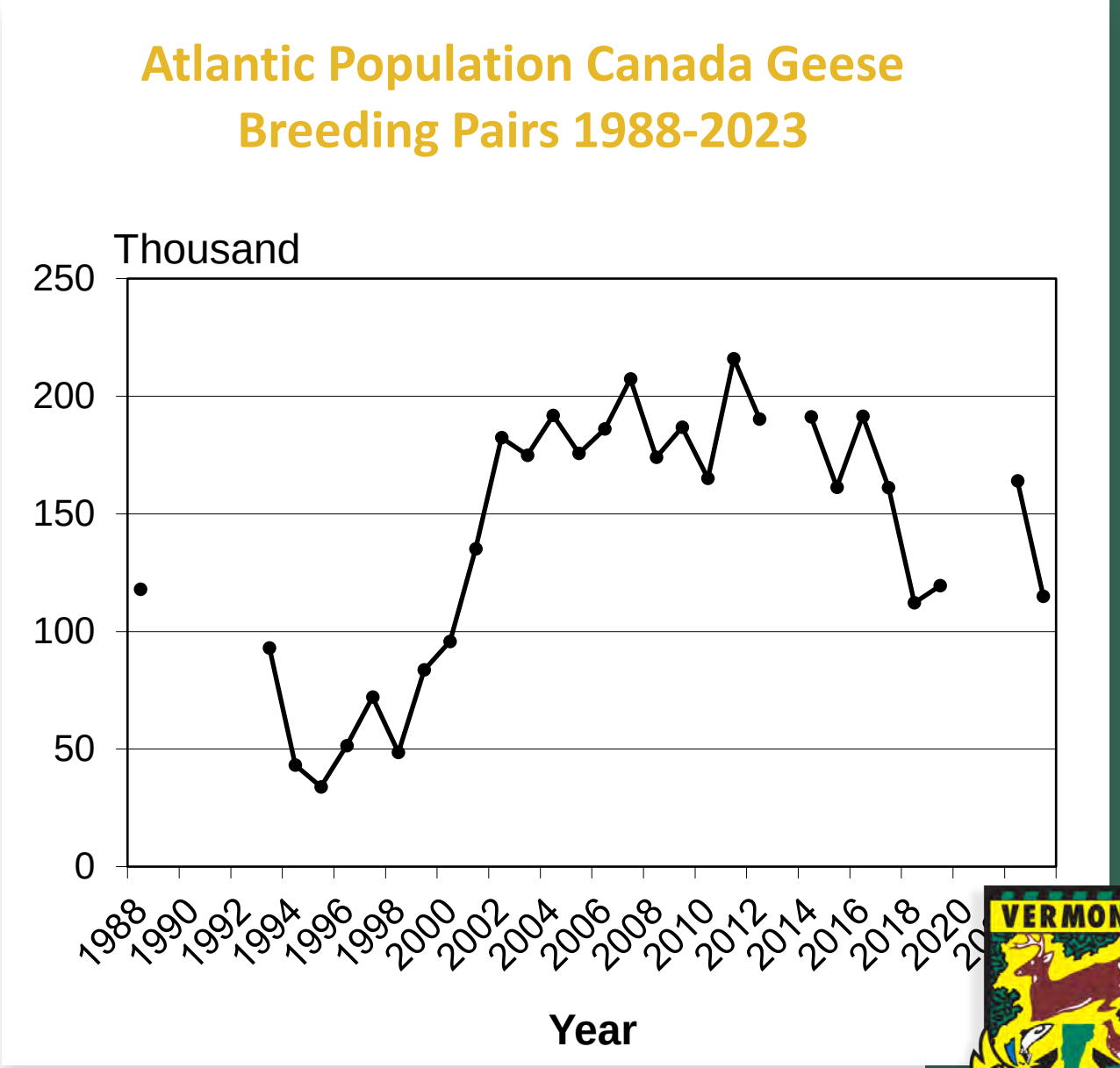
Three Subpopulations

- Atlantic Population
- North Atlantic Population
- Resident



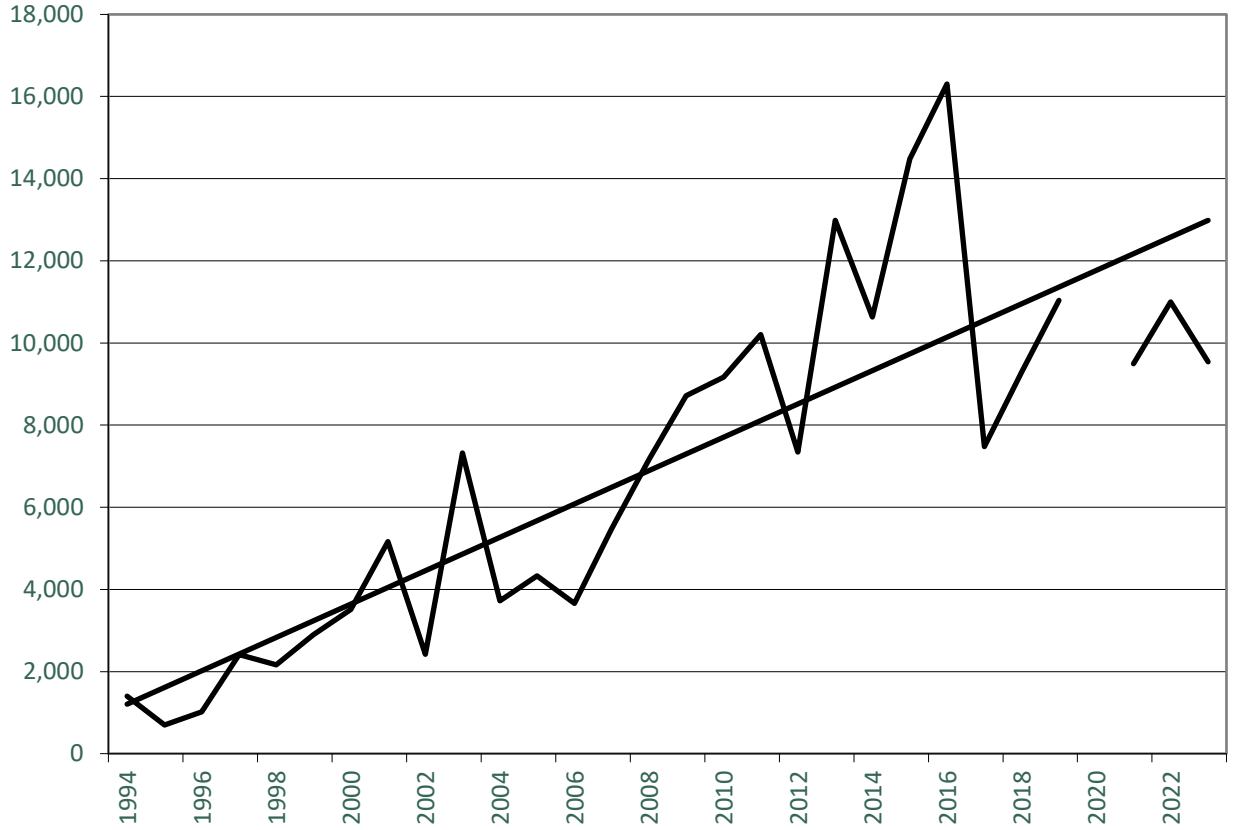
Atlantic Population Canada Geese Breeding pairs 1988-2023

~115,000 Breeding Pairs



Vermont Resident Canada Goose Breeding Pair Estimates

~9538 Breeding Pairs



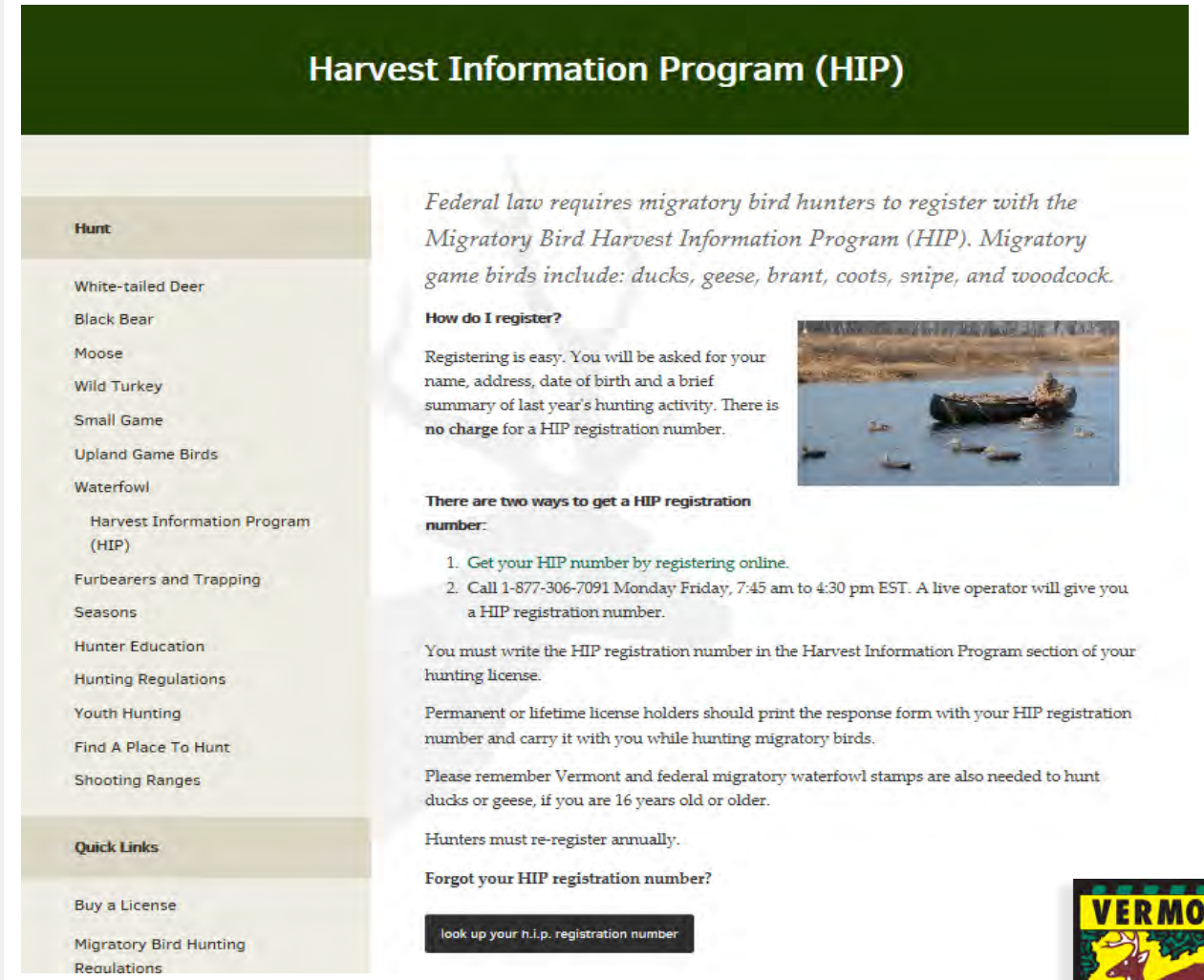
Vermont Waterfowl Hunting and Harvest Data Comparisons

	No. of Active Adult Duck Hunters	Average Seasonal Duck Bagged Per Hunter	Total Season Estimated Duck Harvest	Total Season Estimated Canada Goose Harvest	Total Season Estimated Snow Goose Harvest	Vermont Duck Stamp Sales
2012	2,100	10.0	20,500	8,600	34	5,882
2013	4,000	8.0	31,900	9,600	0	6,436
2014	2,600	6.8	17,800	12,300	46	6,635
2015	2,800	5.8	14,700	6,733	30	6,244
2016	3,400	5.2	17,600	8,800	0	6,016
2017	2,500	7.9	19,900	15,900	0	5,954
2018	2,100	7.8	16.200	7,400	0	5,725
2019	3,000	6.1	18,100	5,600	0	5,620
2020	2,200	9.0	19,900	11,800	116	6,089
2021	2,000	6.4	11,500	5,600	0	6,111
2022	1,900	7.8	14,500	15,683	107	5,956
2023	Not Available	Not Available	Not Available	Not Available	Not Available	6,067

Hunter Harvest Estimates

Three main methods

- Hunter Information Program
- Parts Collection Survey
- Hunter Diaries



Vermont Duck Stamp Fund

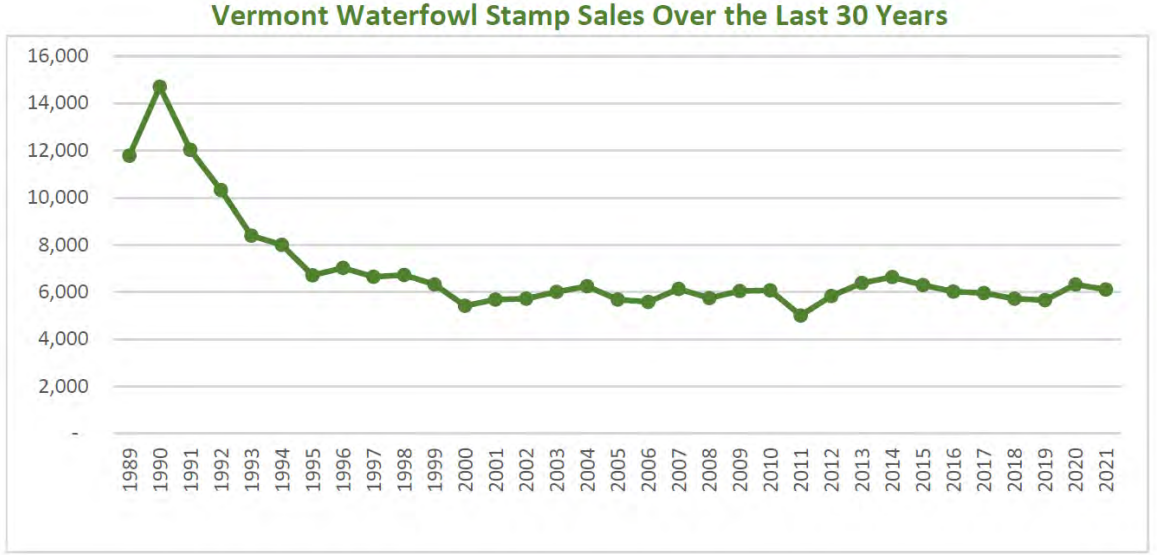
Established by Legislature in 1985

First Duck Stamp in 1986

Raised Over $6 million

Spent Over $3 million on Projects

Completed Over 99 Projects involving more than 12,000 acres



Controlled Hunting Areas 2024

Mud Creek Controlled Hunt Area

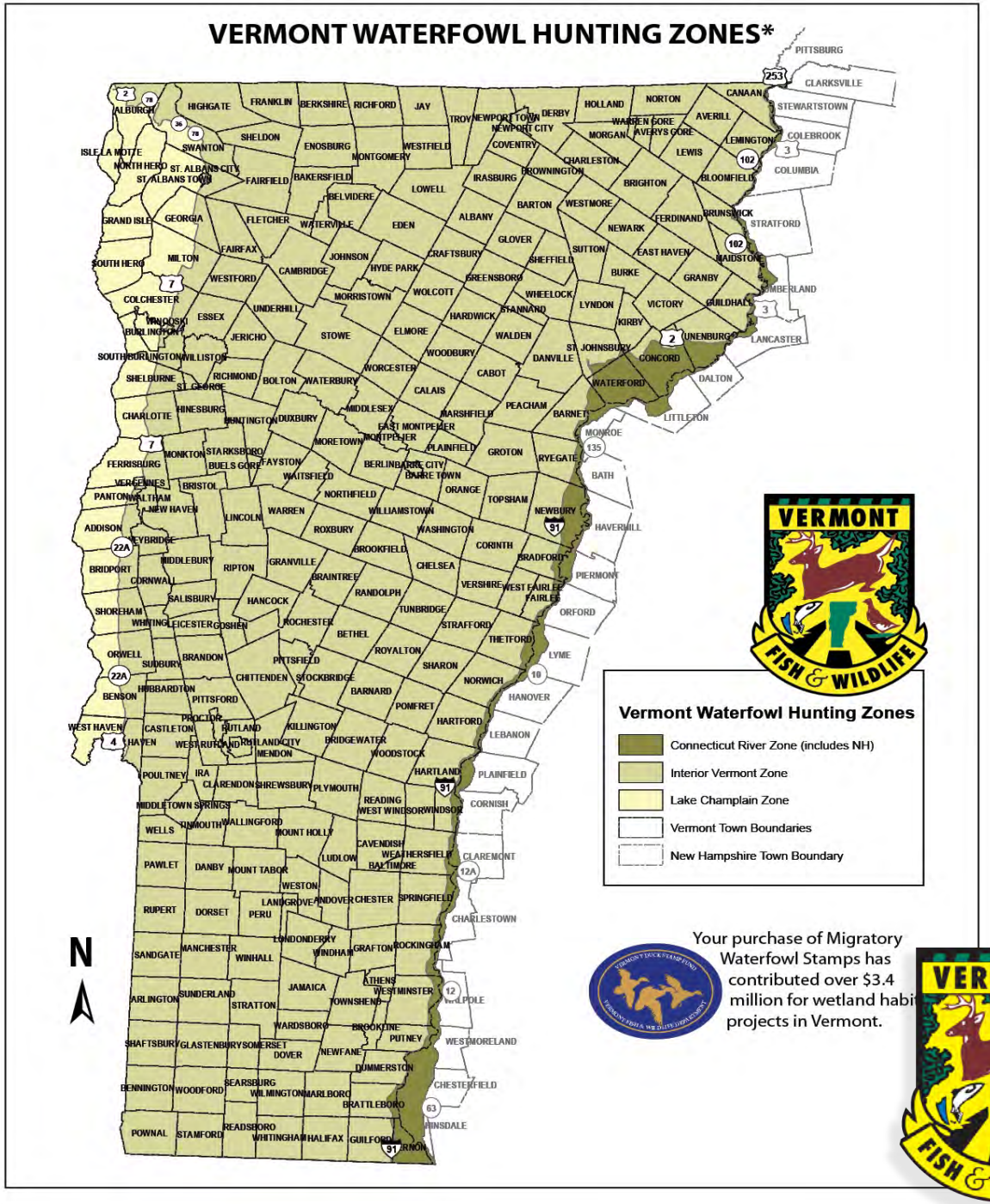
- Tuesday, Thursday & Saturday
- First two hunting days by lottery and blinds will be assigned
- Self registration after first two days

Dead Creek Goose Management Area

- Tuesdays and Thursdays (and Friday, Oct. 18)
- 5 Hunting Zones
- Hunters supply their own blinds
- All sites are by lottery and zones will be assigned
- All hunting is self registration beginning 1.5 hours prior to shooting

Vermont Waterfowl Hunting Zones

- Lake Champlain Zone (LCZ)
  - Shared with NY set by VT
- Interior Vermont Zone (IVZ)
  - Wholly in VT
- Connecticut River Zone (CRZ)
  - Shared with NH set by NH



Guidelines for Duck Zone and Split Seasons

- Rules apply only for the regular duck season.
- Once a zone and split option is selected during an open season, it must remain in place for the following 5 years.
- Next chance to change zones is in 2025
- If changes are made during the rules open season, the zone and split-season configuration must conform to one of the following options:
  (1) No more than four zones with no splits,
  (2) Split seasons (no more than 3 segments) with no zones, or
  (3) No more than three zones with the option for 2-way (2-segment) split seasons in one, two, or all zones.

2024 Hunting Seasons and Bag Limit Recommendations

Woodcock Season Recommendation

Federal Framework:

Season Length: 45 days

Outside Dates: Sept. 13- Jan. 31

Daily Bag limit: 3/day

Recommendation:

Dates: Sept. 28 – Nov. 11

Daily Bag Limit: 3/day

Snipe Season Recommendation

Federal Framework:

Season Length: 107 days
Outside Dates: Sept. 1- Jan. 31
Daily Bag Limit: 8/day

Recommendation:

Length: 45 days
Dates: Sept. 28 – Nov. 11
Daily Bag Limit: 8/day

September Early Resident Canada Goose Hunting Season Recommendations

Federal Framework:

Season Length: 25 days

Outside Dates: Sept 1-25

Limit: 15/day

Recommendation:

LCZ, IVZ and CRZ

Dates: Sept. 1 - 25

Daily Bag Limit: 8/day LCZ and IVZ

5/day CRZ

Migratory AP Canada Goose Hunting Season

Federal Framework:

Season Length: 45 days
Outside Dates: Oct. 10 – Feb. 5
Daily Bag Limit: 3/day

Recommendation:

LCZ and IVZ
Dates: Oct. 12 – Nov. 25
Daily Bag Limit: 3/day

Late Resident Canada Goose Hunting Season Recommendations

Federal Framework:

Season Length: 77 days
Outside Dates: Dec. 1 – Feb. 15
Daily Bag Limit: 5/day

Recommendation:

LCZ and IVZ
Dates: Dec. 1 – Jan. 6
Daily Bag Limit: 5/day LCZ and IVZ

Greater Snow Goose Hunting Season

Federal Framework:

Season Length: 107 days
Outside Dates: Oct. 1 – March 10
Daily Bag Limit: 25/day

Recommendation:

Dates: Oct. 1 - Dec. 31, 2024
Feb. 24 – Mar. 10, 2025
Mar. 11 – Apr. 27, 2025(CO)
Daily Bag Limit: 25/day Regular
15/day CO
Possession limit: No limit

Atlantic Brant Hunting Season Recommendation

Federal Framework:

Season Length: 30 days
Outside Dates: Sept. 23 – Jan. 31
Daily Bag Limit: 1/day

Recommendation:

LCZ and IVZ
Dates: Oct. 12 – Nov. 10
Daily Bag Limit: 1/day

Jim McKnight

Youth Waterfowl Hunting Days

Federal Framework:

Season Length: 2 days
Outside Dates: Within 2 weeks of either end of the allowable hunting days

Recommendation:

LCZ, IVZ, and CRZ
Dates: Sept. 28 & 29
Legal Species: Ducks, geese, mergansers, and coots.

Other Requirements:

Youth hunter must be accompanied by an adult at least 18 years old, Adult may assist in calling, setting decoys, retrieving downed birds

Duck Hunting Season Recommendations

Federal Frameworks:

Season length: 60 days
Outside Dates: Sept. 21 – Jan. 31
Daily Bag Limit: 6/day

Recommendation:

Season Dates:
IVZ: Oct. 5 – Dec. 3
LCZ: Oct. 5 – Oct. 13
Nov. 9 – Dec. 29
Daily Bag Limit: 6/day

Daily bag may include no more than**,** 4 Mallards (2 hens), 3 Wood Ducks, 2 Canvasback, 2 Redheads, 1/40 & 2/20 Scaup, 1 Pintail, 2 Black Duck, 4 Sea Ducks (No more than 3 Scoters, 3 Eiders (1 hen), 3 Long-tailed duck, and no Harlequin).

Merganser Hunting Season Recommendations

Federal Frameworks:

Season length: 60 days
Outside Dates: Sept. 21 – Jan. 31
Daily Bag Limit: 5/day

Recommendation:

Season Dates:
IVZ: Oct. 5 – Dec. 3
LCZ: Oct. 5 – Oct. 13
Nov. 9 – Dec. 29
Daily Bag Limit: 5/day

Falconry Season

Recommendation:

Season Dates: Coincides with established seasons for each migratory bird species.

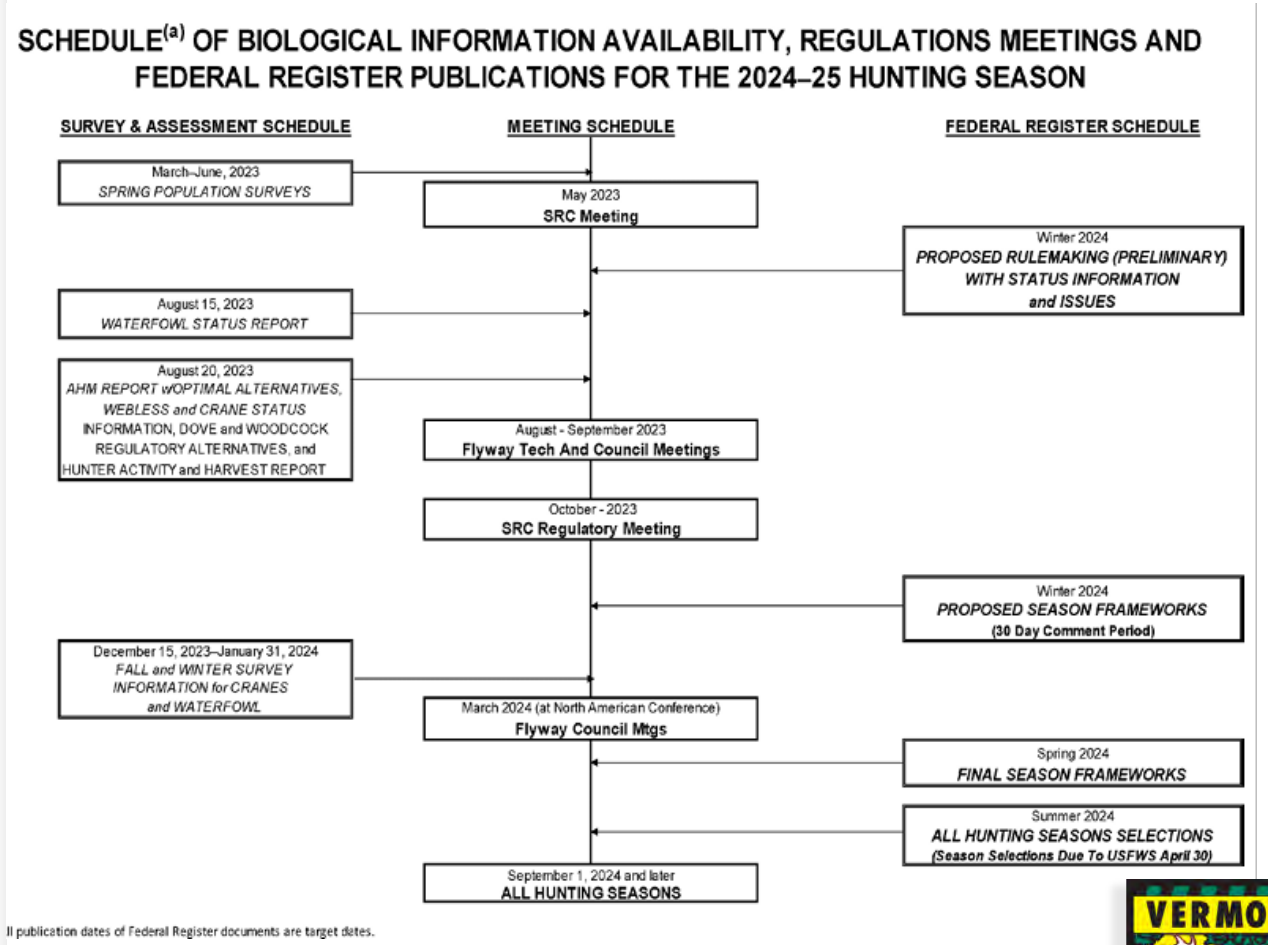
Legal Species: All legal migratory game bird species which have a current open season in Vermont (woodcock, snipe, ducks, geese, mergansers, and coots)

Shooting Hours: Same as established open seasons for each migratory game bird species.

Bag Limit: Three (3) migratory game birds; singly or in an aggregate of species, but not to exceed established restrictions which currently exist.

Regulation Setting/Next Steps

- Presentation to Board (Feb 2024)
- FW Board 1st Vote Feb. 21
- Rulemaking Process (Feb. – April 2024)
  - Post Online and Publish in Newspapers (Feb. 2024)
  - Hold Public Hearings (in-person and video posted on website, March 2024)
  - Final FW Board Vote (April 2024)
  - Commissioner signs off on season selection (April)
  - Submitted to USFWS by April 30, 2024
  - Posted in federal register
- Release of Syllabus August 2024



Questions?

2024
Migratory Game Bird Season Recommendations

to the

Vermont Fish and Wildlife Board

Vermont Fish and Wildlife Department
Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3208
802-828-1000

2024 MIGRATORY GAME BIRD SEASON PREVIEW

Summary of Issues for Consideration:

The majority of Vermont's waterfowl season is driven by the federal framework for the Atlantic Flyway. Below are a few issues that must be decided for the 2024 hunting season. The Department would like the Board to consider the following:

- Hold the liberal season allowed under the federal framework related to season lengths and daily bag limits.
- For the 2024 Duck Season.
    - Open the 2024 duck season on a Saturday, October 5.
    - Interior Zone: October 5 and run through December 3.
    - Lake Champlain Zone: October 5 – Oct. 13 and Nov. 9 - Dec. 29.

- For the 2024 Goose Seasons
    - Open the resident Canada goose season September 1st and continue through September 25.
    - Open the migratory Canada goose season on October 12 and run through November 25.
    - Open the late resident Canada goose on December 1, 2024. End the season on January 6, 2025. Allow a five-bird daily bag limit. Within the Lake Champlain and Interior zones.
    - Open the Snow goose season on October 1.
- Hold youth hunting weekend – September 28-29.
- Open the Atlantic Brant season on Oct. 12 and run through Nov. 10
- Hold woodcock/snipe season: September 28- November 11.

2024 Waterfowl and Migratory Game Bird Season Proposals:

The Department makes these 2024 recommendations based on comments received from waterfowl hunters the past seven years, data collected on availability of various waterfowl species in Vermont, including eBird, internal discussions among Vermont Wildlife Biologists and State Game Wardens, and frameworks provided by the USFWS.

Table 1.

2024-2025 WATERFOWL SEASON RECOMMENDATION

LAKE CHAMPLAIN ZONE

	SEASON TYPE	SEASON LENGTH	INCLUSIVE DATES	DAILY LIMIT	POSSESSION LIMIT
DUCKS *	Split	60 Days	Oct. 5 – Oct. 13 & Nov. 9 - Dec. 29	6	18
SCAUP*	Split	20 Days	Oct. 5–Oct. 13/Nov. 9–Nov.. 19	2	6
	Hybrid	40 Days	Nov. 20 – Dec. 29	1	3
MERGANSERS *	Split	60 Days	Oct. 5 - Oct. 13 & Nov. 9 - Dec. 29	6	18
COOTS	Split	60 Days	Oct. 5 - Oct. 13 & Nov. 9 - Dec. 29	15	45
GEESE					
Canada Geese	Straight	25 Days	Sept. 1 - Sept. 25	8	24
	Straight	45 Days	Oct. 12 – Nov. 25	3	9
	Straight	37 Days	Dec. 1 – Jan. 6	5	15
Snow Geese *					
	Split	107 Days	Oct. 1 - Dec.31, 2024 Feb. 24 – Mar. 10, 2025	25	NONE
	Straight (CO)		Mar. 11 – Apr. 20, 2025	15	NONE
Brant	Straight	30 Days	Oct. 12 – Nov. 10	1	3

SHOOTING HOURS - All Waterfowl - All Days - ½ hour before sunrise to sunset

CO: Conservation Order
* Includes blue geese also.

Table 2.

2024-2025 WATERFOWL SEASON RECOMMENDATION

VERMONT INTERIOR ZONE

	SEASON TYPE	SEASON LENGTH	INCLUSIVE DATES	DAILY LIMIT	POSSESSION LIMIT
DUCKS *	Straight	60 Days	Oct. 5 - Dec. 3	6	18
SCAUP*	Straight	20 Days	Oct. 5 – Oct. 24	2	6
		40 Days	Oct. 25 – Dec. 3	1	3
MERGANSERS *	Straight	60 Days	Oct. 5 - Dec. 3	6	18
COOTS	Split	60 Days	Oct. 5 - Dec. 3	15	45
GEESE					
Canada Geese	Straight	25 Days	Sept. 1 - Sept. 25	8	24
	Straight	45 Days	Oct. 12 – Nov. 25	3	9
	Straight	37 Days	Dec. 1 – Jan. 6	5	15
Snow Geese *	Straight	107 Days	Oct. 1 - Dec.31, 2024 Feb. 24 – Mar. 10, 2025	25	NONE
	Straight (CO)		Mar. 11 – Apr. 20, 2025	15	NONE
Brant	Straight	50 Days	Oct. 12 – Nov. 10	1	3

SHOOTING HOURS - All Waterfowl - All Days - ½ hour before sunrise to sunset

CO: Conservation Order
* Includes blue geese also.

Table 3.

2024-2025 VERMONT MIGRATORY GAME BIRD HUNTING SEASONS
(regulations in effect September 1, 2024 through April 27, 2025)

Species	Lake Champlain Zone	Interior Vermont Zone	Connecticut River Zone
Ducks, Coots and Mergansers	**Oct. 5 – Oct. 13** **Nov. 9 – Dec. 29**	**Oct. 5 – Dec. 3**	**Oct. ? – Nov. ?** **Nov. ? – Dec. ?**
Canada Geese	**Sept. 1 – Sept. 25** **Oct. 12 – Nov. 25** **Dec. 1 – Jan. 6**	**Sept. 1 – Sept. 25** **Oct. 12 – Nov. 25** **Dec. 1 – Jan. 6**	**Sept. ? – Sept. ?** **Oct. ? – Nov. ?** **Nov. ? – Dec. ?**
Snow Geese **(includes blue geese)**	**Oct. 1 - Dec. 31, 2024** **Feb. 24 - Mar. 10, 2025** **Mar. 11 – Apr 20, 2025**	**Oct. 1 - Dec. 31, 2024** **Feb. 24 - Mar. 10, 2025** **Mar. 11 – Apr 20, 2025**	**Oct. ? – Dec. ?**
Brant	**Oct. 12 – Nov. 10**	**Oct. 12 – Nov. 10**	**Oct. ? – Oct. ?**
Woodcock	**Statewide**	**Sept. 28 – Nov. 11**	
Snipe	**Statewide**	**Sept. 28 – Nov. 11**	

Youth Waterfowl Hunting Weekend – September 28 & 29

BAG LIMITS

The daily bag limit is the maximum number of birds of each species that any person may take (or possess in the field) during any one day. The possession limit is three times the daily bag limit for all waterfowl species except snow geese.

Species	Daily Limit	Possession Limit
Ducks *	6	18
Mergansers	6	18
Coot	15	45
Canada Geese		
September season		
Lake Champlain Zone	8	24
Interior Vermont Zone	8	24
Connecticut River Zone	5	15
Oct. - Nov. season		
Lake Champlain Zone	3	9
Interior Vermont Zone	3	9
Connecticut River Zone	2	6
Dec. – Jan. season		
Lake Champlain Zone	5	15
Interior Vermont Zone	5	15
Snow Geese	25	No limit
Mar. 11 – Apr. 20, 2025	15	No limit
Brant	1	3
Woodcock	3	9
Snipe	8	24

* The daily limit of 6 ducks may include no harlequin, and no more than 4 mallards (only 2 of which may be hens), 2 black ducks, 3 wood ducks, 1 pintail, 2 canvasbacks, 2 redheads, 2 or 1 scaup depending on dates, 3 Sea ducks including no more than 3 scoters, 3 eiders (1 of which may be a hen), and 3 long-tailed duck.

Background On Waterfowl Season Setting and Management:

Migratory game bird managers currently base the migratory bird population estimates and recommendations on predictions derived from long-term biological information and harvest strategies instead of current year surveys. In 2018 the Atlantic Flyway region implemented a Multi-Stock Adaptive Harvest Management Strategy based on a suite of four duck species that represent the population dynamics and various habitat types used by waterfowl throughout the flyway, in lieu of relying solely upon the status of eastern mallards. The four species include green-winged teal, common goldeneye, ring-necked duck, and wood ducks. These species compose more than 40% of the harvest within the flyway and supply a sufficient time series of estimates of annual abundance, harvest rates and harvest to monitor population trends. This was necessary because one species, the mallard, was driving all the seasons, which had an effect on multiple species. Within this system, species of concern such as mallard and black duck are evaluated separately with an assessment under the adaptive harvest management strategies developed for the target species. The objectives are to sustain duck populations for all and to allow harvest where appropriate. The estimates allow for a liberal season of 60 days with a 6-bird bag limit. Species specific bag limits follow their respective harvest strategies, with the majority of species bag limits being the same as last year.

Tables 4 and 5 provide background information on past migratory game bird hunting seasons. Table 4 shows the hunting seasons approved during 2023 and is provided as a reference while considering bag limits and the seasons frameworks for 2024. Appendix B provides the history, 1942-2023, of Vermont's waterfowl seasons broken down into season type, season length, dates, and bag limits. This may help one's understanding of how Vermont arrived at our current zones and season types.

Table 5 provides a historic look at waterfowl hunter participation and estimated harvest levels, Vermont waterfowl stamps sold, and the number of individuals that registered with the Harvest Information Program (HIP). HIP is a method used to generate more reliable estimates of hunting activity and number of all migratory game birds harvested. The HIP program numbers include youth and adult waterfowl hunters, woodcock, and snipe hunters. Only adult waterfowl hunters, 16 years of age and older, are required to purchase the state waterfowl stamp. The Department will populate the remaining portions of the table this summer after the USFWS examines wings collected randomly from last season's hunters and harvest estimates are completed.

Vermont currently has three waterfowl zones (Figure 1):

- Lake Champlain Zone that we share with New York. Vermont sets the dates for this zone.
- Interior Zone that is entirely within Vermont.
- Connecticut River Zone that we share with New Hampshire. New Hampshire sets the dates for this zone as an extension of their inland zone.

Under Vermont's current three zones, Vermont can split any zone once to create two hunting segments. Vermont currently has sixty days to divide between the two segments in an effort to accommodate the diverse desires of the variety of Vermont waterfowl hunters. The zones were also set up to take into consideration the differences in the physiographic regions of the state and

the climatic differences each has. Federal regulations allow for zone and split changes every five years. Vermont's next opportunity to adjust zone boundaries and splits is in 2025. Any changes will take effect in the 2026-2031 season and be in effect for 5-years.

2024 Migratory Game Bird Seasons:

Tables 6 and 7 provide the expected USFWS season frameworks for the 2024 duck and goose seasons, respectively, the latter including other migratory game birds as well. Potential changes from 2023 hunting seasons are shown on Table 4.

2024 Duck Season: The 2024 duck season options allow the opportunity to utilize a 60-day season within the dates of September 21, 2024 to January 31, 2025. The allowed daily bag limit is six birds, with species specific limits listed on Table 6. Vermont may allow a possession limit of 18 ducks total. The Board may be more restrictive on the length of the season and bag limits if desired, but the Board cannot set regulations more liberal. The Department recommends taking the liberal hunting option allowed under the federal framework.

The Board has also traditionally held the youth waterfowl weekend the last weekend in September. The Department has withheld any fishing tournament permits for that weekend to reduce conflicts between anglers and youth waterfowlers. The youth weekend must be within 14 days of either end of the federal framework dates.

2024 Goose, Brant, Mergansers, Coots. Snipe, and Woodcock Seasons: Table 7 lays out the season options for geese, brant, mergansers, coots, snipe, and woodcock. The available season lengths, outside dates for the seasons, daily bag limits and possession limits are broken down by species.

We often receive requests to open the migratory Canada goose season in early October. We are not allowed to open the season on migratory Canada geese until October 10th to reduce hunting pressure on the Atlantic population that is flying through the state. Prior to 2010 we were unable to open the season until October 20th. This change came about because of efforts pursued by Vermont and some other New England states. Breeding pairs in 2023 totaled 115,000 decreasing from 2022's total of 164,000 a decrease of 30%. The integrated population model predicts that breeding pairs will increase to 147,500 in 2024.

The Brant Hunt Plan and Harvest Strategy were revised in 2020. The revised plan uses an Integrated Population Model (IPM) to generate a prediction of the brant population. This model prediction will be used in place of the mid-winter survey estimate to determine the annual hunting season recommendation. Advantages of the IPM are that the population estimate is available in the summer, prior to the regulatory flyway meeting and federal register framework publication. In addition, estimates provided by the IPM are less variable than the MWS and will likely result in fewer changes to hunting packages over time. The model prediction for 2024 is 107,000 brant, and the harvest strategy recommends a 30-day season with a 1-bird daily bag limit, which is changed from last year.

2024 Youth Waterfowl Hunting Days: The Department and Board may select two days per duck-hunting zone, designated as ‘‘Youth Waterfowl Hunting Days,’’ in addition to the regular duck seasons. The days must be held outside any regular duck season on a weekend, holiday, or other non-school days when youth hunters would have the maximum opportunity to participate. The days may be held up to 14 days before or after any regular duck-season frameworks or within any split of a regular duck season, or within any other open season on migratory birds. The daily bag limits may include ducks, geese, mergansers, and coots, and would be the same as those allowed in the regular season. Flyway species and area restrictions would remain in effect.

States are allowed to use their established definition of age for youth hunters. However, youth hunters may not be 18 years of age or older. In addition, an adult at least 18 years of age must accompany the youth hunter into the field. This adult may not duck hunt but may participate in other seasons that are open on the special youth day. Youth hunters 16 years of age and older must possess a Federal Migratory Bird Hunting and Conservation Stamp (also known as Federal Duck Stamp). In 2016 Vermont changed the youth waterfowl hunters age to 17 and younger. Vermont also requires all hunters 16 years of age and older to have a state duck stamp. In some years, the end of the resident Canada goose season overlaps the youth waterfowl hunting weekend. This will not occur in our proposal for 2024 Youth Hunting Weekend, Saturday and Sunday, September 28th and 29th.

Special Falconry Regulations: Falconry is a permitted means of taking migratory game birds in any State meeting Federal falconry standards in 50 CFR 21.29. These States may select an extended season for taking migratory game birds in accordance with the following:
Extended Seasons: For all hunting methods combined, the combined length of the extended season, regular season, and any special or experimental seasons must not exceed 107 days for any species or group of species in a geographical area. Each extended season may be divided into a maximum of 3 segments. Framework Dates: Seasons must fall between September 1 and March 10.

Daily Bag Limits: Falconry daily bag limits for all permitted migratory game birds must not exceed 3 birds, singly or in the aggregate, during extended falconry seasons, any special or experimental seasons, and regular hunting seasons in all States, including those that do not select an extended falconry season.

Regular Seasons: General hunting regulations, including seasons and hunting hours, apply to falconry in each State listed in 50 CFR 21.29. Regular season bag limits do not apply to falconry. The falconry bag limit is not in addition to gun limits.

Vermont has traditionally run the falconry season during any open migratory game bird season. Last year falconers had the opportunity to begin on September 1st with the resident Canada goose season and hunt through January 21st. A three-bird daily bag limit was in effect.

In summary, the proposed 2024 waterfowl and migratory bird hunting regulations were made based on the following information:

- Decide when to open the season. Based on comments from previous years, many hunters prefer the season to open earlier when the temperatures are warmer and they can still pursue early migrating species like blue-winged teal.
-
- In the past the state has held opening day on alternating Wednesdays and Saturdays. The Department recommends moving away from this model to an all Saturday model to provide the most opportunity for the most hunters.
- Decide which zones to propose for splits and in which seasons. "Goose hunters in the Lake Champlain zone, regardless of residency, chose straight season more than split seasons. For the Interior Vermont zone, Vermont residents chose straight seasons most commonly for duck and goose seasons".
- Decide on the length of the Lake Champlain Zone split. In comments from previous years many hunters preferred to run the season later in the year which results in a longer split between segments.

Legal Framework for Hunting Season Decision

Beginning in 2015 the Board was given authority by Legislature to set the migratory bird hunting regulations by procedure instead of rule. Part of Title 10 § 4082 reads:

(b)(1) Except as provided for under subdivision (2) of this subsection, the Board annually may adopt rules relating to the management of migratory game birds and shall follow the procedures for rulemaking contained in 3 V.S.A. chapter 25. For each such rule, the Board shall conduct a hearing but, when necessary, may schedule the hearing for a day before the terms of the rule are expected to be determined.

(2) Beginning with the 2015 hunting season, the Board may set by procedure the daily bag and possession limits of migratory game birds that may be harvested in each Waterfowl Hunting Zone annually without following the procedures for rulemaking contained in 3 V.S.A. chapter 25. The annual daily bag and possession limits of migratory game birds shall be consistent with federal requirements. Prior to setting the migratory game bird daily bag and possession limits, the Board shall provide a period of not less than 30 days of public notice and shall conduct at least two public informational hearings. The final migratory game bird daily bag and possession limits shall be enforceable by the Department under its enforcement authority in part 4 of this title.

For your information, included below is the segment of the federal register that pertains to establishing zones and splits. The information below only applies to the regular duck season.

Federal Register** /Vol. 84, No. 199 /Tuesday, October 15, 2019 / Proposed Rules **55126-27
Guidelines for Duck Zones and Split Seasons
The following zone and split-season guidelines apply only for the regular duck season:
(1) A zone is a geographic area or portion of a State, with a contiguous boundary, for which independent dates may be selected for the regular duck season.
(2) Consideration of changes for management-unit boundaries is not subject to the guidelines and provisions governing the use of zones and split seasons for ducks.

(3) Only minor (less than a county in size) boundary changes will be allowed for any grandfathered arrangement and changes are limited to the open season.
(4) Once a zone and split option is selected during an open season, it must remain in place for the following 5 years.
Any State may continue the configuration used in the previous 5-year period. If changes are made, the zone and split-season configuration must conform to one of the following options:
(1) No more than four zones with no splits,
(2) Split seasons (no more than 3 segments) with no zones, or
(3) No more than three zones with the option for 2-way (2-segment) split seasons in one, two, or all zones.
Grandfathered Zone and Split Arrangements
When we first implemented the zone and split guidelines in 1991, several States had completed experiments with zone and split arrangements different from our original options. We offered those States a one-time opportunity to continue (''grandfather'') those arrangements, with the stipulation that only minor changes could be made to zone boundaries. If any of those States now wish to change their zone and split arrangement:
(1) The new arrangement must conform to one of the 3 options identified above; and
(2) The State cannot go back to the grandfathered arrangement that it previously had in place.
Management Units
We will continue to utilize the specific limitations previously established regarding the use of zones and split seasons in special management units, including the High Plains Mallard Management Unit. We note that the original justification and objectives established for the High Plains Mallard Management Unit provided for additional days of hunting opportunity at the end of the regular duck season. In order to maintain the integrity of the management unit, current guidelines prohibit simultaneous zoning and/or 3-way split seasons within a management unit and the remainder of the State. Removal of this limitation would allow additional proliferation of zone and split configurations and compromise the original objectives of the management unit.

Eastern Mallard Collaborative Research Project:

Atlantic Flyway states are conducting a regional study of the eastern mallard population. Vermont is participating and is deploying 2 GSM/GPS units and 15 geolocators in 2024. The project aims to annually deploy 600 GSM/GPS units on female mallards in Eastern Canada and the Northeastern United States to answer several important questions about mallard movements, productivity, and biases within our banded sample. Specifically, the project proposes the following objectives:

1) Quantify and compare reproductive metrics such as reproductive attempts, full-term incubation, and brood-rearing between mallards in the Northeastern US and Eastern Canada, and the extent to which behavior and weather explains variation in reproductive metrics.
    a. Use proportion of stationary behavior from ACC data and daily displacement from GPS data to infer nesting attempts and success
    b. Develop detailed time activity budgets of mallard behavior throughout the annual cycle at the sub-population scale

    c. Explore the extent to which behavior and weather patterns (precipitation, temperature, winter severity) influence reproductive success both directly and through cross-seasonal effects
2) Estimate seasonal survival rates of female mallards in Eastern Canada vs. Northeastern US
3) Quantify and compare female mallard movements and habitat use and selection throughout the annual cycle in the Northeastern US and Eastern Canada
    a. Understand mallard movements during the pre-season banding window to better inform implications for pre-season banding data analyses.
4) Characterize habitat-use and selection of mallards and black ducks throughout the annual cycle.

New York and Pennsylvania have secured internal funding to support much of the project but solicited in-kind and financial support from other flyway states, federal and Canadian partners to reach marking sampling goals/distribution and fully fund the project. The project has begun deployments of GSM and geolocator units during the winter of 2023-2024, coinciding with the American black duck joint venture project.

During the 2022-2023 capture period Vermont placed out 13 GSM/GPS units and 15 geolocators attached to yellow tarsal bands at three locations within the Champlain Valley from February 1st to March 15th.

Public Input and Outreach:

The Department, in conjunction with the Board, is currently planning to hold two public hearings in 2024. Meetings are tentatively planned for the week of March 11th in Ticonderoga, NY and Essex Junction District office conference room, as well as a recording to be posted on the Department website, beginning at 6:30pm. During the hearings, the Department will review the season options, recommendations, current biological information, answer questions, and record public comments for the Board. The public will be encouraged to submit comments through email or a recorded phone line. Hearing times and website posting locations will be advertised on the Department website and through news releases.

After the Board approves final season dates and bag limits (scheduled for April 3, 2024 Board meeting), the Department will submit selections to the U.S. Fish and Wildlife Service by April 30th and the information will be sent to a printer for production of the 2024 syllabus of state and federal hunting regulations. The early decision deadlines allow the Department to have the syllabus available to the public in print version by August 1st, a full month prior to any migratory bird hunting season. Approved seasons will be placed on the Department's website within days after the Board's vote.

The Department is developing a new survey to send out to waterfowl hunters in Vermont (statewide) and New York (those that hunt the Lake Champlain Zone) during spring 2024. This survey will be sent to a broad spectrum of waterfowl hunters in hopes of obtaining an accurate representation of all waterfowl hunters. The goal of this survey is to obtain preferences and opinions about waterfowl seasons for use in the season setting process.

Table 4. 2023 Migratory Bird Hunting Seasons

2023-2024 VERMONT MIGRATORY GAME BIRD HUNTING SEASONS
(regulations in effect September 1, 2023 through April 26, 2024)

Species	Lake Champlain Zone	Interior Vermont Zone	Connecticut River Zone
Ducks, Coots and Mergansers	**Oct. 7 – Oct. 11** **Nov. 4 – Dec. 28**	**Oct. 7 – Dec. 5**	**Oct. 5 – Nov. 3** **Nov. 22 – Dec. 21**
Canada Geese	**Sept. 1 – Sept. 25** **Oct. 14 – Nov. 27** **Dec. 1 – Jan. 6**	**Sept. 1 – Sept. 25** **Oct. 14 – Nov. 27** **Dec. 1 – Jan. 6**	**Sept. 1 – Sept. 25** **Oct. 5 – Nov. 3** **Nov. 22 – Dec. 21** **Dec. 22 – Jan. 6**
Snow Geese **(includes blue geese)**	**Oct. 1 - Dec. 31, 2023** **Feb. 27 - Mar. 10, 2024** **Mar.11 – Apr 26, 2024**	**Oct. 1 - Dec. 31, 2023** **Feb. 27 - Mar. 10, 2024** **Mar. 11 – Apr 26, 2024**	**Oct. 5 – Dec. 21** **Mar.11 – Apr 26, 2024 (applies to land, not CT River waters)**
Brant	**Oct. 14 – Nov. 12**	**Oct. 14 – Nov. 12**	**Oct. 5 – Nov. 3**
Woodcock	**Statewide**	**Sept. 30 – Nov. 13**	
Common Snipe	**Statewide**	**Sept. 30 – Nov. 13**	

Youth Waterfowl Hunting Weekend – September 23 & 24

BAG LIMITS

The daily bag limit is the maximum number of birds of each species that any person may take (or possess in the field) during any one day. The possession limit is three times the daily bag limit for all waterfowl species except snow geese.

Species	Daily Limit	Possession Limit
Ducks *	6	18
Mergansers	5	15
Coot	15	45
Canada Geese		
September season		
Lake Champlain Zone	8	24
Interior Vermont Zone	8	24
Connecticut River Zone	5	15
Oct. - Nov. season		
Lake Champlain Zone	3	9
Interior Vermont Zone	3	9
Connecticut River Zone	2	6
Dec. – Jan. season		
Lake Champlain Zone	5	15
Interior Vermont Zone	5	15
Connecticut River Zone	5	15 (Vermont land portions only)
Snow Geese	25	No limit
Mar. 11 – Apr. 23, 2023	15	No limit
Brant	1	3
Scaup*		
Lake Champlain Zone		
Oct. 7 - Oct. 11 & Nov. 4 - Dec. 8	1	3
Dec. 9 - Dec. 28	2	6
Interior Vermont Zone		
Oct. 7 – Nov. 15	1	3
Nov. 16 - Dec. 5	2	6
Connecticut River Zone		
Oct. 5 - Nov. 3	1	3
Nov. 22 - Dec. 21	1	3
Woodcock	3	9
Common Snipe	8	24

* The daily limit of 6 ducks may include no harlequin, and no more than 4 mallards (only 2 of which may be hens), 2 black ducks, 3 wood ducks, 1 pintail, 2 canvasbacks, 2 redheads, 2 or 1 scaup depending on dates, 4 sea ducks (including no more than 3 scoters, 3 eiders, and 3 long-tailed ducks..

Table 5. Vermont Waterfowl Hunting and Harvest Data Comparisons (Lake Champlain and Interior Vermont Zones Combined)

	Federal Duck Stamp Sales	Vermont Duck Stamp Sales	Vermont HIP Registration	No. of Active Adult Duck Hunters	Average Seasonal Duck Bagged Per Hunter	Total Season Estimated Duck Harvest	Total Season Estimated Canada Goose Harvest	Total Season Estimated Snow Goose Harvest
1999	4,542	6,320		1,600	11.9	25,000	4,100	1,700
2000	4,741	5,418		1,700	10.4	17,700	3,600	4,200
2001	4,824	5,685		1,700	10.4	17,600	4,300	2,200
2002	5,201	5,722		2,600	9.6	26,800	7,100	1,300
2003	5,242	6,012		1,300	12.6	16,300	3,600	3,400
2004	4,723	6,242		2,600	9.3	24,300	7,100	1,700
2005	4,956	5,682		2,400	10.6	25,400	9,300	400
2006	3,391	5,581		2,000	9.9	19,600	7,800	100
2007	3,193	6,137		2,300	9.2	16,700	6,300	500
2008	3,391	5,746	⇧$5-$7.50	2,900	11.9	34,800	12,300	2,100
2009	not available	6,051		2,400	10.7	25,500	11,500	90
2010	not available	6,065 Last Stamp	5,404***	2,700	8.5	22,900	9,600	0
2011	not available	4,872 First Tag	4,949***	2,600	9.0	23,000	8,300	134
2012	not available	5,882	6,283***	2,100	10.0	20,500	8,600	34
2013	not available	6,436	8,719***	4,000	8.0	31,900	9,600	0
2014	not available	6,635	9,913***	2,600	6.8	17,800	12,300	46
2015	not available	6,244	11,122***	2,600	5.8	14,700	6,733	0
2016	not available	6,016	18,598***	3,400	5.2	17,600	8,800	0
2017	not available	5,954	7,006***	2,500	7.9	19,900	15,900	0
2018	not available	5,725	10,541***	2,100	7.8	16,200	7,400	0
2019	not available	5,620	10,359***	3,000	6.1	18,100	5,600	0
2020	not available	6,089	10,123***	2,200	9.0	19,900	11,800	116
2021	not available	6,111	10,236***	2,000	6.4	12,700	6,182	0
2022	not available	5,956	10,088***	1900	7.8	14,500	15,683	107
2023	Not available	6067	9,581***	To Date Not Available	To Date Not Available	To Date Not Available	To Date Not Available	To Date Not Available

*** Includes youth hunters and woodcock/snipe hunters

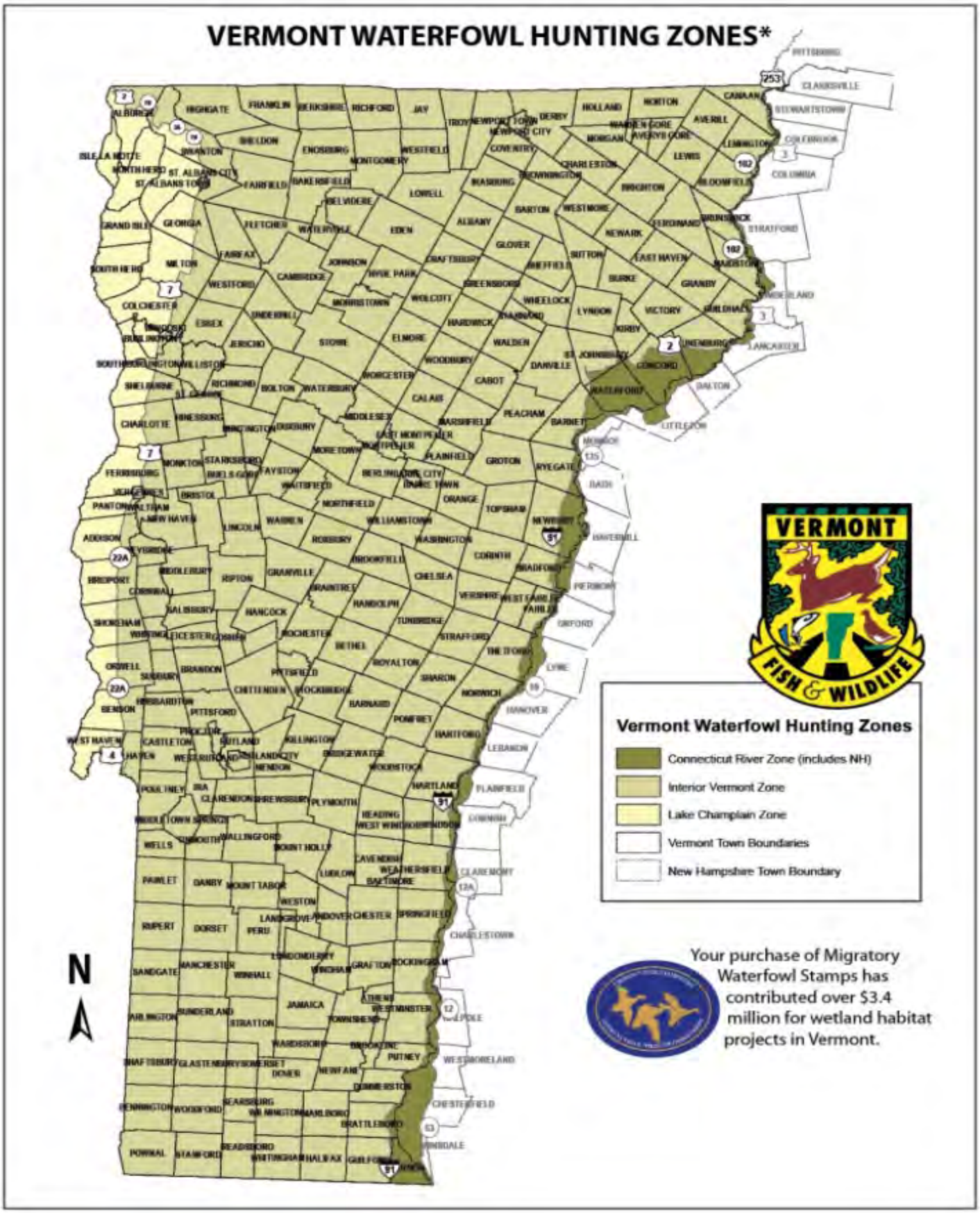


Figure 1. Vermont waterfowl hunting zones

Table 6. USFWS Framework for 2024 Duck Seasons*

LENGTH	OUTSIDE DATES	DAILY BAG	POSSESSION LIMIT**
60 Days	Sept. 21 – Jan. 31	6	18

SPECIES RESTRICTIONS -	Daily Bag
MALLARD	4 (only 2 hens)
WOOD DUCK	3
BLACK DUCK	2
PINTAIL	1
REDHEAD	2
SCAUP	2/day for 20-days 1/day for 40-days
SCOTER	3
EIDERS	3 (only 1 hen)
LONG-TAILED DUCK	3
CANVASBACK	2
HARLEQUIN	CLOSED
MOTTLED DUCK	1
FULVOUS WHISTLING DUCK	1
HOODED MERGANSER	6

* Apply to Lake Champlain, Interior Vermont, and Connecticut River Zones.

** Possession limit is equal to three times the daily bag limit for these species.

*** Four total sea ducks in aggregate, with species specific limits, (no more than 3-scoters, 3-eiders (1hen), or 3-long tailed ducks)

SHOOTING HOURS - ½ HOUR BEFORE SUNRISE TO SUNSET (all days – all species)

Table 7. USFWS Framework for 2024 Geese, Brant, Merganser, Coot, Snipe, and Woodcock Seasons

SPECIES	SEASON LENGTH	OUTSIDE DATES	DAILY BAG	POSSESSION LIMIT**
Canada Geese (No more than 107 days combined)				
Resident	25 days	Sept. 1 – Sept. 25	15	45
Regular	45 days	Oct. 10 – Feb. 5	3	9
Resident	77 days	Dec. 1 – Feb. 15	5	15
Snow & Blue Geese	107 days	Oct. 1 – Mar. 10	25	NONE
Brant	30 days	Sept. 23 – Jan. 31	1	3
Mergansers*	60 days	Sept. 23 – Jan. 31	6	18
Coots**	60 days	Sept. 23 – Jan. 31	15	45
Snipe	107 days	Sept. 1 – Jan. 31	8	24
Woodcock	45 days	Sept. 13 – Jan. 31	3	9

* Season length for mergansers equals season option chosen for ducks. Mergansers may be included as part of the daily duck bag, in which case the limit would be 6 mergansers/day.

** Season length for coots equals season option chosen for ducks.

SHOOTING HOURS - ½ HOUR BEFORE SUNRISE TO SUNSET (all days – all species)

APPENDIX A

2024 FALL CALENDAR

JANUARY						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

FEBRUARY						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	1	2	3
4	5	6	7	8	9	10

MARCH						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
26	27	28	29	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

APRIL						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5
6	7	8	9	10	11	12

MAY						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

JUNE						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
1	2	3	4	5	6	7

JULY						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

AUGUST						
Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

	SEPTEMBER								OCTOBER						
	Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**		**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
	26	**27**	**28**	**29**	**30**	**31**	**1**		**30**	**1**	**2**	**3**	**4**	**5**	**6**
	2	**3**	**4**	**5**	**6**	**7**	**8**		**7**	**8**	**9**	**10**	**11**	**12**	**13**
	9	**10**	**11**	**12**	**13**	**14**	**15**		**14**	**15**	**16**	**17**	**18**	**19**	**20**
	16	**17**	**18**	**19**	**20**	**21**	**22**		**21**	**22**	**23**	**24**	**25**	**26**	**27**
	23	**24**	**25**	**26**	**27**	**28**	**29**		**28**	**29**	**30**	**31**	**1**	**2**	**3**
	30	**1**	**2**	**3**	**4**	**5**	**6**		**4**	**5**	**6**	**7**	**8**	**9**	**10**
	NOVEMBER								**DECEMBER**						
	Mo	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**		**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**	**Su**
	28	**29**	**30**	**31**	**1**	**2**	**3**		**25**	**26**	**27**	**28**	**29**	**30**	**1**
	4	**5**	**6**	**7**	**8**	**9**	**10**		**2**	**3**	**4**	**5**	**6**	**7**	**8**
	11	**12**	**13**	**14**	**15**	**16**	**17**		**9**	**10**	**11**	**12**	**13**	**14**	**15**
	18	**19**	**20**	**21**	**22**	**23**	**24**		**16**	**17**	**18**	**19**	**20**	**21**	**22**
	25	**26**	**27**	**28**	**29**	**30**	**1**		**23**	**24**	**25**	**26**	**27**	**28**	**29**
	2	**3**	**4**	**5**	**6**	**7**	**8**		**30**	**31**	**1**	**2**	**3**	**4**	**5**

APPENDIX B

Vermont Waterfowl Seasons				
YEAR	**SEASON TYPE**	**SEASON LENGTH**	**SEASON DATES**	**GENERAL BAG LIMIT**
1942	Straight	70	Sept. 26 – Dec. 4	10-20
1943	Straight	70	Sept. 25 – Dec. 3	10-20
1944	Straight	80	Sept. 20 – Dec. 8	10-20
1945	Straight	80	Sept. 20 – Dec. 8	7-14
1946	Straight	45	Oct. 5 – Nov. 18	7-14
1947	Straight	30	Oct. 21 – Nov. 19	3-6
1948	Straight	30	Oct. 15 – Nov. 13	3-6
1949	Straight	40	Oct. 21 – Nov. 29	3-6
1950	Straight	40	Oct. 20 – Nov. 28	3-6
1951	Straight	45	Oct. 12 – Nov. 25	3-6
1952	Straight	55	Oct. 7 – Nov. 11	3-6
1953	Straight	60	Oct. 5 – Dec. 3	3-6
1954	Straight	60	Oct. 10 – Dec. 8	3-6
1955	Straight	70	Oct. 5 – Dec. 13	3-6
1956	Straight	70	Oct. 5 – Dec. 13	3-6
1957	Straight	70	Oct. 10 – Dec. 18	3-6
1958	Straight	60	Oct. 10 – Dec. 8	3-6
1959	Straight	50	Oct. 10 – Nov. 28	3-6
1960	Straight	50	Oct. 7 – Nov. 25	3-6
1961	Straight	40	Oct. 14 – Nov. 22	3-6
1962	Straight	40	Oct. 12 – Nov. 20	3-6
1963	Split	45	Oct. 11 – Oct. 27 / Nov. 11 – Dec. 8	3-6
1964	Straight	50	Oct. 10 – Nov. 28	3-6
1965	Straight	50	Oct. 16 – Dec. 4	3-6
1966	Straight	55	Oct. 8 – Dec. 1	3-6
1967	Split	45	Oct. 7 – Nov. 4 / Nov. 25 – Dec. 10	3-6
1968	Straight	50	Oct. 12 – Nov. 30	3-6
1969	Straight	50	Oct. 11 – Nov. 29	3-6
1970	Straight	50	Oct. 10 – Nov. 28	4-8
1971	Straight	50	Oct. 9 – Nov. 27	4-8
1972	Split	50	Oct. 7 – Oct. 15 / Oct. 28 – Dec. 7	4-8
1973	Split	45	Oct. 6 – Oct. 21 / Nov. 3 – Dec. 1	4-8
1974	Straight	50	Oct. 9 – Nov. 27*	4-8
1975	Straight	50	Oct. 8 – Nov. 26*	4-8
1976	Straight	50	Oct. 6 – Nov. 24*	4-8
1977	Straight	50	Oct. 5 – Nov. 23*	4-8
1978	Straight	50	Oct. 4 – Nov. 22*	4-8
1979	Split	50	Oct. 3 – Oct. 14 / Oct. 27 – Dec. 3*	4-8
1980	Straight	50	Oct. 8 – Nov. 26*	4-8
1981	Straight	50	Oct. 10 – Nov. 28*	4-8

Vermont Waterfowl Seasons – Page 2

YEAR	SEASON TYPE	SEASON LENGTH	SEASON DATES	GENERAL BAG LIMIT
1982	Split	50	Oct. 2 – Oct. 10 / Oct. 16 – Nov. 25*	5-10
1983	Split	50	Oct. 8 – Oct. 16 / Oct. 22 – Dec. 1*	5-10
1984	Straight	50	Oct. 10 – Nov. 28*	5-10
1985	Zoned**	40	Oct. 9 – Oct. 13 / Oct. 26 – Nov. 29 (LCZ)* Oct. 9 – Nov. 17 (IVZ)	5-10 5-10
1986	Zoned**	40	Oct. 8 – Oct. 12 / Oct. 25 – Nov. 28 (LCZ)* Oct. 8 – Nov. 16 (IVZ)	5-10 5-10
1987	Zoned**	40	Oct. 7 – Oct. 11 / Oct. 24 – Nov. 27 (LCZ)* Oct. 7 – Nov. 15 (IVZ)	4-8 4-8
1988	Zoned/Split	30	Oct. 8 – Oct. 23 / Nov. 24 – Dec. 7 (LCZ)* Oct. 8 – Oct. 30 / Nov. 24 – Nov. 30 (IVZ)	3-6 3-6
1989	Zoned/Split	30	Oct. 11 – Oct. 29 / Nov. 23 – Dec. 3 (LCZ) Oct. 11 – Nov. 5 / Nov. 23 – Nov. 26 (IVZ)	3-6 3-6
1990	Zoned/Split	30	Oct. 10 – Oct. 21 / Nov. 15 – Dec. 2 (LCZ) Oct. 10 – Nov. 4 / Nov. 22 – Nov. 25 (IVZ)	3-6 3-6
1991	Zoned/Split	30	Oct. 12 – Oct. 27 / Nov. 23 – Dec. 6 (LCZ) Oct. 12 – Nov. 3 / Nov. 25 – Dec. 1 (IVZ)	3-6 3-6
1992	Zoned/Split	30	Oct. 7 – Oct. 11 / Nov. 7 – Dec. 1 (LCZ) Oct. 7 – Nov. 1 / Nov. 26 – Nov. 29 (IVZ)	3-6 3-6
1993	Zoned/Split	30	Oct. 20 – Nov. 7 / Nov. 25 – Dec. 5 (LCZ) Oct. 13 – Nov. 7 / Nov. 25 – Nov. 28 (IVZ)	3-6 3-6
1994	Zoned/Split	40	Oct. 15 – Nov. 6 / Nov. 19 – Dec. 5 (LCZ) Oct. 8 – Nov. 9 / Nov. 21 – Nov. 27 (IVZ)	3-6 3-6
1995	Zoned/Split	50	Oct. 11 – Oct. 22 / Nov. 4 – Dec. 11 (LCZ) Oct. 4 – Nov. 12 / Nov. 18 – Nov. 27 (IVZ)	4-8 4-8
1996	Zoned/Split	50	Oct. 9 – Oct. 20 / Nov. 2 – Dec. 9 (LCZ) Oct. 2 – Nov. 11 / Nov. 23 – Dec. 1 (IVZ)	5-10 5-10
1997	Zoned**	60	Oct. 4 – Oct. 19 / Oct. 25 – Dec. 7 (LCZ) Oct. 4 – Dec. 2 (IVZ)	4-8*** 4-8***
1998	Zoned**	60	Oct. 7 – Oct. 11 / Oct. 17 – Dec. 10 (LCZ) Oct. 7 – Dec. 5 (IVZ)	6-12 6-12
1999	Zoned**	60	Oct. 6 – Oct. 11 / Oct. 23 – Dec. 15 (LCZ) Oct. 6 – Dec. 4 (IVZ)	6-12 6-12
2000	Zoned/Split	60	Oct. 7 – Oct. 9 / Oct. 21 – Dec. 16 (LCZ) Oct. 7 – Nov. 12 / Nov. 18 – Dec. 10 (IVZ)	6-12 6-12
2001	Zoned/Split	60	Oct. 10 – Oct. 14 / Oct. 20 – Dec. 13 (LCZ) Oct. 10 – Dec. 8 (IVZ) Oct. 2 – Nov. 4 / Nov. 21 – Dec. 16 (CRZ)****	6-12 6-12 6-12
2002	Zoned/Split	60	Oct. 9 – Oct. 13 / Oct. 22 – Dec. 15 (LCZ) Oct. 9 – Nov. 14 / Nov. 23 – Dec. 15 (IVZ) Oct. 2 – Nov. 5 / Nov. 27 – Dec. 21 (CRZ)****	6-12 6-12 6-12

Vermont Waterfowl Seasons – Page 3

YEAR	SEASON TYPE	SEASON LENGTH	SEASON DATES	GENERAL BAG LIMIT
2003	Zoned**	60	Oct. 11 - Oct. 13 / Oct. 25 - Dec. 20 (LCZ)	6-12
			Oct. 11 - Dec. 9 (IVZ)	6-12
			Oct. 7 - Nov. 9 / Nov. 26 - Dec. 21 (CRZ)****	6-12
2004	Zoned**	60	Oct. 6 - Oct. 10 / Oct. 23 - Dec. 16 (LCZ)	6-12
			Oct. 6 - Dec. 4 (IVZ)	6-12
			Oct. 5 - Nov. 14 / Nov. 24 - Dec. 12 (CRZ)****	6-12
2005	Zoned**	60	Oct. 5 – Oct. 10 / Oct. 26 – Dec. 18 (LCZ)	6-12
			Oct. 5 – Dec. 3 (IVZ)	6-12
			Oct. 4 – Nov.13/ Nov. 23 - Dec. 11 (CRZ)****	6-12
2006	Zoned**	60	Oct. 7- Oct. 15/ Oct. 25 - Dec. 14 (LCZ)	6-12
			Oct. 7 - Dec. 5 (IVZ)	6-12
			Oct. 3 - Nov. 5/ Nov. 22 - Dec. 17 (CRZ)****	6-12
2007	Zoned**	60	Oct. 10- Oct. 14/ Oct. 27 - Dec. 20 (LCZ)	6-12
			Oct. 10- Dec. 8 (IVZ)	6-12
			Oct. 3- Nov. 4/ Nov. 21 - Dec. 17 (CRZ)****	6-12
2008	Zoned**	60	Oct. 8- Oct. 12/ Oct. 25 - Dec. 18 (LCZ)	6-12
			Oct. 8- Dec. 6 (IVZ)	6-12
			Oct. 2- Nov. 2/ Nov. 23 - Dec. 20 (CRZ)****	6-12
2009	Zoned**	60	Oct. 10- Oct. 13/ Oct. 24 - Dec. 18 (LCZ)	6-12
			Oct. 10- Dec. 8 (IVZ)	6-12
			Oct. 6- Nov. 8/ Nov. 25 - Dec. 20 (CRZ)****	6-12
2010	Zoned**	60	Oct. 6-Oct. 10/Oct. 23 - Dec. 16 (LCZ)	6-12
			Oct. 6-Dec. 4 (IVZ)	6-12
			Oct. 5-Nov. 7/ Nov. 24 – Dec. 19 (CRZ)	6-12
2011	Zoned**	60	Oct. 12-Oct. 16/Oct. 29 - Dec. 22 (LCZ)	6-12
			Oct. 12-Dec 10 (IVZ)	6-12
			Oct. 4-Nov. 6/Nov. 23- Dec. 18 (CRZ)****	6-12
2012	Zoned**	60	Oct. 13-Oct. 17/Oct. 27 - Dec. 20 (LCZ)	6-12
			Oct. 13-Dec 11 (IVZ)	6-12
			Oct. 2-Nov. 4/Nov. 21- Dec. 16 (CRZ)****	6-12
2013	Zoned**	60	Oct. 9-Oct. 13/Oct. 26 - Dec. 19 (LCZ)	6-18
			Oct. 9-Dec 7 (IVZ)	6-18
			Oct. 2-Nov. 3/Nov. 19- Dec. 15 (CRZ)****	6-18
2014	Zoned**	60	Oct. 8-Oct. 12/Oct. 25- Dec. 18 (LCZ)	6-18
			Oct. 8-Dec. 6 (IVZ)	6-18
			Oct. 2-Nov. 2/Nov. 16- Dec. 13 (CRZ)****	6-18
2015	Zoned**	60	Oct. 10-Oct. 14/Oct. 24- Dec. 17 (LCZ)	6-18
			Oct. 10-Dec. 8 (IVZ)	6-18
			Oct. 6-Nov. 5/Nov. 15- Dec. 13 (CRZ)****	6-18
2016	Zoned**	60	Oct. 12-Oct. 16/Oct. 29- Dec. 22 (LCZ)	6-18
			Oct. 12-Dec. 10 (IVZ)	6-18
			Oct. 4-Nov. 6/Nov. 22- Dec. 22 (CRZ)****	6-18
2017	Zoned**	60	Oct. 11-Oct. 15/Nov. 7 - Dec. 31 (LCZ)	6-18
			Oct. 11-Dec. 9 (IVZ)	6-18
			Oct. 3-Nov. 5/Nov. 22- Dec. 17 (CRZ)****	6-18

2018	Zoned**	60	Oct. 13-Oct. 21/Nov. 10 - Dec. 30 (LCZ)	6-18
			Oct. 13-Dec. 11 (IVZ)	6-18
			Oct. 2-Nov. 4/Nov. 21- Dec. 16 (CRZ)****	6-18
2019	Zoned**	60	Oct. 10-Nov. 1/Nov. 23 - Dec. 29 (LCZ)	6-18
			Oct. 10-Dec. 8 (IVZ)	6-18
			Oct. 2-Nov. 3/Nov. 20- Dec. 16 (CRZ)****	6-18
2020	Zoned**	60	Oct. 10-Nov. 1/Nov. 21 - Dec. 27 (LCZ)	6-18
			Oct. 10-Dec. 8 (IVZ)	6-18
			Oct. 6-Nov. 8/Nov. 17- Dec. 12 (CRZ)****	6-18
2021	Zoned**	60	Oct. 13-Oct. 17/Oct. 30 - Dec. 23 (LCZ)	6-18
			Oct. 13-Dec. 11 (IVZ)	6-18
			Oct. 5-Nov. 7/Nov. 24- Dec. 19 (CRZ)****	6-18
2022	Zoned**	60	Oct. 15-Oct. 23/Oct. 29 – Dec. 18 (LCZ)	6-18
			Oct. 15-Dec. 13 (IVZ)	6-18
			Oct. 4-Nov. 6/Nov. 23 – Dec. 8 (CRZ)****	6-18
2023	Zoned**	60	Oct. 7-Oct. 11/Nov. 4 – Dec. 28 (LCZ)	6-18
			Oct. 7-Dec. 5 (IVZ)	6-18
			Oct. 5-Nov. 3/Nov. 22 – Dec. 21 (CRZ)****	6-18

* Regular season was followed by a 16-day special goldeneye/scaup season – 3-bird bag

** Lake Champlain Zone – Split Season
Interior Vermont Zone – Straight Season

*** Two teal (either blue-winged or green-winged) allowed in addition to regular bag limit

**** Connecticut River Zone set by New Hampshire Fish and Game Commission, same as NH Inland Zone

2024 Moose Harvest Recommendation

2023 Moose Harvest

Archery Season:

10 moose

(all bulls)

43% success rate (10/23)

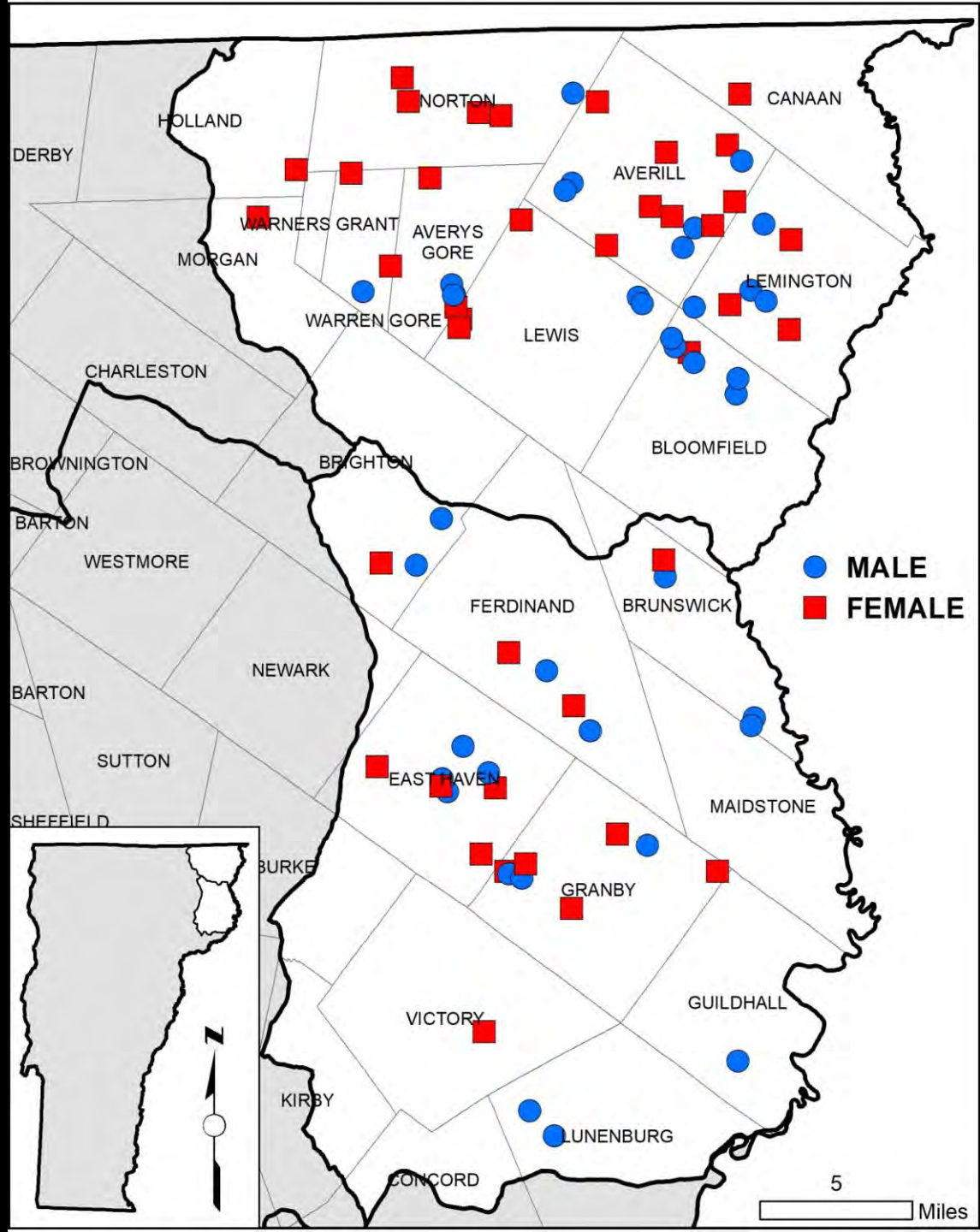
Regular Season:

68 moose

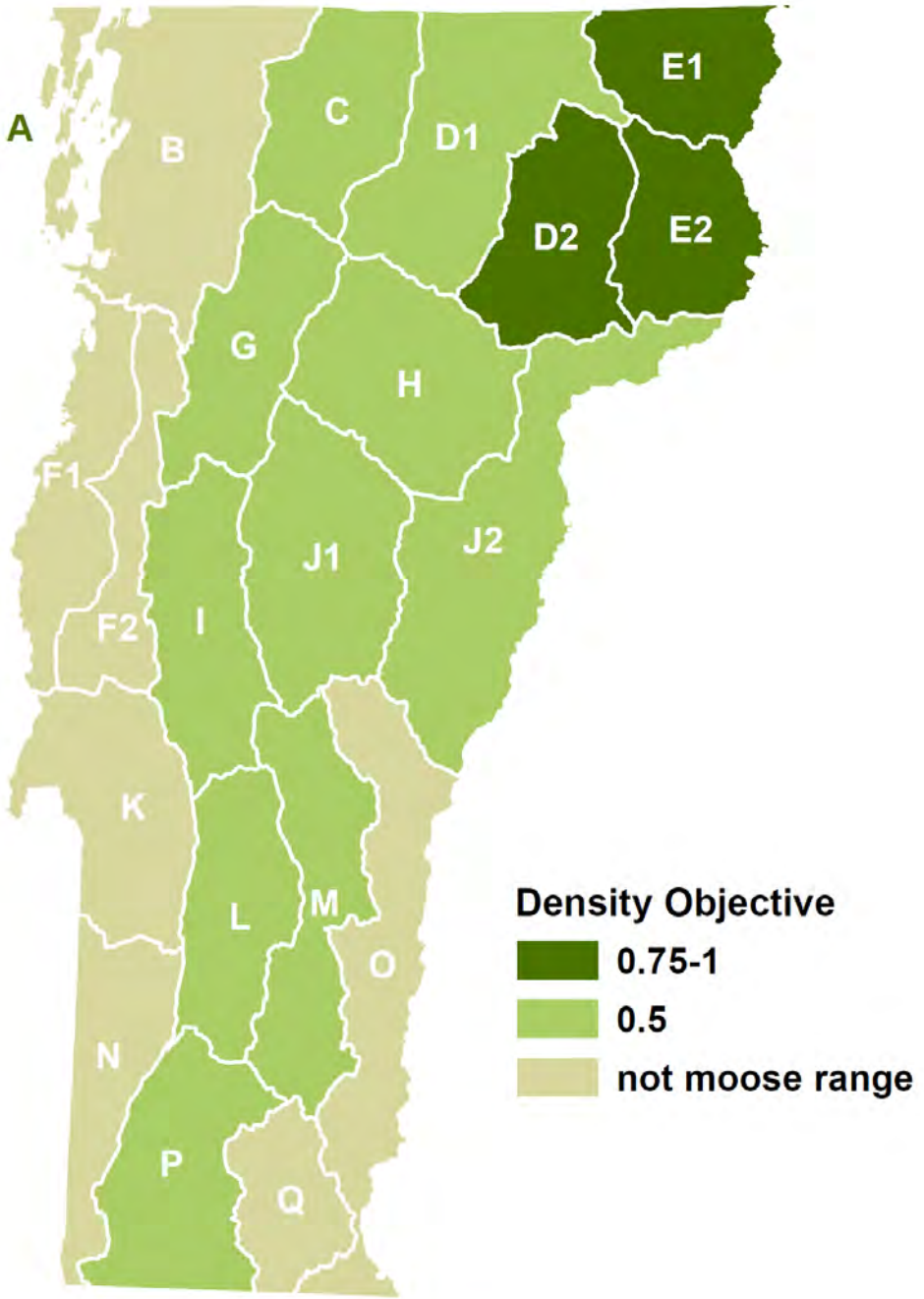
(27 bulls/38 cows/3 calves)

54% ES success rate (31/57)

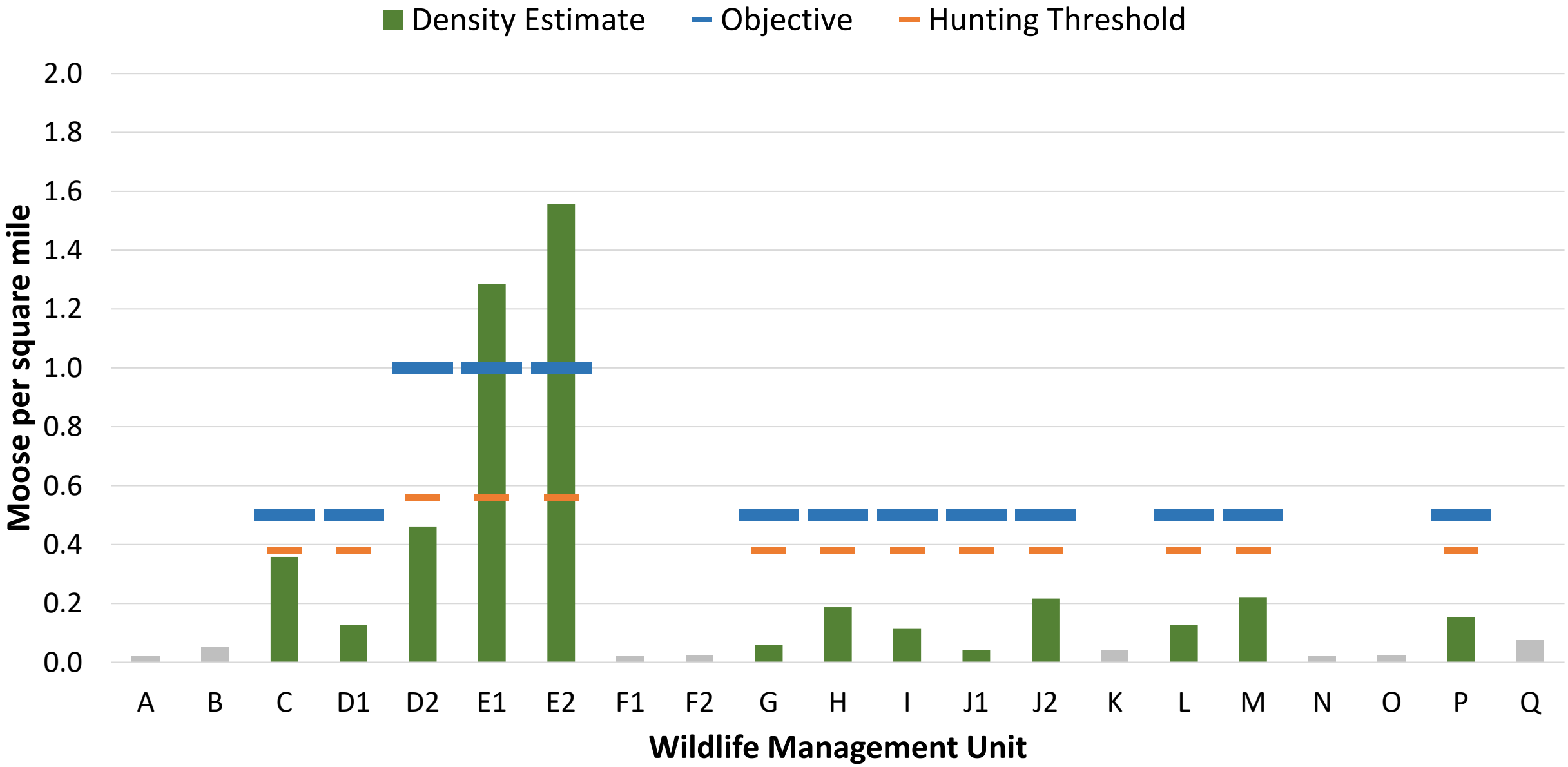
37% AO success rate (37/100)

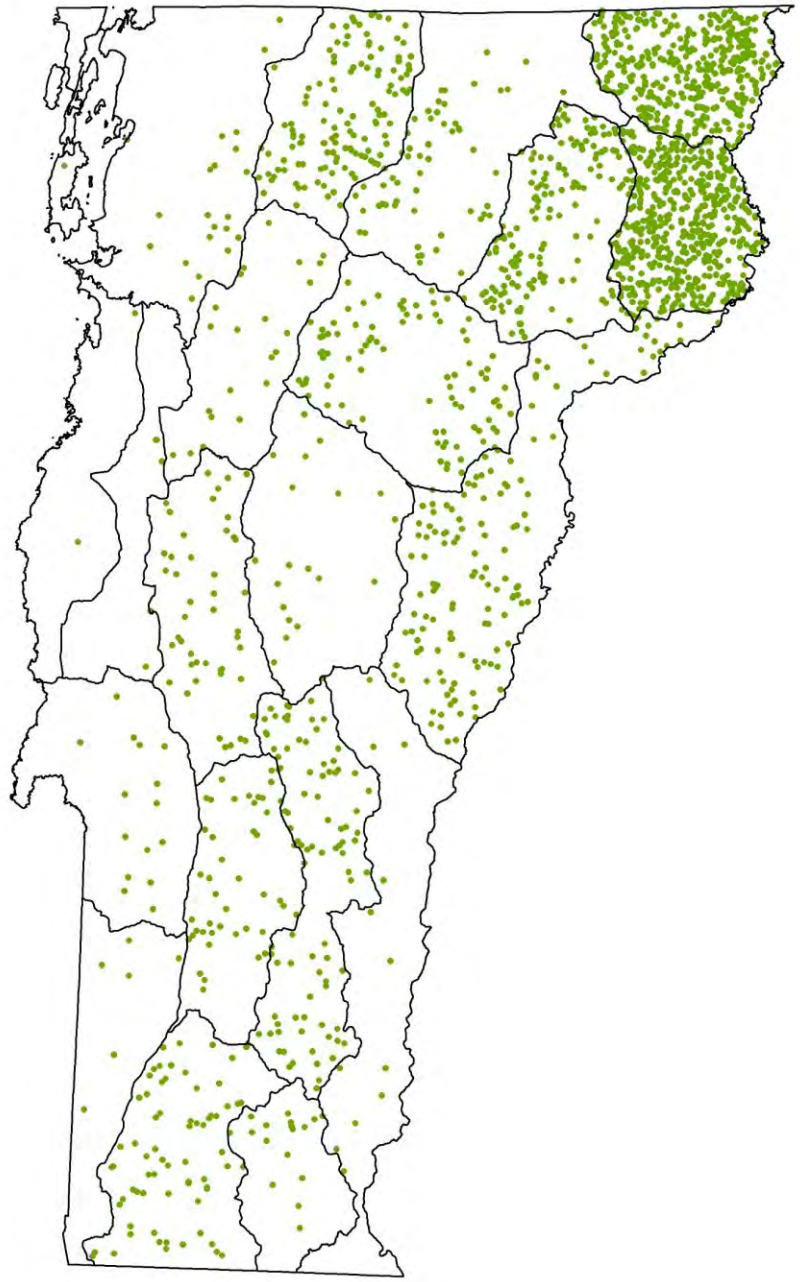


Moose Population Objectives

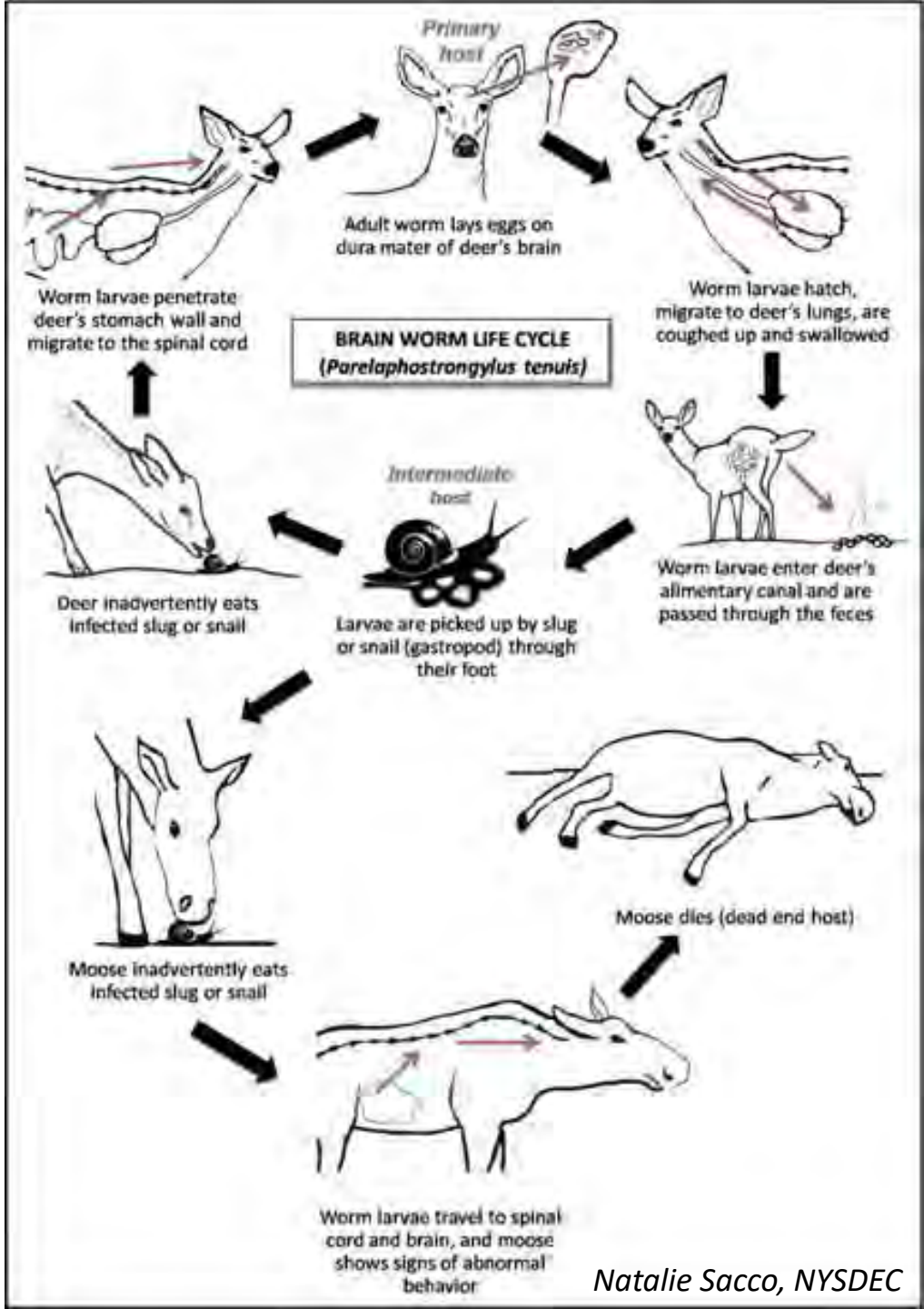


Moose Distribution in Vermont



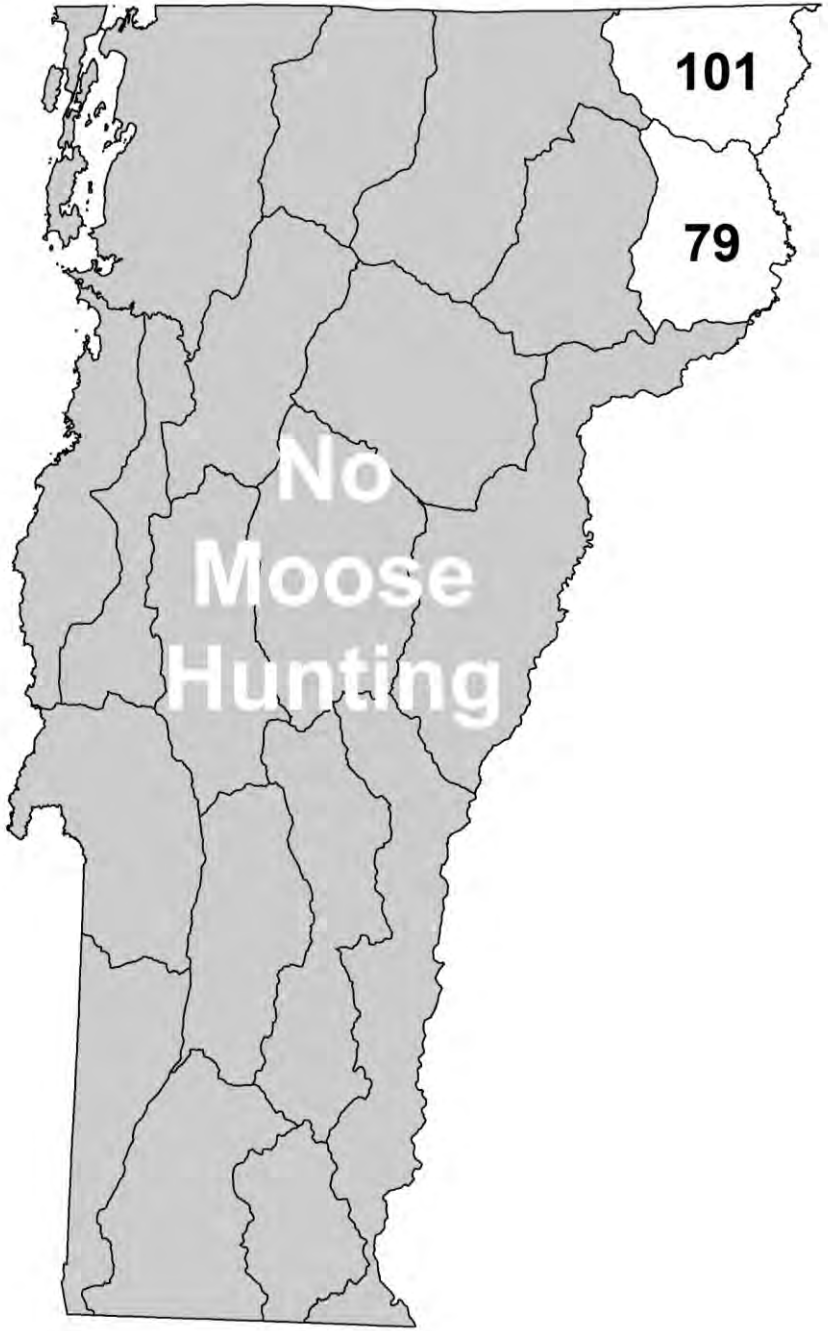


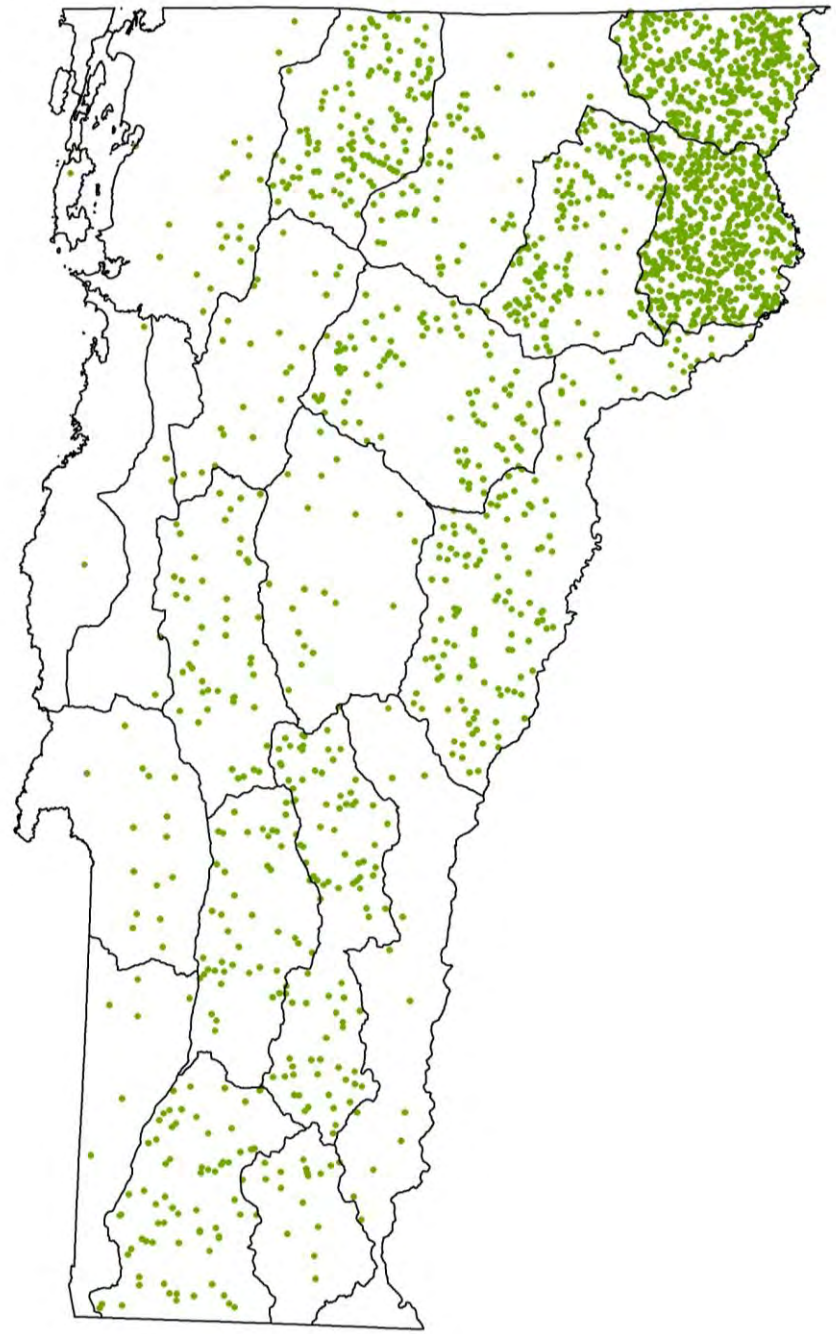
Brainworm

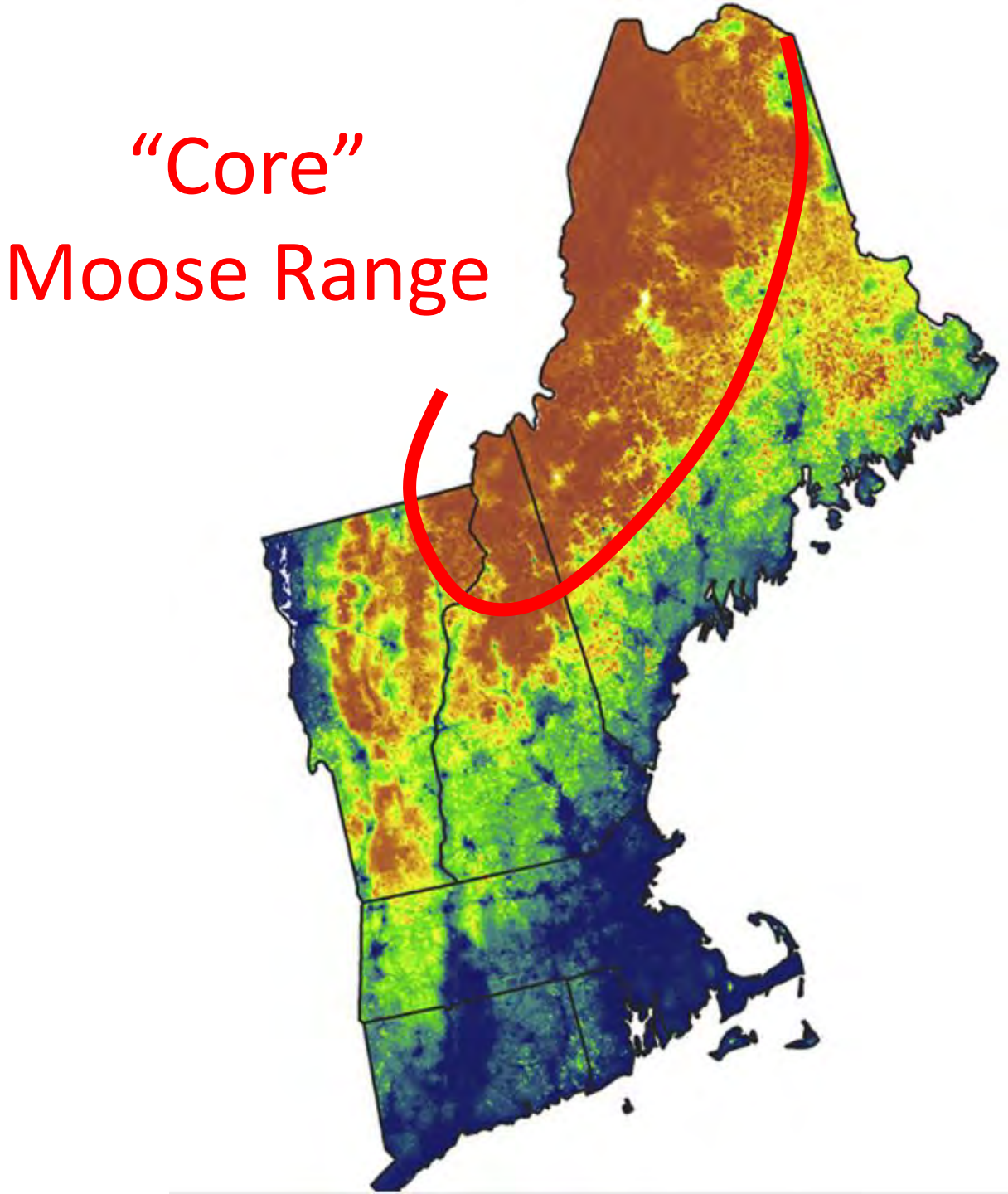


Natalie Sacco, NYSDEC

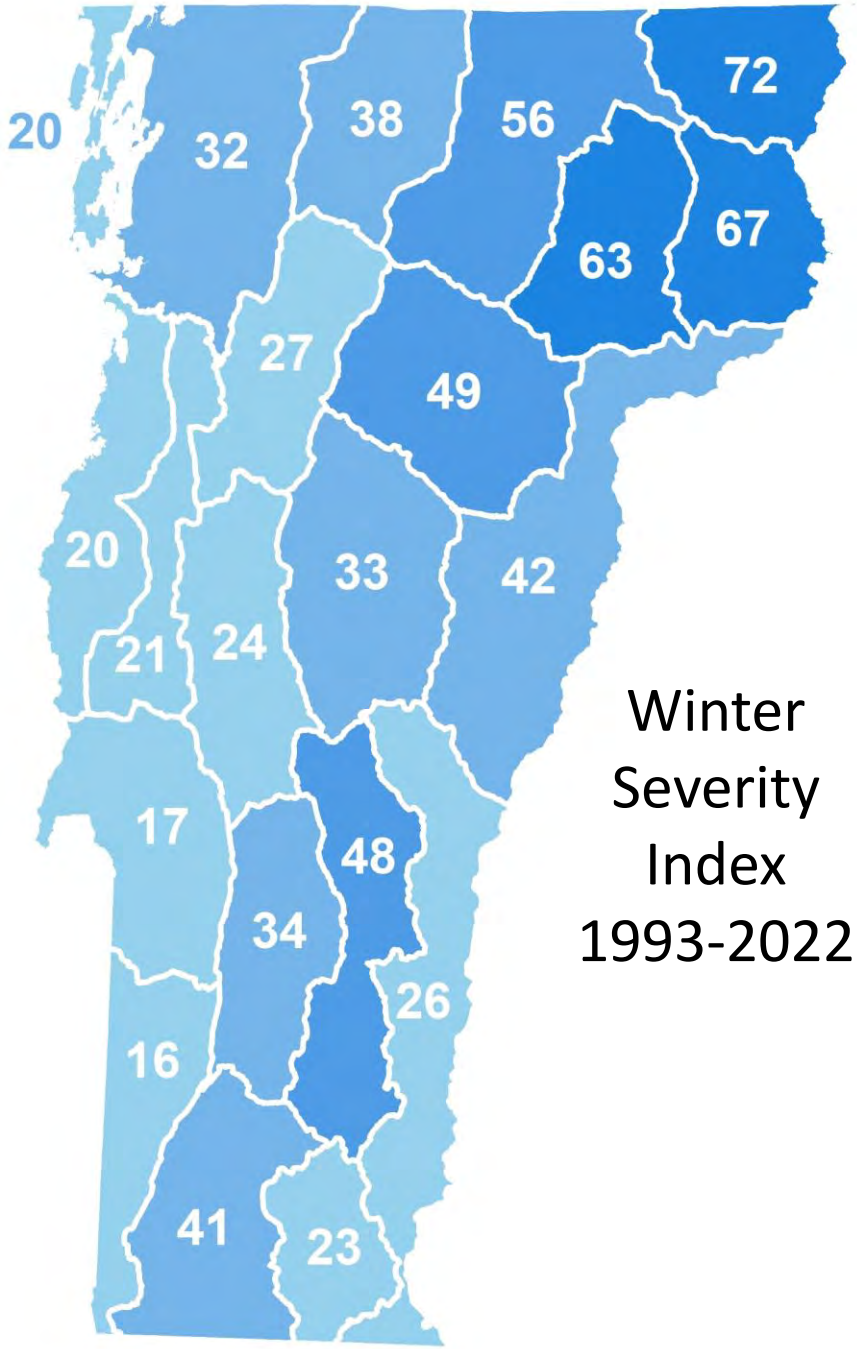
Loss of Young Forest Habitat


101
79
No
Moose
Hunting

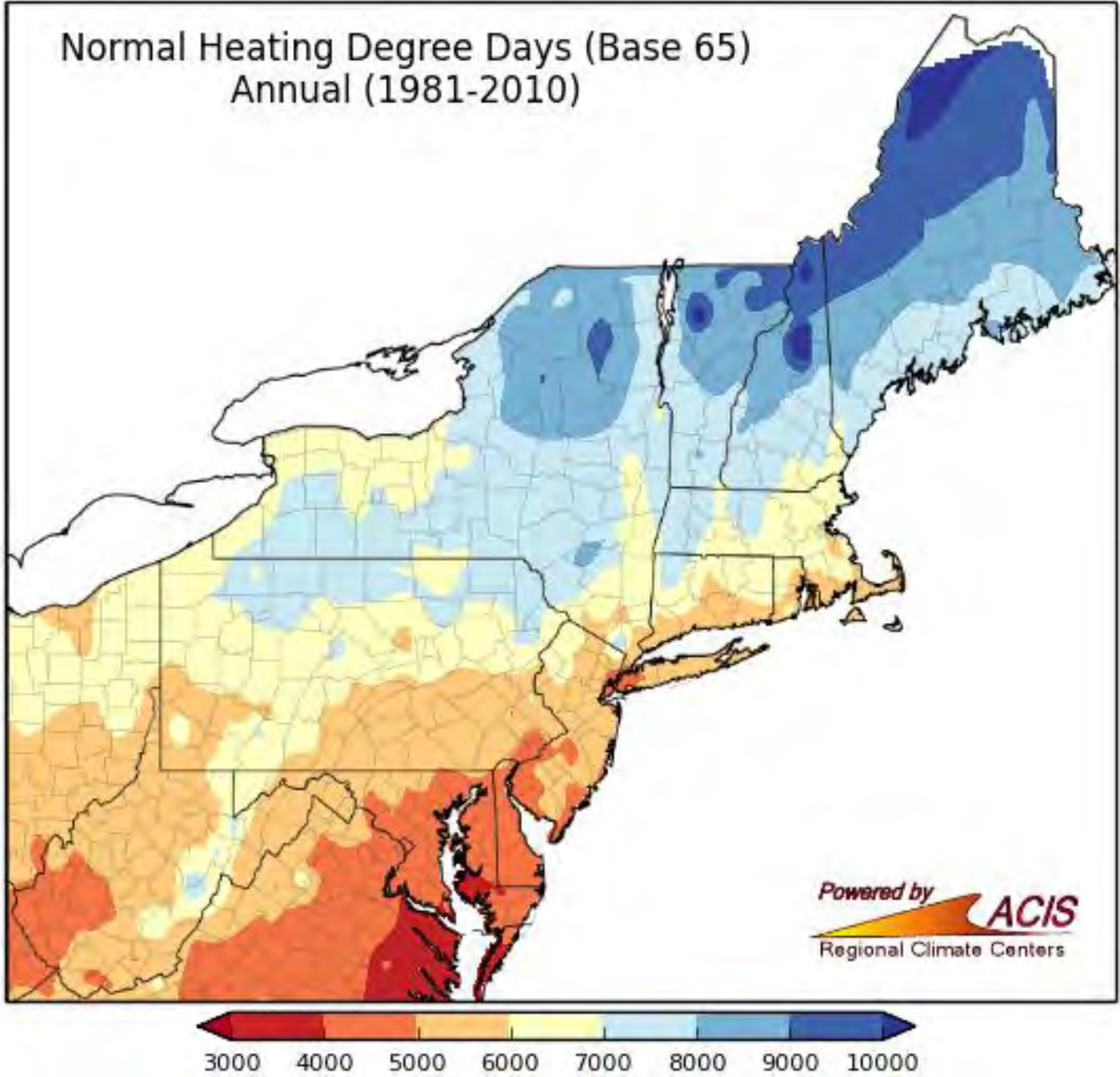




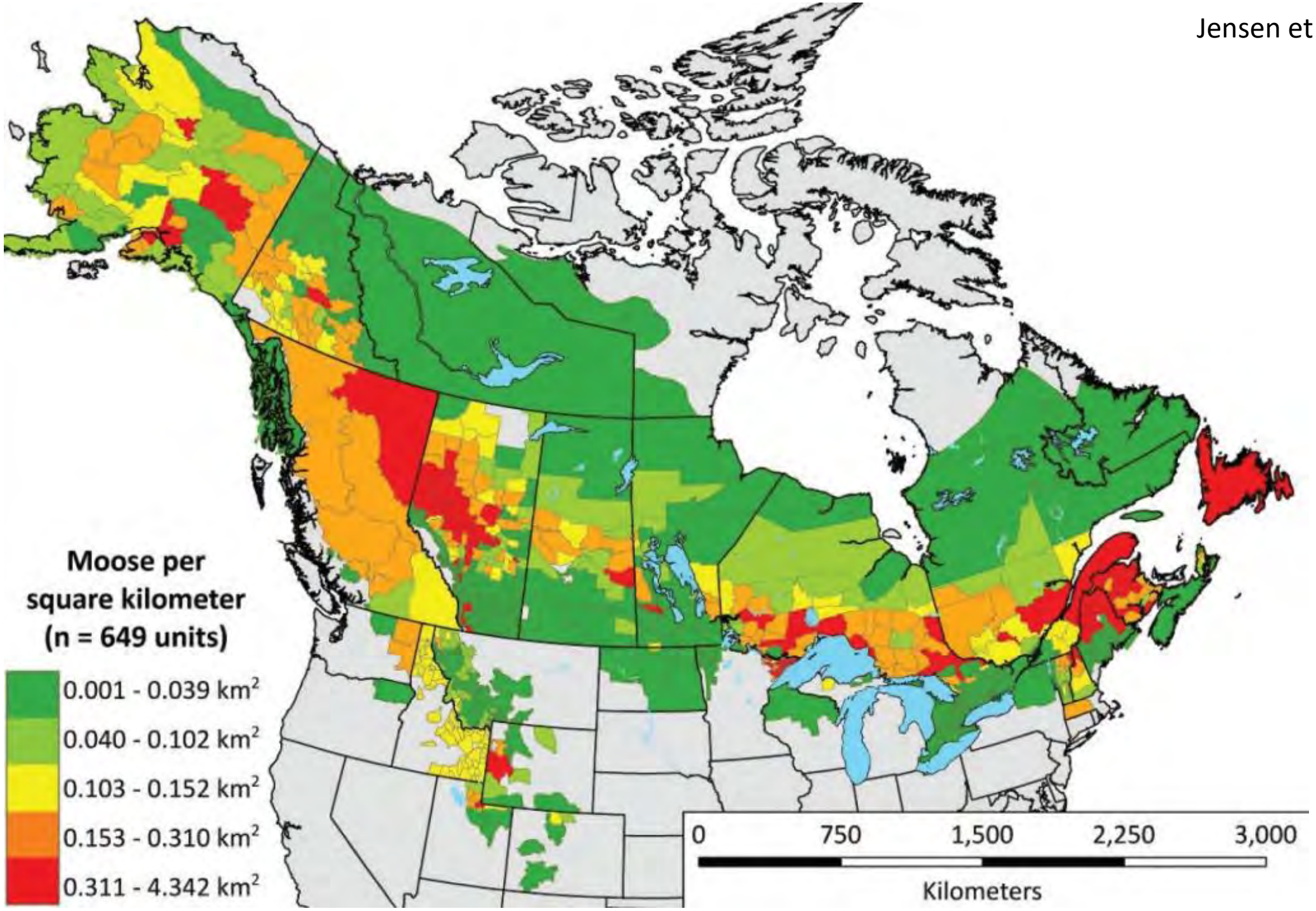
Probability of moose occurrence
Pearman-Gillman et al. 2020



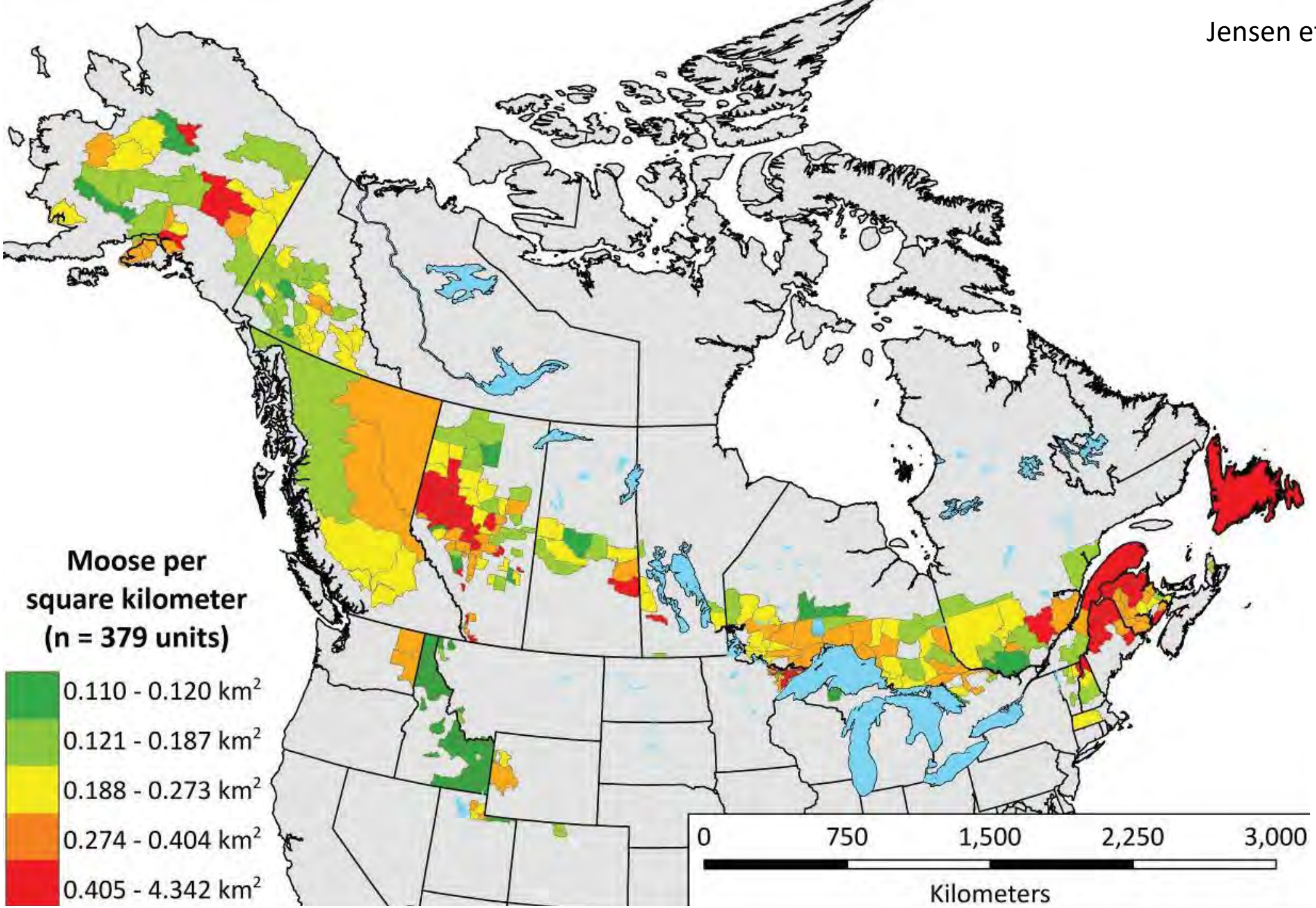
Winter Severity Index 1993-2022



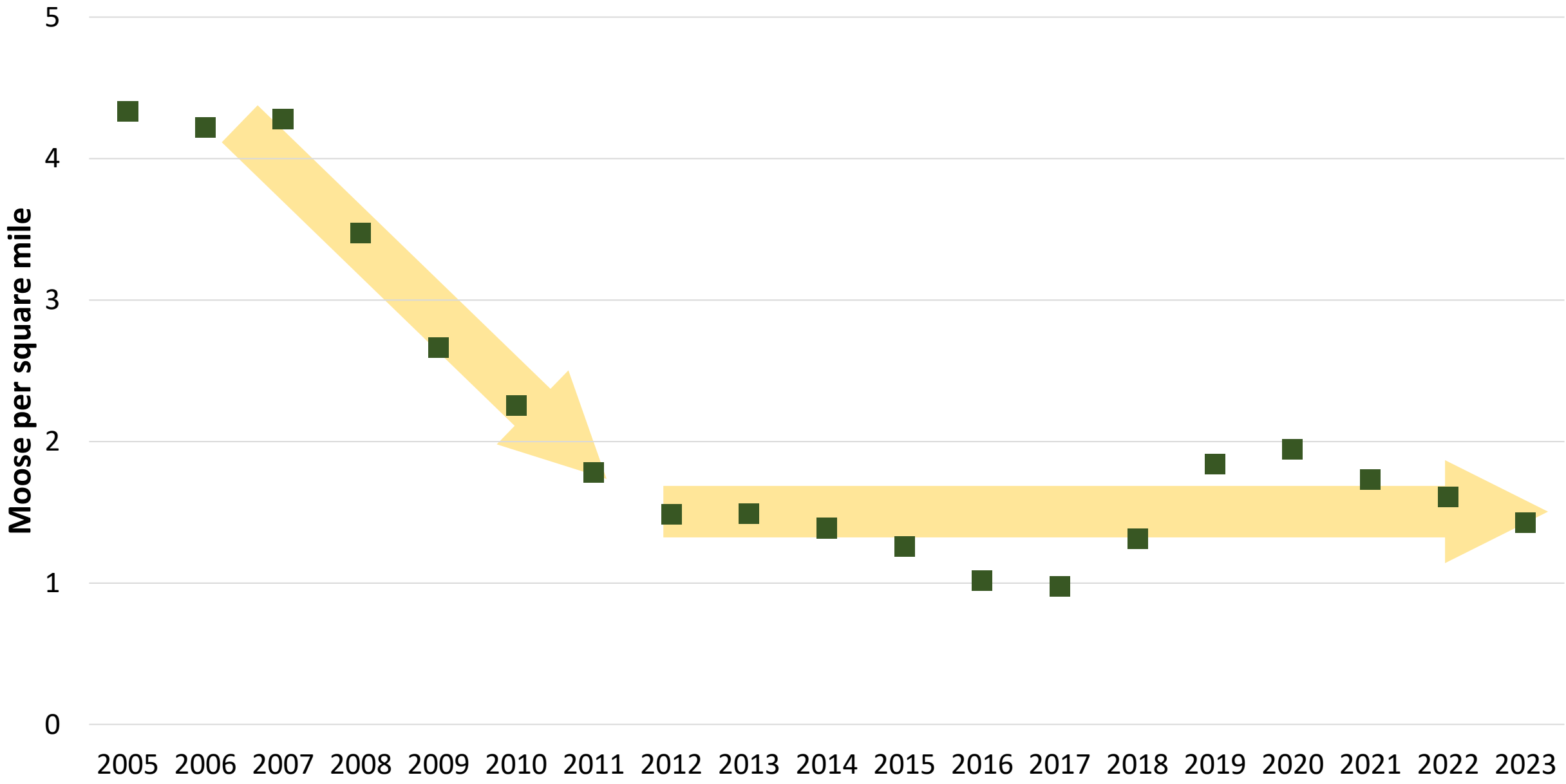
Jensen et al. 2018



Jensen et al. 2018



Population Trend in WMU E



Winter Tick

WINTER TICK LIFE CYCLE

FALL/WINTER
One tick can bring thousands of others using their interlocking limbs.

Then, the thousands of ticks feed on the moose for all three developmental stages, consistently eroding the health of the moose for months.

LATE SUMMER/EARLY FALL
The eggs hatch and larvae climb vegetation, "questing" for an organism to be their host.

EARLY SPRING
Female winter ticks drop off their host to seek leaf litter.

LATE SPRING/EARLY SUMMER
They lay up to 4,000 eggs.

Moose are most active during this period of time because it is mating season. This increases the moose's chance of walking past a cluster of questing winter ticks.

NOT DRAWN TO SCALE

Maine Department of Inland Fisheries and Wildlife

Photo by Cheryl Sullivan

WINTER TICK LIFE CYCLE

FALL/WINTER
One tick can bring thousands of others using their interlocking limbs.

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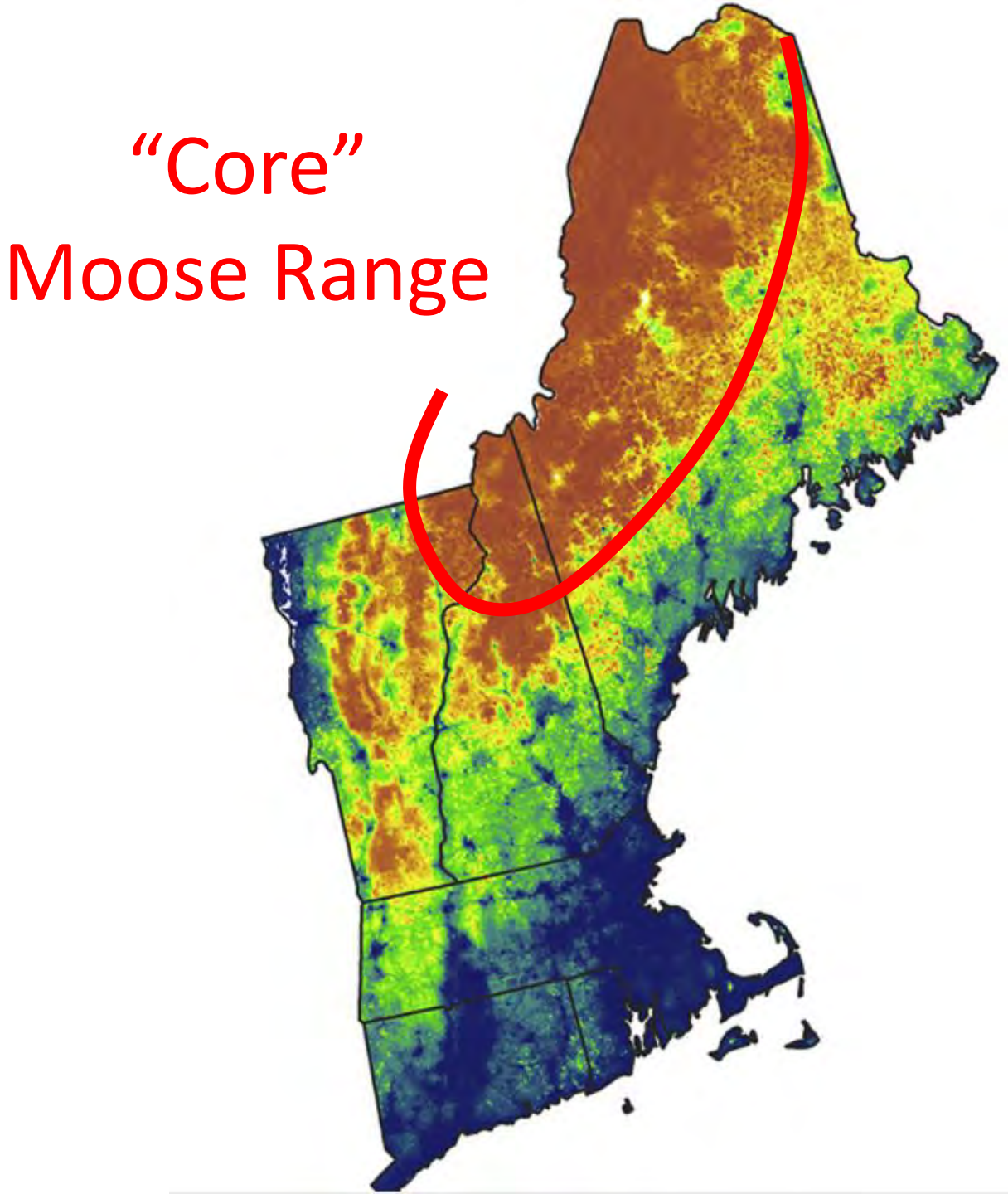
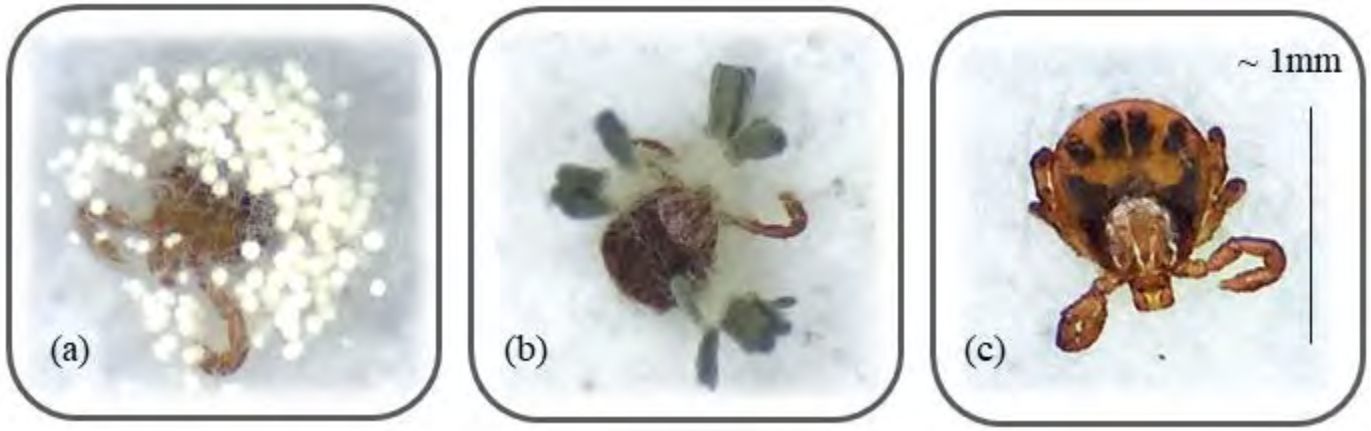
NOT DRAWN TO SCALE

Maine Department of Inland Fisheries and Wildlife

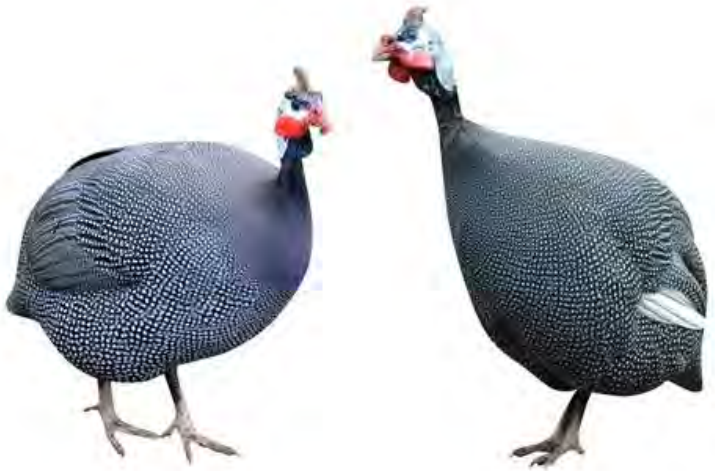


Probability of moose occurrence
Pearman-Gillman et al. 2020

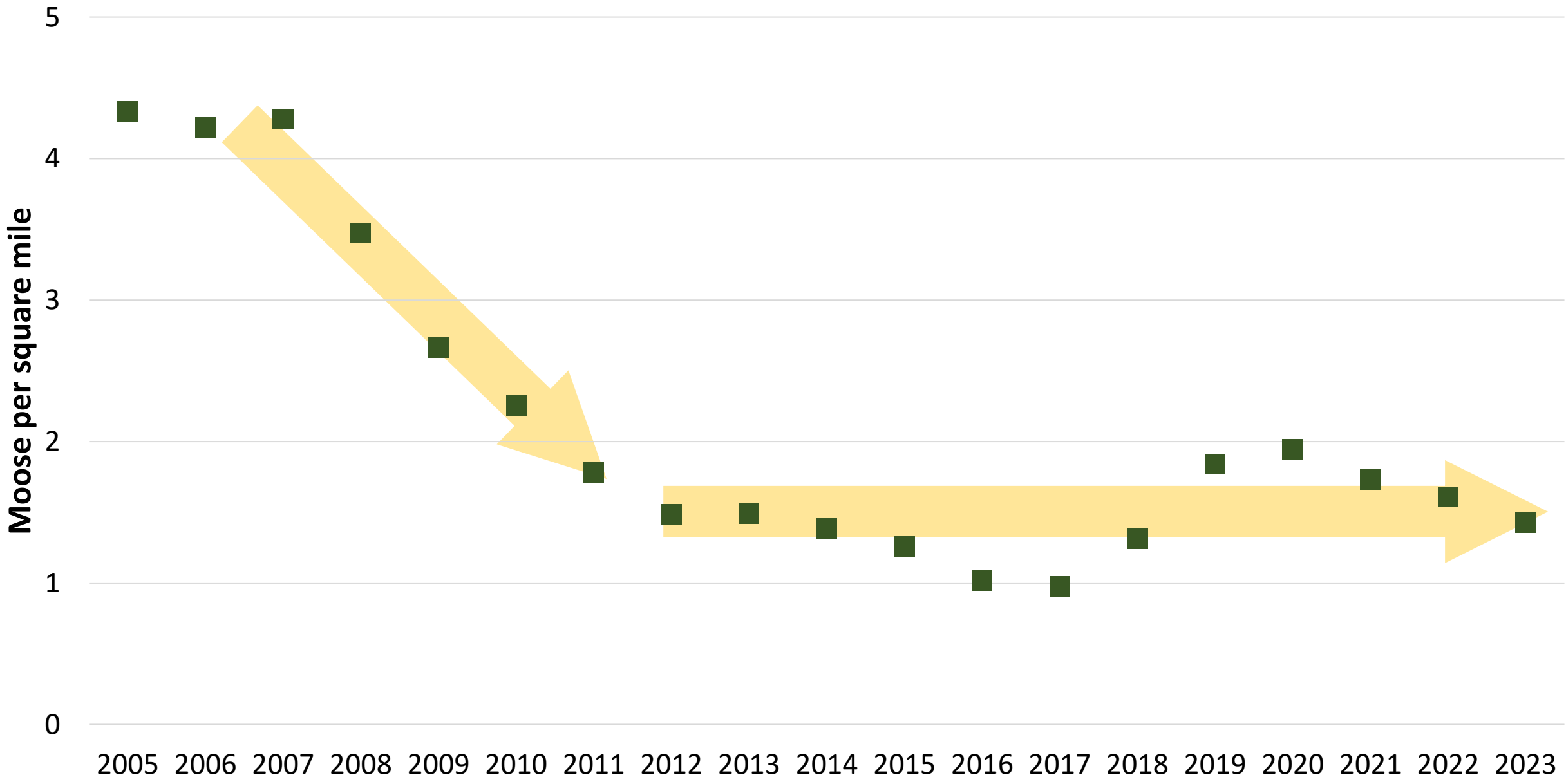
Our Goal: Healthy Moose!



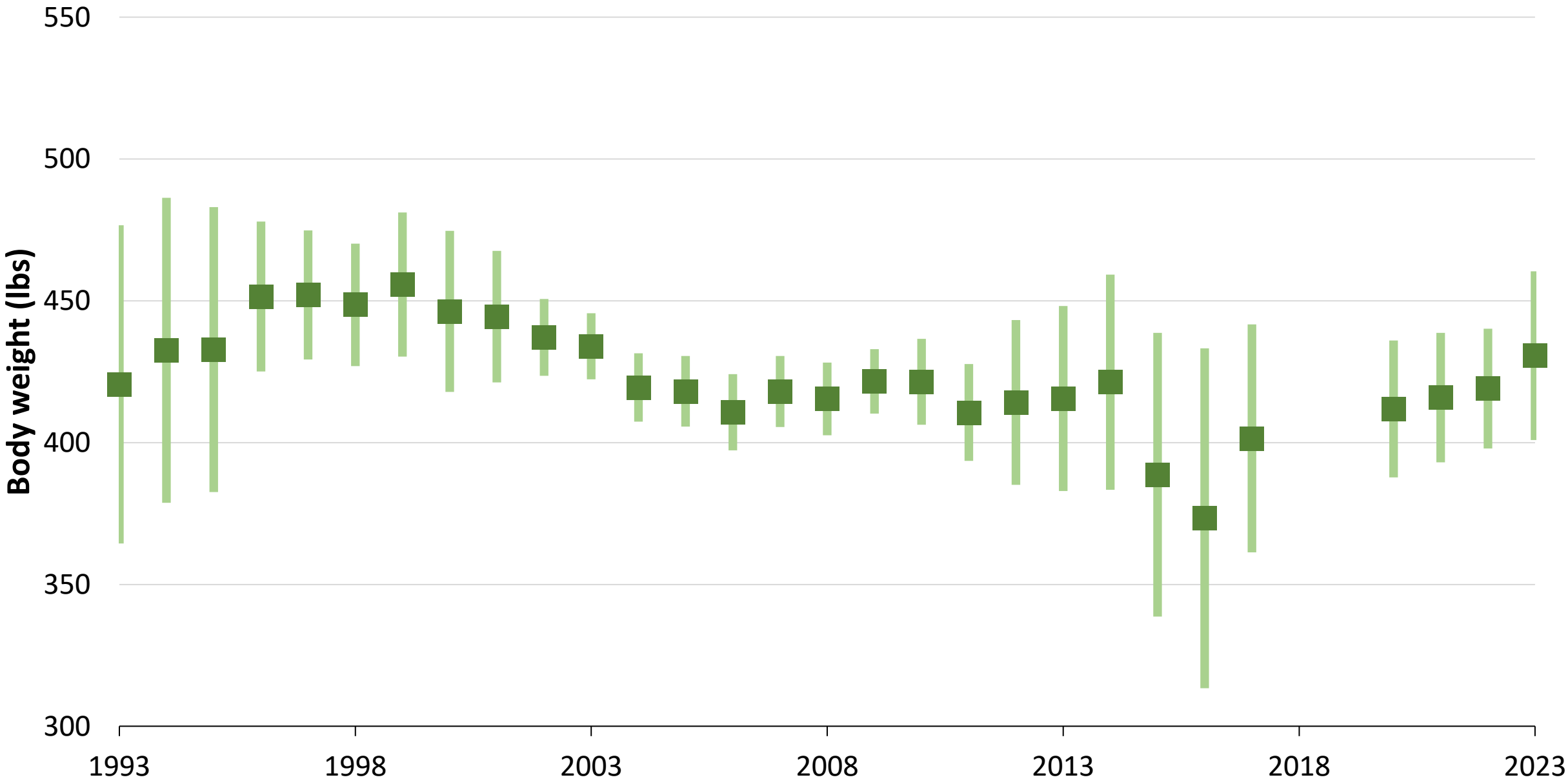
We Can't Manage Winter Ticks Directly



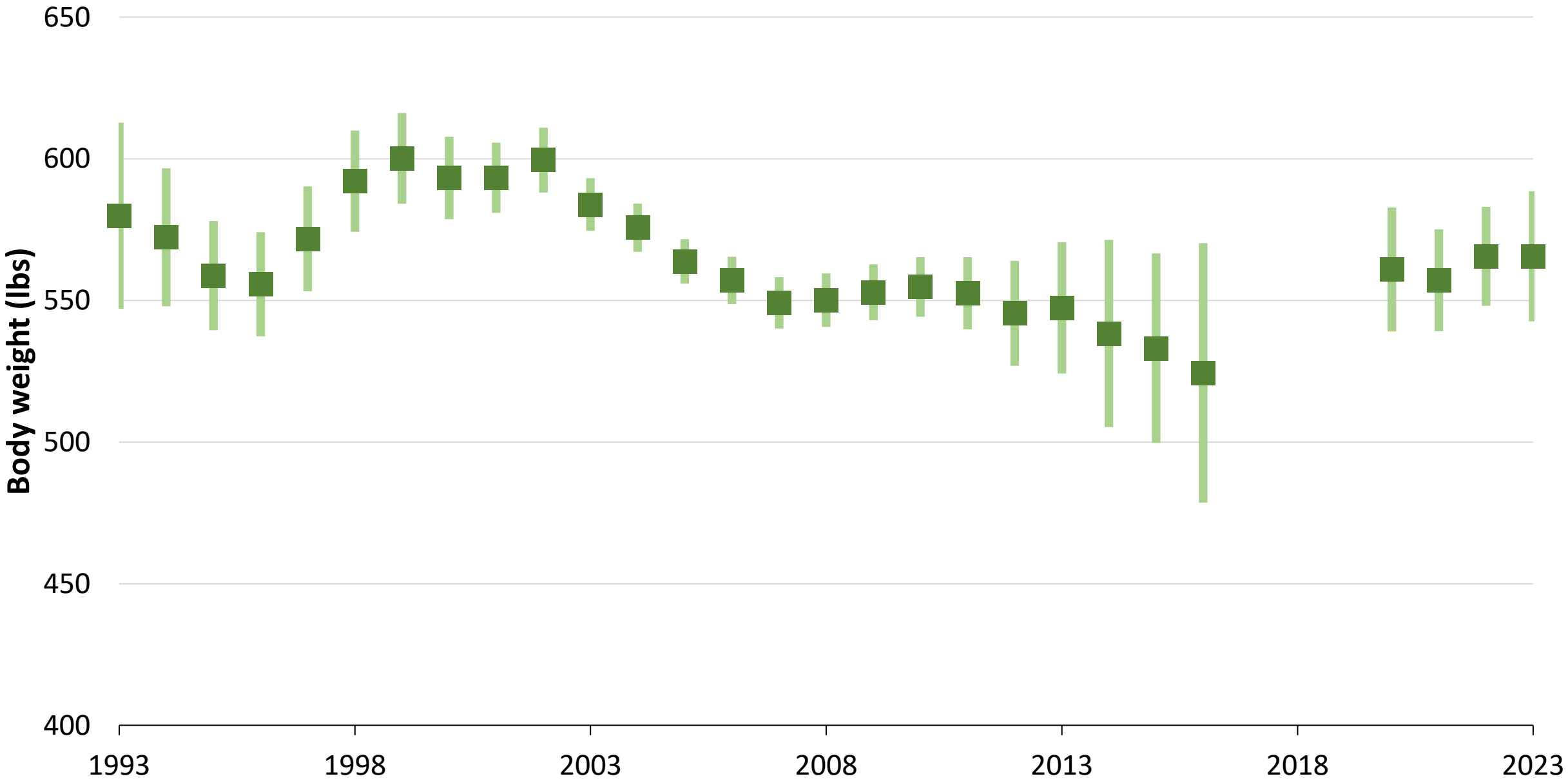
Population Trend in WMU E



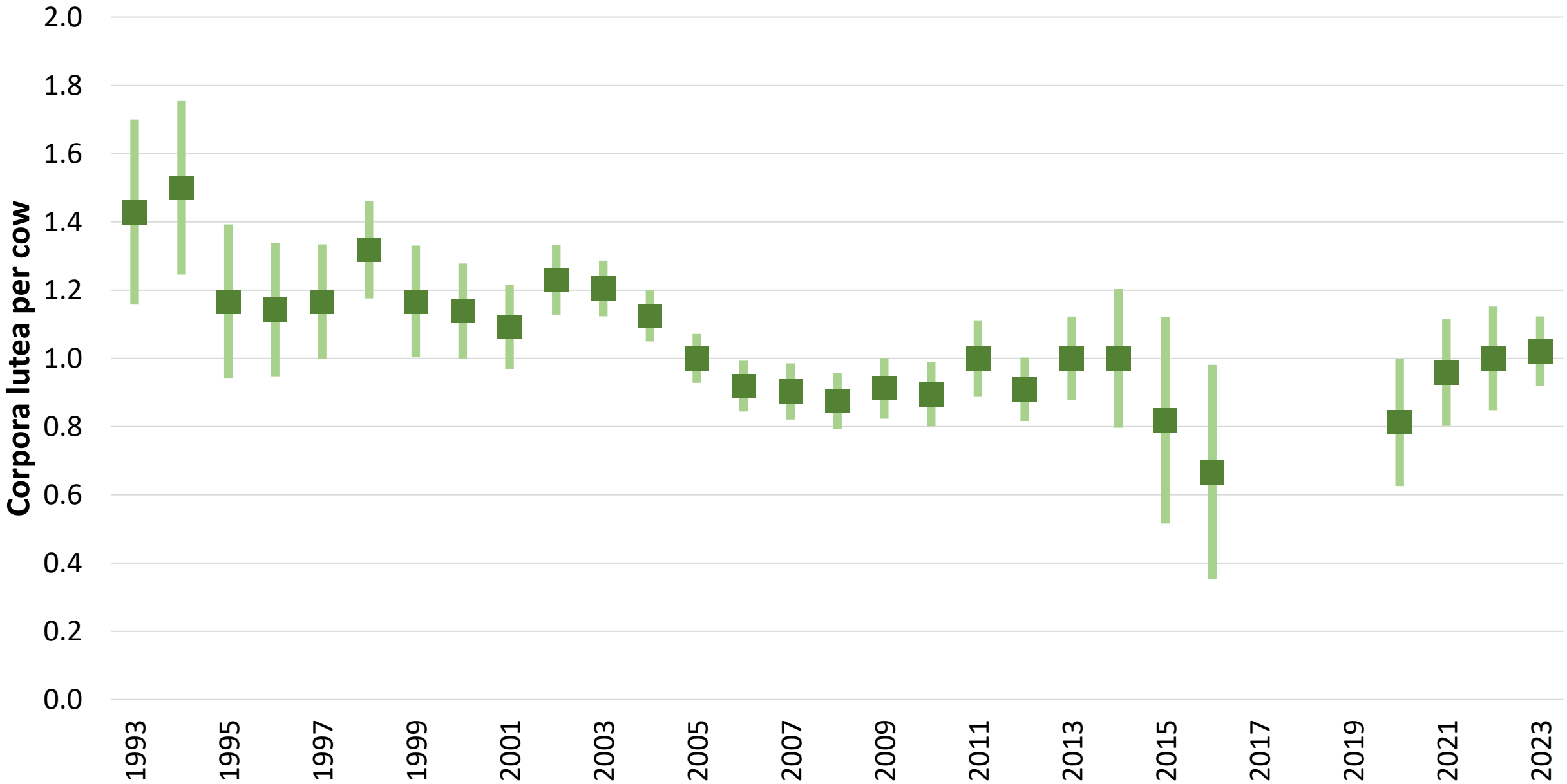
Health Measures: Yearling Female Weight



Health Measures: Adult Female Weight



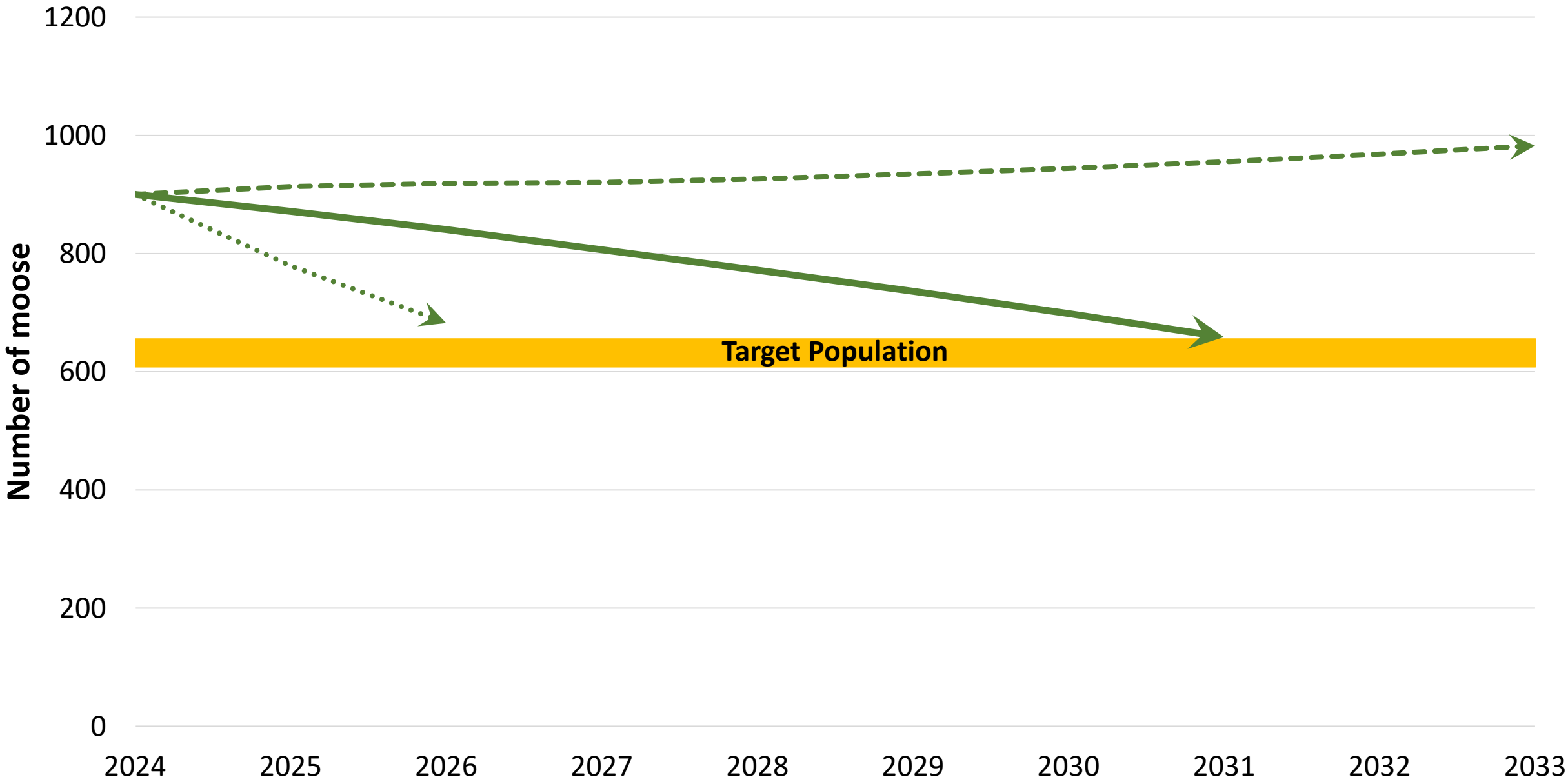
Health Measures: Ovulation Rate



Permit Recommendation

	Permits			Expected Harvest
	E1	**E2**	**Total**	
Archery Season				
Either-sex	11	9	20	10 *(7-13)*
Regular Season				
Either-sex	29	25	54	36 *(29-42)*
Antlerless-only	55	45	100	44 *(37-56)*
Auction	*choice*		3	2 *(0-3)*
Special Opportunity	*choice*		3	2 *(0-3)*
TOTAL			**180**	94 *(73-117)*

Population Projection



Questions?

Next Steps

Tonight

- Presentation to Board
- Preliminary Approval
  (vote on what is presented to public for comment)

Public Comment

- Public Hearings
  - 3/18 – Hardwick
  - 3/20 – Brattleboro
  - 3/21 – Enosburg
  - Presentation & recommendation available online
- Public Comments by email/voicemail

April 3rd

- F&W Board Final Vote

2024
Moose Harvest Recommendation

to the
Vermont Fish and Wildlife Board

Vermont Fish and Wildlife Department
Agency of Natural Resources
1 National Life Drive, Davis 2
Montpelier, VT 05620-3208
802-828-1000

This recommendation aims to achieve moose population objectives established in the *2020-2030 Big Game Management Plan* and to improve the health of moose in WMUs E1 and E2 by reducing the impact of winter ticks. The Department recommends issuing 180 moose hunting permits between WMUs E1 and E2 to reduce the moose population and thereby reduce winter tick abundance. No permits are recommended for the other 19 WMUs, because moose densities remain below established objectives and hunting thresholds. The recommended permit allocation is the same as approved by the Board in 2023.

The current number of moose in WMU E has been sufficient to sustain winter ticks at high levels that are negatively affecting moose health and survival. Winter ticks are a host-dependent parasite with moose being the primary host responsible for major fluctuations in winter tick densities. Therefore, reduction in moose population density decreases the number of available hosts which in turn decreases the number of winter ticks on the landscape. Moose population reduction will be necessary to break the winter tick cycle and improve the health of moose in this region.

Reducing winter tick numbers directly, either by treating moose or the landscape with some form of acaricide or fungal pathogen, is not currently a viable option. Research in this area is ongoing, but the realities of treating an entire landscape or a sufficient portion of the moose population make it unlikely that this will be a practical option soon.

Failure to reduce moose population density will perpetuate the current, unhealthy state of moose in WMU E for decades and would be inconsistent with the Department's established objective of managing for a healthy moose population. Importantly, 65% of Vermont residents support maintaining a smaller moose population through hunting if it reduces the number of moose that die each year from winter ticks. Only 15% oppose this approach (Responsive Management 2019).

Although winter ticks can be found on moose throughout the northeast, they do not significantly impact moose populations across the more-peripheral parts of their range, including the rest of Vermont, due to lower moose population densities that limit tick abundance.

Summary of Key Points

- The moose population remains stable in most of Vermont, including WMU E (E1 & E2).

- Moose density in WMU E remains above the objective of 1 moose per square mile established in the *2020-2030 Big Game Management Plan*.
    - Moose densities greater than 1 moose per square mile are uncommon in North America, occurring in less than 10% of moose range.
    - In Vermont, no WMU outside the Northeast Kingdom ever had a moose density of 1/mi^2.
    - Moose densities greater than 1/mi^2 support high numbers of winter ticks that negatively impact the health of moose.
    - Moose densities below 0.75/mi^2 support relatively few winter ticks that do not impact moose populations. This is the case in most of Vermont – winter ticks are present, but do not cause population level impacts.

- Results of moose research and ongoing monitoring in WMU E indicate health of moose is poor in that region.
    - Adult survival remains relatively good, but detrimental health impacts of winter ticks have caused birth rates to be very low.
    - Heavy winter tick loads can cause more than half of moose calves to die in late winter.

- The Department recommends 180 moose hunting permits (80 either sex and 100 antlerless only) be allocated in WMU E to reduce moose numbers and thereby reduce the impacts of winter ticks on the health of moose and help maintain a sustainable moose population.
    - This would result in the harvest of approximately 94 moose, or about 10% of the current estimated population in WMU E.

- No permits are recommended for the other 19 WMUs, which cover 93% of Vermont, because moose densities remain below objectives and hunting thresholds established in the *2020-2030 Big Game Management Plan*.

Goals

This recommendation aims to achieve moose population objectives established in the *2020-2030 Big Game Management Plan* and to improve the health of moose in WMUs E1 and E2 by reducing the impact of winter ticks.

Management Objectives

Moose population objectives for each WMU were established in Vermont's *2020-2030 Big Game Management Plan*. These objectives aim to maintain healthy regional moose populations at levels that are socially acceptable and ecologically sustainable.

Moose density objectives throughout most of moose range in Vermont have been set at 0.5 moose/mi^2 (**Figure 1**). This objective is a carryover from earlier moose management plans, and reflects ecological limitations on moose densities in these regions due to limited young forest habitat, higher deer densities, and a warming climate. Moose densities in most of these WMUs have never reached 0.5 moose/mi^2.

In WMUs D2, E1, and E2, density objectives reflect higher historical densities and the impact of winter ticks on the size and health of the region's moose population. Research has found reduced frequency of winter tick epizootics (where more than 50% of calves die from winter tick infestations) at moose densities near 1/mi^2 and no tick epizootics at densities below 0.75/mi^2 (Samuel 2007, Jones 2016). The Department will initially try to maintain moose densities at or below 1/mi^2 to reduce winter tick abundance and the frequency of epizootics and improve the health of the moose population. However, if tick impacts are not reduced, the moose density may need to be reduced to 0.75/mi^2. Ultimately, the goal is to have healthy moose, with fewer calves dying each year from heavy winter tick loads and healthier cows with higher birth rates.

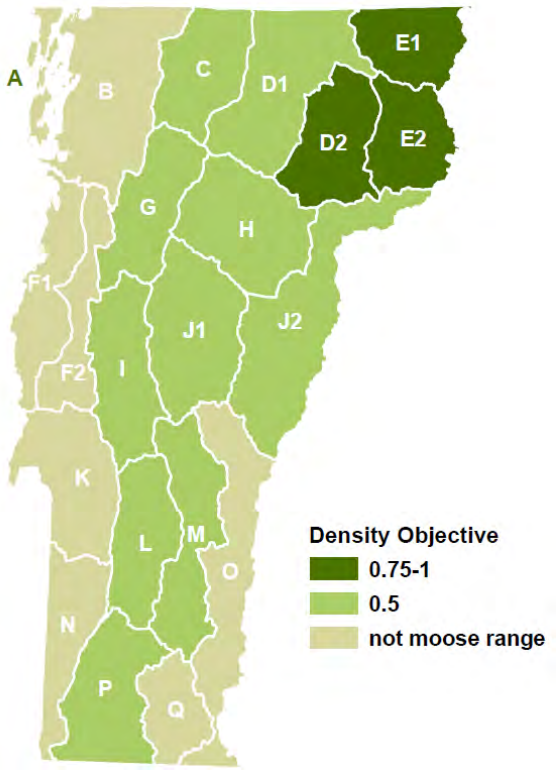


Figure 1. Moose density objectives (moose per square mile of moose habitat) established in Vermont's *2020-2030 Big Game Management Plan*.

Hunting thresholds have also been established for each WMU at 75% of the density objective (**Table 1**). The Department will only consider hunting moose when densities exceed this threshold for two consecutive years. This ensures the other values of moose are maximized at these lower densities.

Population Status

Population Estimates

Regional moose densities in Vermont are estimated from moose sighting rates reported by deer hunters during the November rifle season. This approach, originally developed by the New Hampshire Fish and Game Department, relates sighting rates to moose densities determined by aerial surveys (Bontaites et al. 2000). Aerial surveys conducted in Vermont allowed the Department to modify this model to better fit Vermont sighting data. Sighting rates often vary from year to year due to factors other than the number of moose (e.g., weather conditions), so a 3-year rolling average is used to smooth out some of this variation.

Using this approach, the 2023 (2021–2023 rolling average) density estimates for WMUs E1 and E2 are 1.29 and 1.56 moose/mi^2, respectively, which are well above the density objectives established in the *2020-2030 Big Game Management Plan*. Moose population densities in all other WMUs remain below established hunting thresholds (**Table 1**).

Table 1. Moose density estimates based on sighting rates by deer hunters and density objectives and hunting thresholds established in the *2020-2030 Big Game Management Plan*, by WMU. Density estimates are based on average sighting rates during 2021–2023.

WMU	Habitat (mi^2)	Density (moose/mi^2)			Population Estimate	
		Objective	Hunting Threshold	Current Estimate	N	(80% CI)
A	35	n/a	n/a	0.02	1	(1–1)
B	420	n/a	n/a	0.05	21	(14–29)
C	351	0.5	0.38	0.36	126	(105–146)
D1	449	0.5	0.38	0.13	57	(41–72)
D2	346	0.75-1	0.56	0.46	160	(129–190)
E1	306	0.75-1	0.56	1.29	393	(343–444)
E2	326	0.75-1	0.56	1.56	508	(428–588)
F1	108	n/a	n/a	0.02	2	(2–2)
F2	158	n/a	n/a	0.03	4	(3–5)
G	363	0.5	0.38	0.06	22	(14–29)
H	466	0.5	0.38	0.19	87	(70–105)
I	407	0.5	0.38	0.11	46	(34–59)
J1	464	0.5	0.38	0.04	19	(14–23)
J2	633	0.5	0.38	0.22	137	(108–166)
K	359	n/a	n/a	0.04	15	(8–21)
L	346	0.5	0.38	0.13	44	(31–57)
M	424	0.5	0.38	0.22	93	(69–117)
N	275	n/a	n/a	0.02	6	(6–6)
O	478	n/a	n/a	0.02	12	(10–14)
P	447	0.5	0.38	0.15	68	(49–88)
Q	219	n/a	n/a	0.08	17	(10–23)
STATE	**7380**				**1837**	**(1489–2185)**

The Department continues to receive interest in moose hunting in areas outside WMU E, and some local areas could likely sustain a limited moose harvest. However, the uneven distribution of functional moose habitat (and therefore moose) in much of Vermont is a challenge for management. The Department will be reevaluating moose habitat mapping, taking advantage of recent research efforts (e.g., Pearman-Gilman et al. 2020, Blouin et al. 2021*a*) to better reflect the area of functional habitat in each WMU. This should allow for setting more appropriate and achievable population objectives and calculating more meaningful estimates of moose density in WMUs with less homogeneous moose habitat.

In WMU E, moose were overabundant in the early 2000s and the Department intentionally worked to reduce moose numbers. Since population reduction efforts ended in 2010, moose density has remained relatively stable in WMU E near 1.5 moose/mi^2 (**Figure 2**). Importantly, the density of moose over that time has been high enough to support problematic numbers of winter ticks.

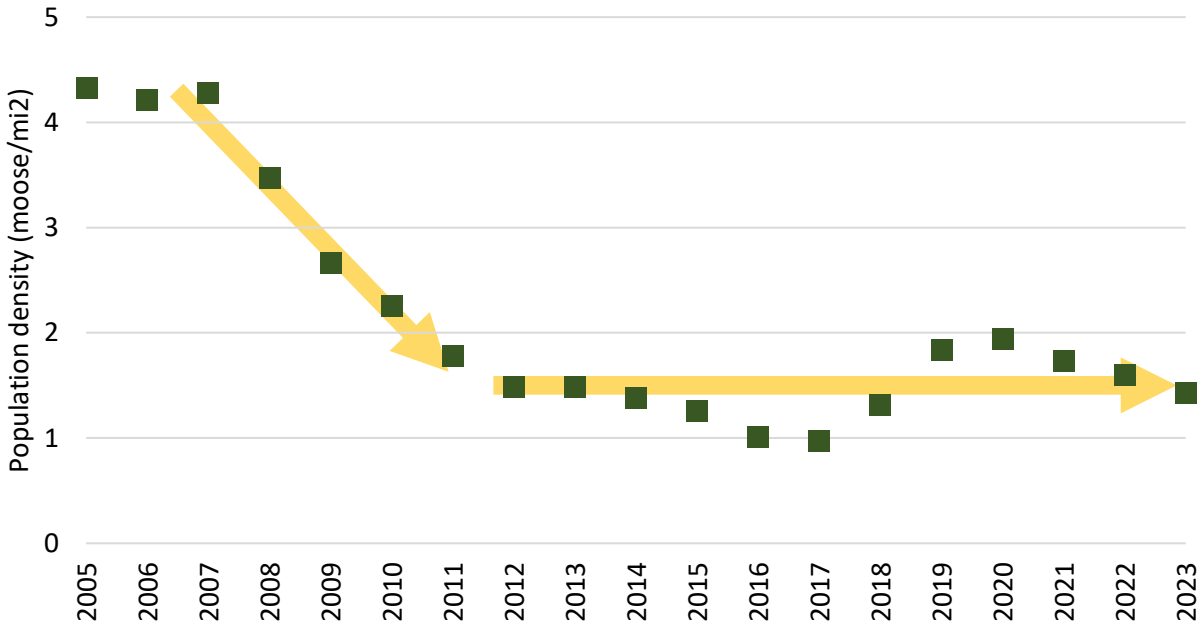


Figure 2. Moose density estimates (green squares) and major trends (yellow arrows) in WMU E during 2005–2023. Density estimates are based on moose sighting rates reported by deer hunters.

Moose and Winter Ticks

Studies in Vermont, New Hampshire, and Maine have concluded that winter ticks are the primary cause of moose mortality across their core range in New England (Musante et al. 2007, 2010, Bergeron et al. 2013, Dunfey-Ball 2017, Jones et al. 2017, Ellingwood et al. 2019, Jones et al. 2019, DeBow et al. 2021), with some moose hosting an astonishingly high number of ticks (>50,000/individual; Jones et al. 2019).

Core moose range (continuous red/brown area in **Figure 3**) in New England extends from northeastern Vermont through northern New Hampshire and western and northern Maine. This part of the region has a colder climate with longer winters, low deer densities, large blocks of forest, and an abundance of young forest created by commercial timber management which allows it to sustain higher densities of moose than more peripheral parts of their range. Population-level effects of winter ticks have only been observed in the region's core moose range, where moose densities have been high enough to support large numbers of winter ticks.

Although winter ticks can be found on moose throughout the region, they are not impacting moose populations across the more-peripheral parts of their range in the northeast, including the rest of Vermont, due to lower moose densities which limit tick abundance. Moose numbers outside of the Northeast Kingdom have declined, but the main cause of that decline was not winter ticks. It was likely due to a combination of declining quantity of young forest, increased parasite loads (particularly brainworm linked to increasing deer densities), and fewer moose in core moose range to migrate out to these other regions.

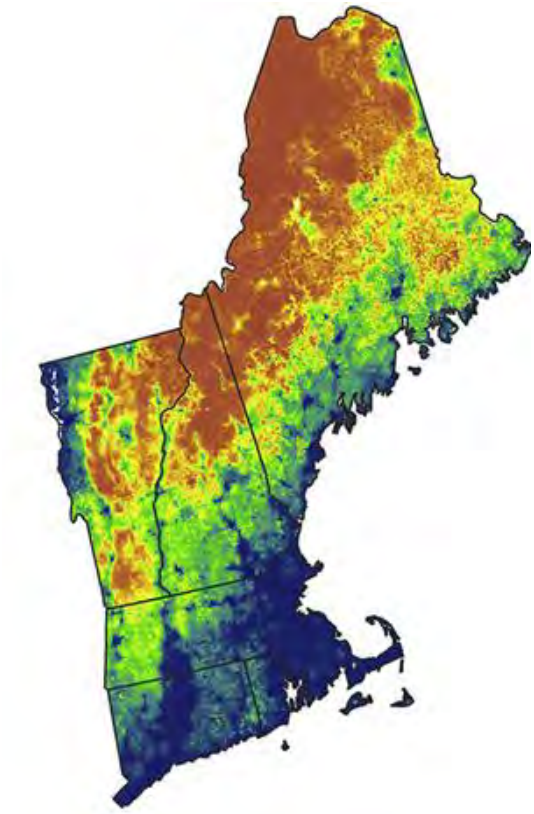


Figure 3. Estimated probability of occurrence of moose in the New England region from Pearman-Gilman et al. 2020.

Vermont Research

During 2017–2019, 126 moose (36 adult cows and 90 calves) were fitted with GPS radio collars in WMU E to monitor survival and birth rates. Results of this research clearly showed that chronic, high winter tick loads caused the health of moose in WMU E to be poor. Birth rates were low and overwinter calf survival was poor (49%; DeBow et al. 2021). Although adult female survival remained relatively good, it was lower than expected for a population without major predators. Survival of breeding age females has significant influence on population trends in long-lived species like moose.

Ongoing and Future Research

Fieldwork associated with the survival study concluded in 2019; however, the Department continues to monitor survival and calf recruitment in the remaining collared cows. Additionally, the large amounts of data collected during this study allowed University of Vermont researchers to analyze other aspects of

moose and winter tick ecology. This related research focused on understanding 1) How winter tick impacts on moose relate to habitat use and quality (*see* Blouin et al. 2021*a* and Blouin et al. 2021*b*), 2) How winter ticks affect moose nutritional condition and stress levels (*see* Rosenblatt et al. 2021), and 3) Moose genetic diversity and connectivity (*see* Rosenblatt et al. 2023).

Other related research at UVM assessed the effect of various fungal pathogens on survival of winter tick larvae (*see* Sullivan et al. 2021 and Sullivan et al. 2022). While some of these fungi resulted in high mortality of winter tick larvae in the lab, an important next step is to determine the effectiveness and feasibility of using these pathogens to control winter ticks in the field.

The Department is currently partnering with multiple northeastern universities and state and federal agencies on regional research efforts focused on non-invasive monitoring of moose and winter ticks. A component of this involves deployment of hundreds of long-term camera monitoring stations that will hopefully allow for better monitoring of moose health and population trends, particularly in parts of the region with little or no moose harvest.

Recent Winter Tick Impacts in WMU E

The severity of annual tick infestations is dependent not only on moose density, but also on climate, including temperature, humidity, wind, and snow. Annual variation in climate conditions results in variation in winter tick loads on moose. As long as climate conditions periodically result in reduced winter tick infestations, moose densities can remain at levels that perpetuate heavy tick loads and unhealthy moose for the foreseeable future.

Vermont has not collared moose calves since 2019. As a result, the Department relies on other sources of information to estimate winter tick impacts since that time. Summer calf recruitment of collared cow moose was better during 2020-2023 than during 2017-2019 (**Figure 4**). Additionally, small improvements in health measures for all age classes (***see* Population Health**), and anecdotal evidence (e.g., reports of dead moose, bloody beds, engorged ticks in snowmobile trails) suggest that tick impacts have been lower during at least 3 of the past 4 years.

While reduced winter tick impacts are encouraging, they are likely the result of unfavorable climate conditions for winter ticks in recent years. Fluctuations in winter tick impacts are expected, and current moose densities in WMU E will allow winter tick abundance and impacts on moose to increase again when climate conditions are more favorable for ticks.

Winter tick counts on bull moose harvested in October 2023 were comparable to those observed in recent years (**Figure 6**). The long-term trend in this index is encouraging, but there has been no change since 2016.

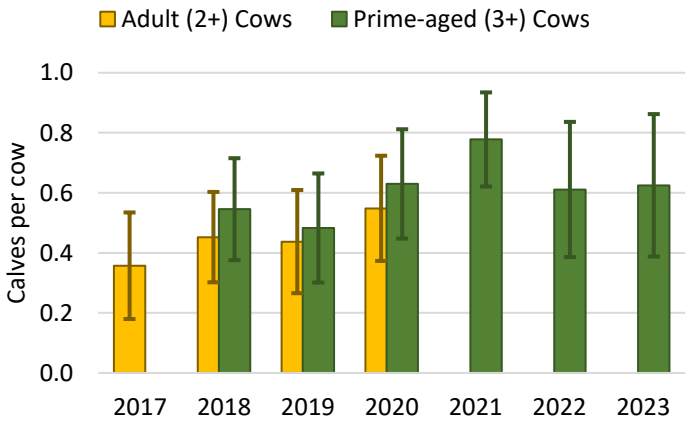


Figure 5. Summer calf recruitment of collared cow moose in Wildlife Management Unit E, 2017–2023.

This measure provides an indication of tick abundance on the landscape, but final tick loads on moose are largely determined by the length of the questing period. The questing period is typically ended by weather conditions (e.g., persistent snow or freezing conditions) that kill questing winter tick larvae. Persistent snow arrived in late October, 2023 in much of WMU E, which may result in reduced winter tick impacts again in 2024.

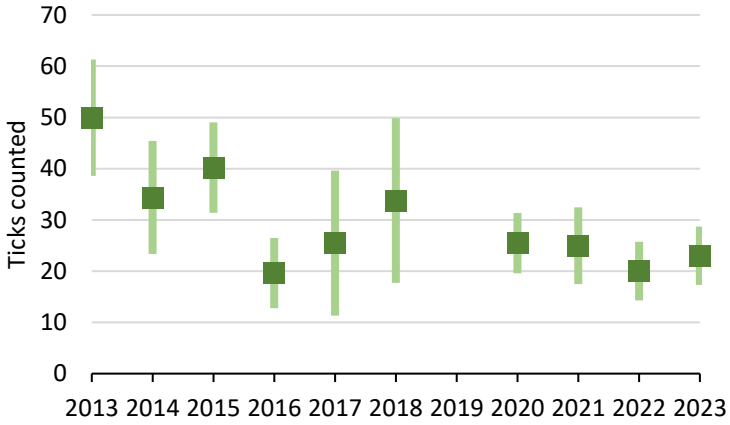


Figure 6. Winter tick counts on bull moose harvested in Wildlife Management Unit E, 2013–2023.

Population Health in WMU E

In the early 2000s, moose were overabundant in WMU E. They were causing significant damage to forest regeneration and their physical condition was declining as habitat quality declined. The Department actively reduced the moose population in this area to bring it into balance with the habitat and to improve the health of moose. By 2011, the population had been reduced to a level the habitat could support; however, health measures did not improve (**Figures 7** and **8**).

Moose body condition and reproductive rates have remained poor since 2011 due to the impacts of chronic high winter tick loads. Moose are not currently limited by habitat in the core part of their range, including WMU E (Dunfey-Ball 2017). However, habitat quality can influence the distribution of moose on the landscape (i.e., higher densities of moose in areas with the highest quality habitat), which can influence local winter tick abundance and impacts on moose health (Healy et al. 2019, Blouin et al. 2021*a* and *b*). Broader distribution and increased volume of timber harvests in WMU E over the past decade has resulted in a better distribution of optimal habitat. As a result, it appears moose are less concentrated around a limited number of hot spots.

It is unlikely that recent moose harvests (prior to 2023) were sufficient to cause a population reduction that would affect winter tick abundance. However, they have at least limited or prevented population growth, which in combination with a better distribution of optimal habitat, has likely limited local concentrations of moose that benefit winter ticks. In this way, moose density, as it affects winter tick abundance, may have functionally been reduced despite little or no change in overall average density across the WMU.

Body condition and reproductive rates have shown signs of improvement in recent years. This has likely been driven by reduced winter tick impacts in recent years due primarily to unfavorable climate conditions for ticks. While this is encouraging, we still need to see additional and sustained improvement. Even with a better distribution of optimal habitat, moose population reduction will be necessary to maintain these improvements when future climate conditions become more favorable for winter ticks.

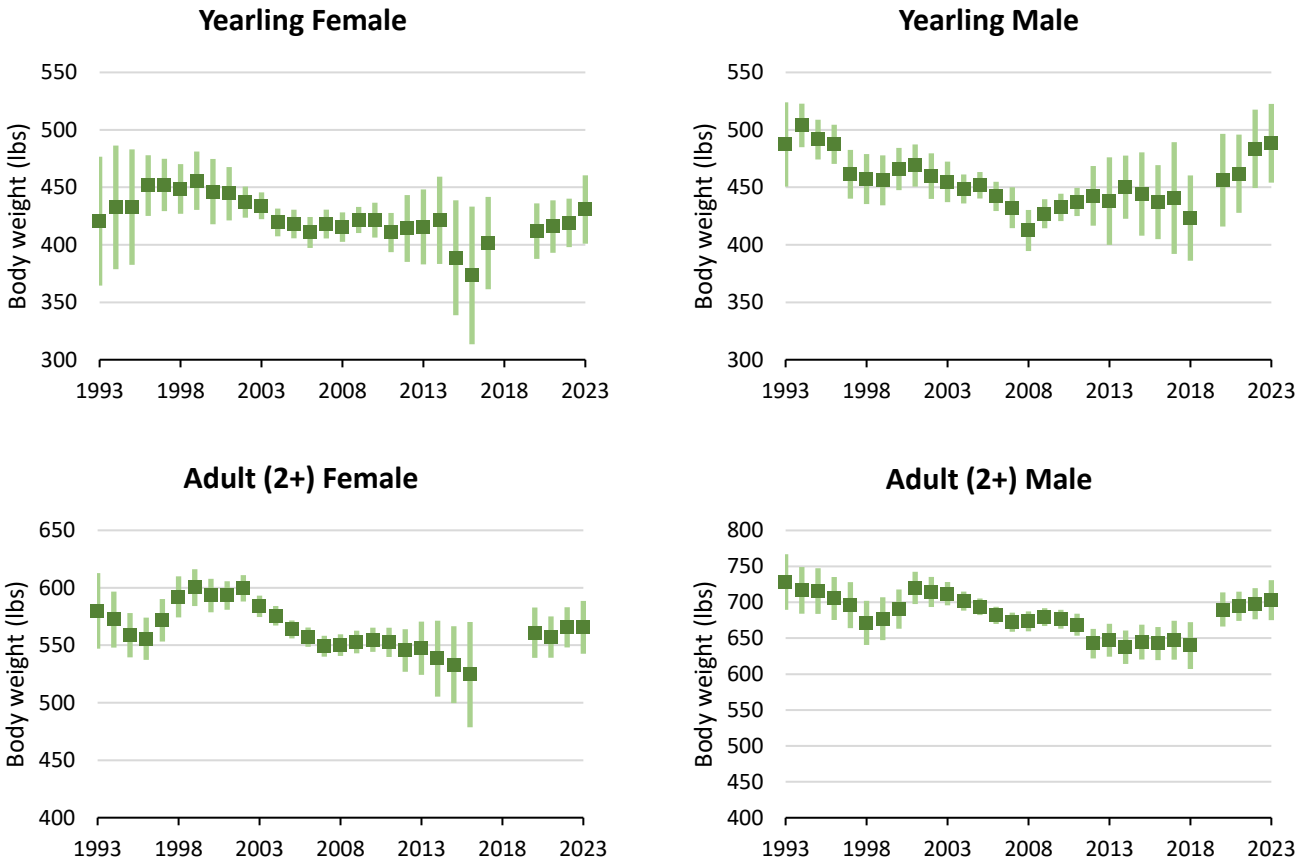


Figure 7. Field-dressed body weights of moose harvest during the regular season in Wildlife Management Unit E, 1993–2023. Data are 3-year rolling averages with 95% confidence intervals.

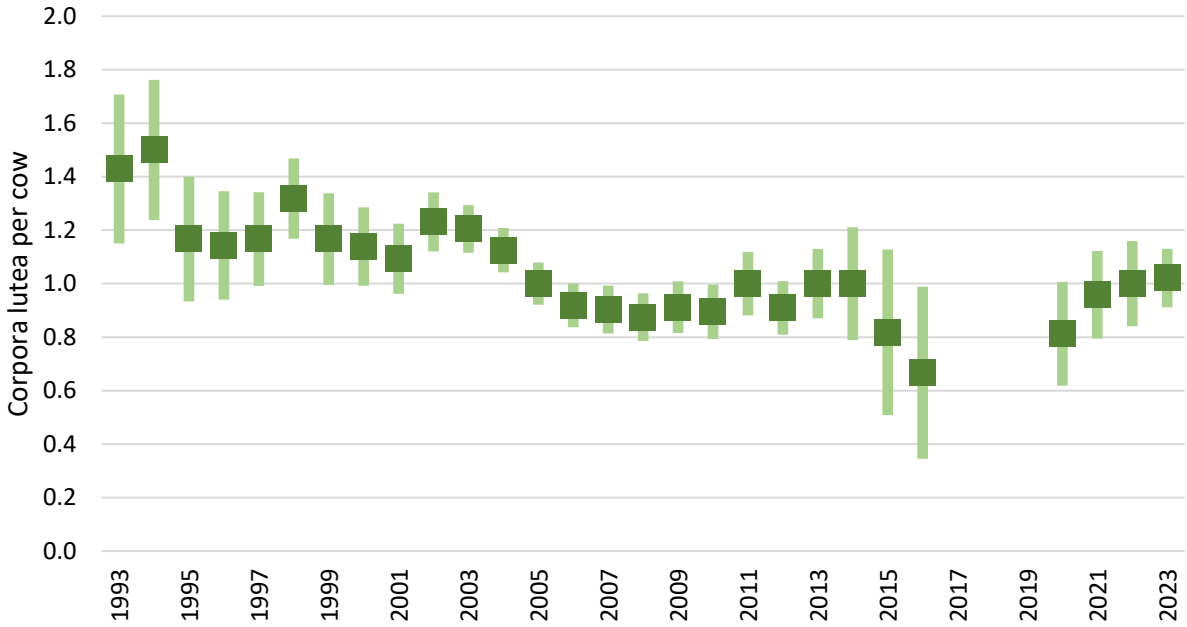


Figure 8. Ovulation rate of prime-aged (≥3 years old) cow moose in WMU E, 1993-2023. Data are 3-year rolling averages from counts of corpora lutea in ovaries collected from hunter-harvested moose.

Harvest Recommendation

The Department recommends harvesting approximately 47 adult cow moose (~10% of the cow population) in WMU E during the 2024 moose hunting seasons. The Department further recommends that this be accomplished through the issuance of 80 either-sex hunting permits and 100 antlerless-only hunting permits. Given historical success rates and sex-age composition of the harvest for each permit type, this allocation is expected to result in the harvest of approximately 94 moose with an expected breakdown of 41 bulls, 47 cows, and 6 calves.

Approximately 55% of permits are recommended to be allocated to WMU E1 due to higher moose densities in that WMU. Approximately 25% of either-sex permits are allocated to the archery season, based on the percentage of total applications that were for this season in recent years and the need to obtain sufficient biological data during the regular season. Allocations to the auction, special opportunity, and veterans are the same as prior years and are limited by statute and regulation. Permit breakdown by season, type, WMU, and special allocation is provided below in **Table 2**. This is the same permit allocation approved by the Fish and Wildlife Board in 2023.

Table 2. Recommended 2024 moose hunting permit allocations and expected harvest by season, permit type, and WMU.

	Permits			Expected Harvest	
	E1	E2	Total		
Archery Season					
Either-sex	11	9	20	10	*(7–13)*
Regular Season[1]					
Either-sex	29	25	54	36	*(29–42)*
Antlerless-only	55	45	100	44	*(37–56)*
Auction[2]	choice		3	2	*(0–3)*
Special Opportunity[2]	choice		3	2	*(0–3)*
TOTAL			**180**	**94**	*(73–117)*

[1] *Veteran permits are a priority draw for the first 5 regular season permits.*

[2] *Auction and Special Opportunity Permits are either sex and allow choice of season and WMU.*

The results of the moose study and continued monitoring of moose clearly show that the current density of moose in WMU E has been sufficient to sustain winter ticks at high levels that negatively affect moose health and survival. Research has shown that winter tick abundance is directly related to moose population density. Reducing the density of moose decreases the number of available hosts which in turn decreases the number of winter ticks on the landscape. Moose population reduction will be necessary to break the winter tick cycle and improve the health of moose in this region.

The Department is committed to achieving a healthy moose population in WMU E by meeting the population objectives established in the *2020-2030 Big Game Management Plan*. The proposed permit allocation and resulting cow harvest would reduce the population by about 4% per year and reach the objective of 1 moose/mi^2 (632 moose in WMU E) in 2031 (**Figure 9**).

In a worst-case scenario, where tick impacts are relatively severe every year, it would still take several years for the population to reach the target level. Importantly, the Department is confident that such a steep decline could be detected and that reducing the cow harvest would halt that decline. If tick impacts are reduced each year, as in the past 4 years, this harvest may not be enough to prevent population growth.

Each of these projections assumes constant harvest each year and no change in moose survival or reproductive rates. In practice, the moose population and winter tick impacts are dynamic, and management must remain adaptive. Actual permit allocations and harvest will be adjusted annually based on new information as it becomes available.

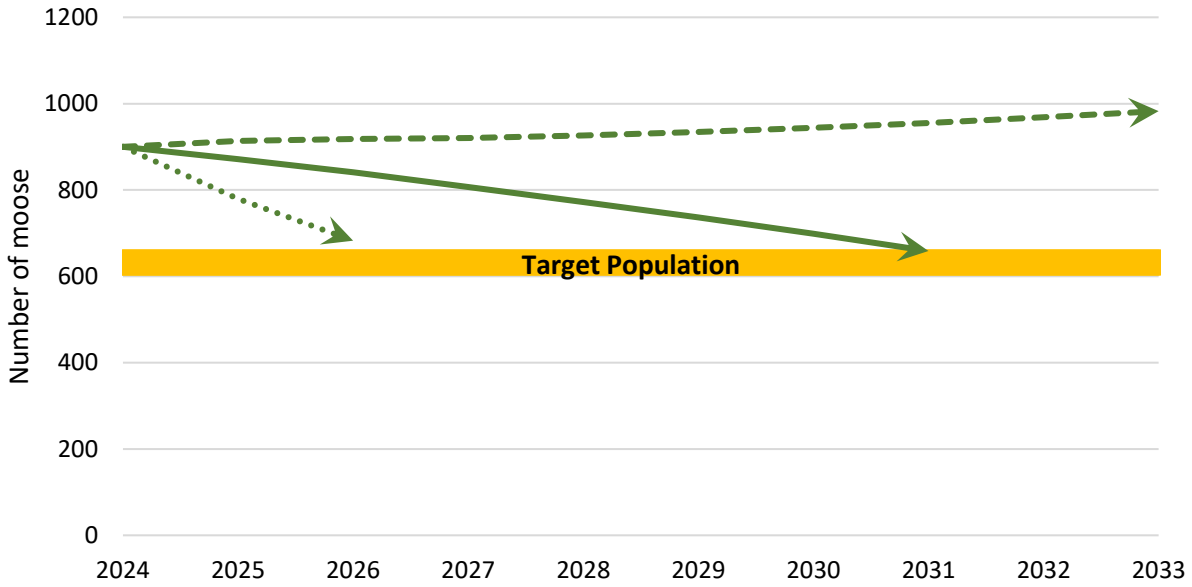


Figure 9. Moose population projections in WMU E at the proposed cow harvest given expected (solid line), worst-case (dotted line), and improved (dashed line) winter tick impacts. Projections assume consistent harvest each year and no change in survival or birth rates.

Maintaining a healthy, stable, and sustainable moose population requires action to improve moose health. Without management action to reduce the moose population, high tick loads will continue to impact the health of moose in WMU E for the next decade and beyond. The resulting chronic stress, low birth rates, and high calf mortality will make the population less resilient to diseases, parasites, and environmental variation, which could cause the population to destabilize. Importantly, 65% of Vermont residents support maintaining a smaller moose population through hunting if it reduces the number of moose that die each year from winter ticks. Only 15% oppose this approach (Responsive Management 2019).

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