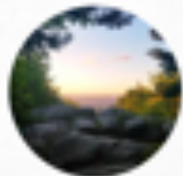




Vermont Center for Ecostudies advances conservation of wildlife across the Americas through research, monitoring, and citizen engagement. We deliver the science people need to make good decisions for wildlife.



The Vermont Center for Ecostudies unites people and science for conservation.



MOUNTAINS



FORESTS



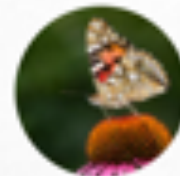
GRASSLANDS



LAKES & PONDS



CARIBBEAN



VT ATLAS OF LIFE

From shorelines to mountain tops...



Photos: Karsten Moran for The New York Times



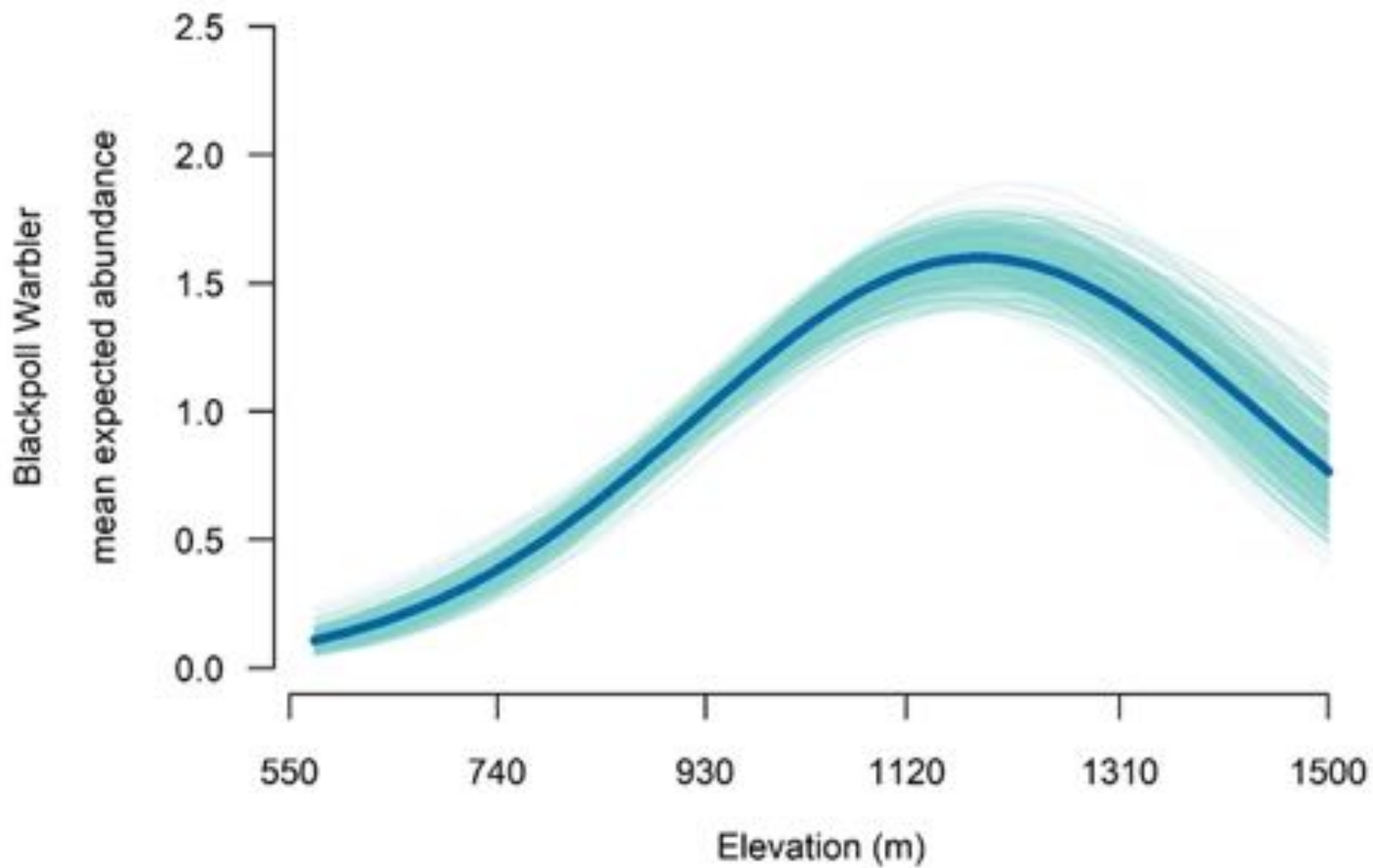
A person wearing a hat and a light-colored shirt is sitting on a rocky outcrop, looking through binoculars. The background shows a mountain range under a sunset sky with orange and blue hues.

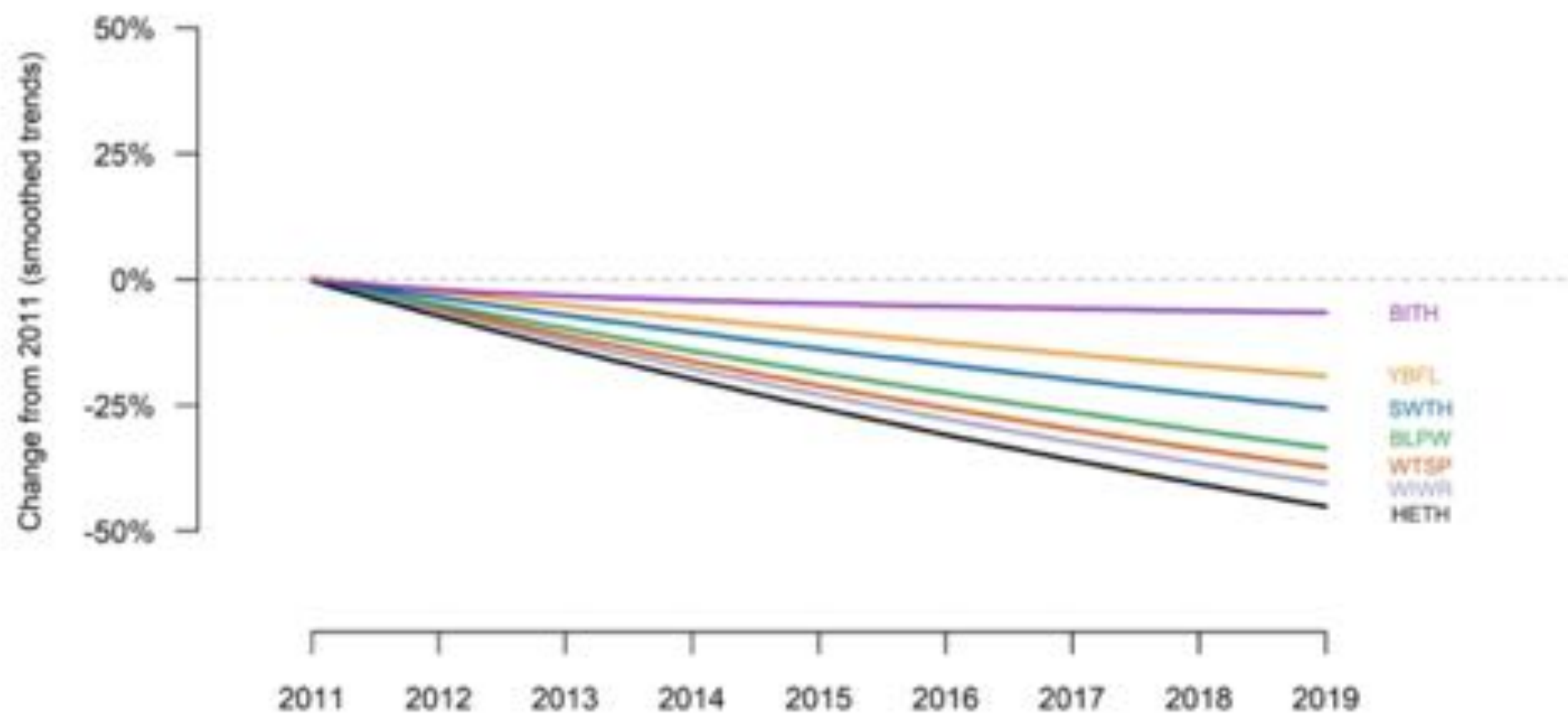
THE STATE OF THE MOUNTAIN BIRDS

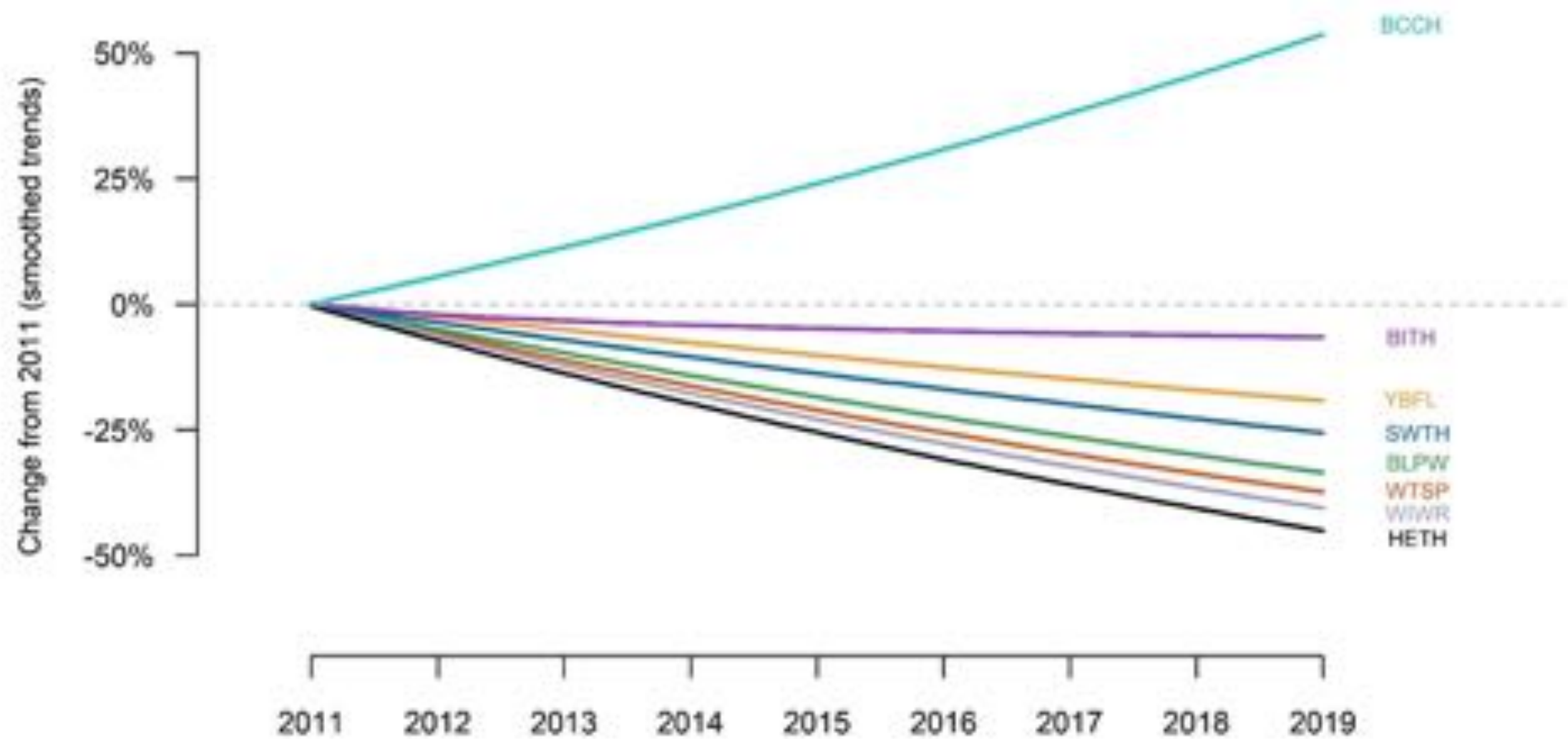
Measuring the Population Health of Our Northeastern
U.S. Montane Bird Species

READ THE SUMMARY OF THE STATE OF THE MOUNTAIN BIRDS
REPORT: 2020

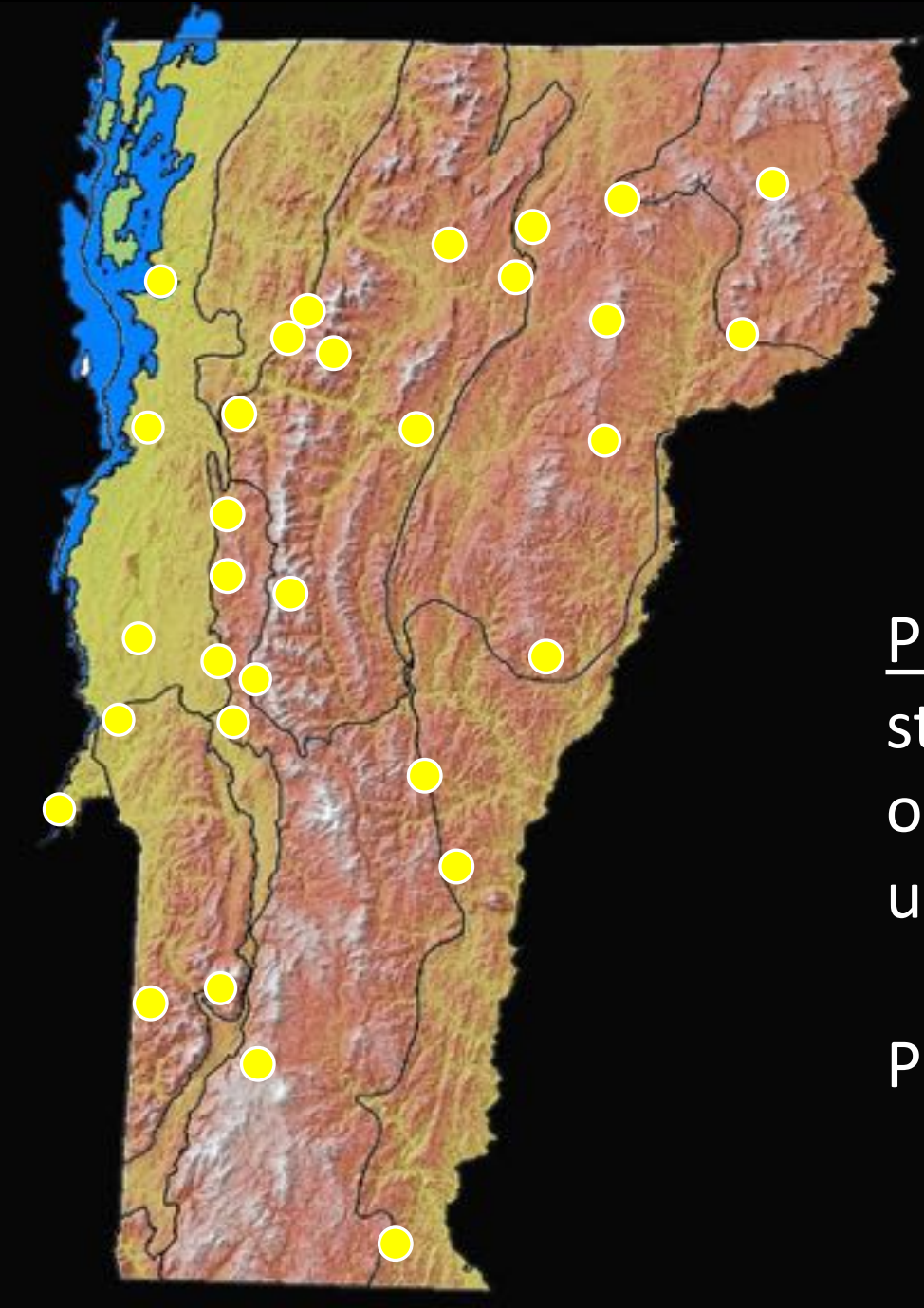
PI: Jason Hill <https://mountainbirds.vtecostudies.org/>







Vermont Forest Bird Monitoring Program 1989-present



Primary Goal: Monitor the status and population trends of interior forest birds in unmanaged woodlands.

PI: Steve Faccio



A close-up photograph of a yellow throat greenlet bird perched on a thin, brown branch. The bird has a bright yellow face and throat, a black cap, and a black and white striped pattern on its wings and back. The background is a soft, out-of-focus forest scene with green foliage and tree trunks.

2017

**THE STATUS OF
VERMONT
FOREST BIRDS:**

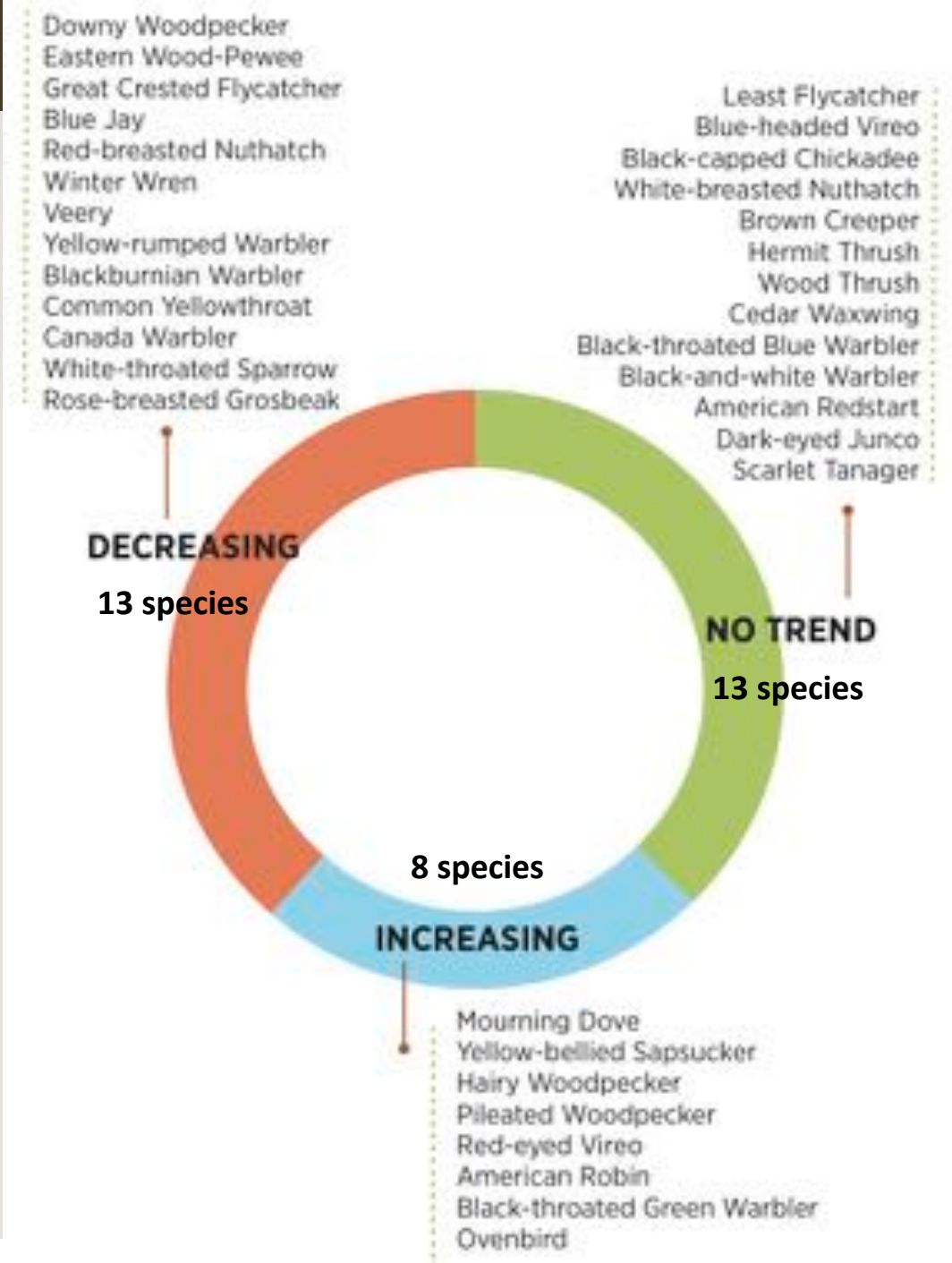
A Quarter Century of Monitoring

1989 – 2013

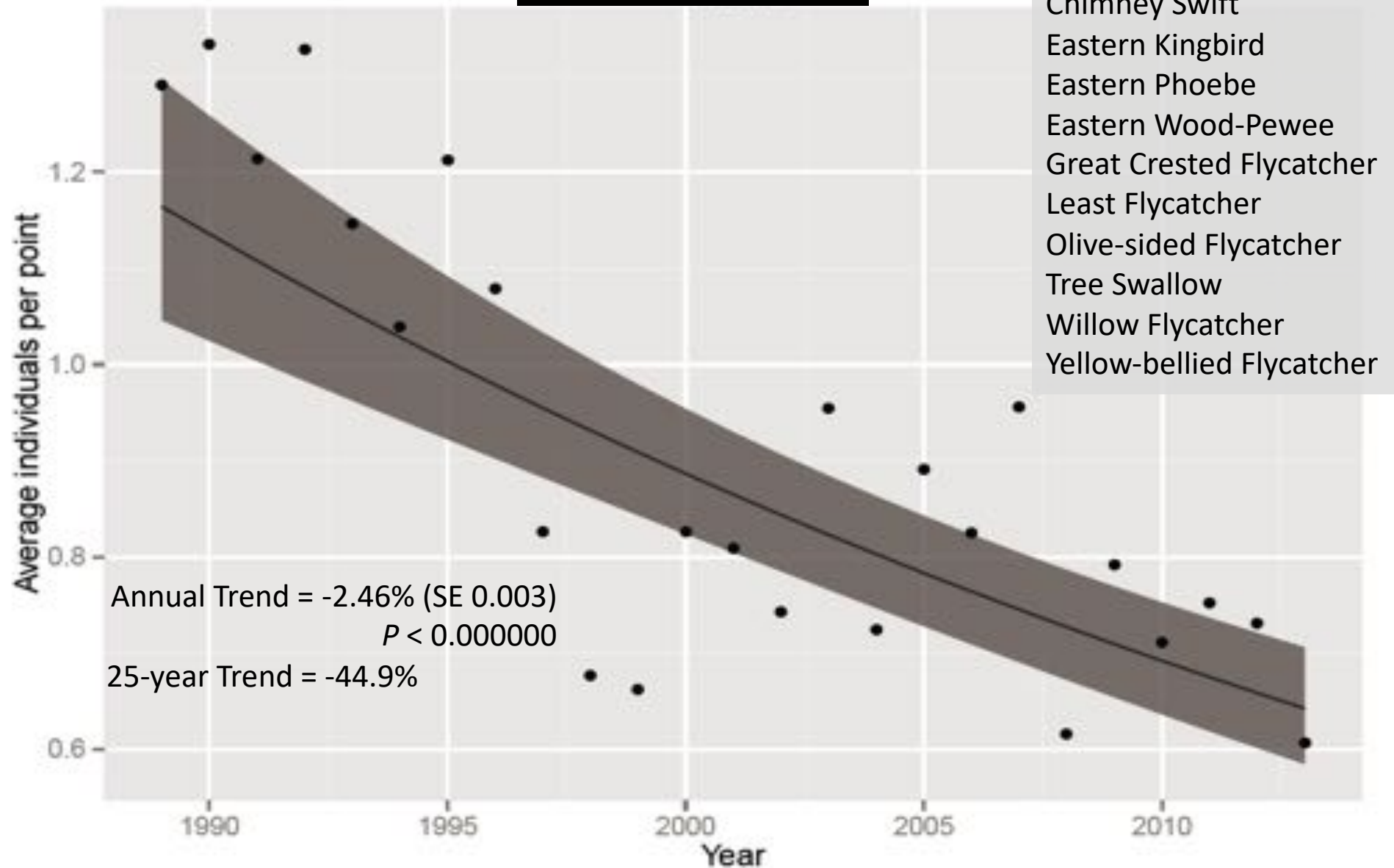
TABLE 3. Results of population trend analysis for 34 species, Vermont Forest Bird Monitoring Program, 1989-2013, and comparison with Vermont Breeding Bird Survey (BBS) trends, 1989-2013.
Blue = significantly increasing trend; **Red** = significantly decreasing trend; Black = no significant trend.
 Species listed in taxonomic order. Species included in analysis if they occurred at ≥10 study sites with ≥100 individuals.

SPECIES	Annual Change (%)	25-year Change (%)	P-value	Statistical Significance	VT BBS (1989-2013) Annual Change (%)	Agreement w/ FBMP
Mourning Dove	3.67	137.61	0.000	***	1.38	Strong
Yellow-bellied Sapsucker	3.82	146.14	0.000	***	2.90	Strong
Downy Woodpecker	-3.35	-55.91	0.000	***	-0.01	Moderate
Hairy Woodpecker	2.50	80.64	0.005	**	-1.24	None
Pileated Woodpecker	2.13	65.81	0.029	*	2.44	Moderate
Eastern Wood-Pewee	-1.76	-34.63	0.000	***	-2.31	Strong
Least Flycatcher	0.91	24.42	0.329		-3.08	None
Great Crested Flycatcher	-4.50	-66.92	0.000	***	0.37	None
Blue-headed Vireo	-0.79	-17.26	0.296		-0.55	Strong
Red-eyed Vireo	0.60	15.42	0.050	*	1.75	Strong
Blue Jay	-1.97	-38.00	0.000	***	-0.64	Moderate
Black-capped Chickadee	-0.59	-13.27	0.270		0.38	Moderate
Red-breasted Nuthatch	-2.90	-50.63	0.000	***	-0.52	Moderate
White-breasted Nuthatch	-0.24	-5.62	0.742		0.29	Moderate
Brown Creeper	-0.91	-19.74	0.244		2.31	Weak
Winter Wren	-1.82	-35.62	0.000	***	1.82	None
Veery	-2.14	-40.45	0.000	***	-1.46	Strong
Hermit Thrush	-0.15	-3.51	0.723		1.06	Weak
Wood Thrush	-0.07	-1.75	0.889		-4.55	Moderate
American Robin	1.33	37.27	0.015	*	-0.50	None
Cedar Waxwing	0.02	0.42	0.987		1.43	Strong
Black-throated Blue Warbler	0.31	7.60	0.462		-0.21	Moderate
Yellow-rumped Warbler	-4.49	-66.83	0.000	***	-1.42	Moderate
Black-throated Green Warbler	1.90	57.13	0.000	***	0.92	Moderate
Blackburnian Warbler	-1.73	-34.25	0.014	*	2.46	None
Black-and-White Warbler	-0.91	-19.71	0.279		0.12	Moderate
American Redstart	0.14	3.41	0.811		-1.91	None
Ovenbird	1.86	55.67	0.000	***	0.88	Strong
Common Yellowthroat	-6.30	-79.02	0.000	***	-0.46	Moderate
Canada Warbler	-5.10	-71.55	0.000	***	-5.42	Strong
Scarlet Tanager	-0.68	-15.02	0.200		-1.18	Moderate
White-throated Sparrow	-3.99	-62.37	0.000	***	-3.91	Strong
Dark-eyed Junco	-0.82	-17.88	0.260		-0.26	Strong
Rose-breasted Grosbeak	-1.83	-35.85	0.001	***	-1.50	Moderate

Significance: * = P ≤ 0.05, ** = P ≤ 0.01, *** = P ≤ 0.001
 NOTE: 73% of FBMP and BBS trends agree, either strongly (32%) or moderately (41%), while 27% show either weak (6%) or no (21%) agreement.



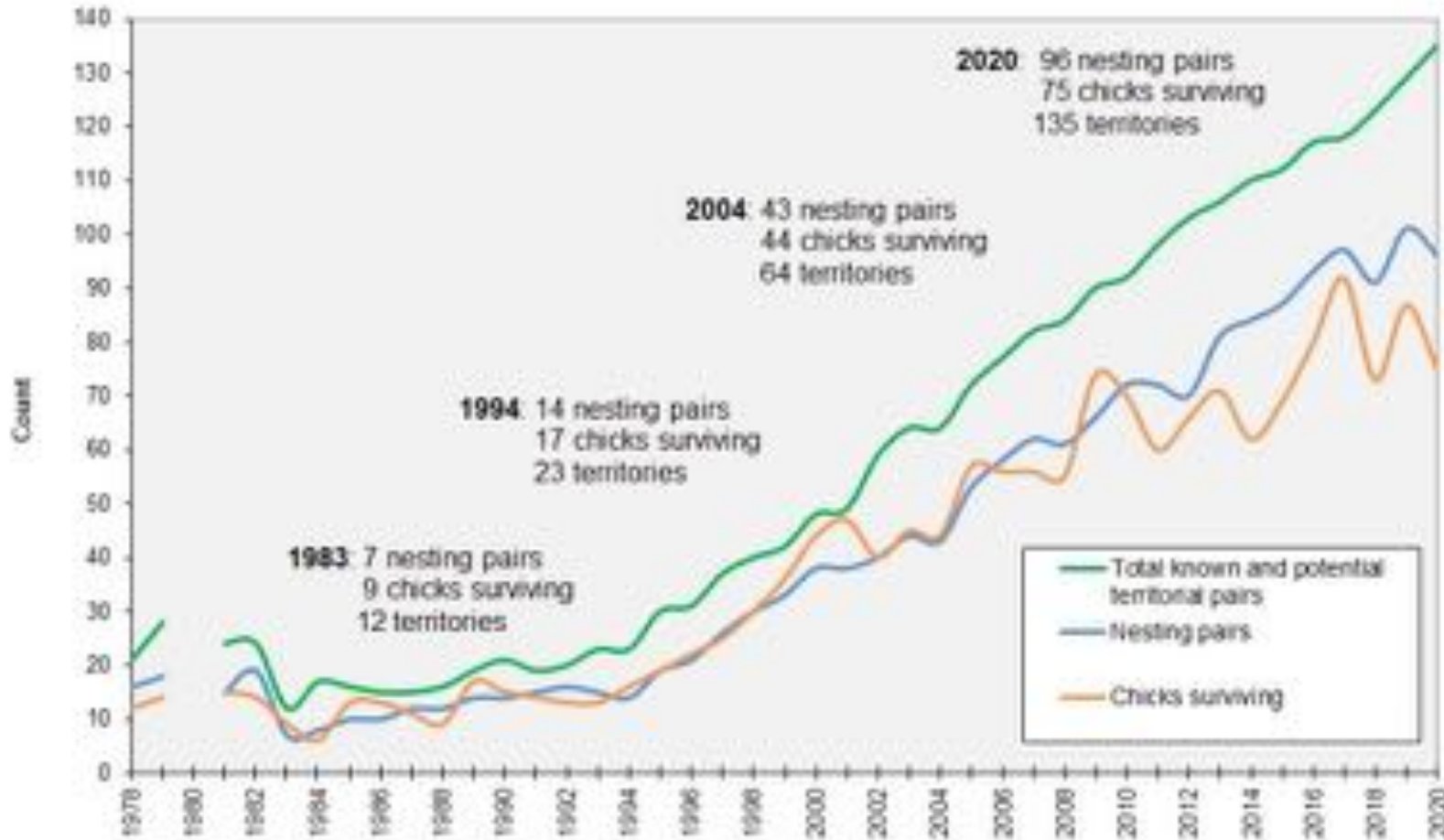
Aerial Insectivores



Vermont Loon Conservation Project

Monitoring – Management – Public Outreach

PI: Eric Hanson

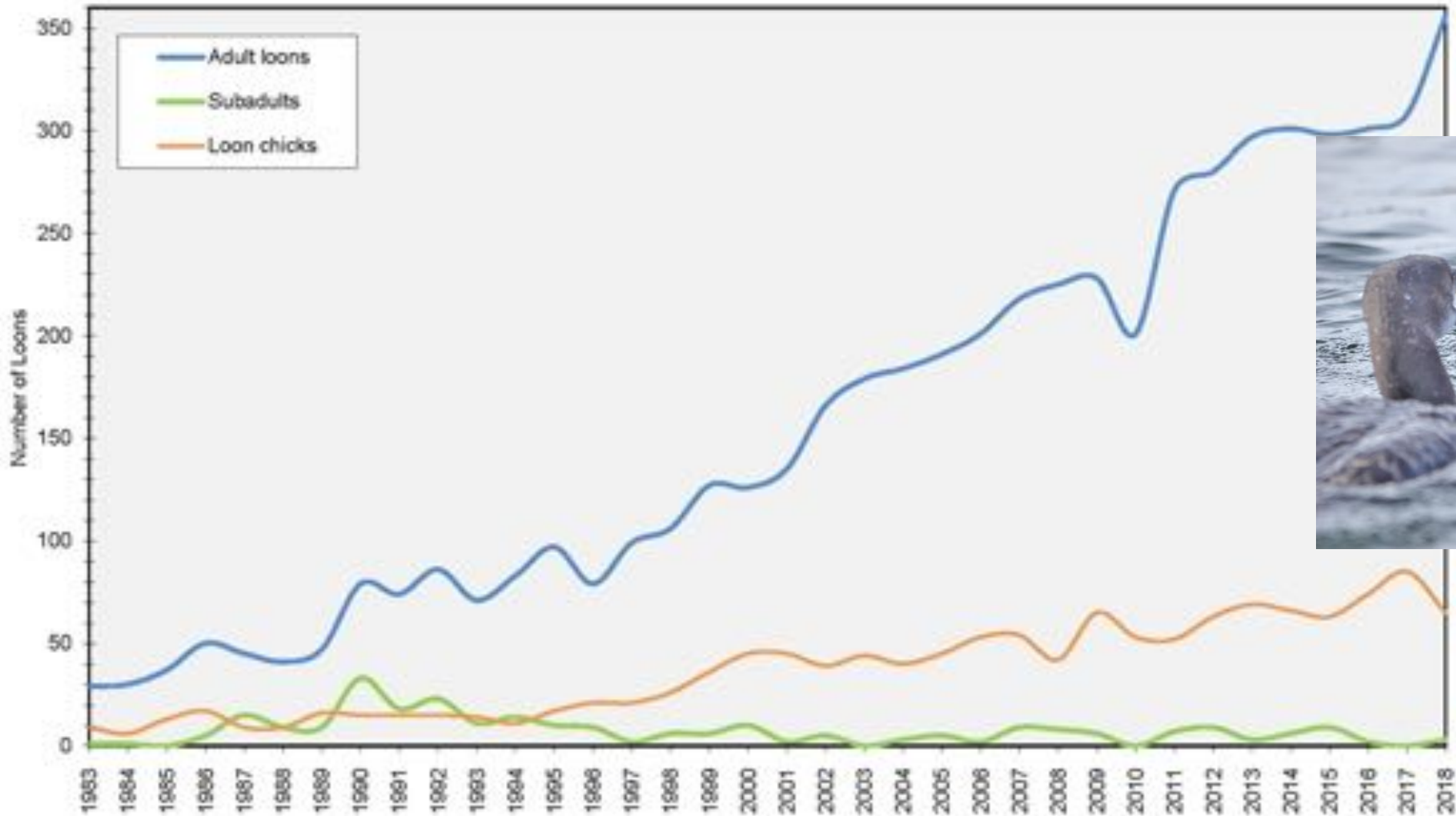


Listed as state endangered in 1987

Delisted 2005



Annual LoonWatch Day



2015-2020 Eastern Whip-poor-will detections



PI: Sarah Carline

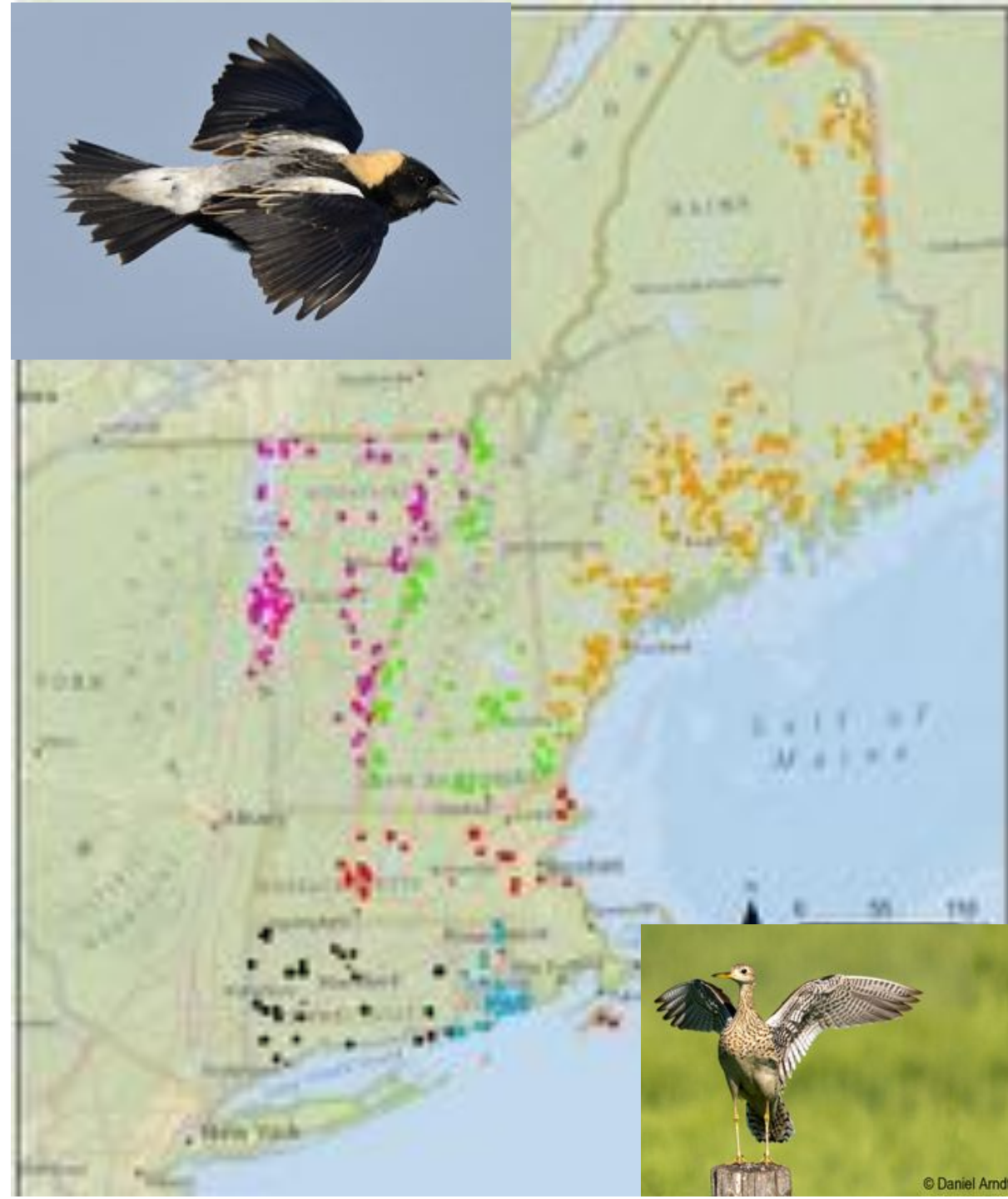


Listed
Threatened in
VT in 2011

NE Grassland Bird Surveys

- Surveyed in the late 1990s
- Resurveyed 2014-2015
- 8 of the 9 species we surveyed were detected at an average of 41% fewer sites
- Upland Sandpiper, was found in only 4% of the sites where they were previously found.
- Eastern Meadowlark site occupancy had declined by 76%.

Joint project of VCE, Mass Audubon, and the University of Delaware



Vermont eBird



Vermont eBird is a collaborative project managed by the Vermont Atlas of Life at the Vermont Center for Ecostudies.

COLLABORATOR



SPONSORS



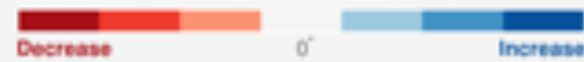
POWERED BY eBird The Cornell Lab

Wood Thrush

Trends: Breeding

This map depicts the ranked amount of change during the breeding season in estimated relative abundance across the years 2007-2016. Circles are colored by ranked increasing or decreasing trends and circle sizes are scaled by the maximum estimated relative abundance across 2007-2016. Light gray circles represent locations with trends not significantly different from zero.

CHANGE IN RELATIVE ABUNDANCE 2007-2016



*Trend not significantly different from zero

RELATIVE ABUNDANCE



SEASON DATE RANGE May 31 - Jul 6



- Most reliable trends [Learn more](#)
- Modeled area (0 abundance)
- No prediction

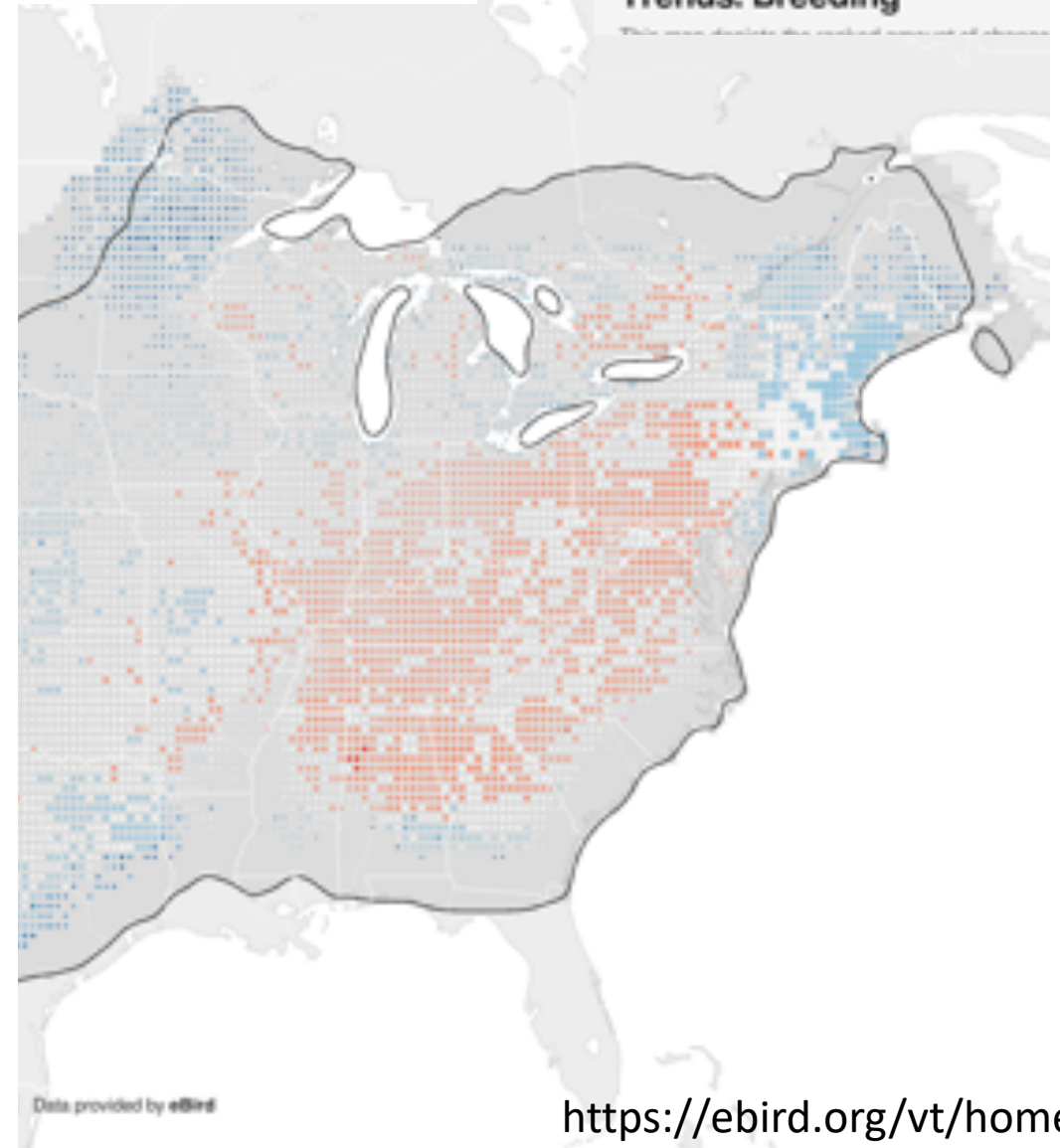
eBird data from 2004-2016. Estimated for 2007-2016.

Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, M. Bitt, and S. Kelling. eBird Status and Trends. Version: November 2018. <https://ebird.org/science/status-and-trends>. Cornell Lab of Ornithology, Ithaca, New York.

Eastern Phoebe

Trends: Breeding

This map depicts the ranked amount of change during the breeding season in estimated relative abundance across the years 2007-2016. Circles are colored by ranked increasing or decreasing trends and circle sizes are scaled by the maximum estimated relative abundance across 2007-2016. Light gray circles represent locations with trends not significantly different from zero.



Data provided by eBird

<https://ebird.org/vt/home>

The Vermont Atlas of Life

Discovering and Sharing Biodiversity Knowledge



5,262,052
records



10,424
species

Search the Atlas....



VAL Data Explorer

An online platform based on the Living Atlas infrastructure for exploring biodiversity information in Vermont.

Explore Data

Submit Your Observations

Vermont Atlas of Life Data Explorer

Open Access to Vermont's Biodiversity Data



5,262,052
records



10,424
species



364
datasets

Search the Atlas...



Explore with Maps



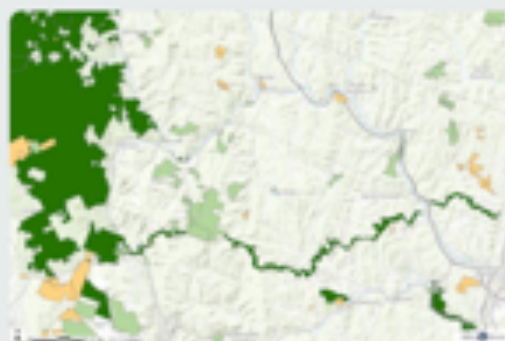
Search and Map by Polygon

Explore species records in an area you draw on a map.



Explore by Location

Search a map for biodiversity records by address, zip code, or location.



Explore Pre-defined Areas

Map and explore species reported in biophysical regions, protected areas, towns or counties. COMING SOON!

Submit Your Observations



Vermont Atlas of Life on iNaturalist

Get connected with a community of over a million scientists and naturalists who can help you learn more about nature! What's more, by recording and sharing your observations, you'll create research quality data for scientists working to better understand our natural heritage.

[Visit iNaturalist](#)



Vermont eBird

Vermont eBird has revolutionized the way that the birding community reports and accesses information about birds. Join the more than 9,000 bird watchers in Vermont in discovering and reporting bird observations for education, science and conservation. Every sighting matters. Contribute yours.

[Visit Vermont eBird](#)



eButterfly

Join the thousands of butterfly watchers in recording your observations. From the rarest butterflies to the most common, your sightings contribute to conservation decisions, scientific knowledge, education, and more. Share your observation and make a difference.

[Visit eButterfly](#)

Tiger Spiketail



© Dale Ferland

Dale Ferland



EXPLORE OR JOIN A WILDLIFE ATLAS PROJECT

Vermonters have long upheld a tradition of documenting biodiversity. Biologists and citizen scientists have recently completed major statewide surveys of breeding birds, butterflies, reptiles and amphibians, beetles, giant silk moths and more. Explore these specific surveying efforts and learn about the diversity and conservation status of our natural heritage.



Vermont Lady Beetle Atlas

Did you know that 34 native lady beetle species have been documented in Vermont? Unfortunately, almost half of these species have not been reported recently. Are they truly gone? It's a mystery we're eager to solve. We're declaring 2020 the Year of the Lady Beetle. Learn more about these insects and help us find them!

[Join](#)

Vermont Wild Bee Survey

Although we estimate there are about 300 species of wild bees in Vermont, there has never been a full survey. Without even a checklist of species, it is very difficult to know whether populations are healthy or declining. VTBees is the first step in assessing bee populations across Vermont. We begin our quest in Chittenden County in 2019 as well as historical collections across the state.

[Explore and Join](#)

Vermont Moth Atlas

The Vermont Atlas of Life, with the aid of many volunteers across Vermont, has been mapping moth distribution and phenology one photo-observation at a time. You can help us record and map all moths—rare or common. Take digital photographs and submit your observations!

[Explore and Join](#)

Vermont Butterfly Atlas

From 2002 - 2007 volunteers of all kinds searched fields and fens, mountains and meadows, even their own backyards, to survey Vermont butterflies.

[Explore](#)

Atlas of Vermont Orthoptera (Grasshoppers, Crickets, Katydids)

Welcome to the most comprehensive assessment of Vermont Orthoptera ever assembled. The Atlas of Vermont Orthoptera is also a living survey, growing every year with new discoveries and updated distribution maps.

[Explore](#)

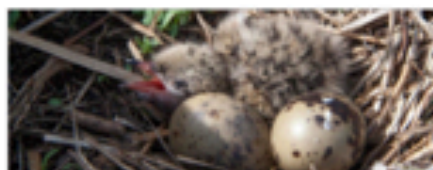
Vermont Bumble Bee Atlas

From 2012 to 2014, VCE biologists and citizen scientists spread across the state, from roadsides to mountain meadows, to survey bumble bees, and the similar appearing, Eastern Carpenter Bee. Nearly half of these bees are of conservation concern.

[Explore](#)

Vermont Vernal Pool Atlas

The Vermont Vernal Pool Atlas is an online, interactive database that compiles and archives data for the Vernal Pool Mapping Project and the Vernal Pool Monitoring Project. Browse the Atlas or join and submit information about vernal pools you visit.

[Explore and Participate](#)

Breeding Bird Atlas

The Vermont Breeding Bird Atlas is the most comprehensive bird survey in the state, and occurs only once every 25 years. The first atlas was from 1976-1981 and the second was completed in 2003-2007. Learn about the birds and their populations changes and join us for the third atlas in just a few more years!

[Explore](#)

Dragonfly and Damselfly Atlas

Vermont's fauna was poorly known until a new wave of fieldwork beginning in the late 1990s quickly relieved Vermont of its reputation as the most mysterious among New England states for odonates. This atlas presents the evidence.

[Explore](#)

Vermont Freshwater Mussel Atlas

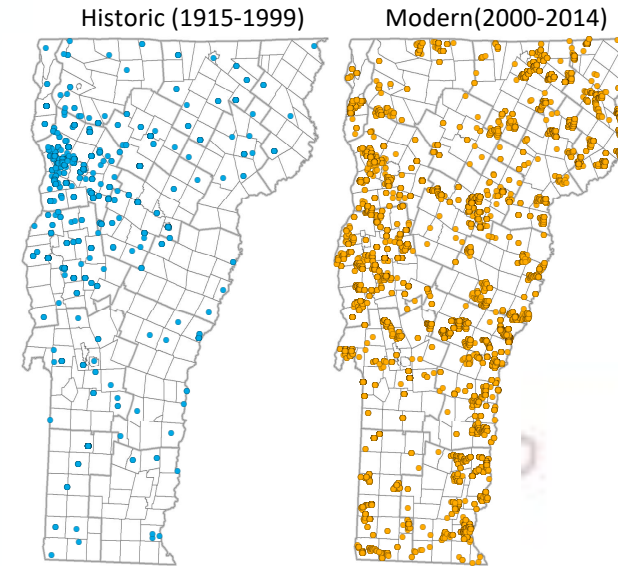
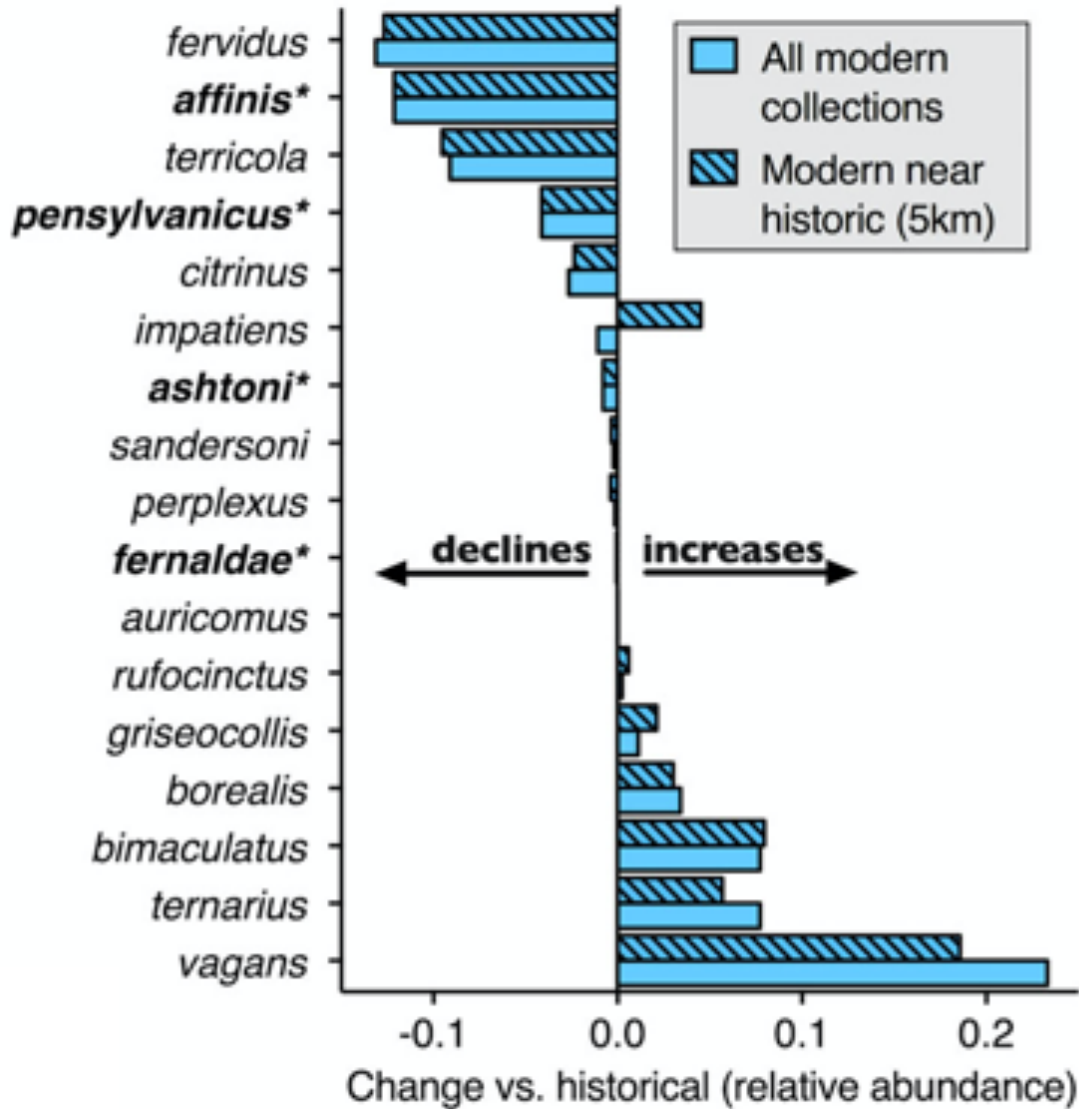
The mission of the Vermont Freshwater Mussel Atlas is to bring past, present, and future knowledge about freshwater mussel biogeography into currency for conservation, science, and society. Vermont has 18 native species and the majority are of conservation concern. Learn more about these bellwethers of water quality.

[Explore](#)

Bumble Bee (*Bombus*) Distribution and Diversity in Vermont, USA: A Century of Change



Kent P. McFarland², Leif L. Richardson^{1,2}, Sara Zahendra¹, and Spencer Hardy¹
¹Vermont Center for Ecostudies, Norwich, VT, ²Gund Institute for Environment, University of Vermont, Burlington, VT
Corresponding authors: kmcfarland@vermontecostudies.org | @KPMcFarland | leifrichardson@uvm.edu | @leifv7



Species of Greatest Conservation Need



West Virginia white
(*Pieris virginiensis*)



Early hairstreak
(*Erora laeta*)



Hackberry emperor
(*Asterocampa celtis*)



Tawny emperor
(*Asterocampa clyton*)



Edward's hairstreak
(*Satyrium edwardsii*)



Mulberry wing
(*Poanes massasoit*)



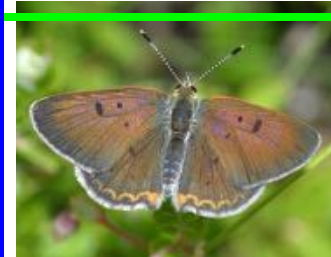
Dion skipper
(*Euphyes dion*)



Black dash skipper
(*Euphyes conspurcator*)



Two-spotted skipper
(*Euphyes bimacula*)



Bog copper
(*Lycaena epixanthe*)



Broad-winged skipper
(*Poanes viator*)



Dusted skipper
(*Lycaena epixanthe*)



Cobweb skipper
(*Hesperia metea*)



Persius duskywing
(*Erynnis persius*)

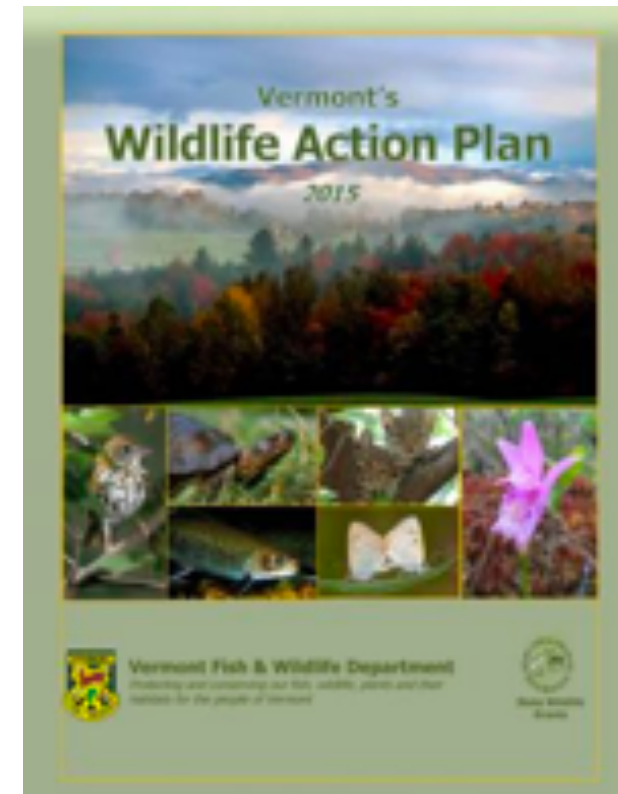


Jutta arctic
(*Oeneis jutta*)

Conservation Status Ranks (rarity, threats, trends)

NatureServe State Rank	Definition	Butterfly	Bumble Bee
SXSH	Presumed Extinct	1	3
S1	Critically Imperiled	13	1
S2	Imperiled	6	2
S3	Vulnerable	6	1
S4	Apparently Secure	11	4
S5	Secure	53	4
SU	unknown status	7	1
SGCN	Sp. of Greatest Cons. Need	14	9

- 25% of Butterflies
- 44% of Bumblebees



Vermont Wild Bee Survey

2019-2022

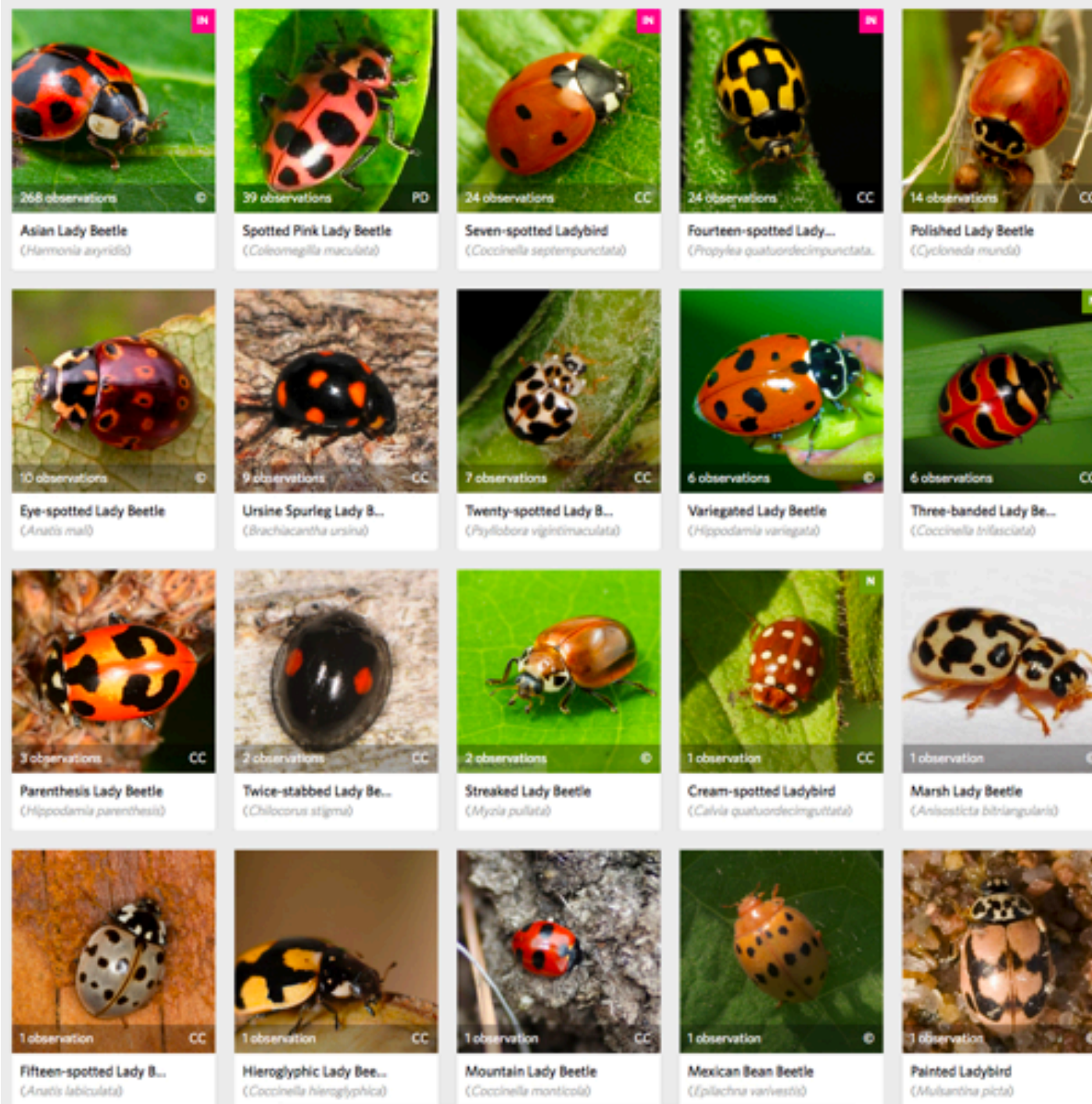
- We have documented 301 bee species in the state and we believe we may find as many as 350
- 37 new species discovered for Vermont
- 13 introduced non-native bees discovered. Some could be competing with native species.



GUND INSTITUTE FOR ENVIRONMENT



Sunflower Burrowing-Resin Bee (*Paranthidium jugatorium*) first discovered in Vermont by Kevin Hemeon.



Vermont Lady Beetle Atlas



GBIF | Global Biodiversity Information Facility

Free and open access to biodiversity data

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Occurrence records
1,650,322,943

Datasets
55,826

Publishing institutions
1,632

Peer-reviewed papers using data
5,330

