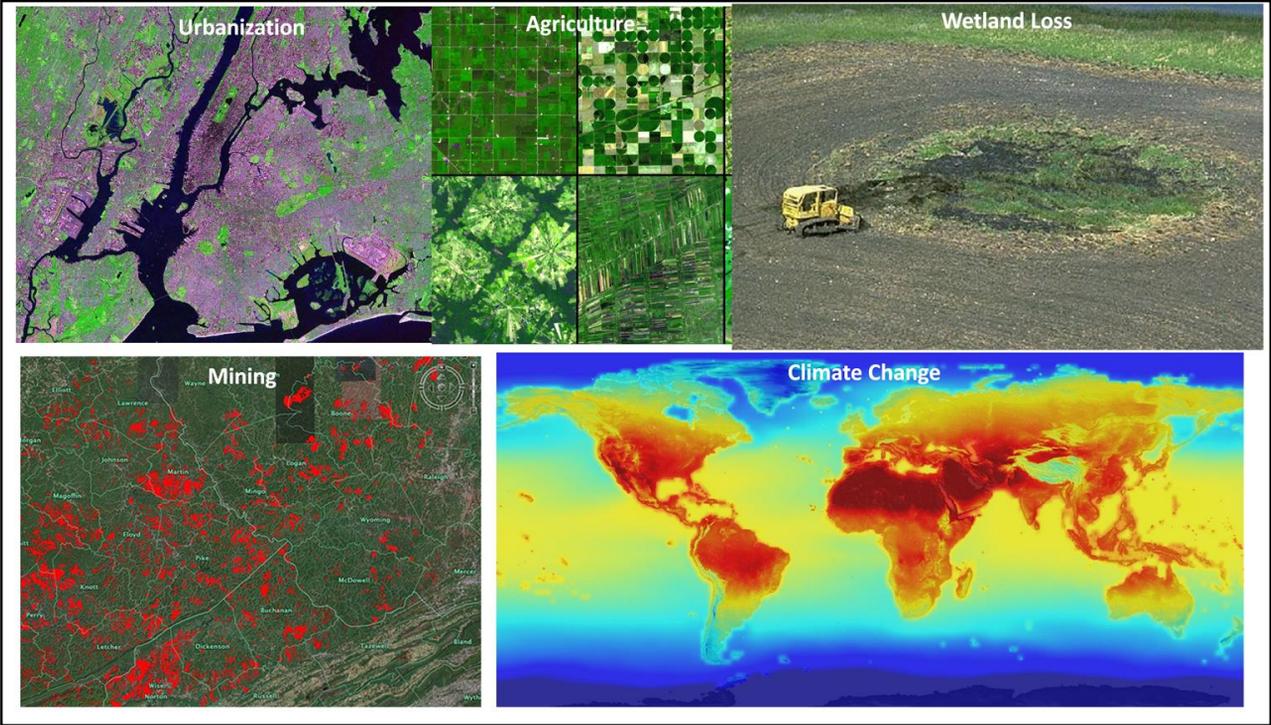


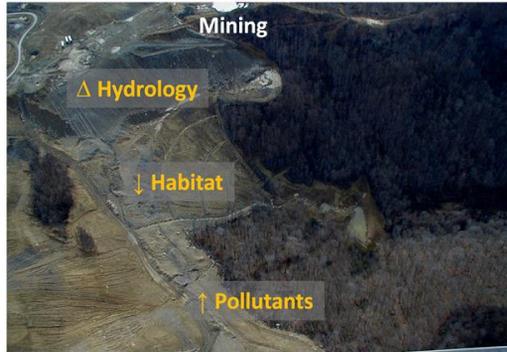
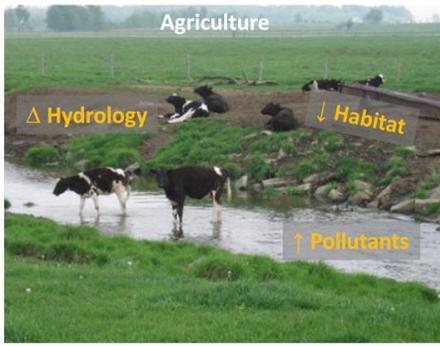
# Hudsonian Emerald in Boulder County

Status and Conservation of an Uncommon Dragonfly

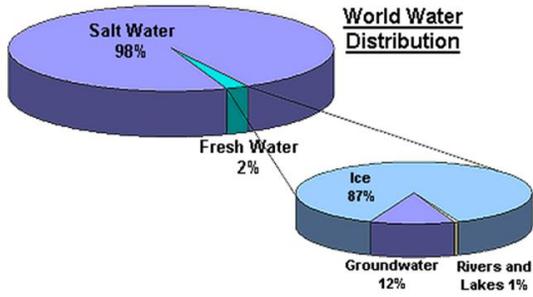
Kristofor Voss, Ph.D.  
Assistant Professor & Director of MS Enviro. Bio.  
Regis University  
kvoss@regis.edu

Katrina Loewy  
Research & Conservation Coordinator  
Butterfly Pavilion  
kloewy@butterflies.org

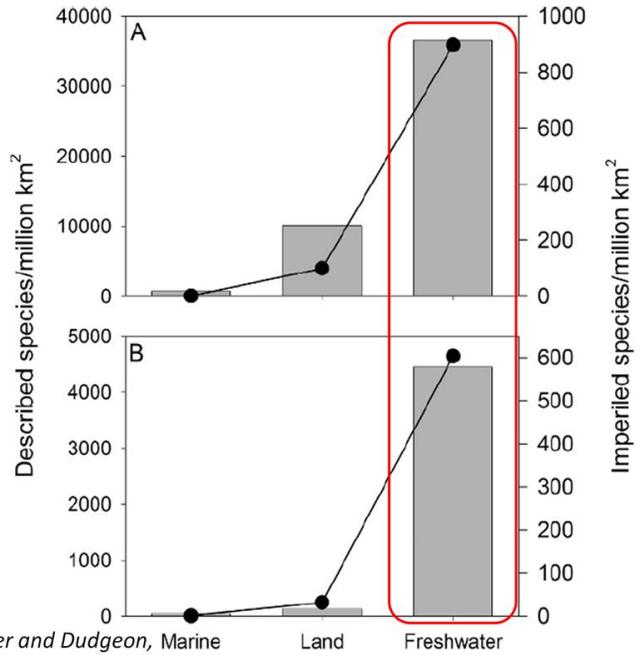




*Downstream freshwater ecosystems integrate the landscape changes that occur in their upstream watersheds including changes to climate and loss of wetlands.*



*Freshwater ecosystems are biodiversity hotspots AND are more prone to biodiversity loss than other ecosystems. Given the rarity of available freshwater on the landscape, freshwater organisms are in peril.*



Strayer and Dudgeon, Marine  
2010

# Dragonflies: Indicators of Change in Ecosystems



## Dragonfly Facts



- Can be sensitive to environmental degradation
- Important links in aquatic and terrestrial food webs
- Ectothermic = metabolism related to climate

## Hudsonian emerald (*Somatochlora hudsonica*)



- A rare dragonfly whose southern edge is in Boulder County.
- Listed as a species of concern by USFS and CPW
- Similar to other dragonflies, little is known about the ecology of the species.

# Research Questions

***Q1. In which areas of Boulder County Parks & Open Space do Hudsonian emeralds occur and how common is the species?***

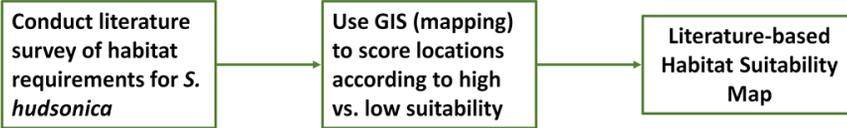
***Q2. What local-scale habitat features (e.g. water quality, vegetation management, etc.) tend to correlate strongly with presence of Hudsonian emeralds?***

***Q3. When and where do Hudsonian emeralds emerge from the water as adults?***

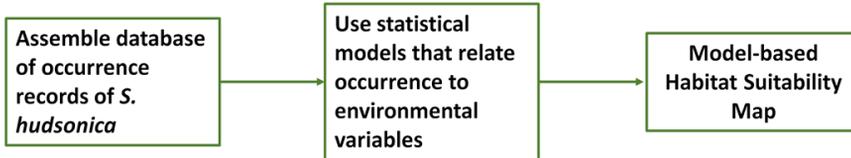
***Q4. Can we successfully rear larvae from eggs under controlled laboratory conditions?***

# Q1a: Where is *S. hudsonica* likely to occur?

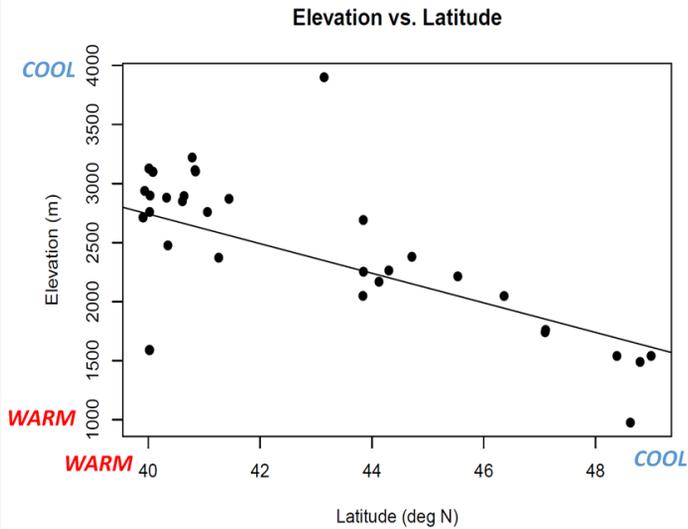
## Literature-based Method



## Model-based Method



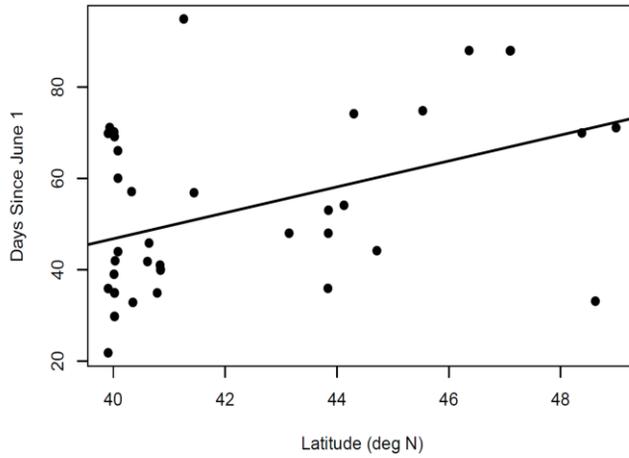
# Q1a: Where is *S. hudsonica* likely to occur?



***At lower latitudes,  
S. hudsonica is  
restricted to higher  
elevations.***

## Q1a: Where is *S. hudsonica* likely to occur?

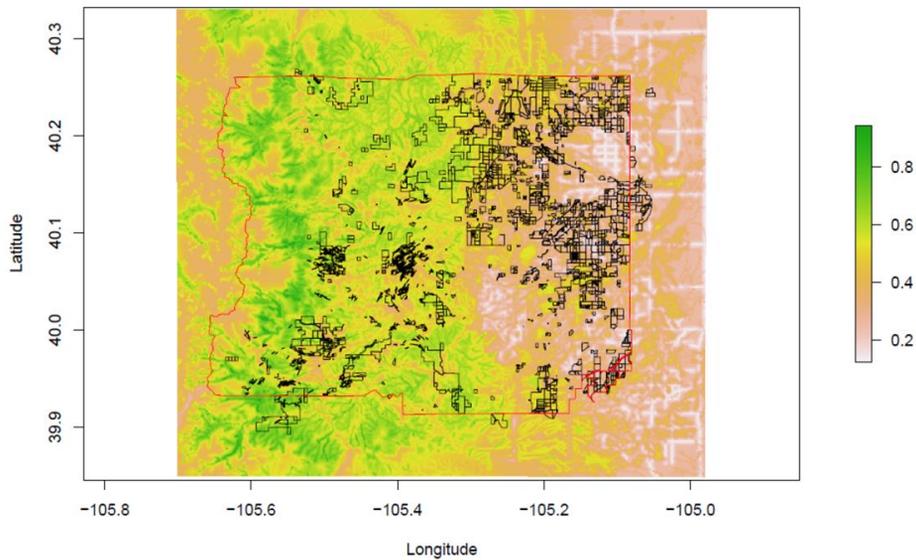
Observation Date vs. Latitude



***At lower latitudes,  
S. hudsonica is  
found earlier in the  
summer.***

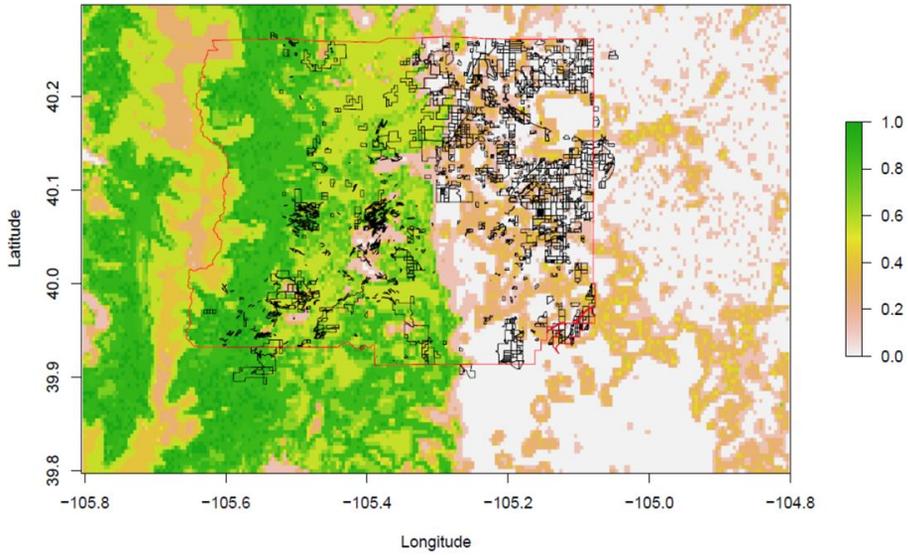
# Q1a: Where is *S. hudsonica* likely to occur?

Literature-Based Habitat Suitability

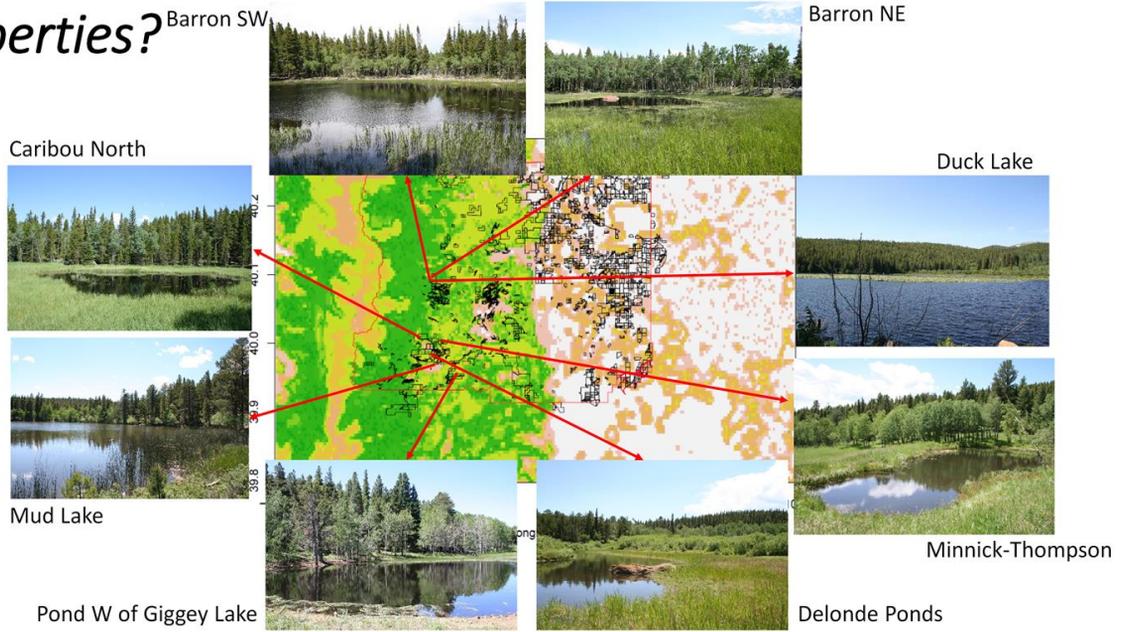


# Q1a: Where is *S. hudsonica* likely to occur?

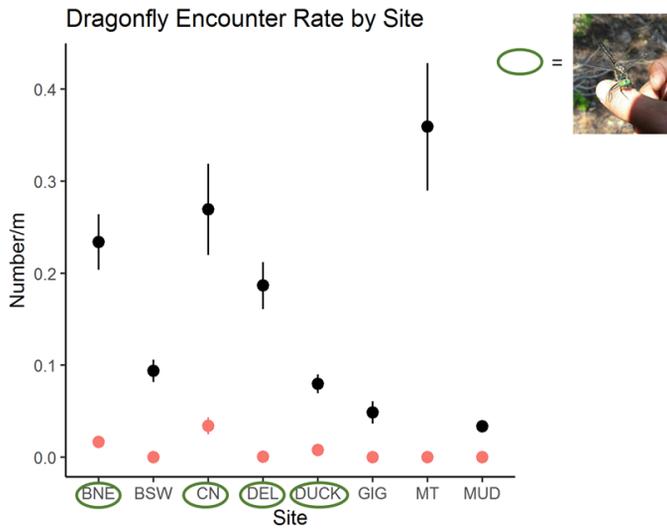
Model-Based Habitat Suitability



# Q1b: Where does *S. hudsonica* occur on BCPOS properties?



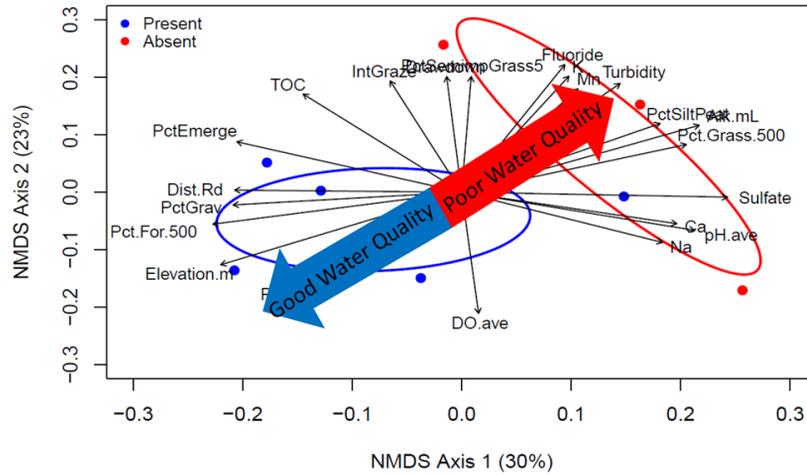
## Q1b: Where does *S. hudsonica* occur on BCPOS properties?



- *S. hudsonica* found at Barron, Caribou Ranch, and Duck Lake
- Across all sites, the relative abundance of *S. hudsonica* < 5%

# Q1b: What are the habitat requirements of *S. hudsonica*?

NMDS Ordination of Habitat Variables



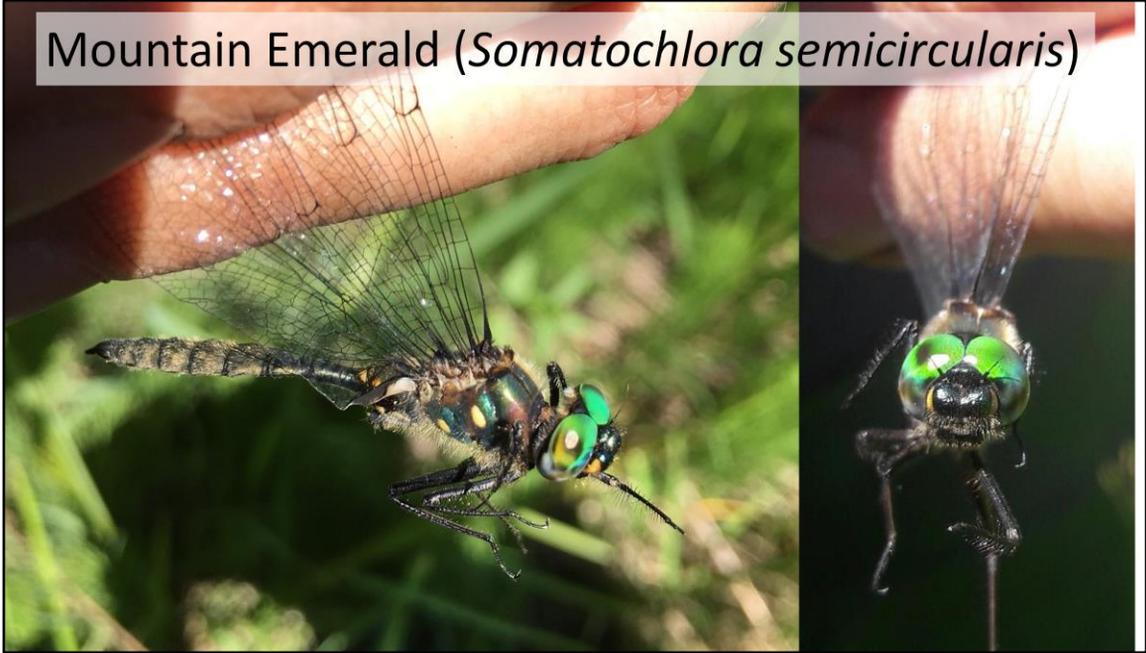
## *Conclusions*

***S. hudsonica is a thermally restricted species vulnerable to climate change and land use change. Under a changing climate, this species will be restricted to higher elevations. This makes protecting high quality habitat a priority for this species. Furthermore, S. hudsonica could be used an indicator of high quality habitat in higher elevation ponds within the county.***

## Hudsonian Emerald (*Somatochlora hudsonica*)



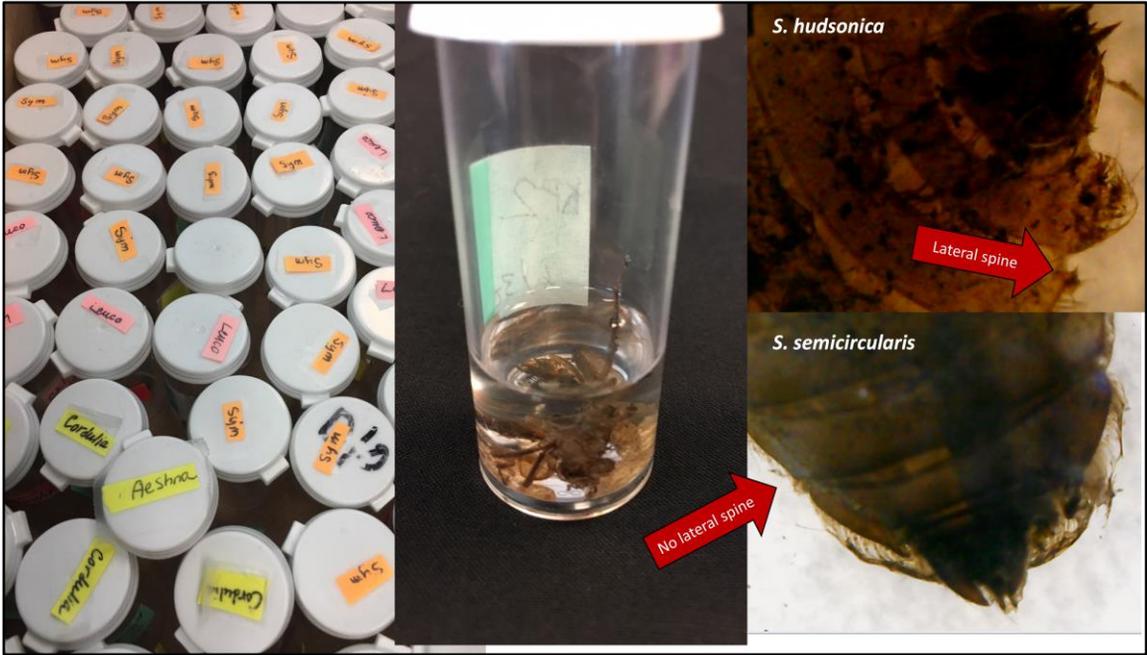
Mountain Emerald (*Somatochlora semicircularis*)



## American Emerald (*Cordulia shurtleffii*)

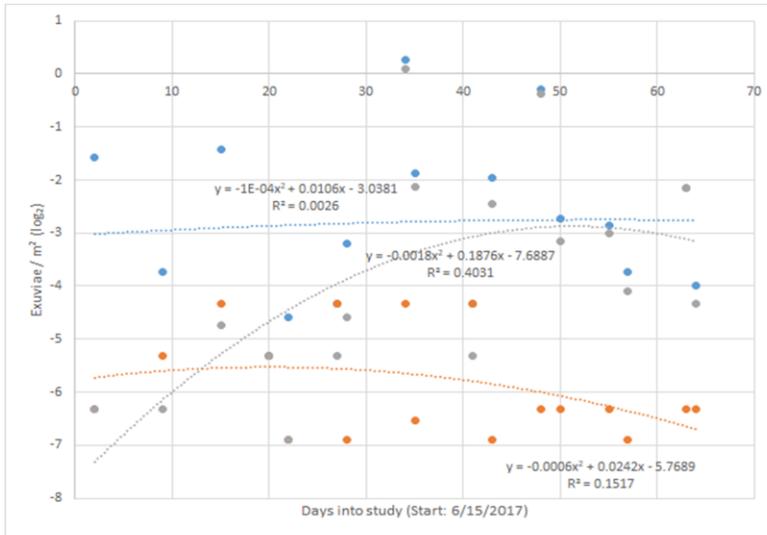






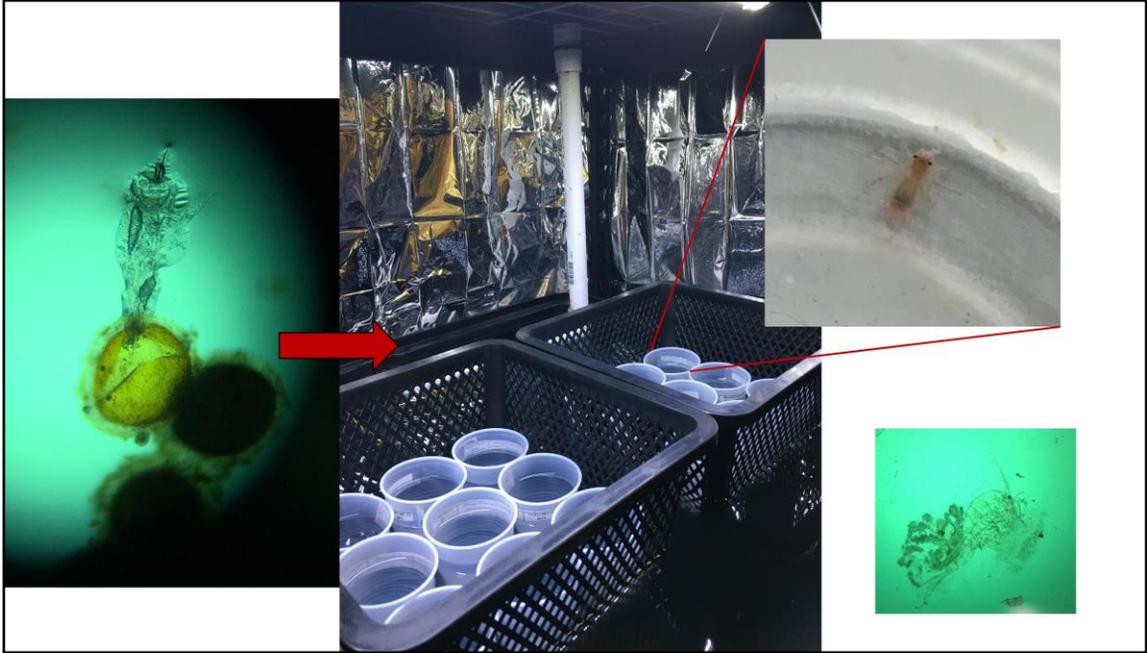
## Summary: exuviae collection

Site	Somatochlora hudsonica (Hudsonian Emerald)	Somatochlora semicircularis (Mountain Emerald)	Cordulia shurtleffii (American Emerald)	Genus: Aeshna/Rhionaeshna	Genus: Libellula	Genus: Leucorrhinia	Genus: Sympetrum
Barron NE	0	0	0	19	2	4	49
Barron SW	1	3	28	0	1	23	15
Caribou Kettle	0	4	0	0	3	4	170
Delonde Ponds	1	0	1	3	0	0	2
Duck Lake	0	0	3	2	2	1	0
<b>Total Counts</b>	<b>2</b>	<b>7</b>	<b>32</b>	<b>24</b>	<b>8</b>	<b>32</b>	<b>236</b>
<b>Relative Abundance (%)</b>	<b>0.59</b>	<b>2.05</b>	<b>9.38</b>	<b>7.04</b>	<b>2.35</b>	<b>9.38</b>	<b>69.21</b>



## Emergence times

- *Somatochlora* sp.
- *Sympetrum* sp.
- All dragonflies



## Head-start Update

	Mom A	Mom B
Oviposition date	7/7/2017	7/20/2017
Total eggs	62	143
Live hatchlings (days since oviposition)	14 (53)	6 (40); 7 (43); 10 (63)**
Hatched/broken eggs by November 15, 2017	22	27
Unfertilized eggs	0	9
Remaining viable eggs by November 15	40	107
Proportion eggs hatched pre-winter	35%	19%
Larval survival past 2nd instar	64%	37%
Range larval lengths on November 15 in mm	2.5 - 3.5	1.3 - 3.0
Mean larval length on November 15 in mm (n)	3.0 (5)	2.3 (8)

## Threats and Recommendations

- Climate Change
- Forest cutting and thinning
- Grazing
- Water pollution
  - Herbicides and pesticides
  - Mining
  - Recreation
  - Road runoff



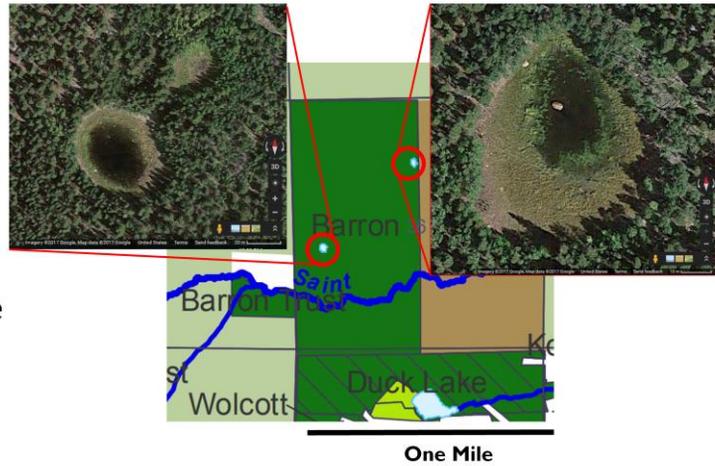
## Recommendations

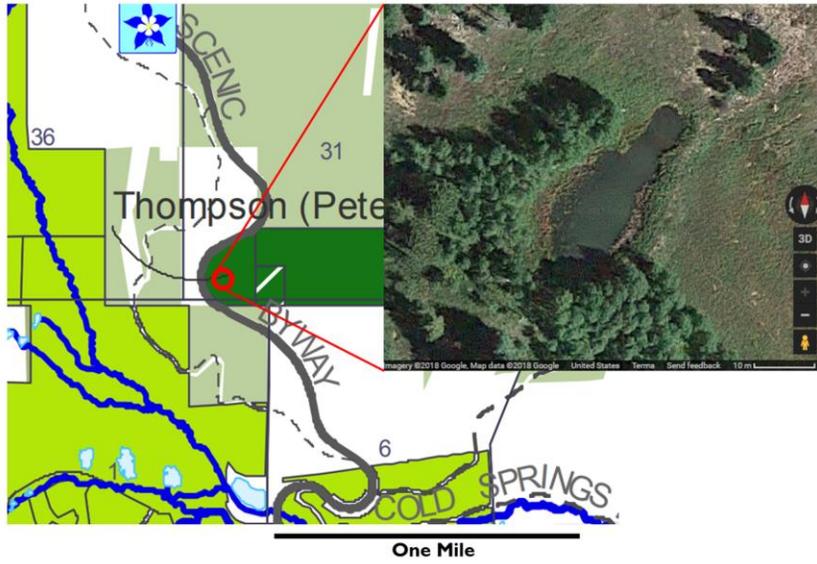


- Locate additional populations
- Utilize partnerships
- Continue monitoring
- Fill gaps in knowledge

## Summer 2018: Next steps

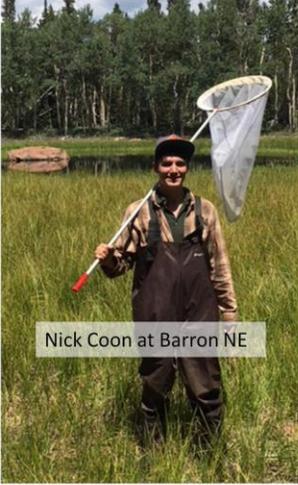
- Exuvial survey
  - Start date
  - Frequency
- Prey base
- Vegetation structure





# Acknowledgements

## Interns and Volunteers



Wendy Elliott (not pictured)

## Staff and Institutional Support



Especially: Mac Kobza, Rich Reading,  
Sarah Stevens, Mary Ann Colley

# Acknowledgements



Andy Pitluck, Colin Martin, Ariel Wooldridge, Jesse Rosso, Cat Devitt, Andrew Palmquist



Mac Kobza & Sue Spaulding



Rich Reading



# Homelessness on Open Space

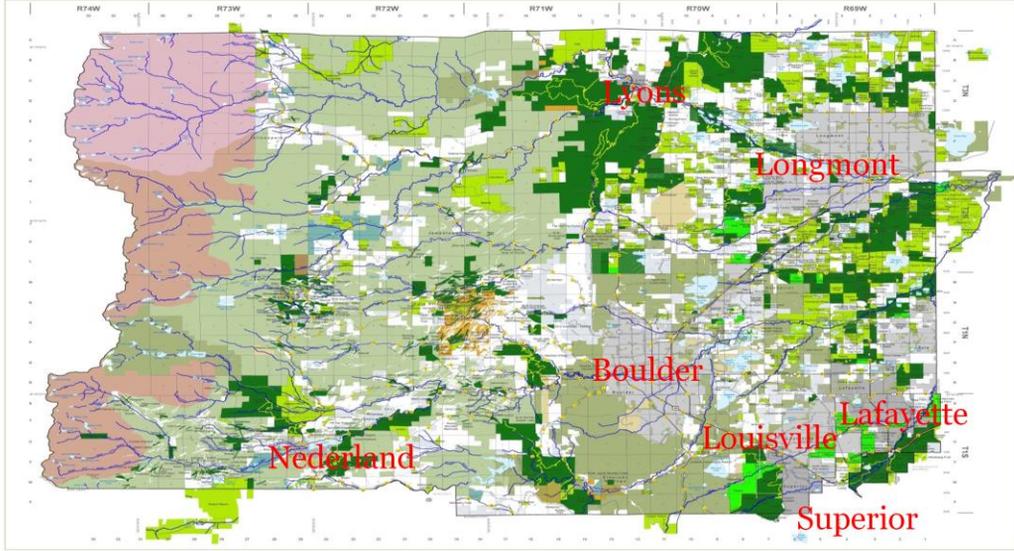


POSAC PRESENTATION MARCH 22, 2018



# Open Space in Boulder County

 Parks & Open Space



**Sheriff Map  
October 2017**

- County Open Space
- County Conservation Easement or Other Restrictions on Property Use (Under Review/In Progress or Completed)
- Joint County/City Open Space
- County Option Parcels
- County Closed Areas
- County Seasonal Closure Areas \*
- City Parks and Open Space
- State Land Board
- State Parks
- Indian Peaks Wilderness
- USFS Land
- B&E Land
- Rocky Mountain National Park
- Other Public Lands
- Non-County Conservation Easements
- Subdivisions or Platted Area
- Incorporated Area
- U.S. State Highway
- Non-Roaded Parkway
- Corridor
- Local Access
- Jeep Trail
- Scenic Byways



## Boulder County Parks and Open Space Camping



- **Camping**
  - Camping is prohibited in all County Parks and Open Space areas except...
  - Camping is only allowed at the Boulder County Fairgrounds campground
  - All Parks and Open Spaces close at Sunset and open at Sunrise year round



# Camping at the Fairgrounds



- No Tent Camping
- 14 day/night per calendar year camping limit
- Must be street legal
- Fee Camping only

# Fairgrounds



Just here for the night

# Fairgrounds



Vehicles



Buses

# Camps on Open Space



# Urban Camps



# Urban Camps



# Urban Camps



# Urban Camps



# Urban Camps



# Backcountry Camps



# Backcountry Camps



# Backcountry Camps



# Backcountry Camps



Man and a dog sleeping in here!

# Backcountry Camps



# Backcountry Camps



# Backcountry Camps



# Backcountry Camps



“Farming”



# Backcountry Camps



# How WE Deal with Camps



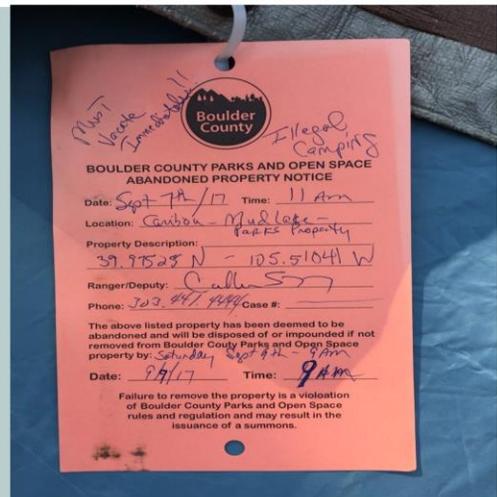
## How WE deal with them

- Ranger responds with at least one deputy
  - Higher risk contacts for us
- Gather info prior to entering camp
  - How many people/Where are they
  - Animals/Pets
  - Weapons
  - Illegal activity



# How WE Deal with Camps

- Attempt to contact Occupants
- Issue appropriate citations
- If no contact, apply and document abandoned property tag
- Clean up – After deemed as abandoned
  - Throw all trash away
  - Any item of “Value” is logged into SO Evidence
  - May use contractor if a large camp



# Officer/Personal Safety - Occupants



Cold Springs Fire

# Officer/Personal Safety

- Weapons found in camps

- Knives
- Axes
- Spears
- Bows/Arrows
- Shotgun



- Other considerations

- Drugs
- Paraphernalia
- Biohazard
  - ✦ Needles
  - ✦ Feces
  - ✦ Used Condoms...
- Stolen Items
- Legal Protections?

# What Community Resources Are Available?

- Overnight Shelters
- Day Shelters
- Food Resources
- Physical and Mental Health Services
- US Department of Veteran Affairs
- Boulder County Homeless Systems Coordinated Entry



# Clean up Considerations



Drug Paraphernalia

Valuable? Stolen?



# Clean up Considerations



- Who does it?
  - The campers
  - Ranger Staff
  - Grounds/Maintenance Staff
  - Jail Crews
  - Contractors

## Backcountry Camp Example – Kaufman Property



Long Term Camper



Backcountry Rest Room

# Kaufman Property



Work Shop



Garage/Storage

## Considerations



Occupant had been there for 8+ years

- Had wife and three kids – HHS?
- Camp included:
  - Living tent
  - Garage/Storage
  - Chicken Coup
  - Solar panels
  - Archery/clay pigeon range
  - Woodworking area
  - 10 foot spear

# What Happened?



# What Happened?



## Questions?



Jason Vroman

Lead Ranger

Boulder County Parks and Open Space

Office: 303-678-6350

[jvroman@bouldercounty.org](mailto:jvroman@bouldercounty.org)

# E-Bikes Public Engagement Plan Update

POSAC Meeting, March 22, 2018



# Colorado Statute

## HB 17-1151



- Defines e-bikes as non-motorized vehicles
- Defines 3 classes of e-bikes
- Requires manufacturers to label e-bikes by class
- Allows Class 1 & 2 bikes on bike/ped paths where bikes are allowed
- Local authority to prohibit

State legislators passed HB 17-1151, which defined three different classes of e-bikes, requires manufacturers to label e-bikes by class, defines e-bikes as non-motorized vehicles, and allows the use of Class 1 and 2 e-bikes where on bike or pedestrian paths where bicycles are allowed to travel. This bill gives local authorities the ability to prohibit use on trails under their jurisdiction.

# BCPOS Rules & Regulations Update



- Bike definition: exclusively human powered (#8)
- E-bikes prohibited (#8 & 9a)
- Note: “other power-driven mobility devices” allowed for disabled visitors (#9b)

# E-bike Demos & Open Houses



- Tues. Feb. 6, Boulder
- Sat. Feb. 10, Rock Creek Farm
- Tues. Feb. 13, Longmont

# E-bike Demos & Open Houses



- Public comment accepted through Feb. 28
- ~400 comments/surveys collected

# Timeline to Recommendation



- **March-April:** develop staff recommendation
- **May:** referral to communities
- **June:** public open house
- **July:** POSAC & BOCC public hearings

**County Commissioners  
Public Meetings & Hearings**

**THIS WEEK**

**TUESDAY, FEBRUARY 13**

8 a.m. **Business Meeting**  
Parks and Open Space: 2017 Open Space Summary

9 a.m. **Public Hearing**  
Land Use Department: Docket EP-17-0205  
Open-House: Boulder's Line Adjustments  
26 Pine Brook Road & 54 Wilderness Lane

**WEDNESDAY, FEBRUARY 15**

10:30 a.m. **Business Meeting**

11:00 a.m. **Public Hearing**  
Land Use Department: Docket EP-19-0001  
Open House Manager: Bob K. Hepler  
45 57 & Cooks Trail

2:00 p.m. **Public Hearing**  
Land Use Department: Docket SE-18-0001 Downson  
124 Cambridge  
27 Eldorado Springs Drive

**OTHER MEETINGS**

**Board of Health**  
5:30 p.m., Monday, February 12  
Public Health Auditorium  
3450 Broadway, Boulder

**Boulder County Council**  
6:00 p.m., Tuesday, February 13  
Hearing Room  
County Courthouse, 1310 Pearl Street, Boulder

The public is invited to attend all County Commissioners' meetings. Public comment will be accepted at those designated as "public hearings." Location (unless otherwise specified): Commissioners' Hearing Room, Boulder County Courthouse, 3rd floor, 1325 Pearl St., Boulder, Limited, temporary parking is available in the parking lot on Spruce Street between 33rd and 14th Avenues. For more parking information and other questions, please call: 303-441-3500 or email: [commissioners@bouldercounty.org](mailto:commissioners@bouldercounty.org). Agendas are subject to change. Please call ahead to verify an item of interest. For special assistance, please contact our ADA Coordinator (303)441-3525 48 hours before the scheduled agenda item.

**E-bikes on Boulder County  
Open Space -  
Open House Feb. 13**

Boulder County Parks & Open Space is hosting its last open house (on Tuesday, Feb. 13, in Longmont) to seek public input regarding e-bike use on Boulder County Parks & Open Space property. Interested parties are also encouraged to provide input online at: [www.BoulderCountyOpenSpace.org/ebike](http://www.BoulderCountyOpenSpace.org/ebike)

**Open House Date:**  
Tuesday, Feb. 13  
The open house will be preceded by an opportunity to test-ride e-bikes.

**E-Bike Demo, 4-5 p.m.**  
Lagerman Agricultural Preserve  
7100 Pike Rd., Longmont

**Open House, 5-6:30 p.m.**  
Ron Stewart Parks & Open Space Building  
5201 St. Vrain Rd., Longmont

For more information or to submit comments, visit [www.BoulderCountyOpenSpace.org/ebike](http://www.BoulderCountyOpenSpace.org/ebike) or contact Tina Nielsen, Special Projects Manager at 303-478-6279 or [tinielsen@bouldercounty.org](mailto:tinielsen@bouldercounty.org).

**Some worry about damage to trails;  
others say they're an alternative to vehicles**

DC 1/27/18

From the Editorial Advisory Board

**E-bikes  
and trails**

**B**oulder County is seeking comments on whether electric-powered bikes should be allowed on bike trails in county parks and open space. Your take?



Boulder resident Ceryn Miles (top) takes a fast ride on an electric bicycle during a demonstration event Tuesday at the Gerald Shocco Outdoor Trails in Boulder.   
Jenny Powers / Staff Photographer  
Gerald Shocco Outdoor Trails in Boulder.

Most of the people at the open house seemed to be in favor of the bikes being allowed, at least to some extent, on county open space.

**County considers  
e-bike potential**

**Decisions on e-bikes' use on trails still months away**