NORTHLAND COLLEGE

LOONWATCH
SIGURD OLSON ENVIRONMENTAL INSTITUTE

Erica LeMoine
Director of LoonWatch
Email: loonwatch@northland.edu
Phone: 715-682-1220

LoonWatch Mission

Engage, educate and connect students and citizens with resource professionals.

Wisconsin Loon Population Survey

Training Workshops

Sigurd T. Olson Loon Research Award

Resource to Answer Citizen Questions

Annual Lakes Monitoring Program

Educational Materials

Work Study and Interns

LOONWATCH
SIGURD OLSON ENVIRONMENTAL INSTITUTE

Website

Advisory Council

Speakers' Bureau

Get the Lead Out!

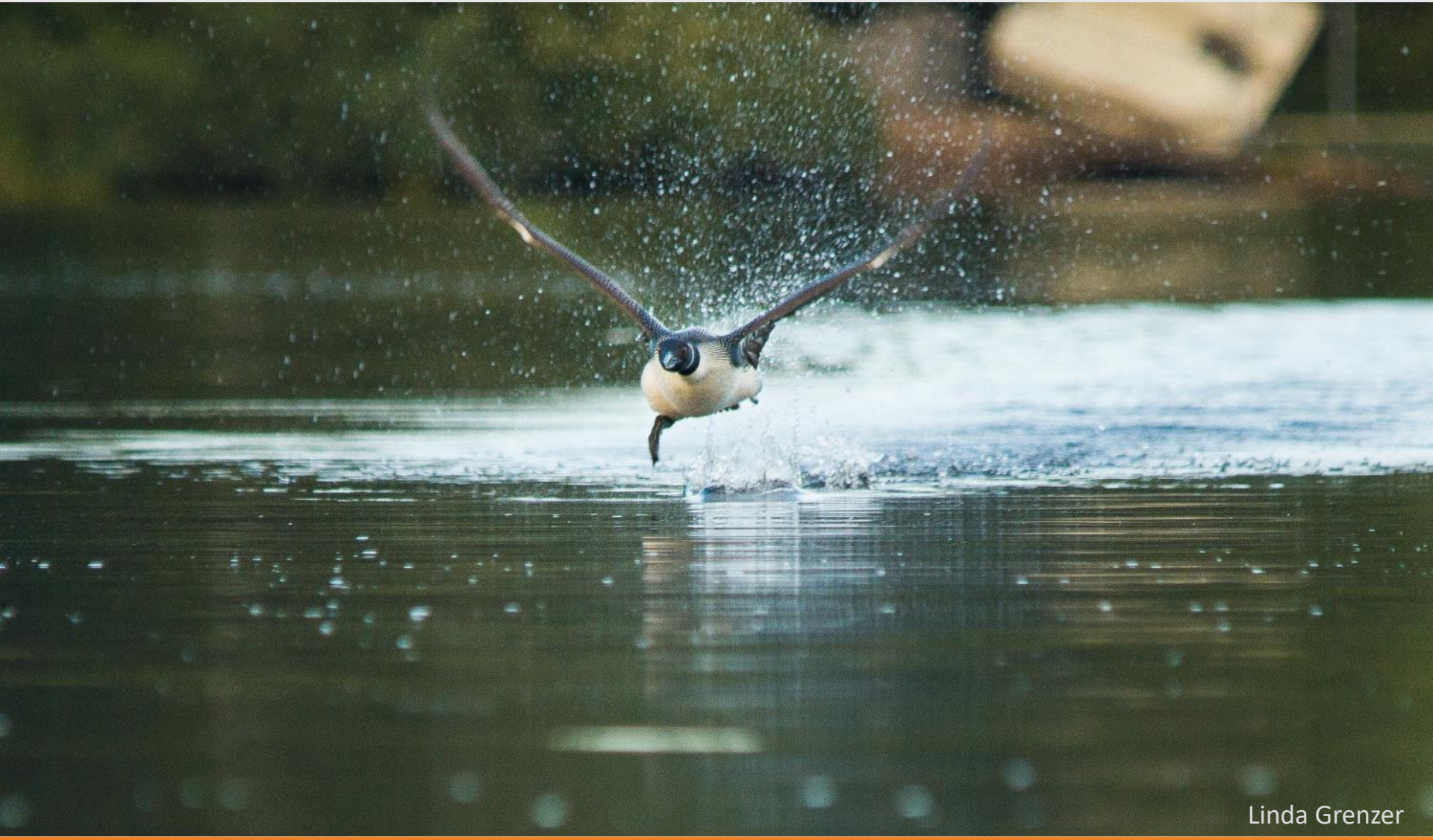
Presentations and Events

Loon Appreciation Week

Common Loon (*Gavia immer*)

Jeff Weber

¼ Mile Aquatic Runway



Linda Grenzer

Yellow-billed Loon (*Gavia adamsii*)

Pacific Loon (*Gavia pacifica*)

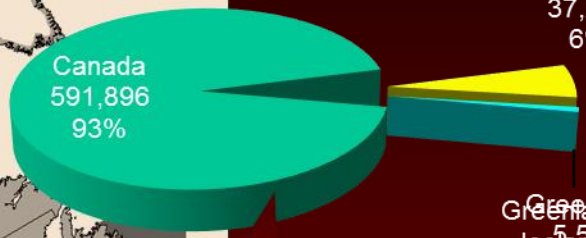
Hank Krizman

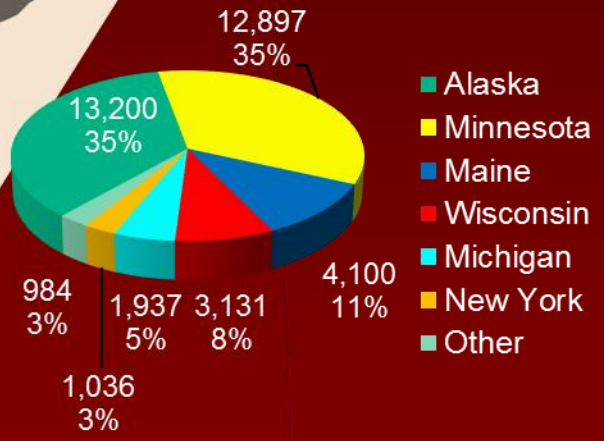
Arctic Loon (*Gavia arctica*)

Red-throated Loon (*Gavia stellata*)

Ryan Askren

Common Loon Range Map

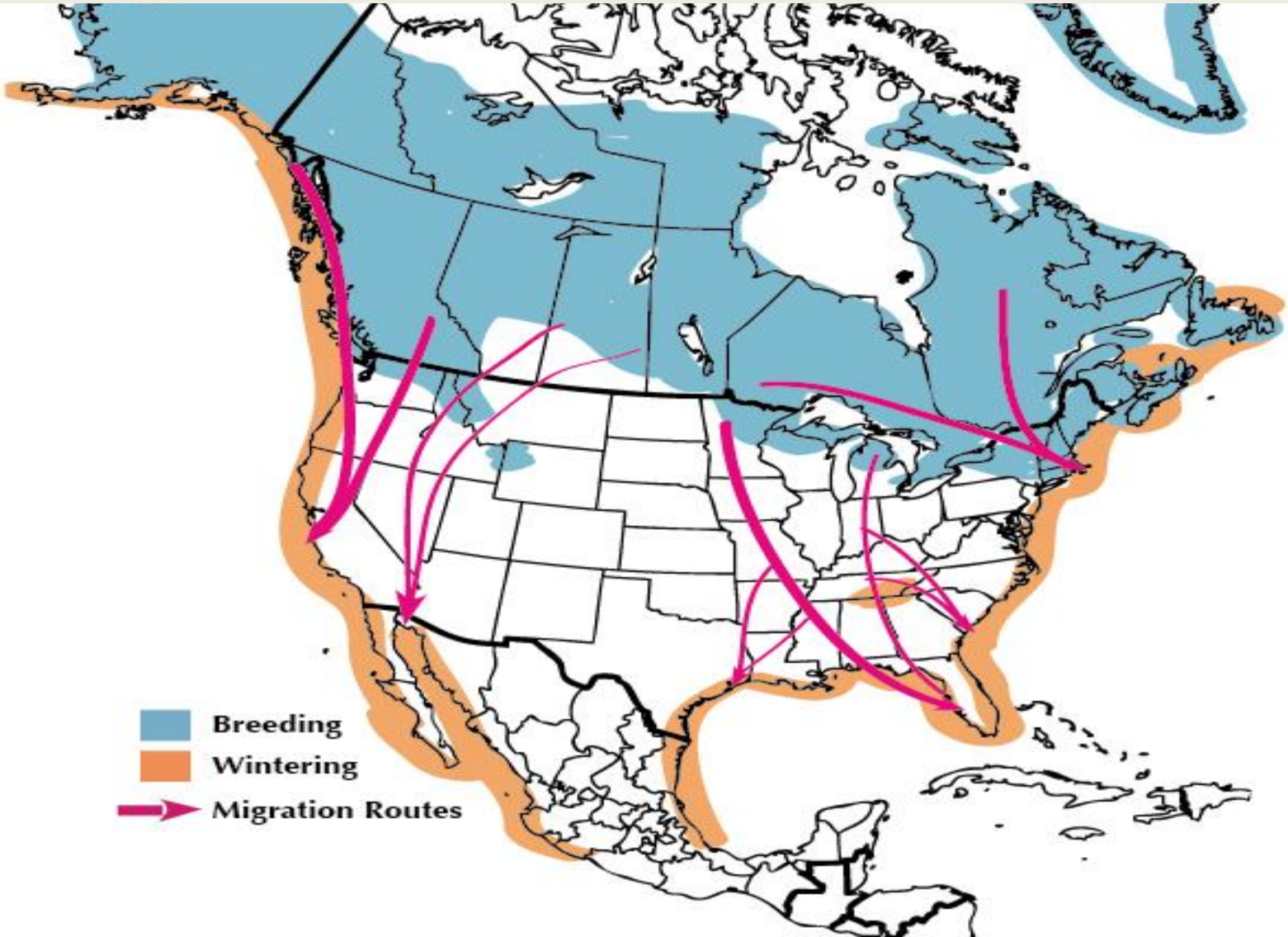




From Evers (2007)

USGS

Common Loon Range and Migration in North America



Spring Migration Stopover Lakes

Migration

Eagle River Airport

Arrival

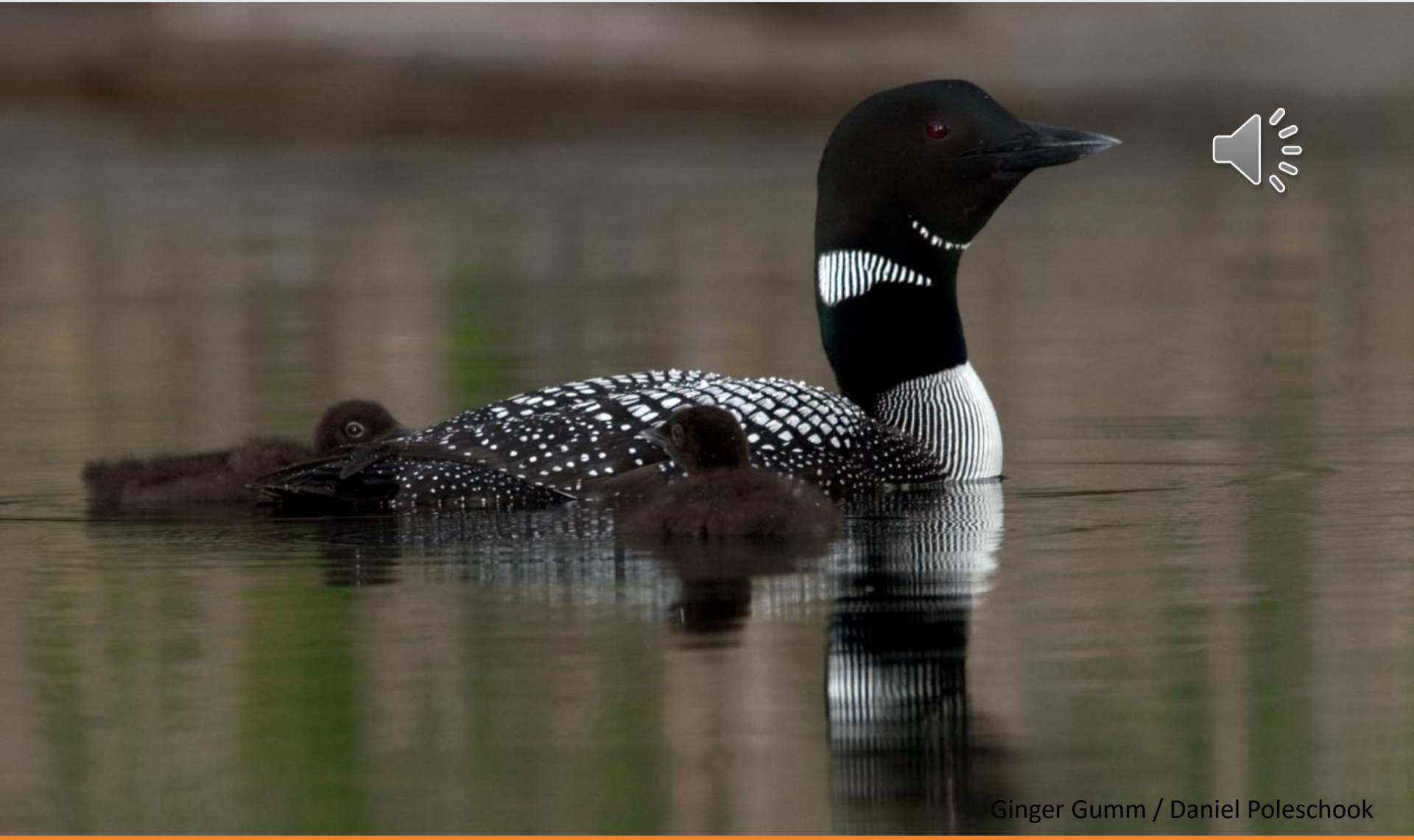
Wisconsin River near Rhinelander, April 2, 2017

Photo by Linda Grenzer

Yodel

Gregory Nelson

Wail



Ginger Gumm / Daniel Poleschook

Tremolo

Gregory Nelson

In-flight Tremolo

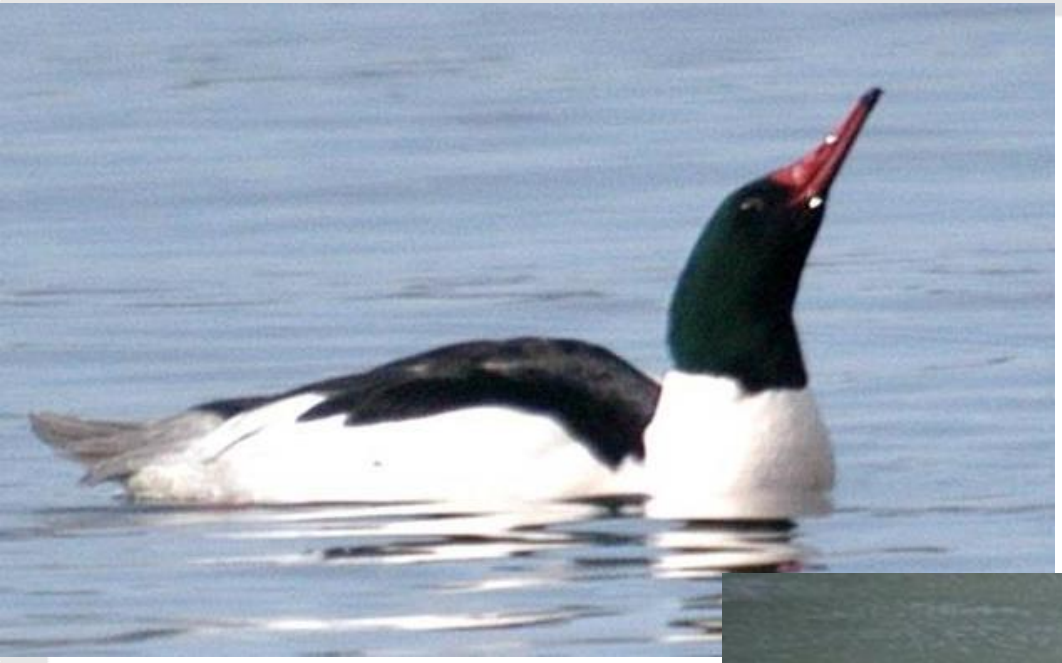
Ginger Gumm / Daniel Poleschook

Hoot

Loon Calls *courtesy of* Jay Mager

David Rippon

Look Alike Species



Common Merganser

Look Alike Species

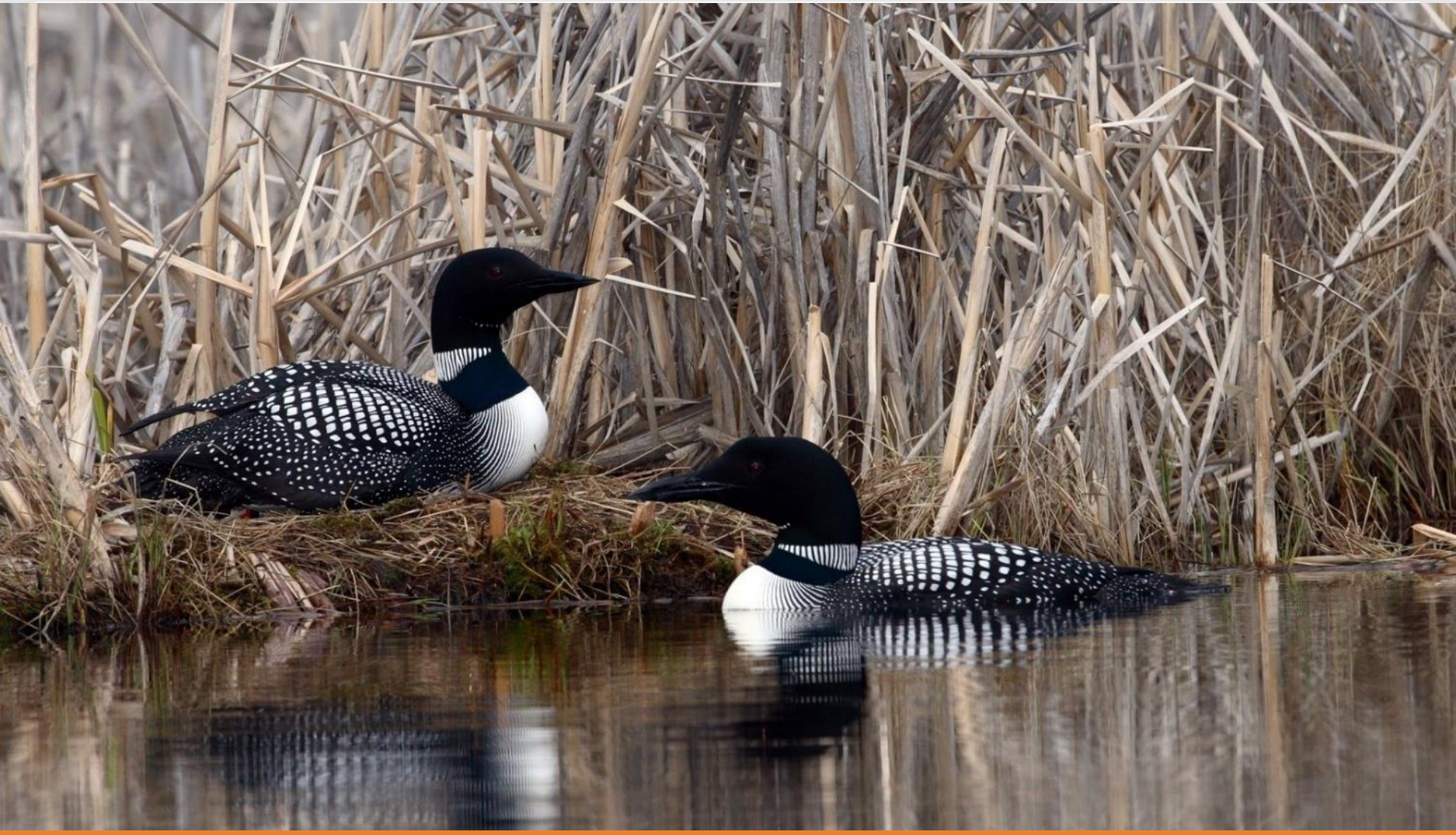
Western Grebe

Look Alike Species

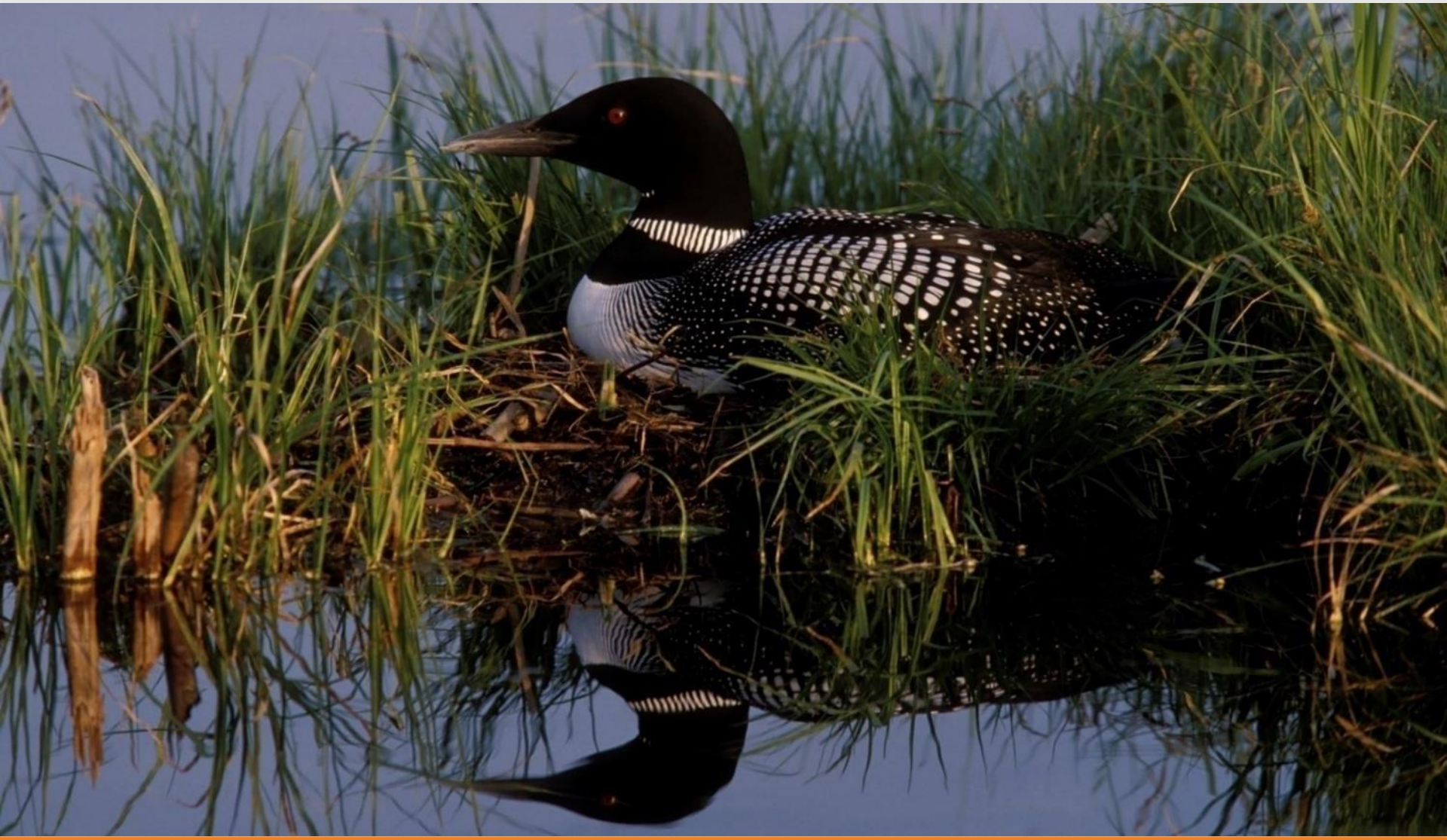
Double-crested Cormorant

Look Alike Species

Nesting Habitat



Nesting Habitat



Nesting Habitat

Linda Grenzer

Artificial Nesting Platforms

Predators

Mark Armstrong
Boot Lake, Oconto County

Predators

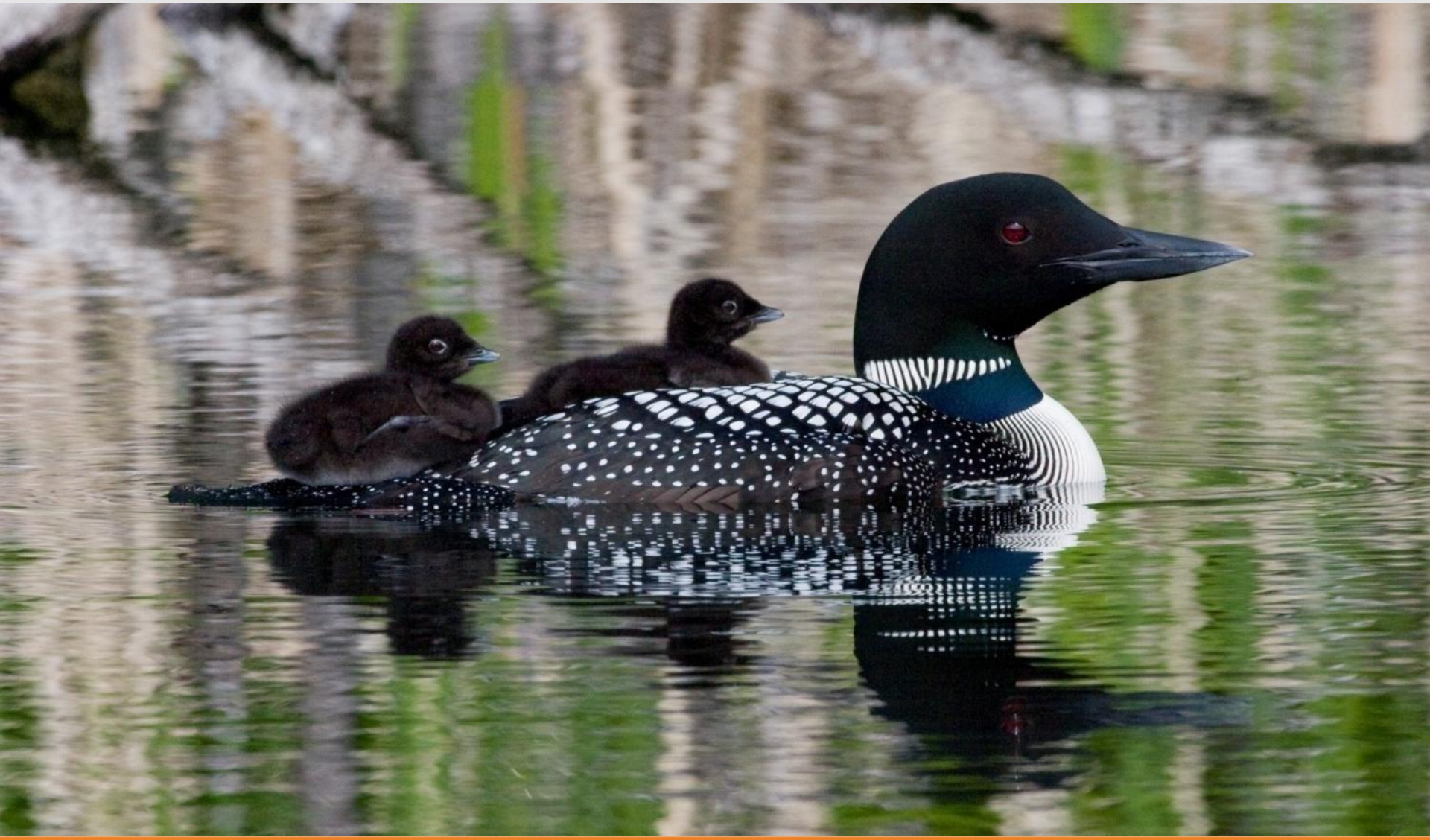
Loon Eggs

Nesting Behavior

Defensive Postures

Defensive Postures

Chick Rearing



Loon Identification

Loon Identification

Loon Identification

Threats

- Loss of Habitat

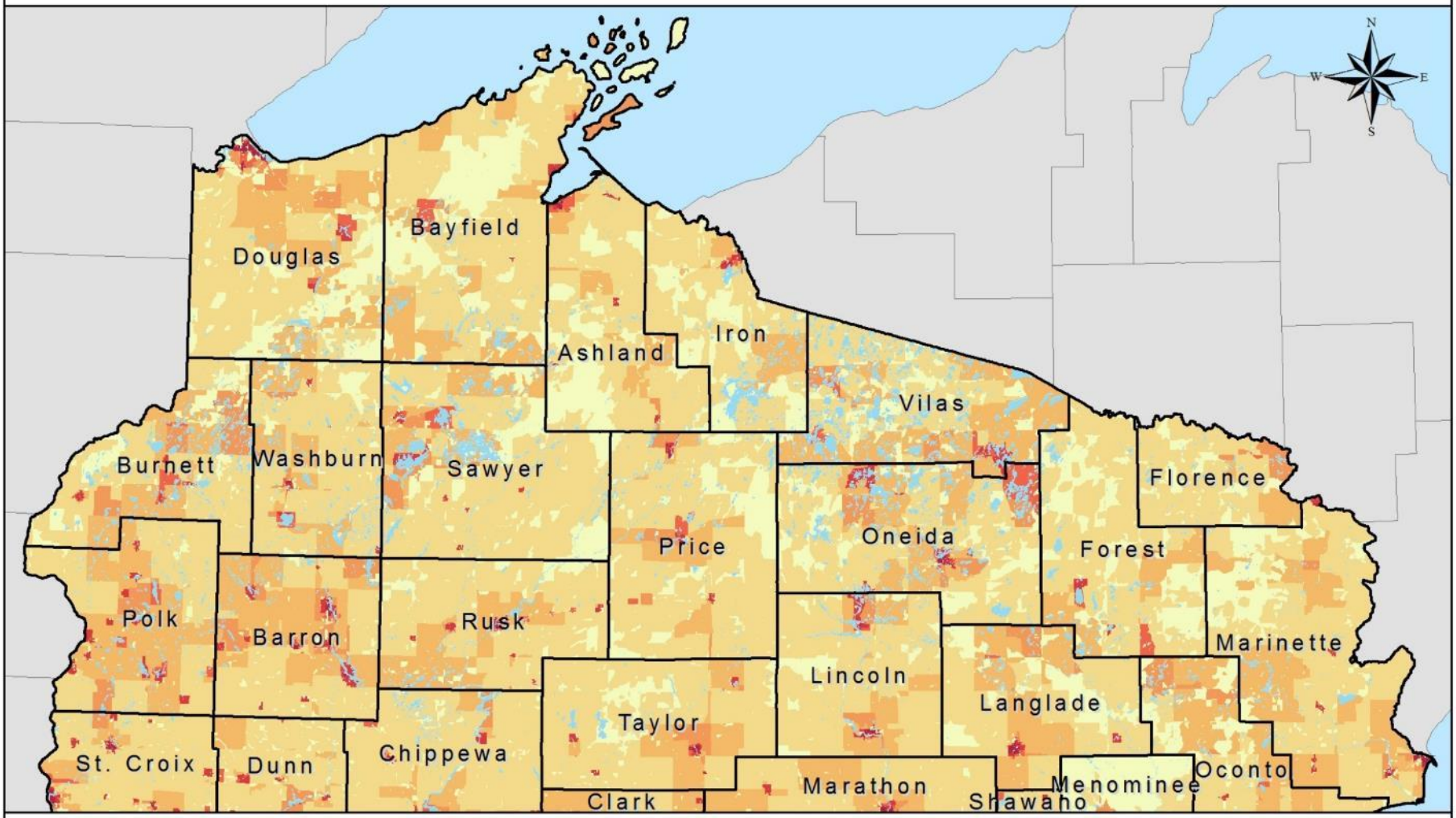
Past and Present Common Loon Breeding Range in North America

Current Range

Historical Southern Limit

McIntyre 1988

Census 1940 Housing Density
Northern Wisconsin



Housing Units Per Square Mile

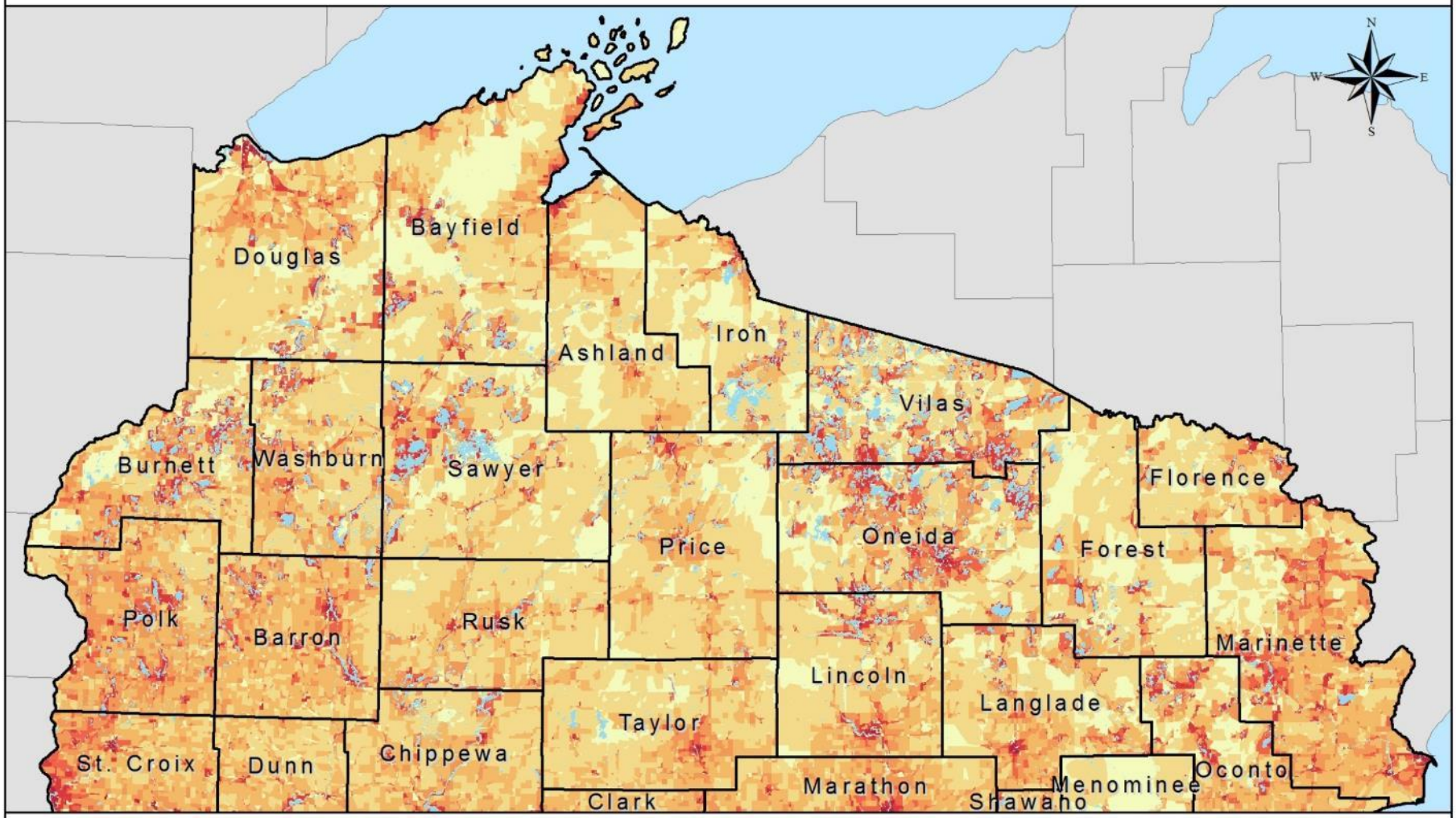
- 0
- 0 - 5
- 5 - 10
- 10 - 20
- 20 - 40
- 40 - 360
- 360 or more
- Roads and Highways circa 2010

0 10 20 40 60 80 Miles

Sources:
Roads: ArcGIS Streetmap USA, 2010
1940 - 1980 Housing Density: US Census Partial Block Group Data
Hammer, R. B. S. I. Stewart, R. Winkler, V. C. Radeloff,
and P. R. Voss. 2004. Characterizing spatial and temporal
residential density patterns across the U.S. Midwest, 1940-1990.
Landscape and Urban Planning 69: 183-199.
http://silvis.forest.wisc.edu/old/Library/HousingData.php

Applied Population Laboratory
UW Madison
http://www.apl.wisc.edu/

Census 1990 Housing Density
Northern Wisconsin



Housing Units Per Square Mile

- 0
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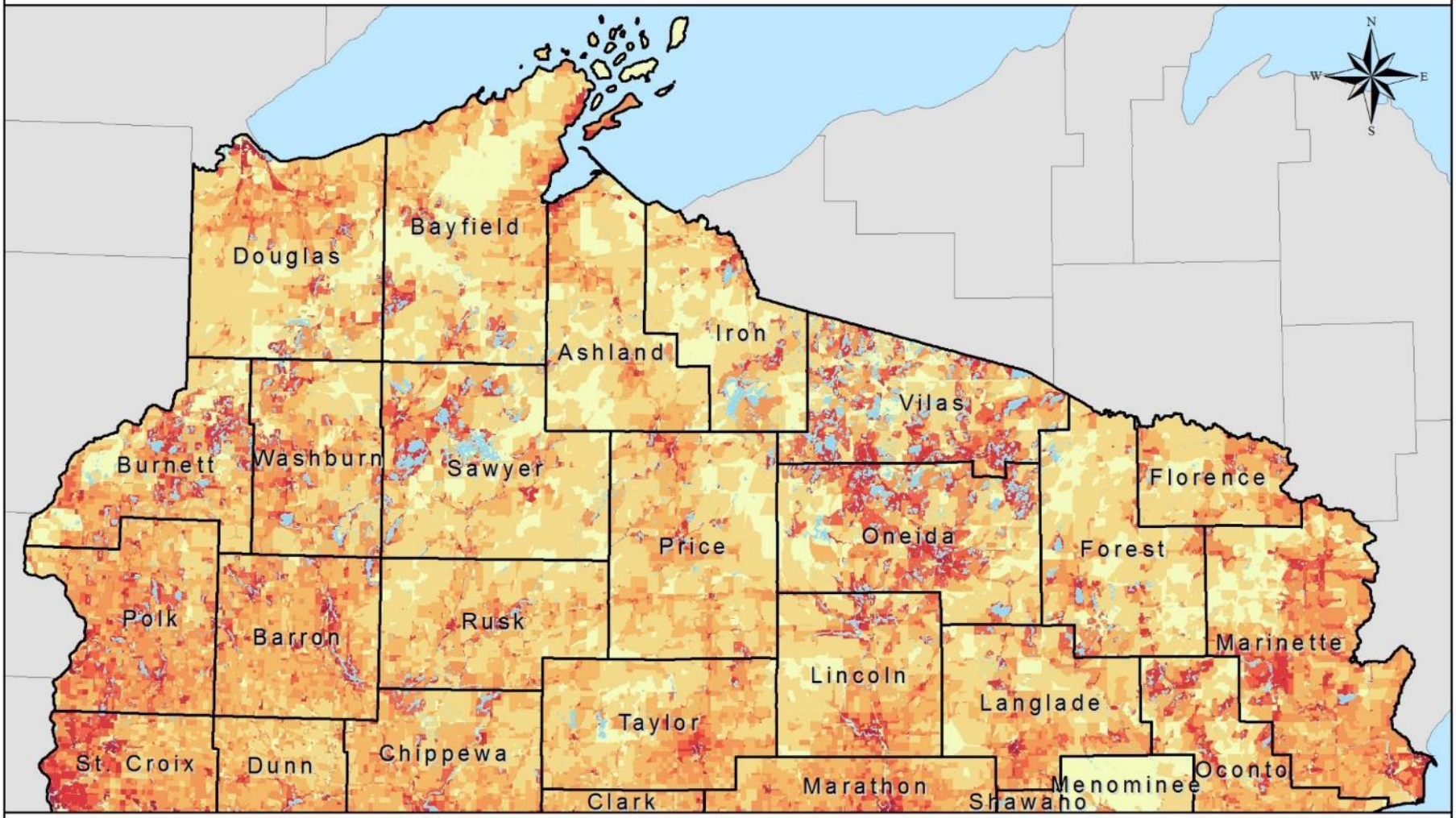
- 20 - 40
- 40 - 360
- 360 or more
- Roads and Highways circa 2010

0 10 20 40 60 80 Miles

Sources:
Roads: ArcGIS Streetmap USA, 2010
1990 Housing Density: US Census Bureau (census blocks)

Applied Population Laboratory
UW Madison
http://www.apl.wisc.edu/

Census 2010 Housing Density
Northern Wisconsin



Housing Units Per Square Mile

- 0
- 0 - 5
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- 360 or more
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0 10 20 40 60 80 Miles

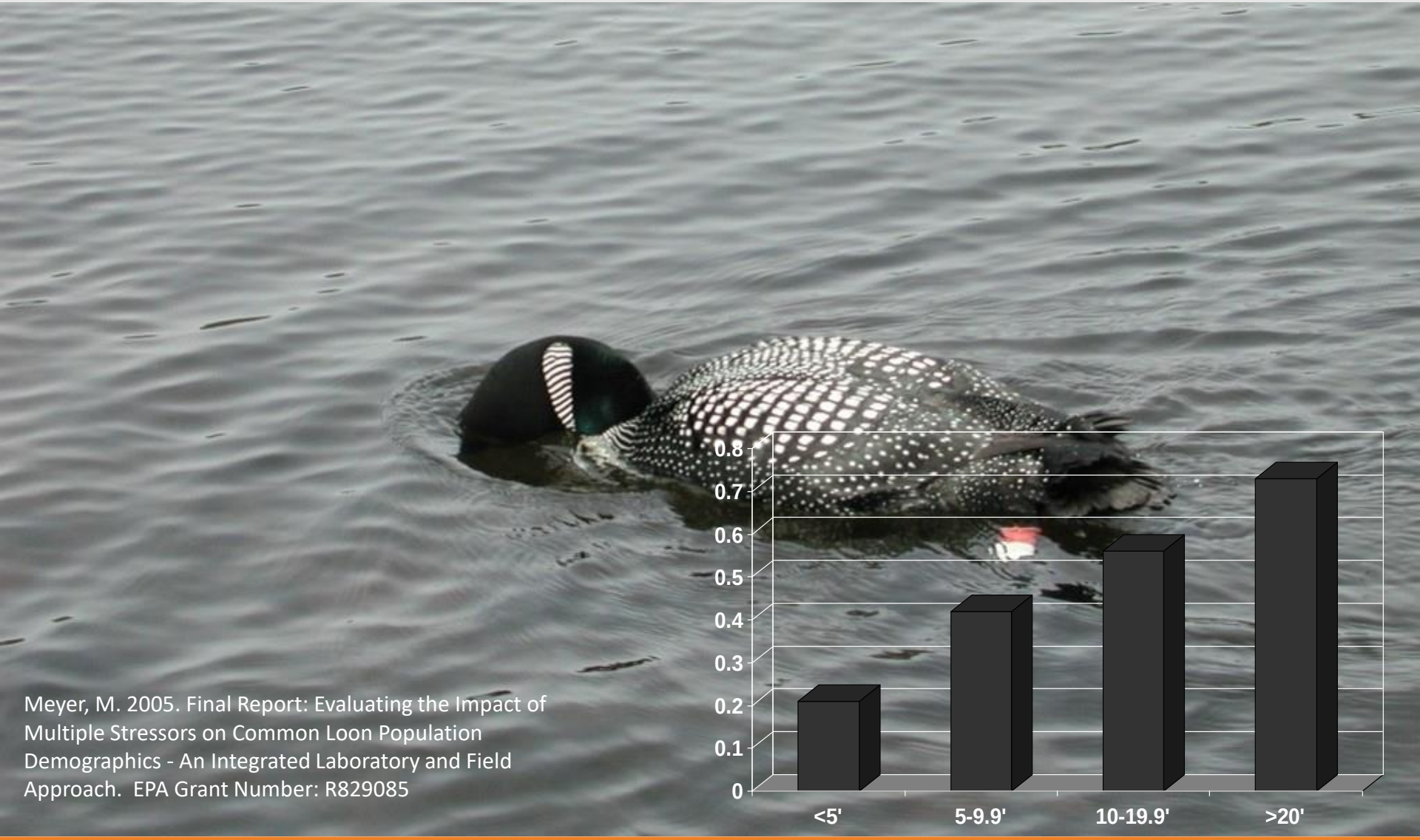
Sources:
Roads: ArcGIS Streetmap USA, 2010
2010 Housing Density: US Census Bureau (census blocks)

Applied Population Laboratory
UW Madison
http://www.apl.wisc.edu/

Threats

- Loss of Habitat
- Poor Water Quality

Water Quality



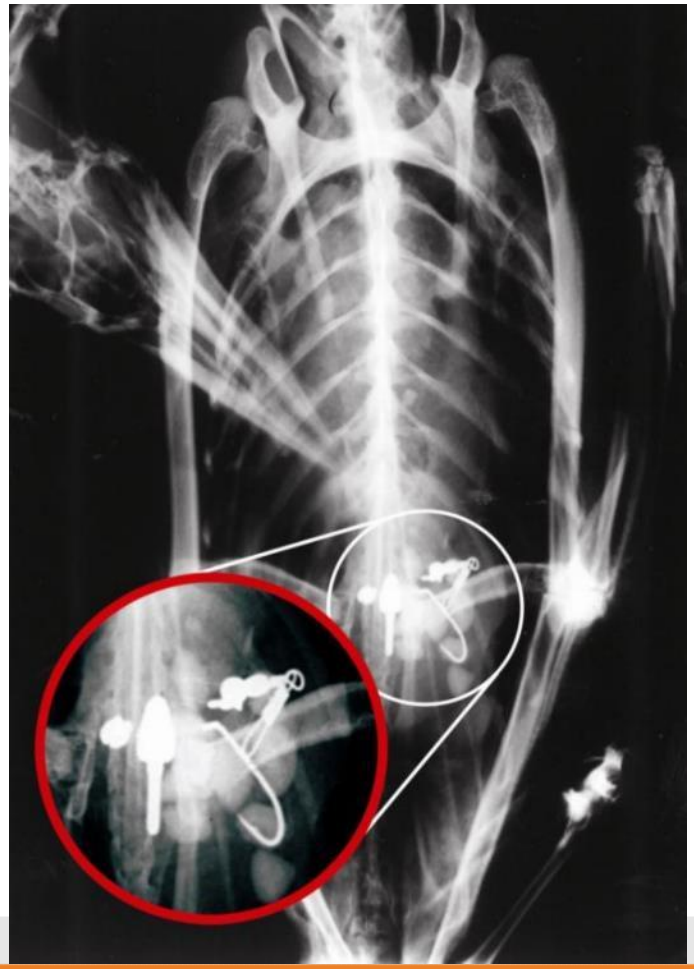
Meyer, M. 2005. Final Report: Evaluating the Impact of Multiple Stressors on Common Loon Population Demographics - An Integrated Laboratory and Field Approach. EPA Grant Number: R829085

Threats

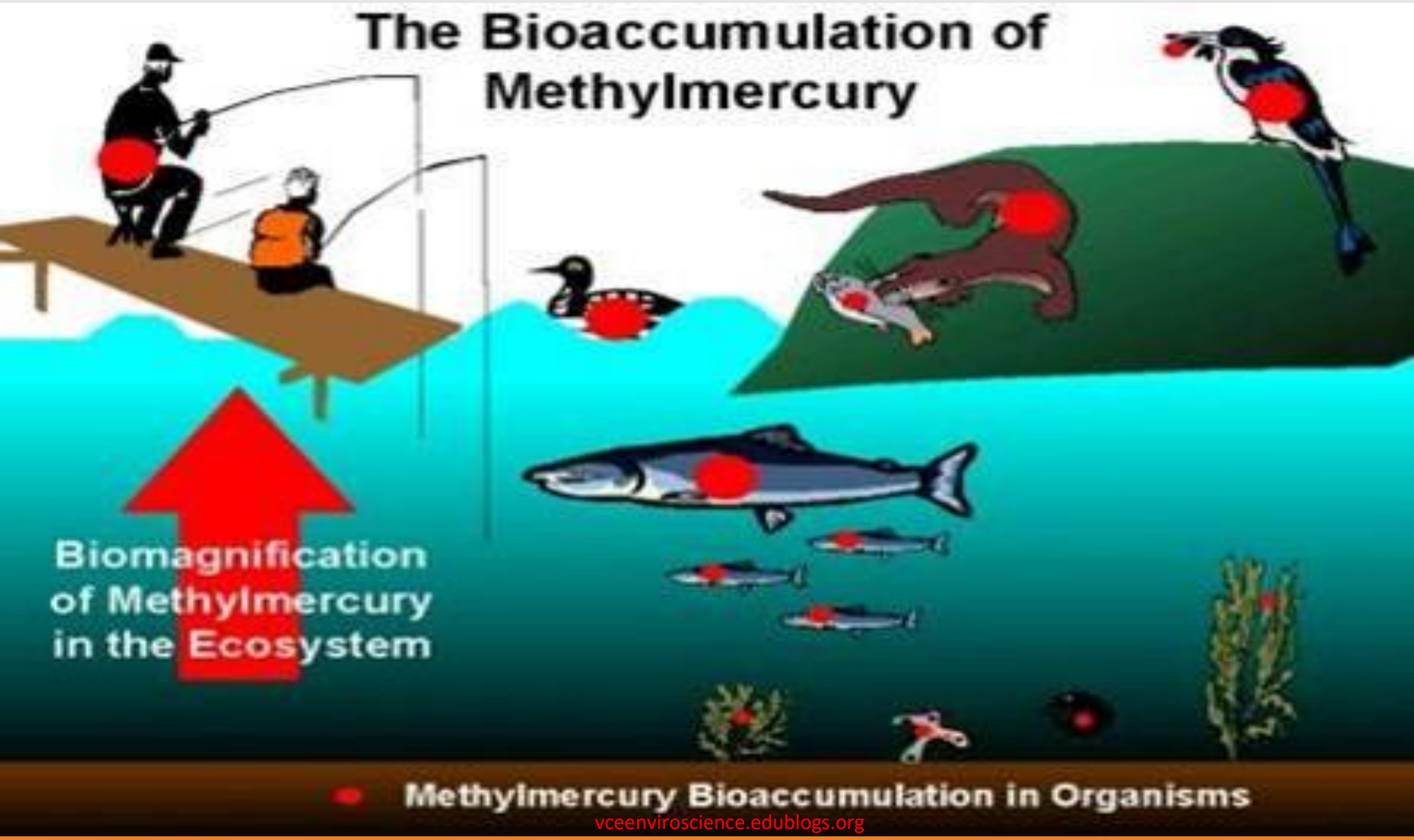
- Loss of Habitat
- Poor Water Quality
- Toxins

Lead Fishing Tackle

- Approximately 20% of loons succumbed to lead poisoning
- X-ray shows lead tackle in a loon's stomach



Mercury


The Bioaccumulation of Methylmercury
Biomagnification of Methylmercury in the Ecosystem
Methylmercury Bioaccumulation in Organisms
vceenviroscience.edublogs.org

Monofilament Line

- Loss of Habitat
- Poor Water Quality
- Toxins
- Monofilament Line

Monofilament Line

When left in the water or on shore, fishing line will harm wildlife that become tangled in it or ingest it.

Photo courtesy REGI


Photo by Linda Grenzer

Threats

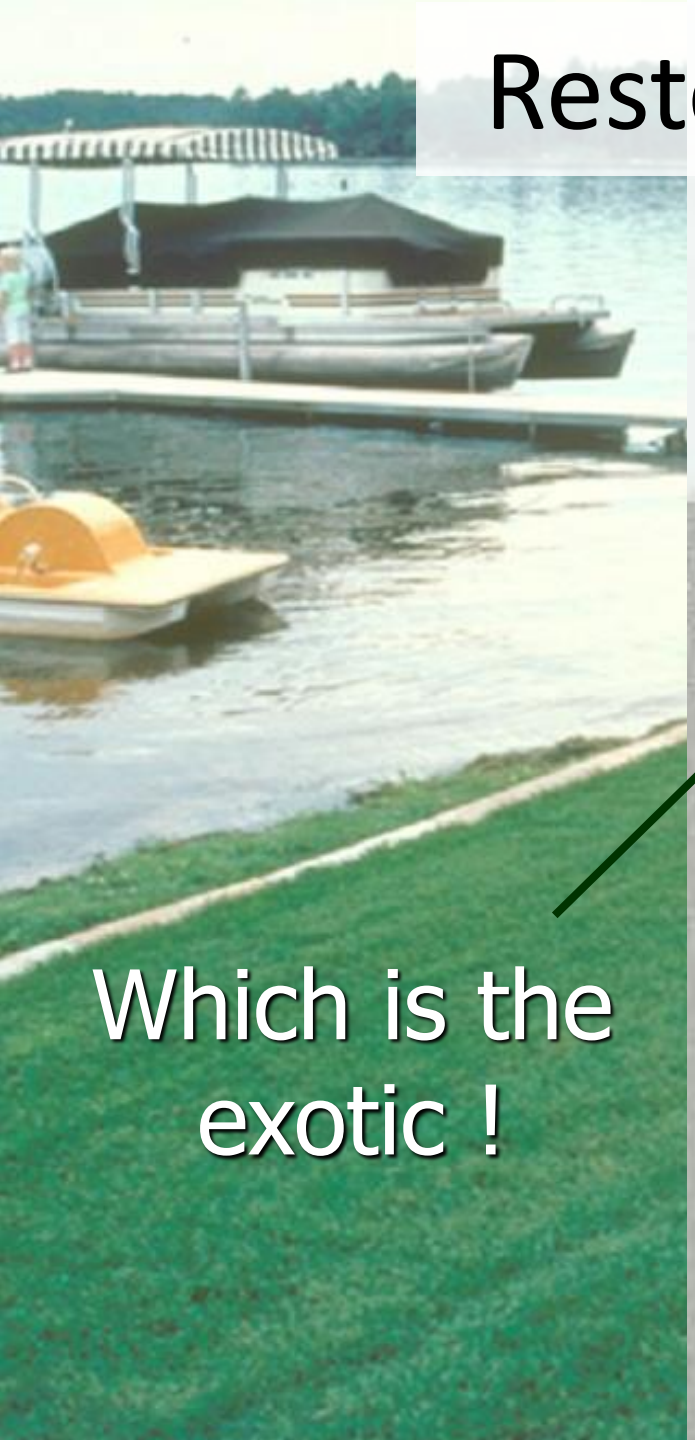
- Loss of Habitat
- Poor Water Quality
- Toxins
- Monofilament Line
- Human Disturbance

Human Disturbance

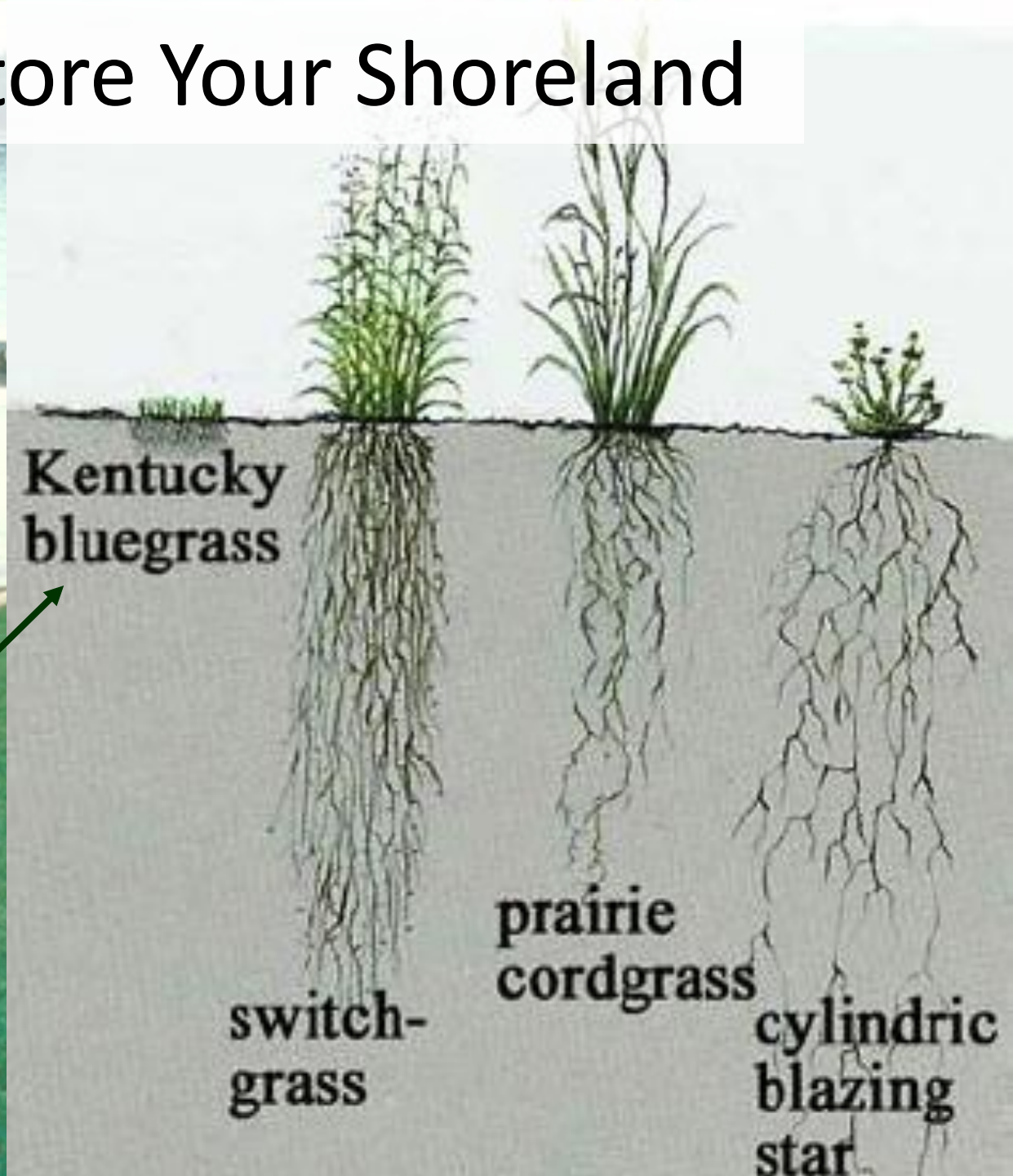
What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants

Restore Your Shoreland



Which is the exotic !



What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels

Land Use and Polluted Runoff:

Residential Property

Pet Waste

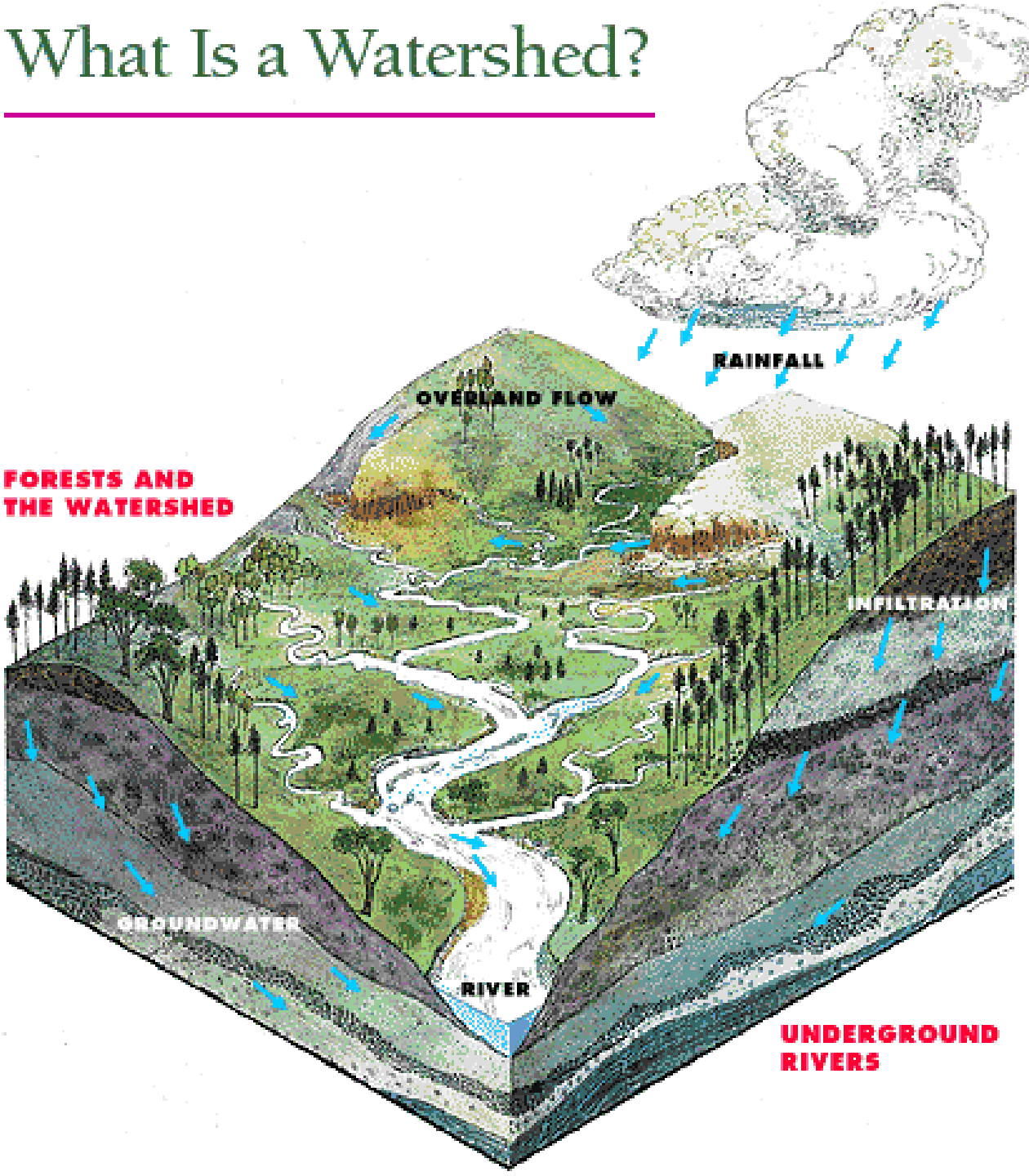
Septic System

Development

Agriculture

Forestry

What Is a Watershed?



Build a Rain Garden and Utilize Rain Barrels

Project Location:
River Falls, WI

A rain barrel used to collect rooftop runoff using a gutter / downspout system

What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels
- Get the Lead Out!

Get the Lead Out!

Replace your tackle with lead-free tackle

What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels
- Get the Lead Out!
- Recycle or properly dispose of monofilament line

Monofilament Line

- Recycle your monofilament line or cut in 6” lengths and throw it away.
- Participate in the WI DNR’s new monofilament recycling program http://dnr.wi.gov/topic/Recycling/FishingLine.html

What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels
- Get the Lead Out!
- Recycle or properly dispose of monofilament line
- Reduce Your Energy Consumption

Reduce Your Energy Consumption

- Walk or bike to work, store, errands
- Carpool
- Use public transportation
- Drive the posted speed limit
- Make sure your tires are properly inflated
- Purchase locally produced products

What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels
- Get the Lead Out!
- Recycle or properly dispose of monofilament line
- Reduce Your Energy Consumption
- Educate Your Fellow Lake Users

Educate Your Fellow Lake Users

LEAD ALERT

Lead fishing tackle kills loons, eagles, swans, and other wildlife due to lead poisoning. Please use non-lead tackle when fishing this lake!

Prevent wildlife death and entanglement. Discard unwanted fishing line in a trash receptacle and lead tackle at a local hazardous waste collection site.

LoonWatch Sigurd Olson Environmental Institute Northland College

Get the Lead Out!

REGI Raptor Education Group Inc.

For more information, visit LoonWatch at www.northland.edu/loonwatch or the Raptor Education Group, Inc. at 715-623-4015

LOON ALERT

Help keep this lake safe for loons by staying 200 feet from:

- **loons on the water, and**
- **shoreline areas used by loons.**

LoonWatch

a program of

Sigurd Olson Environmental Institute, Northland College

Wildlife harrassment is illegal. Please report violations to the local Department of Natural Resources office or call toll free 1-800-TIP-WDNR. For loon information write: LoonWatch, Sigurd Olson Environmental Institute, Northland College, Ashland, WI 54806 or visit our website: www.northland.edu/soei or email us at loonwatch@northland.edu.

What Can Be Done to Protect Loons?

- Restore Your Shoreland to Native Plants
- Build a Rain Garden and Utilize Rain Barrels
- Get the Lead Out!
- Recycle or properly dispose of monofilament line
- Reduce Your Energy Consumption
- Educate Your Fellow Lake Users
- Contact Your Local Legislators

Contact Your Local Legislators

Latitude and longitude: 46.55612, -90.95244

Your Legislators

Senator Janet Bewley
(D - Ashland)
Senate District 25
(608) 266-3510
(800) 469-6562
Sen.Bewley@legis.wi.gov

Representative Beth Meyers
(D - Bayfield)
Assembly District 74
(608) 266-7690
(888) 534-0074
Rep.Meyers@legis.wisconsin.gov

U.S. House of Representatives and U.S. Senate

IT’S TIME FOR A 10 MINUTE BREAK.

Current Science and Trends

Common Loon Research in Wisconsin

Dave Evers
Biodiversity Research Institute
Gorham, ME

Mike Meyer, Nova Ecological Services
Arbor Vitae, WI

Kevin Kenow, USGS
La Crosse, WI

Jay Mager
Ohio Northern University

Walter Piper
Chapman University
Orange, CA

Erica LeMoine
Northland College LoonWatch
Ashland, WI


Kittie Wilson

Banding Loons

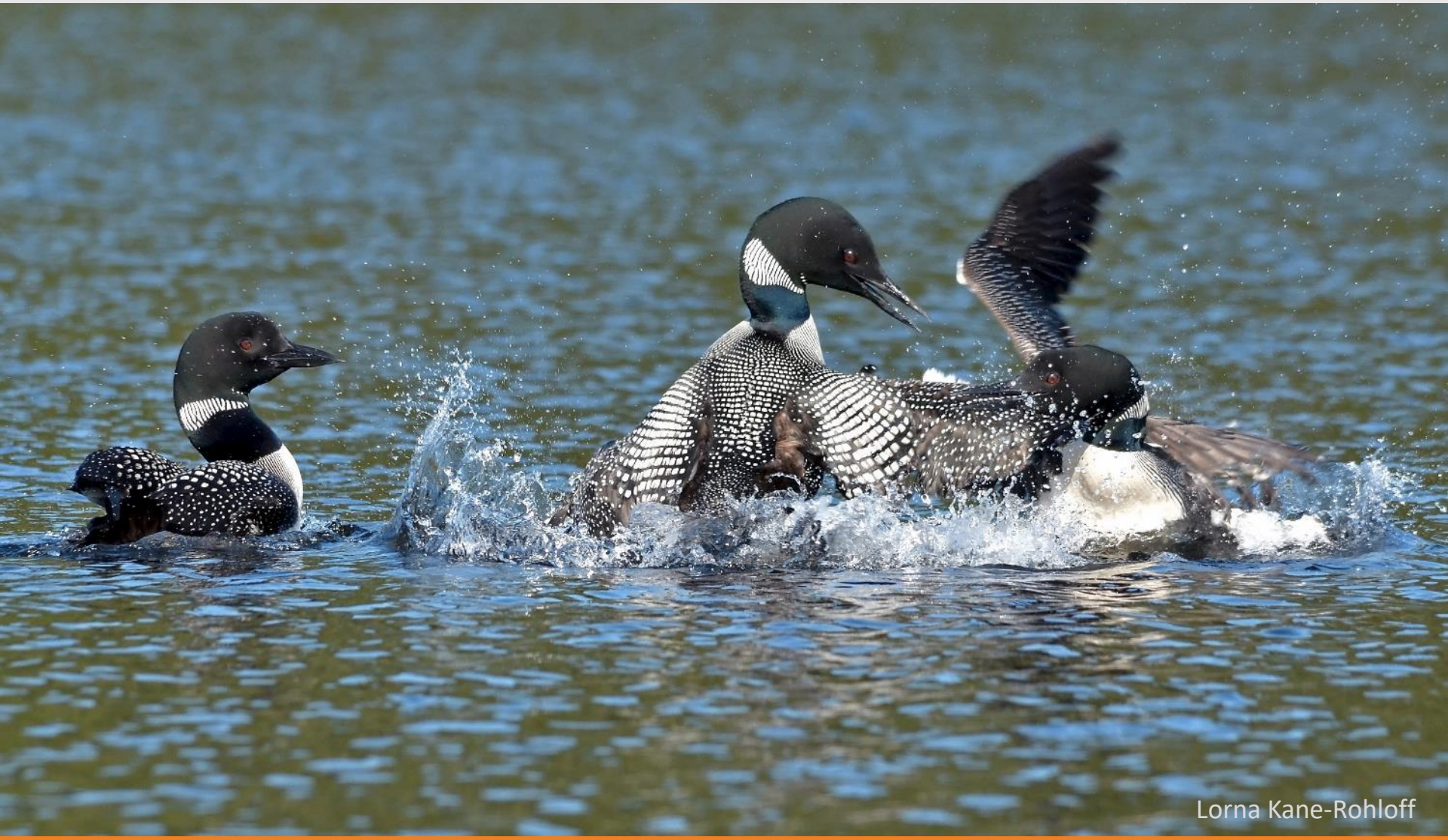
Dave Evers

Loon Bands


red-stripe ("Rs")
red ("R")
orange ("O")
orange-dot ("Od")
yellow ("Y")
white ("W")
taupe-stripe ("Ts")
mint ("M")
mint-burgundy ("Mb")
green ("G")
green-stripe ("Gs")
blue ("B")
blue-stripe ("Bs")
white-periwinkle ("Wp")
copper-cream ("Cc")
copper ("C")
auric-red ("Ar")
pink ("P")
iceberg ("I")

Territorial Dispute

Walter Piper

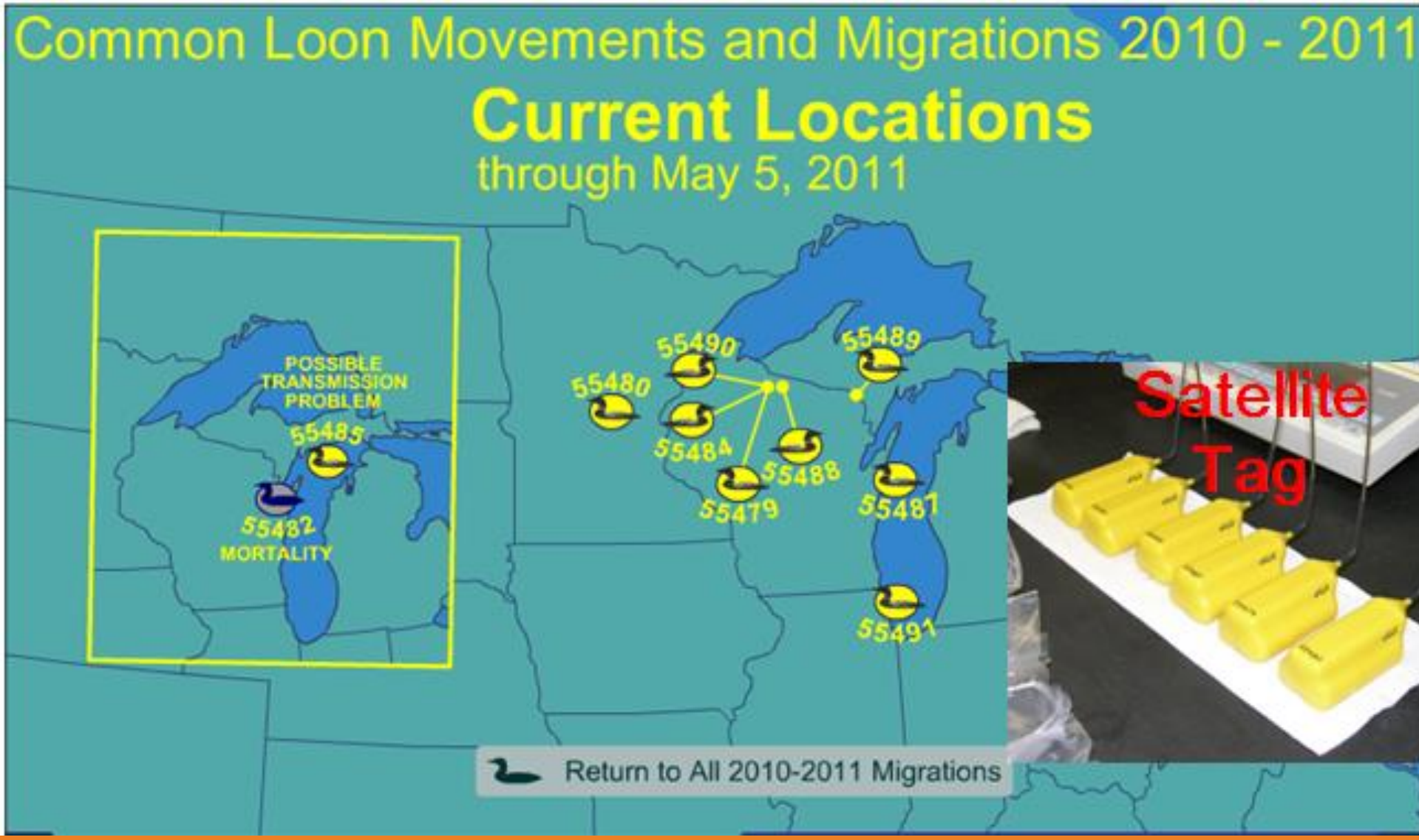


Sternal Puncture

Dan Pagel
Blue Lake, Oneida County

Lake Preference – ABJ's

Common Loon Migration Study



Number of adult common loons radiomarked and geotagged in Minnesota, Wisconsin, and Michigan during 2009-2012; and subsequent geotag recoveries

Year	No. loons radiomarked	No. loons geotagged	Recaptures-recoveries of adult loons/geotags recovered	No. geolocator records used in analyses
2009	0	18	14/13	4
2010	10	79	52/46	31
2011	21	37	23/16	10
2012	0	42	25/19	8
Total	**31**	**176**	**114/94**	**53**

USGS

Great Lakes Botulism Outbreaks

Great Lakes Botulism Outbreaks

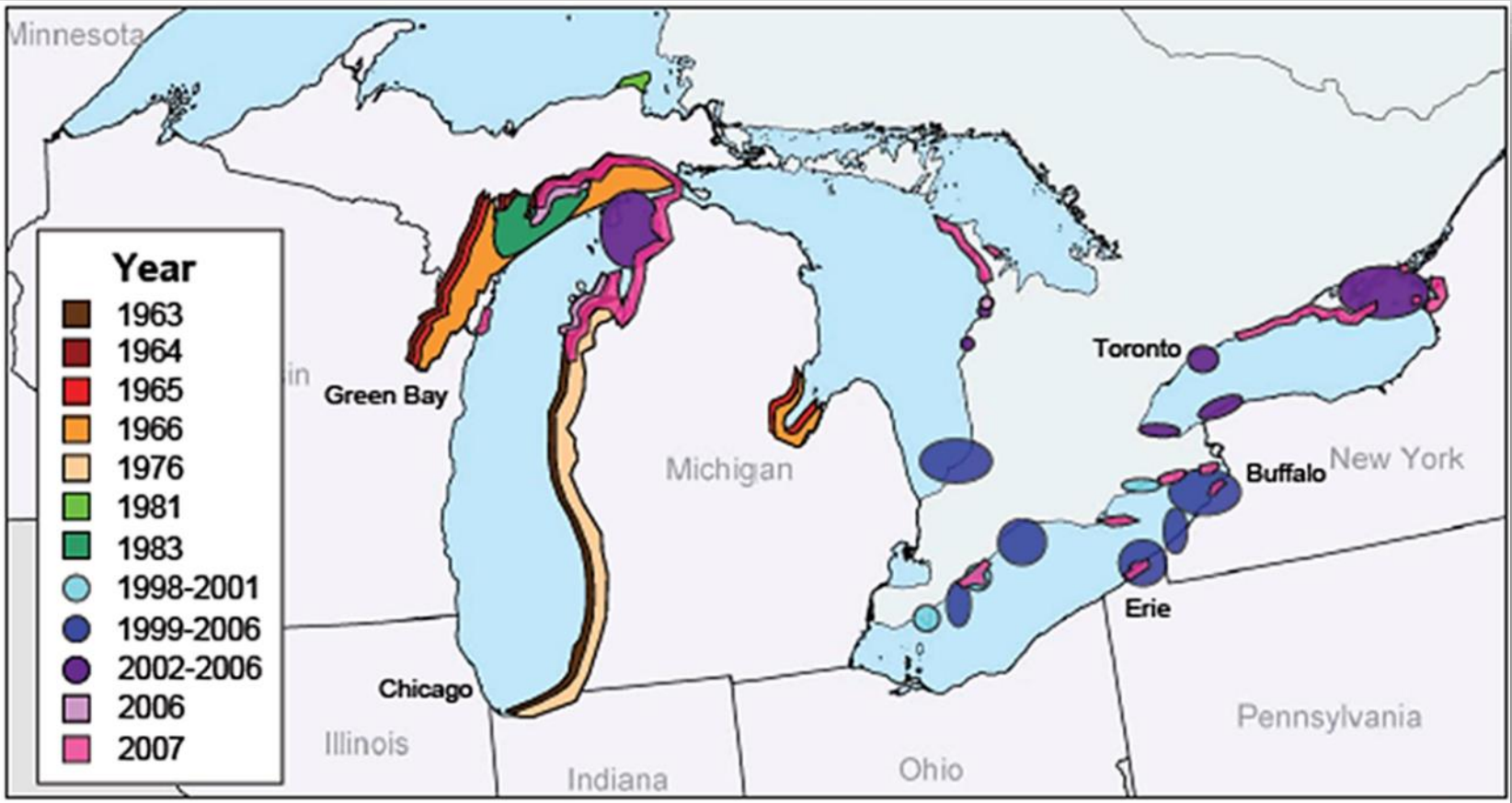
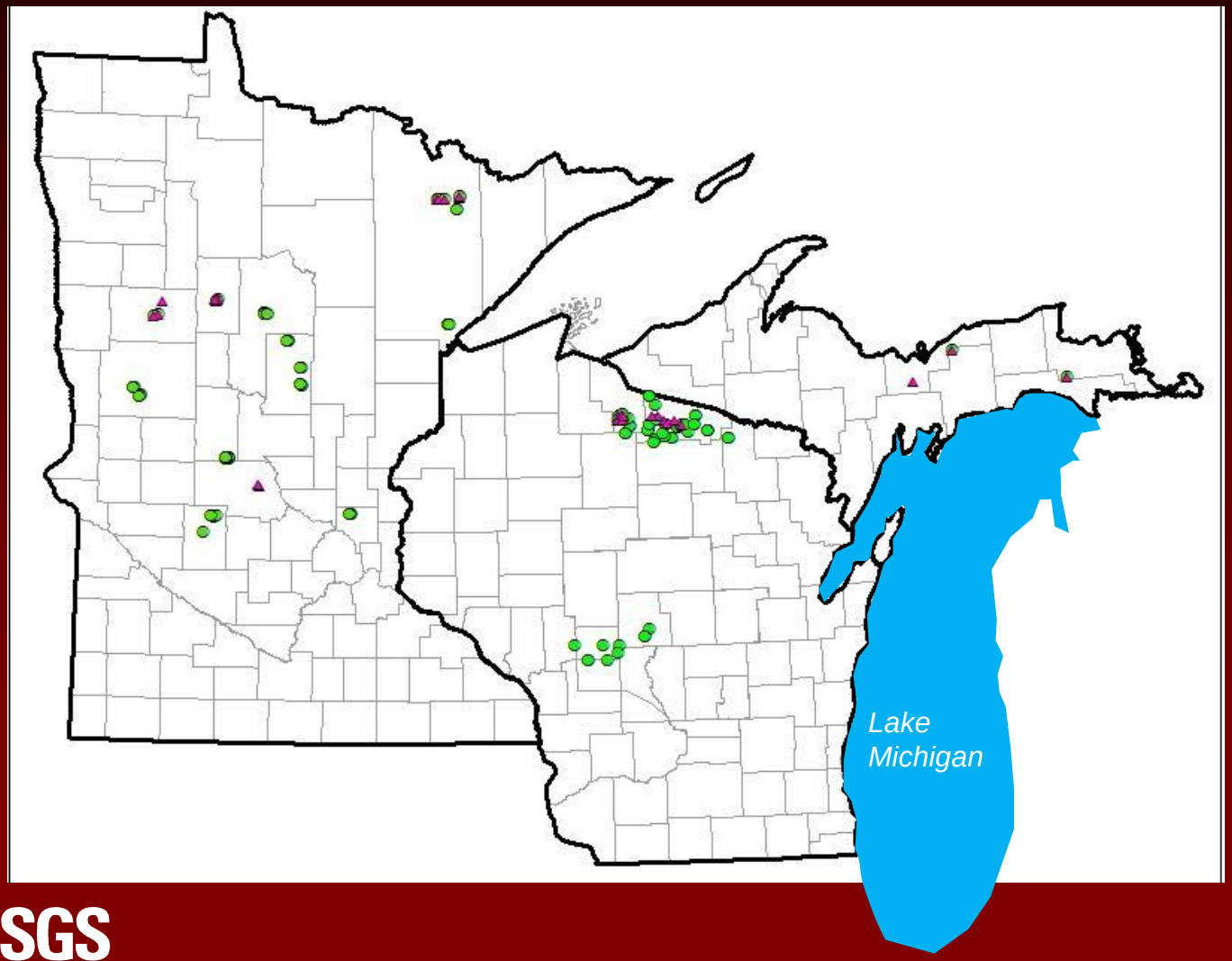


Figure 1. Historic botulism outbreaks (Zuccarino-Crowe 2009)

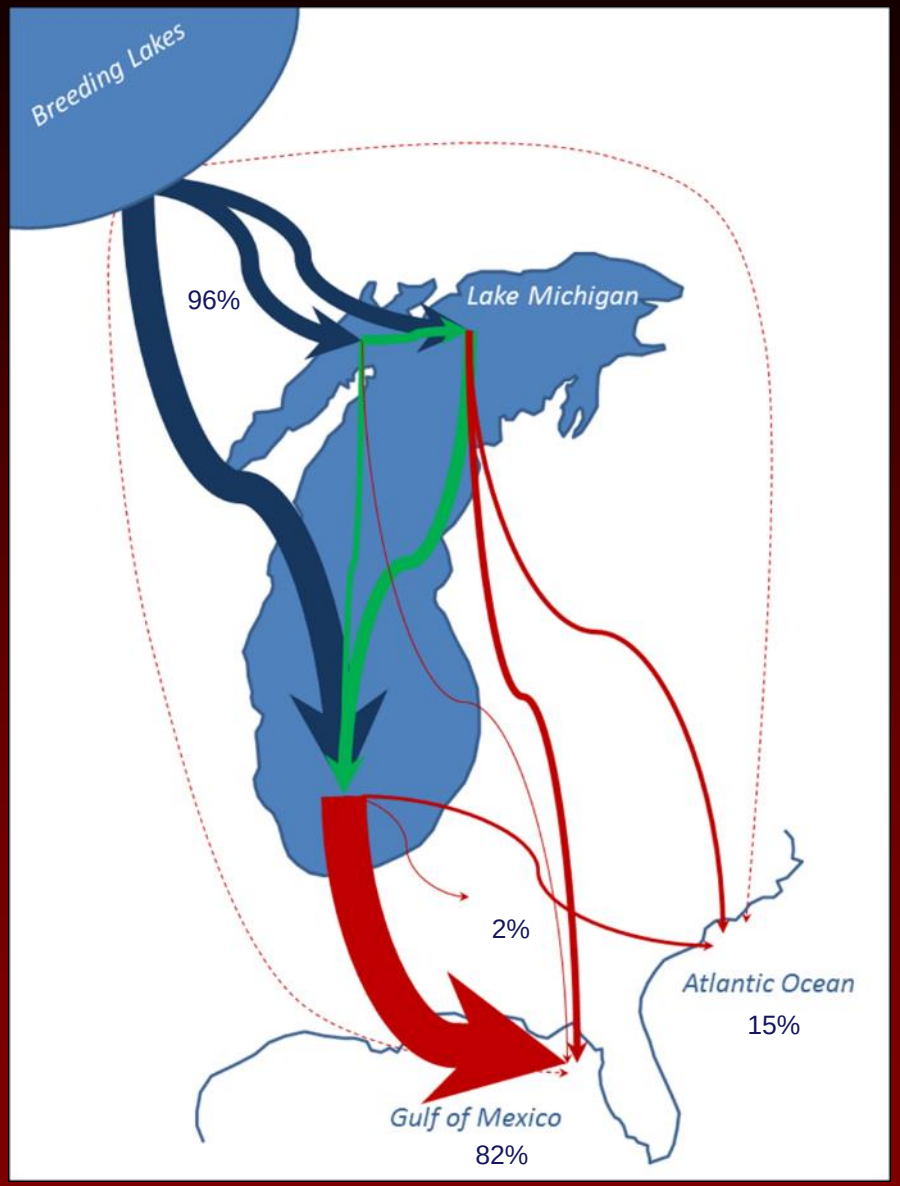
Over past 50 years, >100,000 avian mortalities in the Great Lakes attributed to type-E botulism; a variety of waterbirds at risk

Distribution of common loons marked with satellite transmitters (n=31; triangles) and geolocator tags (n=176; circles+triangles) during summer 2009-2012



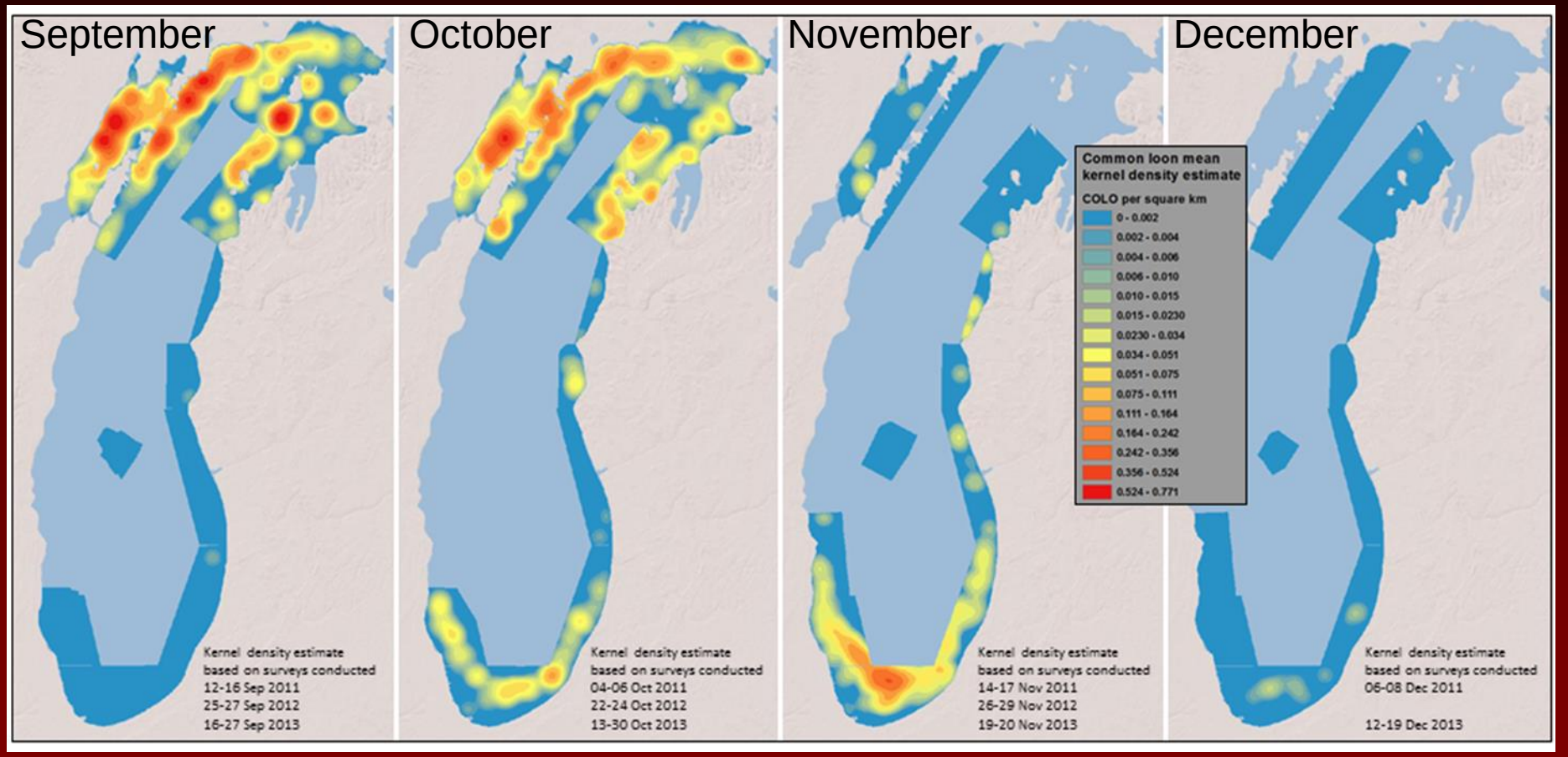
USGS

Migration patterns of adult common loons breeding in MN, WI, and MI



USGS

Distribution and average relative density of common loons on Lake Michigan by month as interpreted from aerial surveys averaged over three years, 2011 – 2013

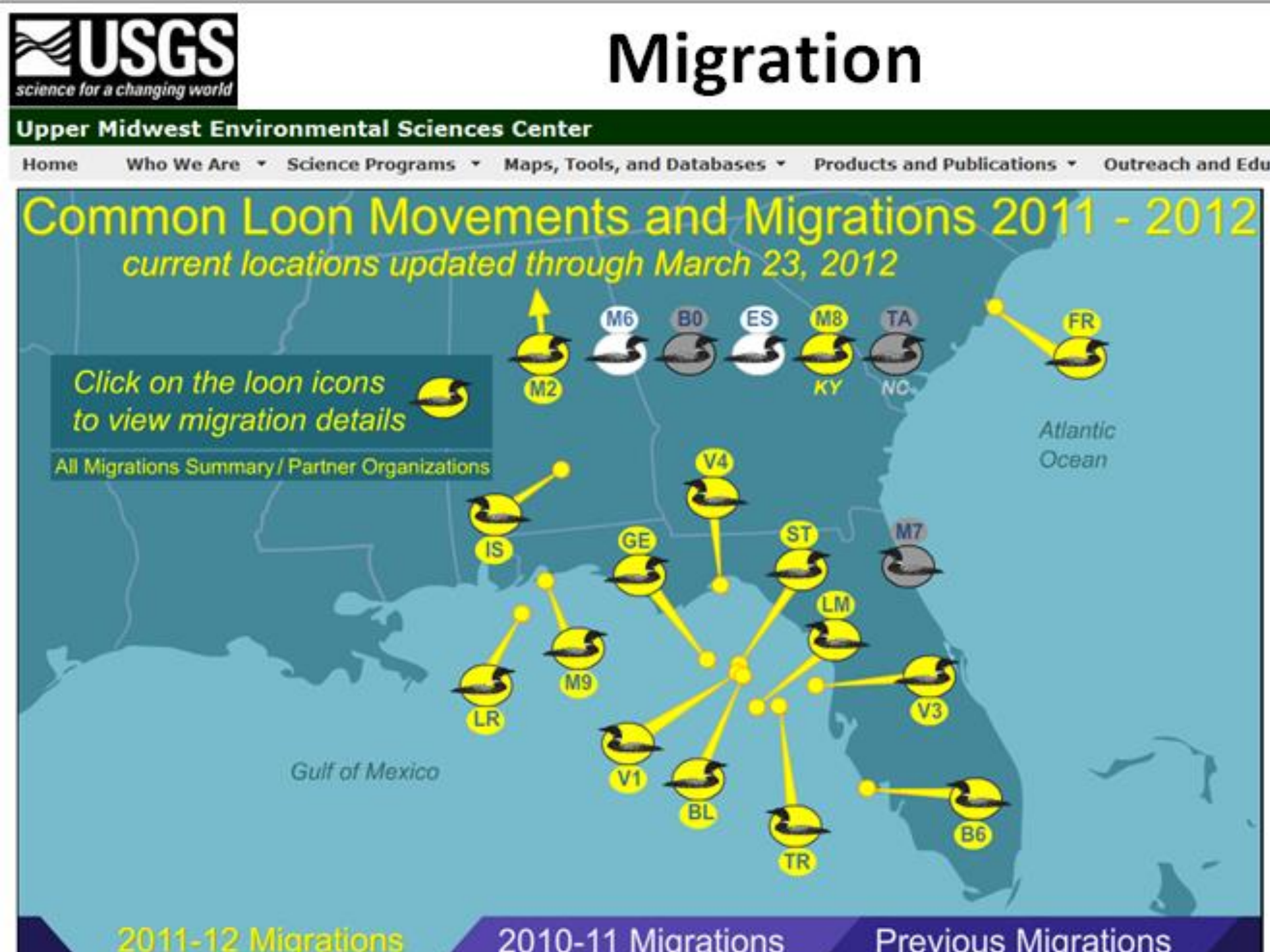


Kernel density estimates were averaged by month across years, smoothed, and then clipped to the union of the surveyed areas.

USGS

68% of observations consisted of a single loon
Flock size varied from 1 to 35 loons
90% of flocks contained ≤ 3 loons
Of total number of loons tallied, 37% occurred as singles

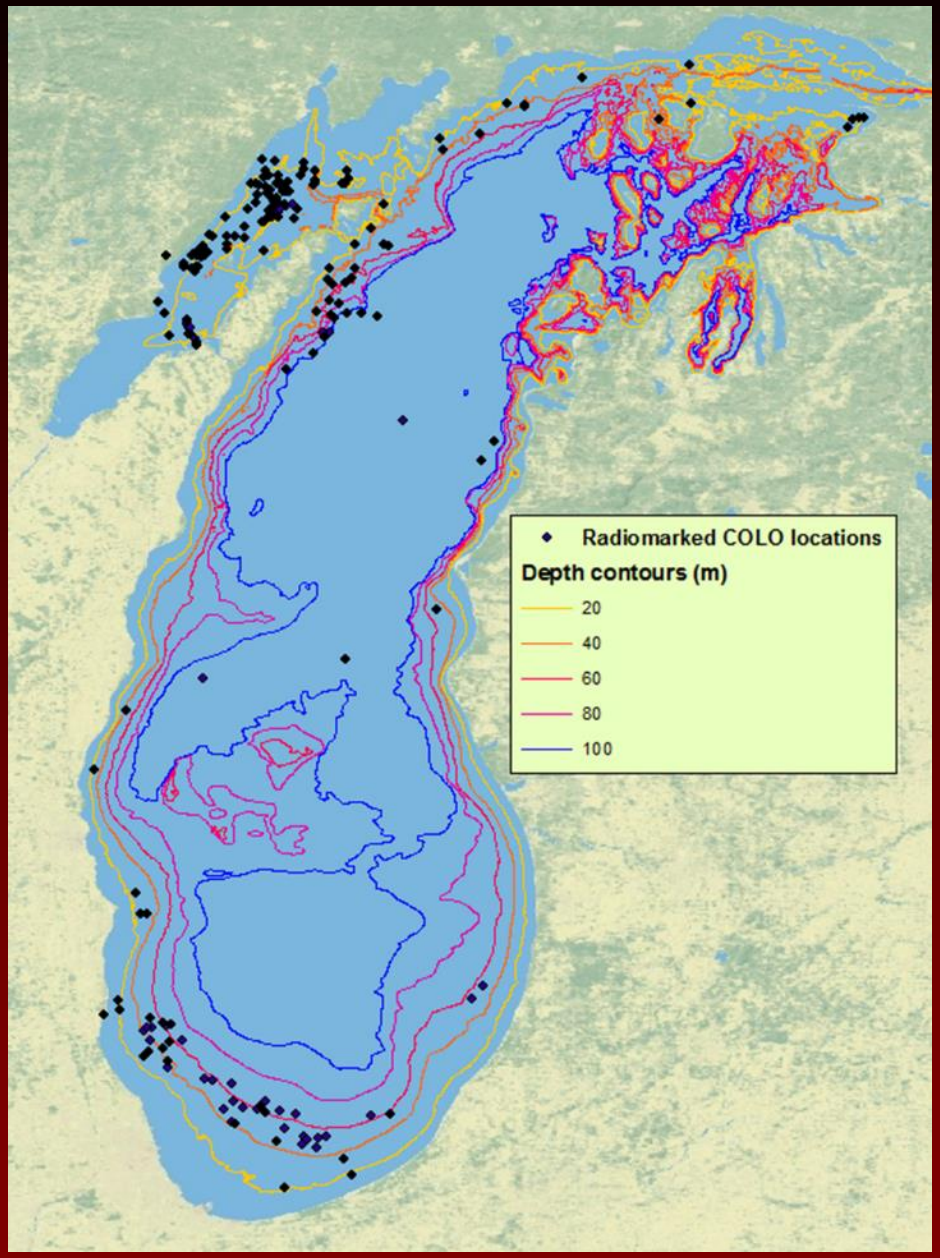
Migration


USGS
science for a changing world
Upper Midwest Environmental Sciences Center
Home
Who We Are
Science Programs
Maps, Tools, and Databases
Products and Publications
Outreach and Edu
Common Loon Movements and Migrations 2011 - 2012
current locations updated through March 23, 2012
Click on the loon icons
to view migration details
All Migrations Summary / Partner Organizations
M2
M6
B0
ES
M8
KY
TA
NC
FR
Atlantic
Ocean
IS
V4
GE
ST
M7
LM
M9
LR
V3
V1
BL
TR
B6
Gulf of Mexico
2011-12 Migrations
2010-11 Migrations
Previous Migrations

Distribution of location estimates of radiomarked common loons on Lake Michigan during autumn staging (where LC ≤ 1)

Depth:
Median = 32.4 m
Range = 6.2-250 m

Distance from shore:
Median = 10.5 km
(95% > 2.8 km)
Range = 1.7 to 39.2 km



USGS

Great Lakes Botulism Outbreaks

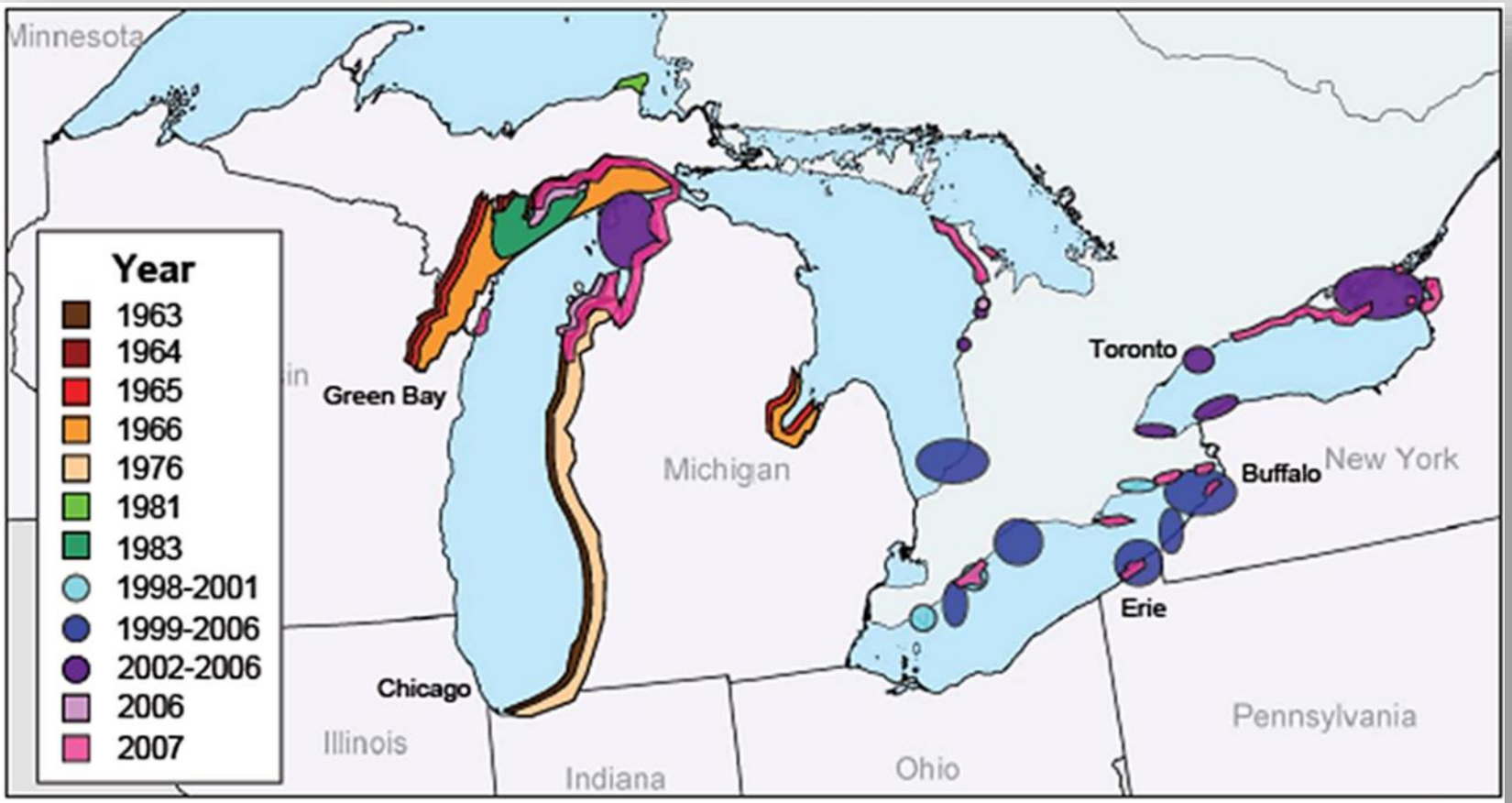
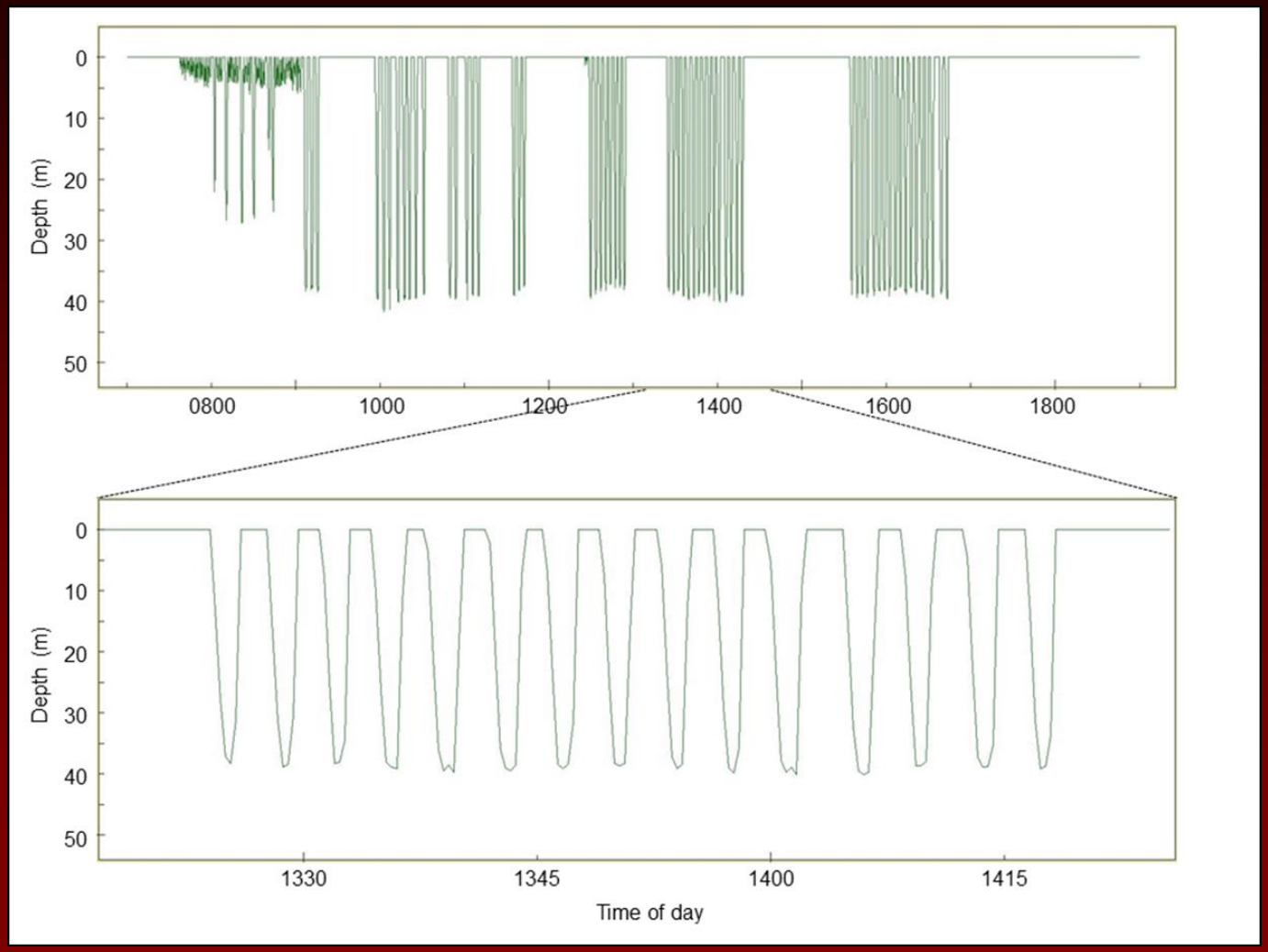


Figure 1. Historic botulism outbreaks (Zuccarino-Crowe 2009)

Over past 50 years, >100,000 avian mortalities in the Great Lakes attributed to type-E botulism; a variety of waterbirds at risk

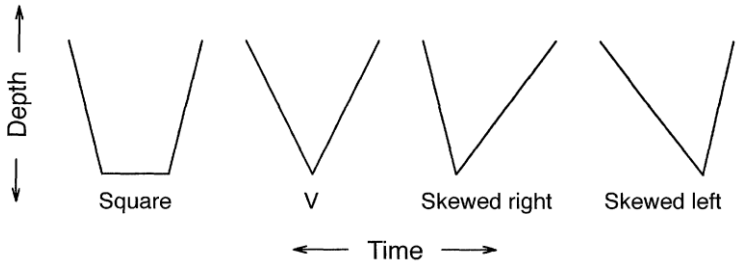
Dive profile of geotagged common loon staging on Lake Michigan, 08 November 2010



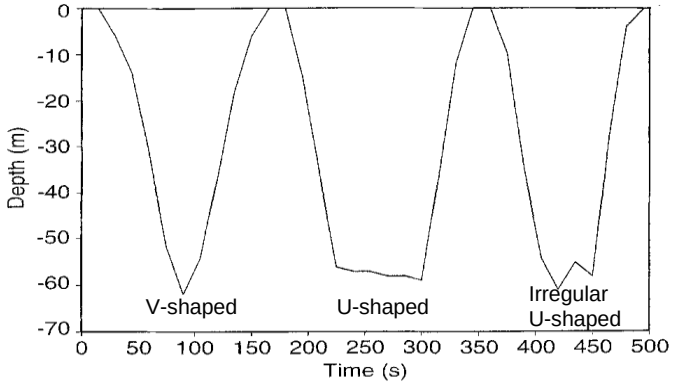
USGS

Common loon dive shapes at Lake Michigan

- Characterized by long duration at maximum depth relative to duration of entire dive
  - Most dives (82%) met the criteria of Schreer et al. (2001) of a “square” shape, where time at maximum depth was ≥ 50% of dive duration (also termed “U-shaped” by others)
- Dive profile patterns typically consisted of a series of repeated dives to a consistent depth and consistent duration of time at or near the maximum depth
  - Halsey et al. (2007; king penguins) suggested that such a pattern of successive dives are indicative of benthic diving
  - Wilson and Wilson (1988; cormorants) also noted that rapid descent and ascent rates, indicative of steep descent and ascent angles, coupled with extended time at maximum depth are characteristic of benthic-feeding species
- Comparison among recorded dive depths and estimated water depths among high-accuracy telemetry locations, provide multiple examples of loons foraging at or near benthic zone



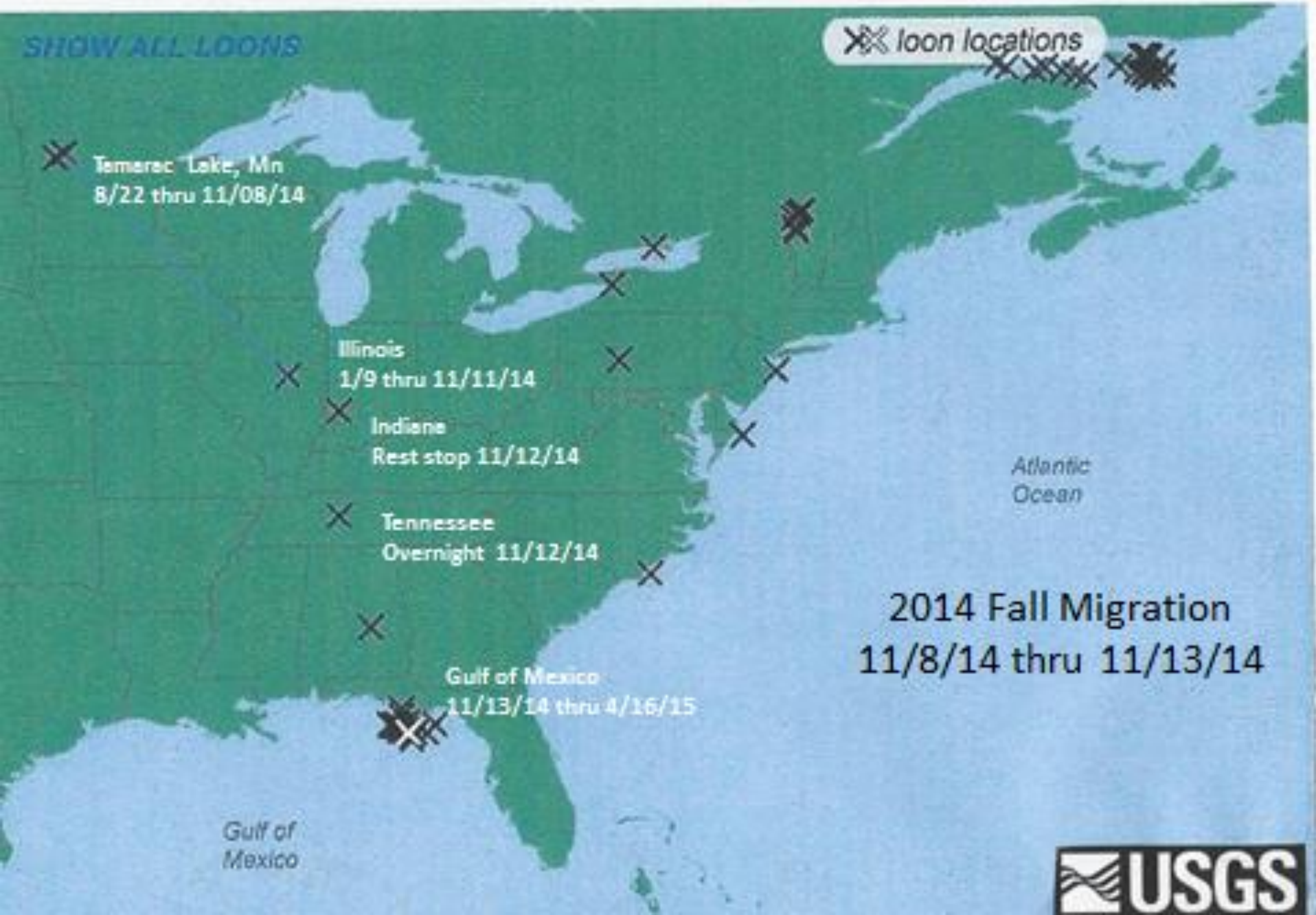
Schreer et al. (2001) Pinniped and seabird dive shape classification



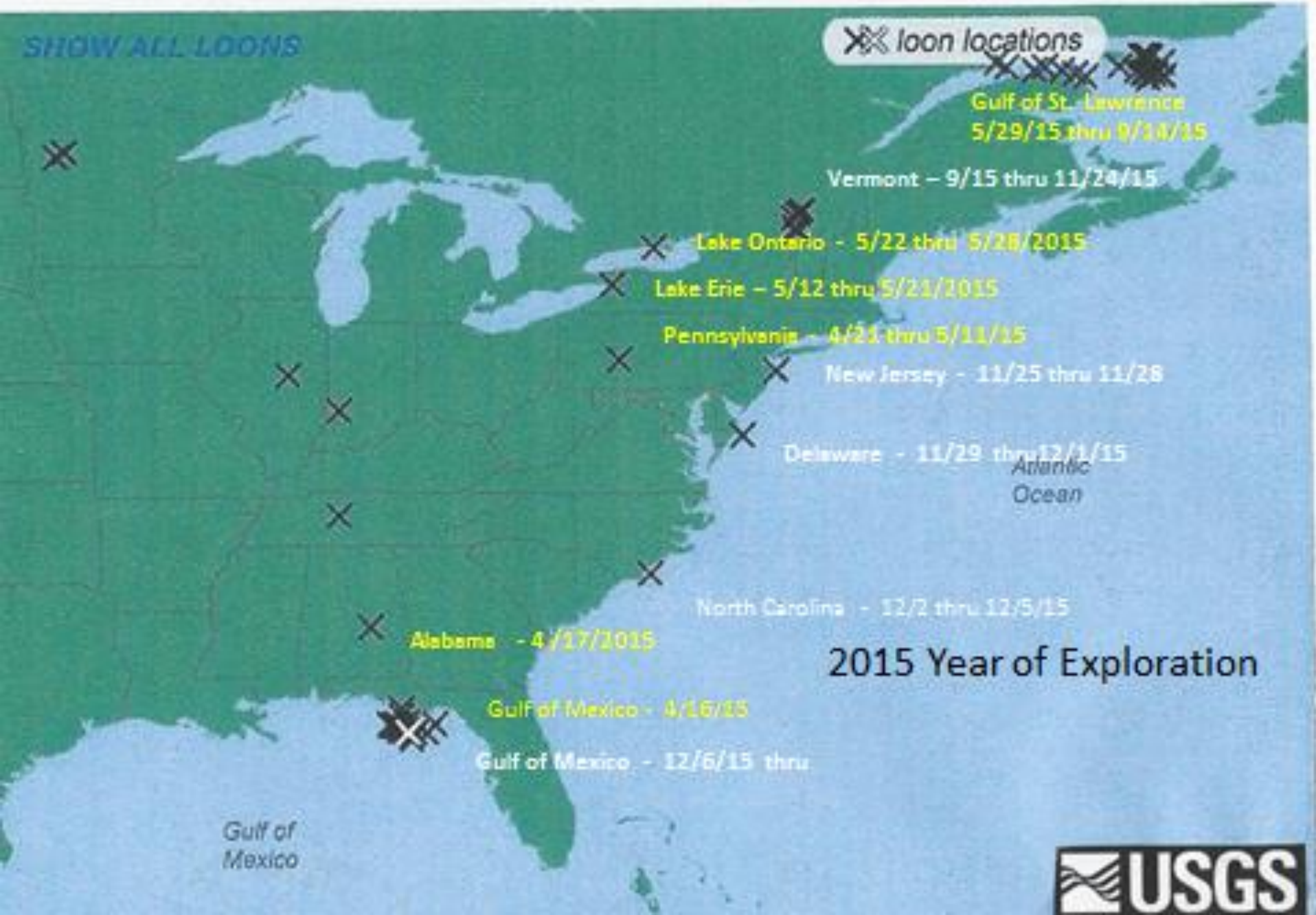
Wilson et al. (1996) Dive profiles of a Gentoo penguin

USGS

Loon: tri_14 **Natal lake: Tamarac Lake, Becker County, MN**

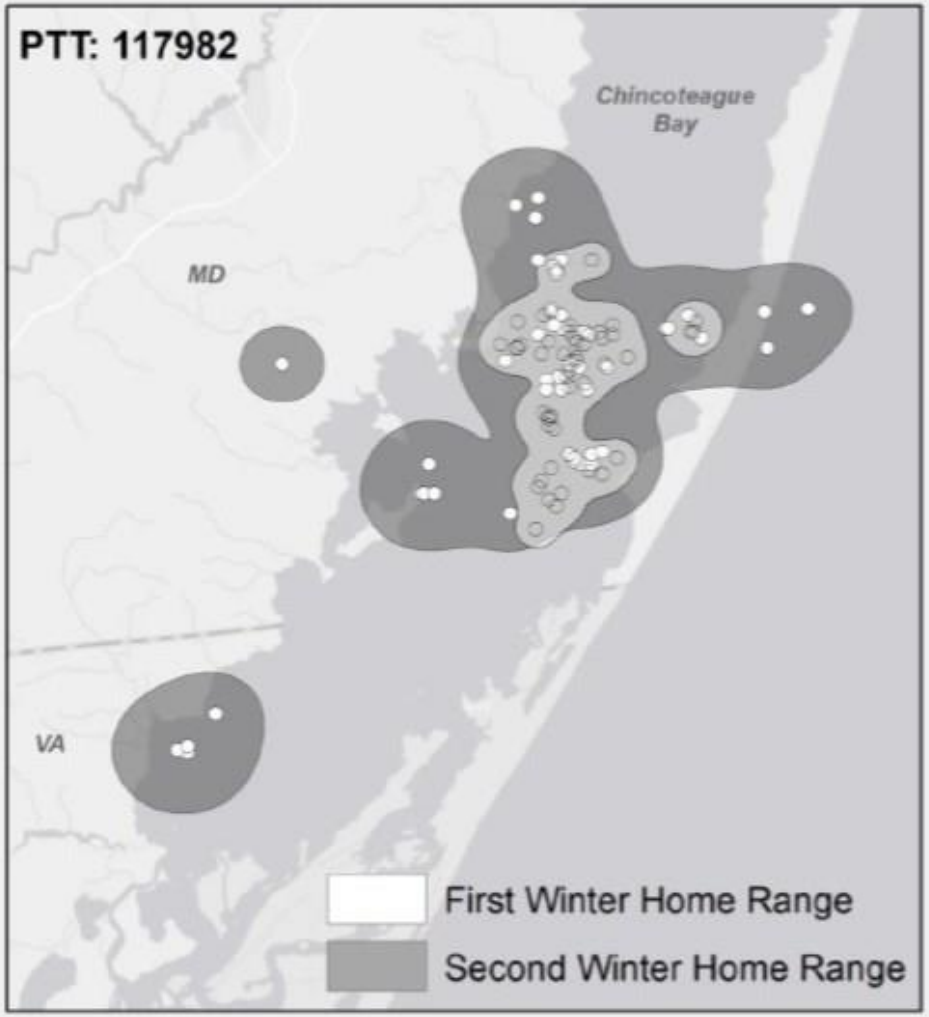


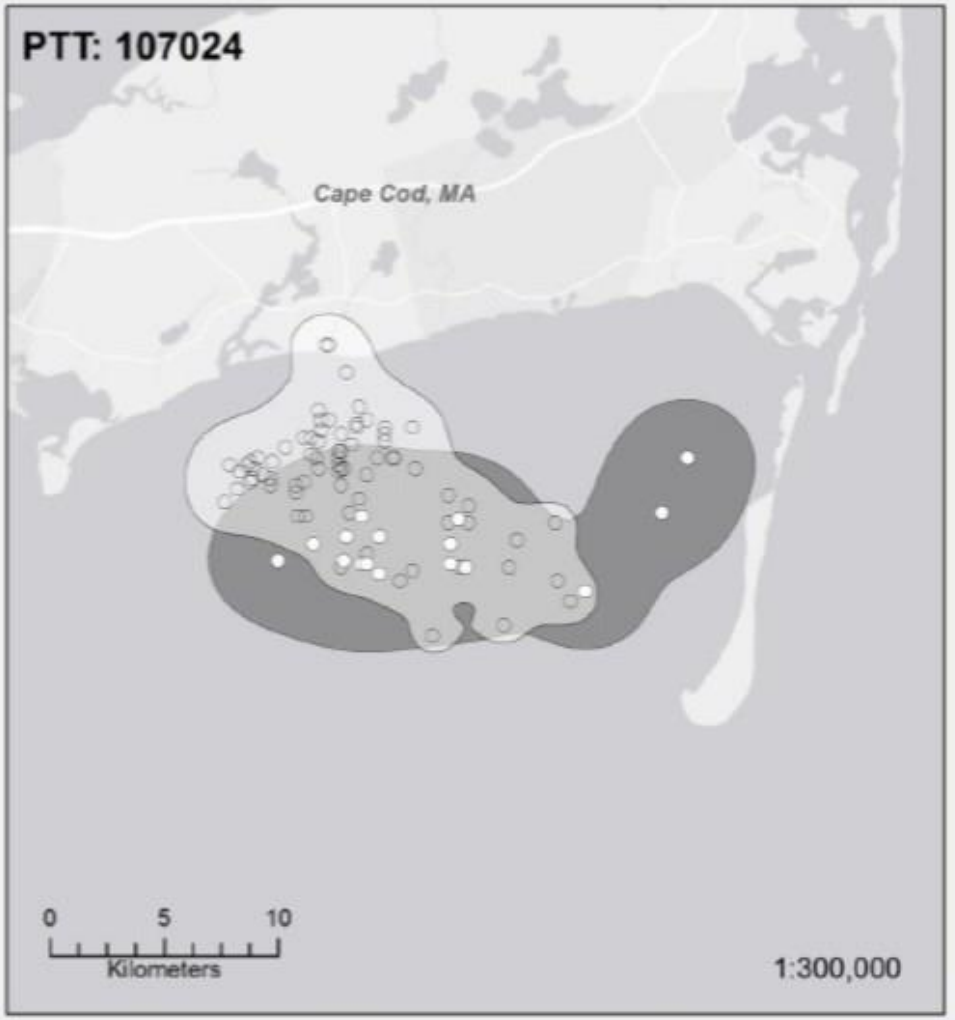
Loon: tri_14 **Natal lake: Tamarac Lake, Becker County, MN**



Winter Site Fidelity

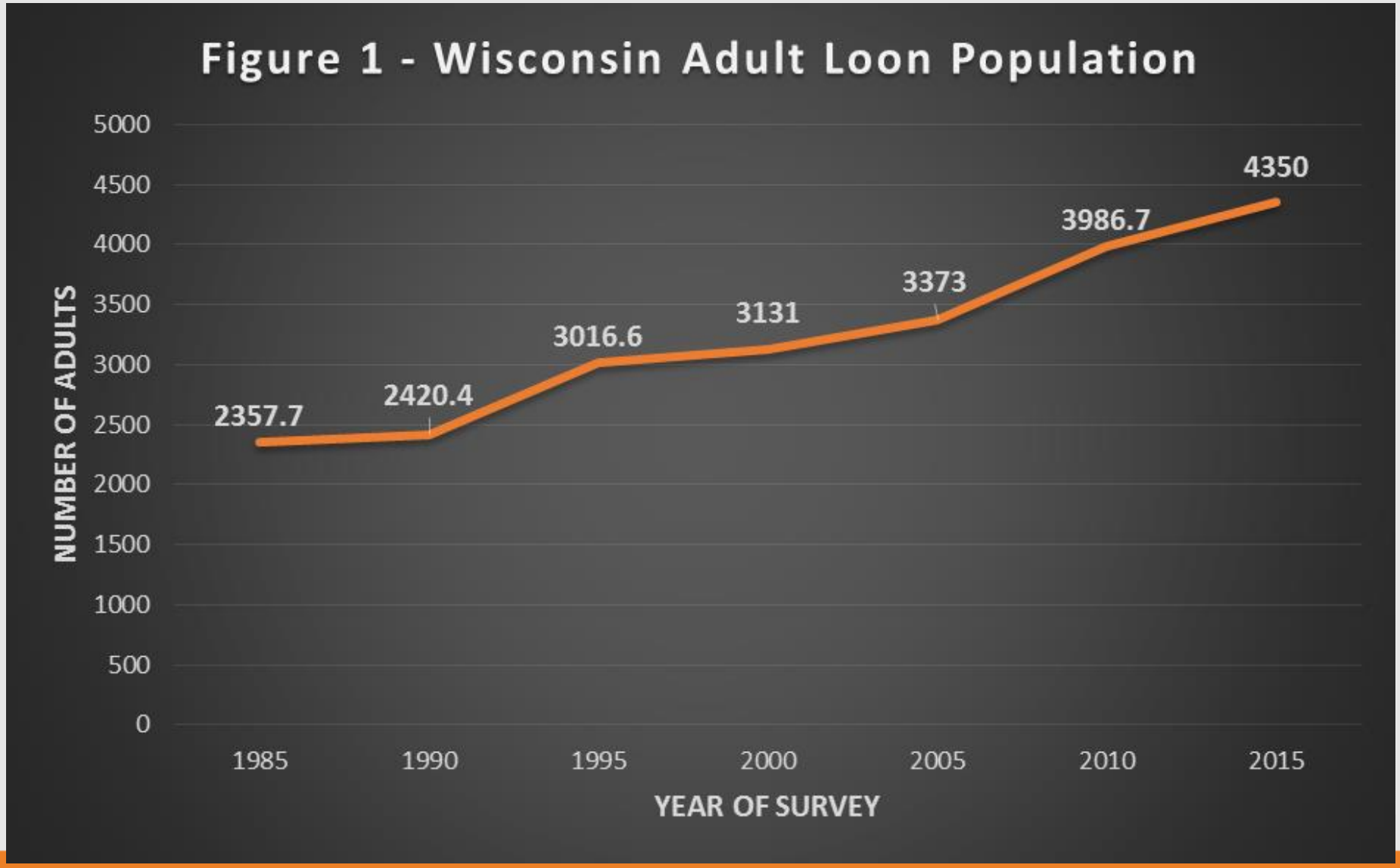
Biodiversity Research Institute





*Paruk, J.D., M. Chickering, D. Long, IV, H. Uher-Koch, A. East, E. A. Adams, K. A. Kovach, D.C. Evers. 2015. Winter site fidelity in Common Loons across North America. 2015. The *Condor: Ornithological Applications* 117:485-493.

Population Estimate of Adult Common Loons in Wisconsin



Chick Phenology


2 Day Old Chick
Linda Grenzer


4 Day Old Chicks
Linda Grenzer


7 Day Old Chicks
Linda Grenzer


10 Day Old Chick
Linda Grenzer


Two Week Old Chick
Linda Grenzer


3 Week Old Chick
Linda Grenzer


3 Week Old Chick
Linda Grenzer


5 Week Old Chicks
Linda Grenzer


6 Week Old Chick
Linda Grenzer


7 Week Old Chick
Linda Grenzer


Two Month Old Chick
Linda Grenzer

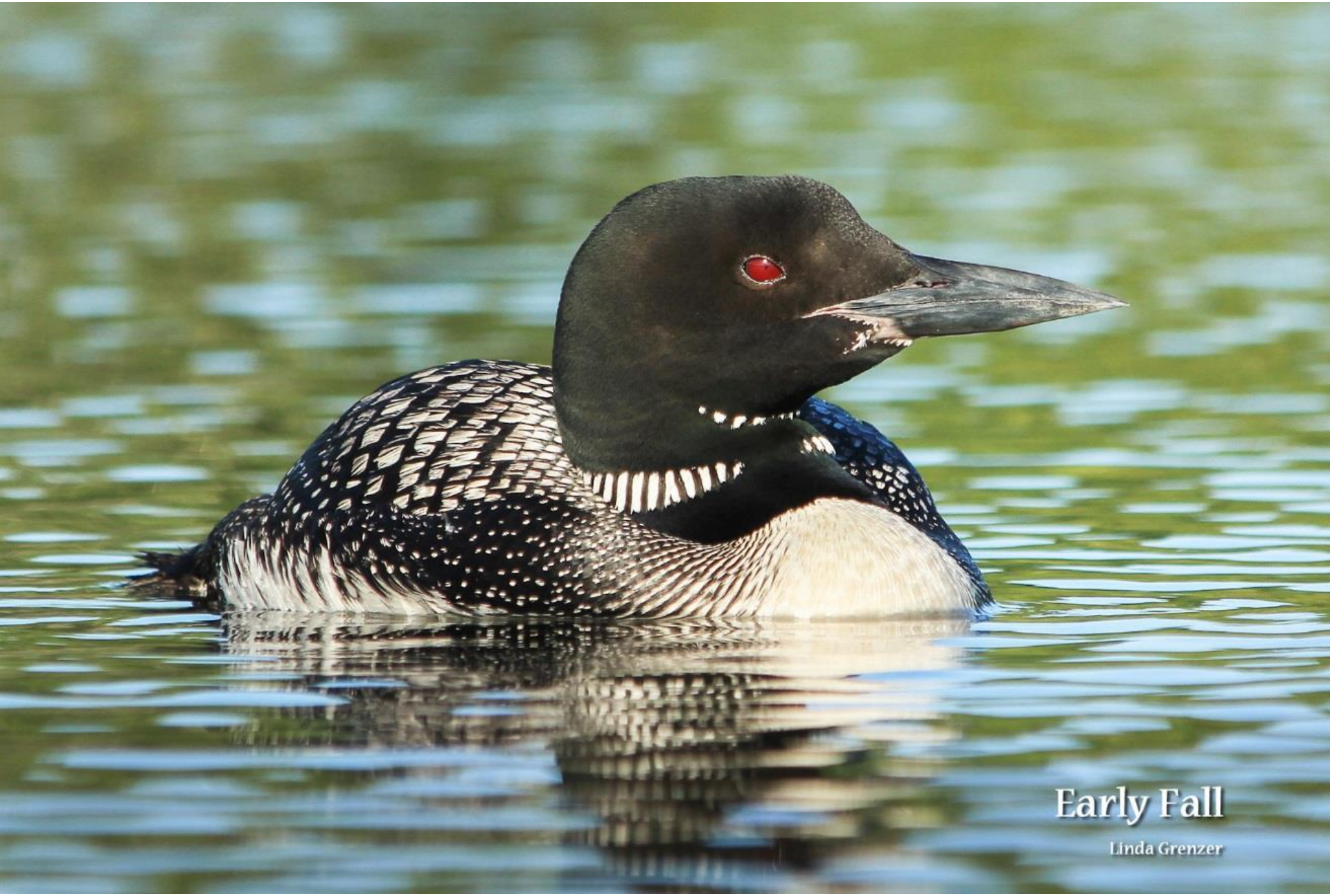

Juvenile Chick
Linda Grenzer

Spring

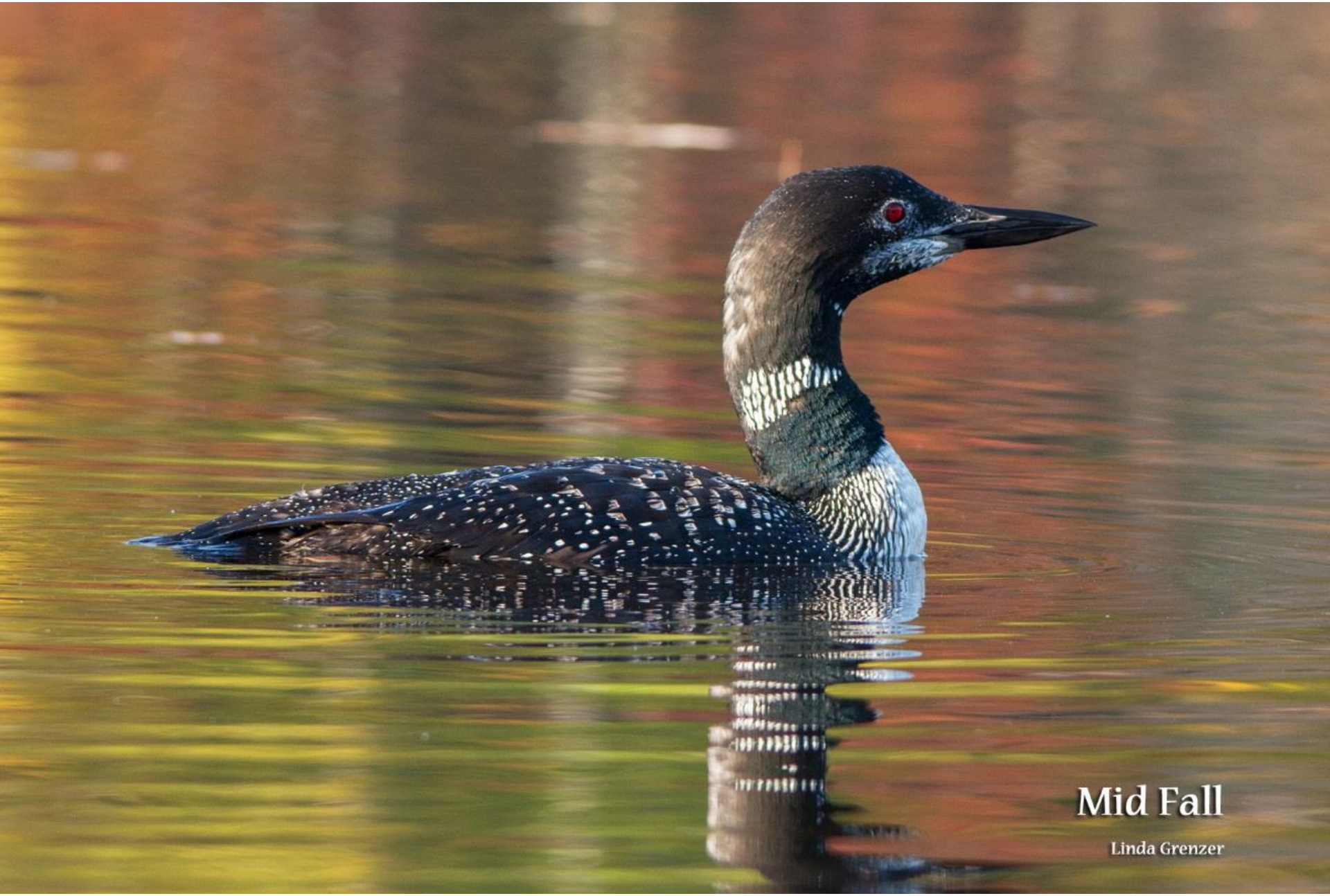
Summer

Late Summer

Early Fall

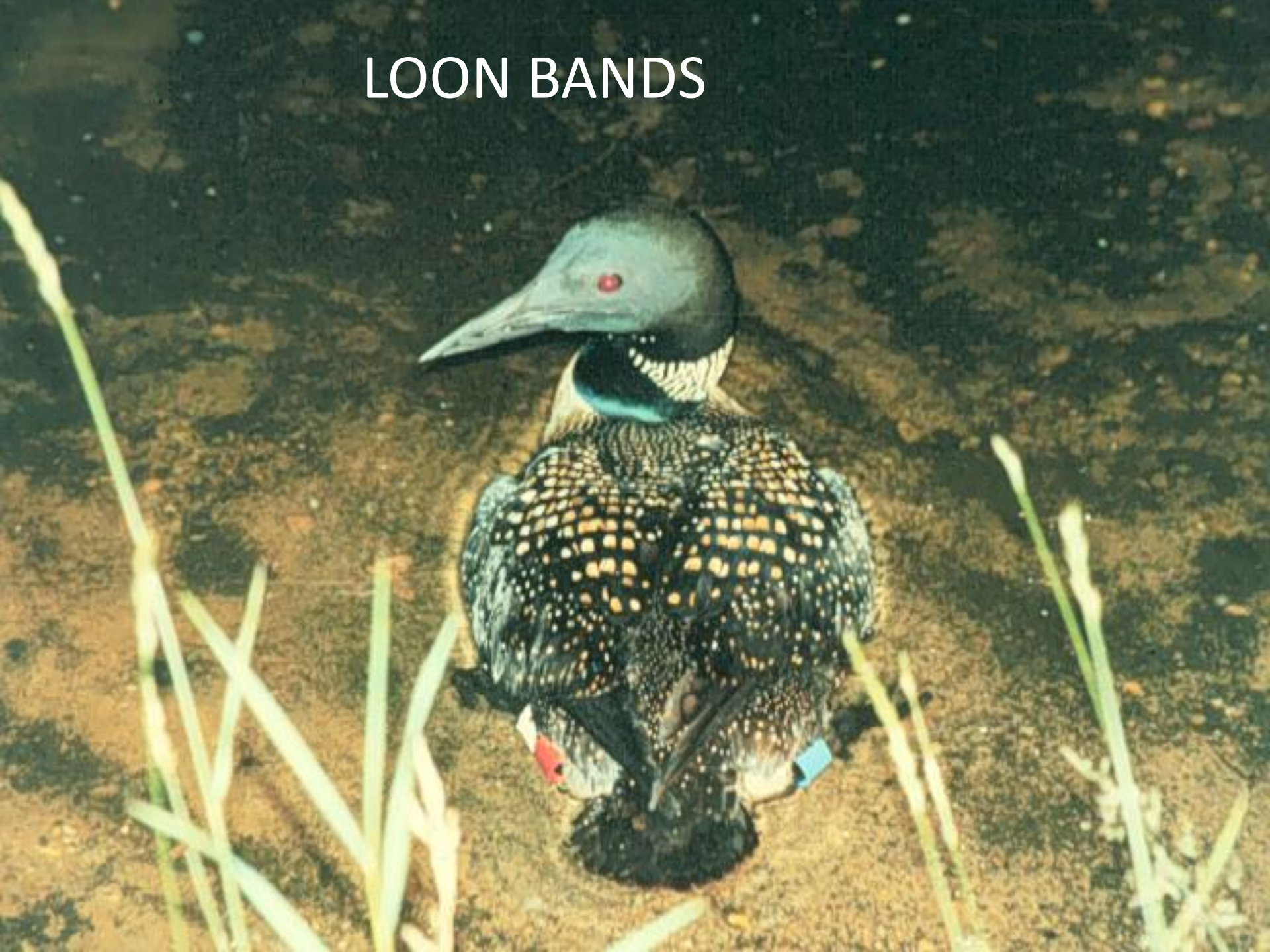


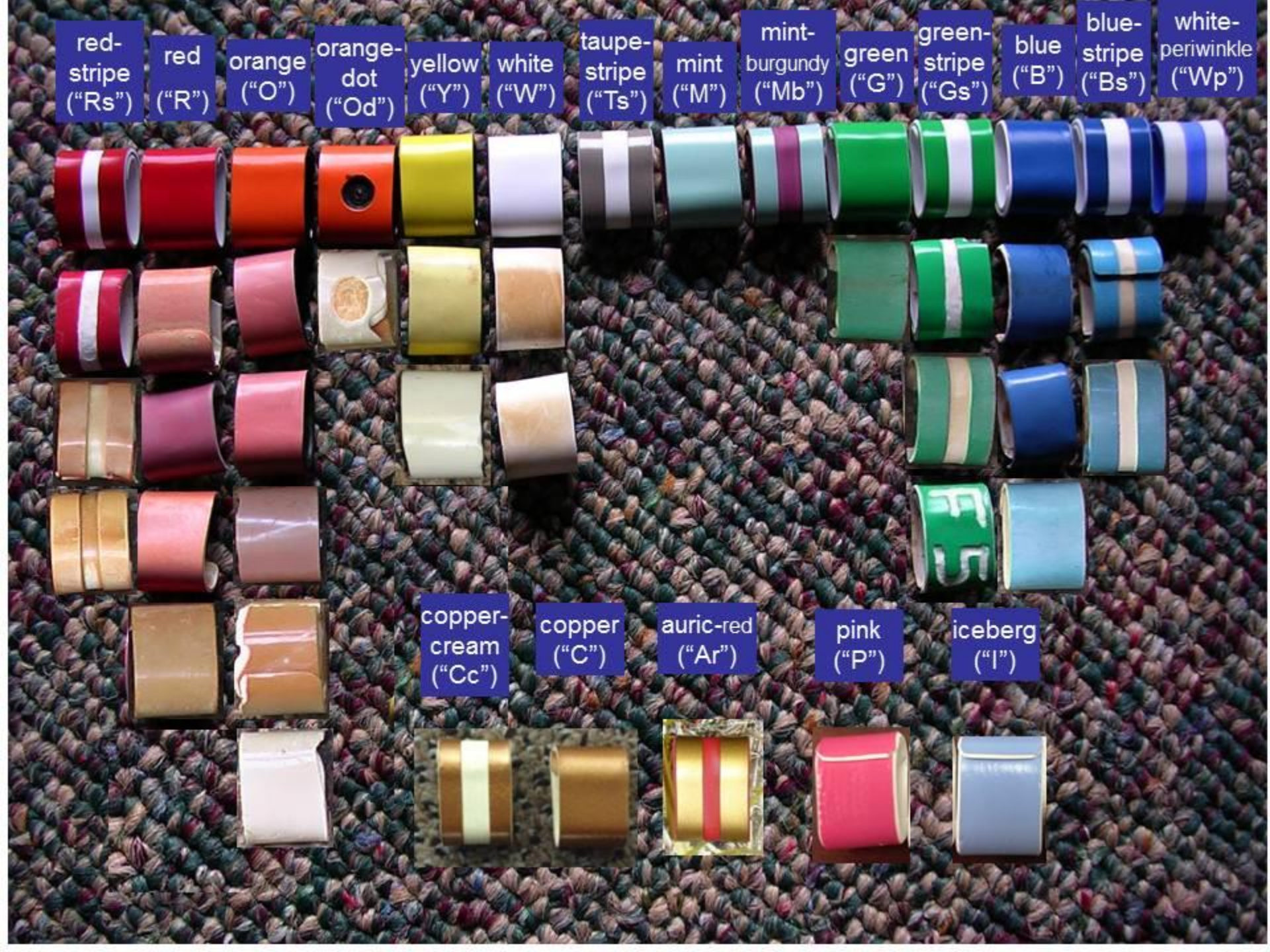
Mid Fall



Late Fall

LOON BANDS




red-stripe ("Rs")
red ("R")
orange ("O")
orange-dot ("Od")
yellow ("Y")
white ("W")
taupe-stripe ("Ts")
mint ("M")
mint-burgundy ("Mb")
green ("G")
green-stripe ("Gs")
blue ("B")
blue-stripe ("Bs")
white-periwinkle ("Wp")
copper-cream ("Cc")
copper ("C")
auric-red ("Ar")
pink ("P")
iceberg ("I")

Annual Lakes Monitoring Program

- An annual monitoring program. Ideally, volunteers **monitor once a week from ice-out to migration**.
- Volunteers collect **productivity and phenology data**: arrival date, floaters, territorial pairs, nesting pairs, # of nesting attempts, # chicks, # chicks surviving to 8 weeks.
- **Volunteers can select the lake(s)** they want to monitor.

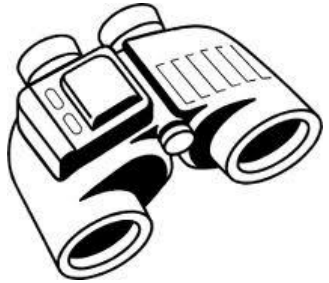
Photo by Linda Grenzer

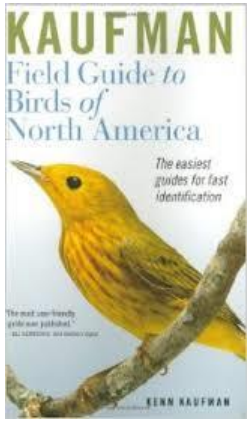
Weekly lake surveys document presence of:

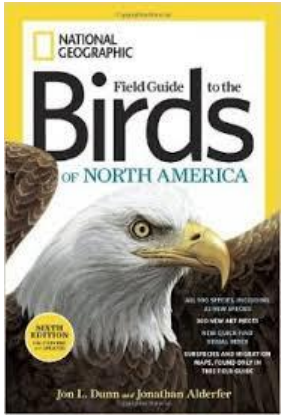
Chick Survival

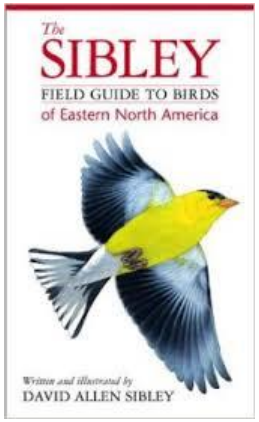
Equipment

- Make sure you are able to positively identify loons – adults, chicks and juveniles.
- Low light and bright light conditions, wind, fog, and rain can make it difficult to see.
- Bring binoculars, your survey form and instructions, and a field guide.



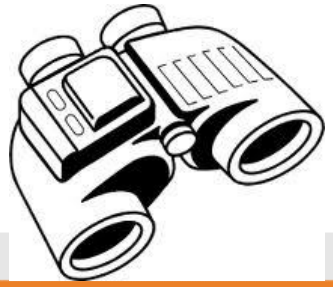


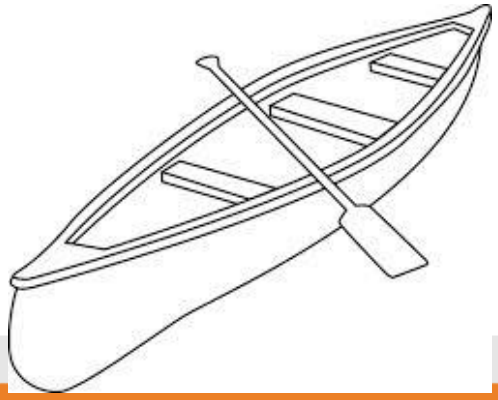




Equipment

1. Be careful – wear life vests if you go in a boat or canoe
2. Try to avoid disturbing the loons as you count them
3. Bring binoculars, spotting scope (if available), pencil, monitoring form, map, instructions, field guide
4. Remember to check your boat (and boat trailer if applicable) for aquatic invasive species (esp plants) when removing it from the water. We recommend washing your boat before transferring it to a different water body.
5. Have fun!





NORTHLAND COLLEGE

Binoculars – How to Use Em'

1. Fit

Eyeglass Wearer

Non-Eyeglass Wearer

Adjust interpupillary distance

2. Focus

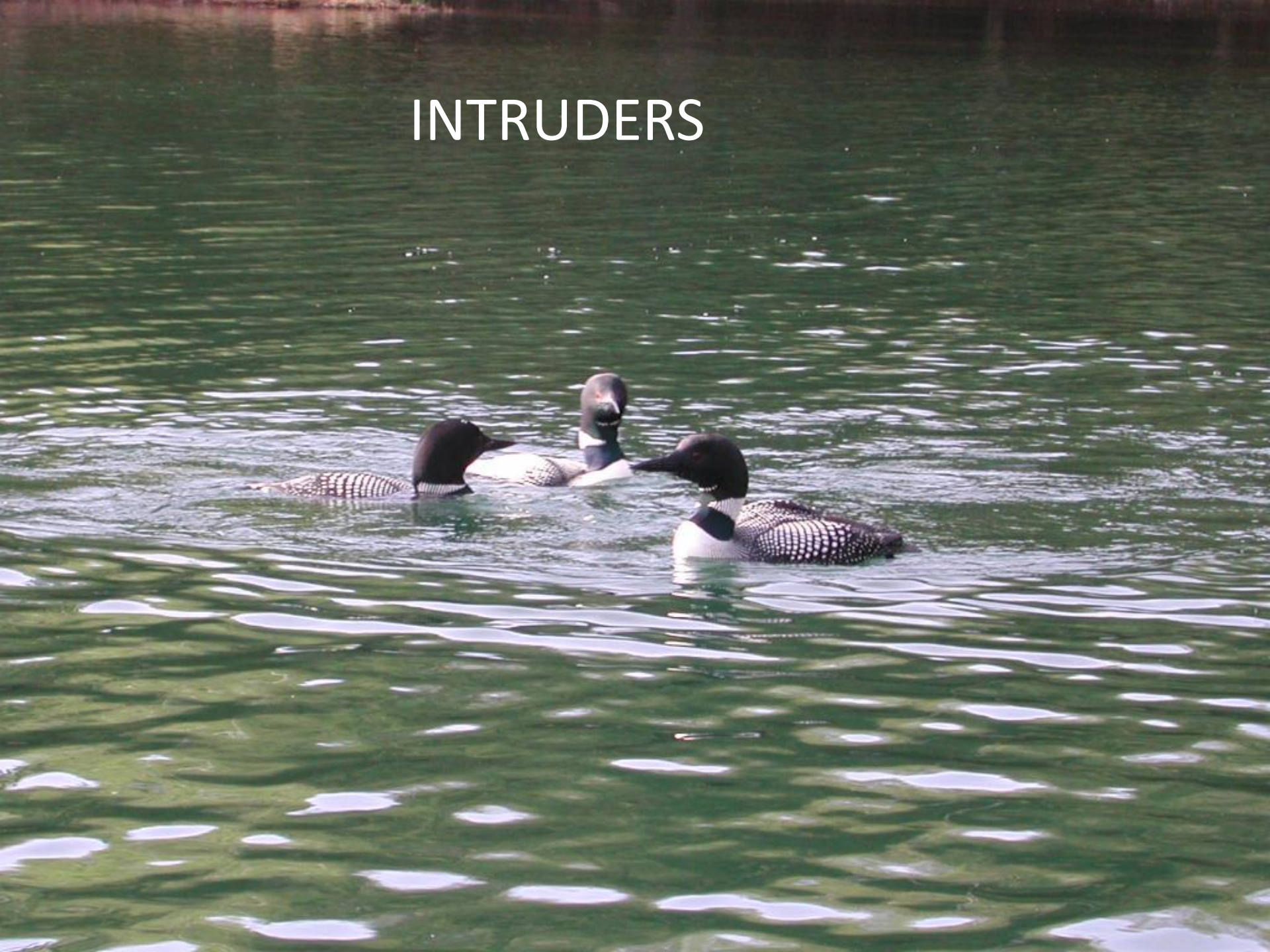
Focus with your left eye by focusing ring.

Then, focus with your right eye with diopter.

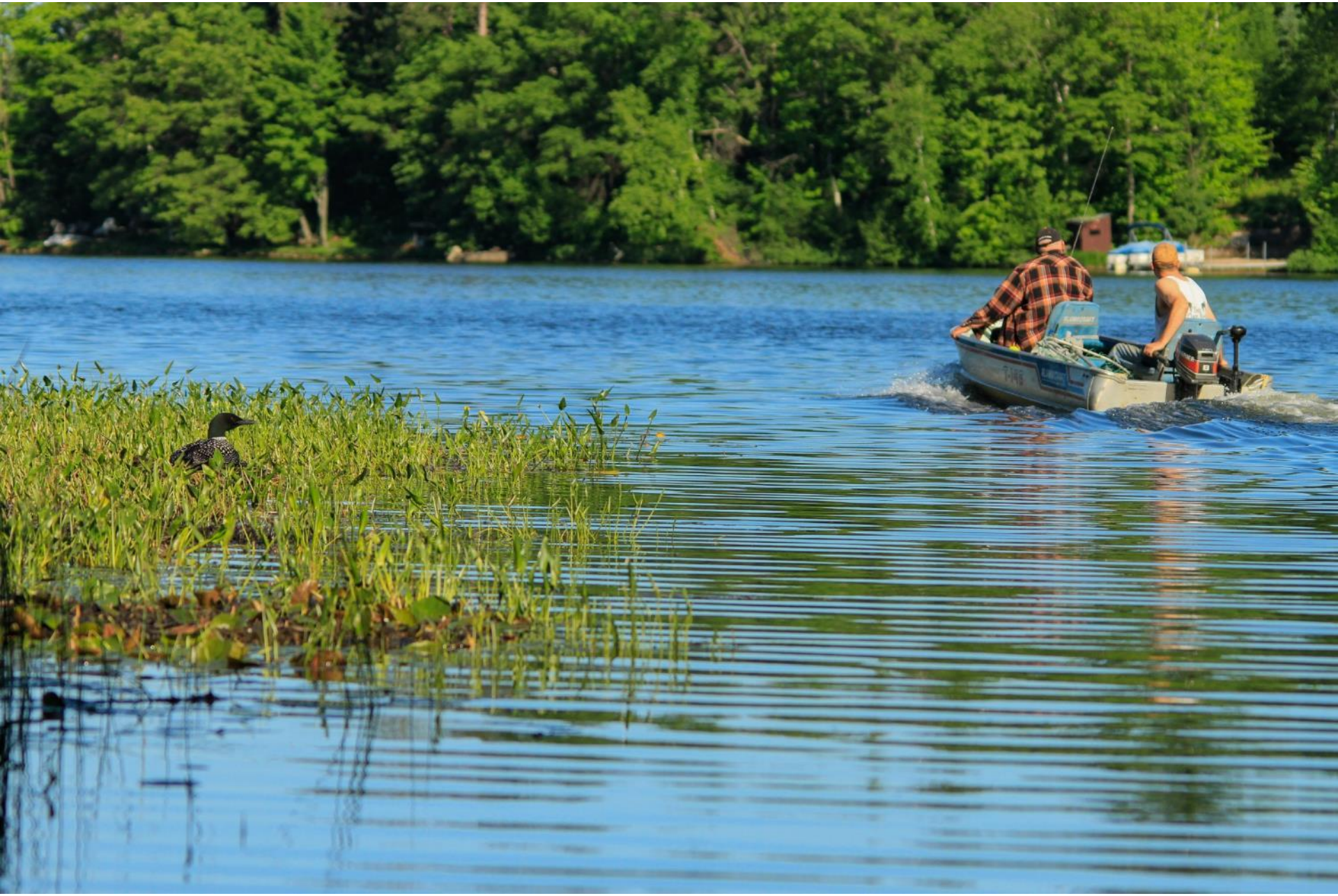
Loon Citizen Scientists

TERRITORIAL PAIRS

INTRUDERS

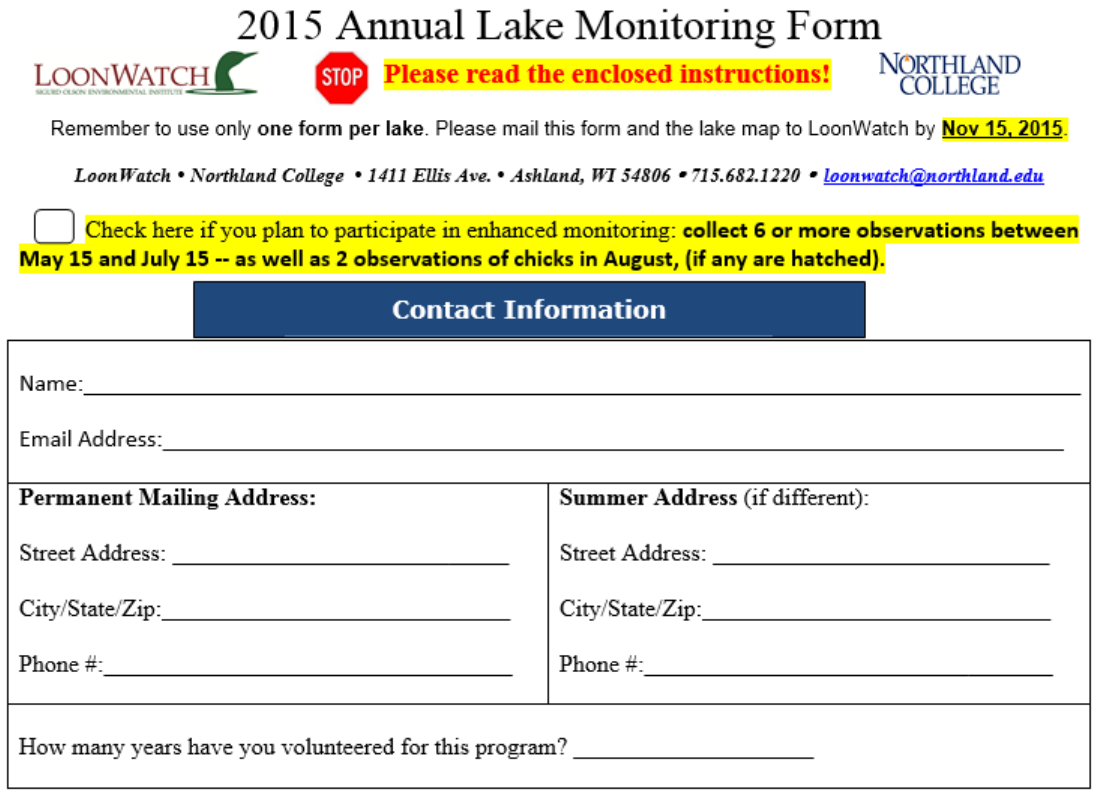



LOON NESTS



Protocol

- READ THE INSTRUCTIONS
- Volunteers have the option to participate at an enhanced level – this is very helpful for management recommendations
  - Check the box above the contact information if you want to participate
- Return your monitoring form no later than November 15



2015 Annual Lake Monitoring Form

LOONWATCH STOP **Please read the enclosed instructions!** NORTHLAND COLLEGE

Remember to use only **one form per lake**. Please mail this form and the lake map to LoonWatch by **Nov 15, 2015**.

LoonWatch • Northland College • 1411 Ellis Ave. • Ashland, WI 54806 • 715.682.1220 • loonwatch@northland.edu

☐ Check here if you plan to participate in enhanced monitoring: **collect 6 or more observations between May 15 and July 15 -- as well as 2 observations of chicks in August, (if any are hatched).**

Contact Information

Name:_____

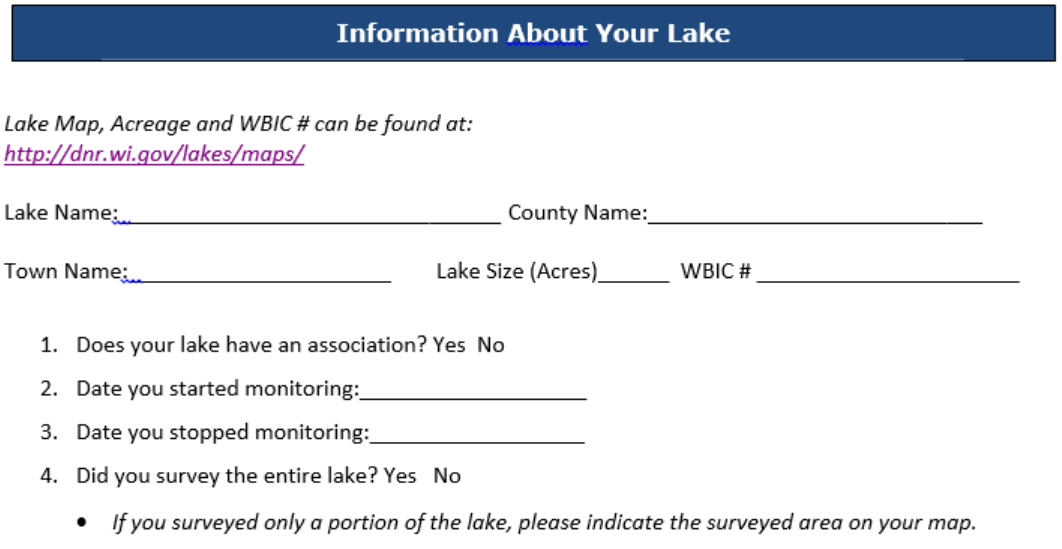
Email Address:_____

Permanent Mailing Address:	**Summer Address** (if different):
Street Address: _____	Street Address: _____
City/State/Zip:_____	City/State/Zip:_____
Phone #:_____	Phone #:_____

How many years have you volunteered for this program? _____

Protocol

- Fill out basic information about the lake you are monitoring
- WBIC # can be found on your lake map
- Dates you started and stopped monitoring are very important – did you catch the first nesting attempt?
- Want more information about your lake including water quality? Check out the WI DNR website http://dnr.wi.gov/lakes/



Information About Your Lake

Lake Map, Acreage and WBIC # can be found at:
http://dnr.wi.gov/lakes/maps/

Lake Name:_____ County Name:_____

Town Name:_____ Lake Size (Acres)_____ WBIC # _____

1. Does your lake have an association? Yes No
2. Date you started monitoring:_____
3. Date you stopped monitoring:_____
4. Did you survey the entire lake? Yes No
   - *If you surveyed only a portion of the lake, please indicate the surveyed area on your map.*

Protocol

- Survey Log
  - Fill out one row for each week you observed loons on your lake
  - Record the # of floaters, territorial pairs, nesting pairs, and chicks
- At the end of the season, use the survey log to fill out the Loon Season Summary

Weekly Loon Survey Log

Please indicate the weekly observation date, the type of residency and number of loons using your lake.

Use one row for each week.

Date	# Floater Adult Loons	# Territorial Pairs	# Nests with Incubating Adults	# Chicks	Comments

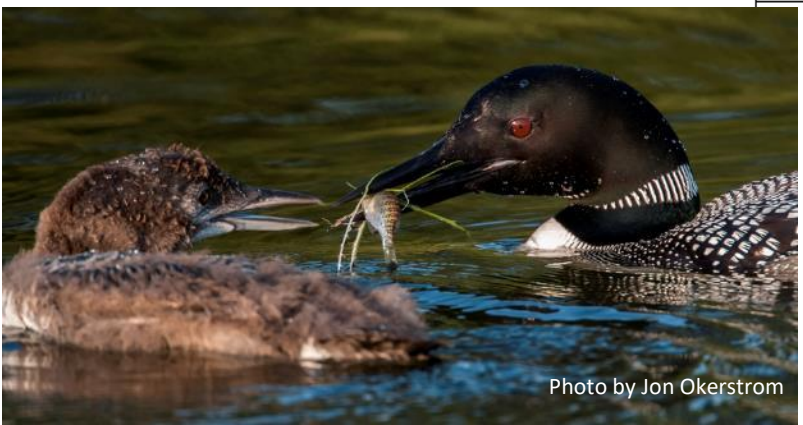


Photo by Jon Okerstrom

Protocol

- Record
  - # of territories
  - Give each territory a name
- Complete each step as it applies to your observations
  1. Were you able to locate the nesting site? Yes No

     If yes, indicate the type of nesting site used:

     Island On/near mainland shore ANP Different Lake Other____


Photo by Rich Floyd

Loon Territory Summary

Identify each loon territory by its name or unique location on your lake, and outline this area on your lake map. For example, if you do not have a territory name, you may name them by a unique geographic reference, such as North Bay and South Bay territories. **IF YOU HAVE MORE THAN 2 TERRITORIES, MAKE A COPY OF THIS PAGE, fill out and return**

Total Territories on Lake: _____ # Territories

Loon Territory Description:_____

1. Were you able to locate the nesting site? Yes No

   If yes, please indicate the type of nesting site used:

   Island On/near mainland shore Artificial Nesting Platform Different Lake Other:____

2. What type of ownership is the land where the nest is located?

   Public Private Unknown

3. Did the eggs in the nest fail to hatch? Yes No

   If yes, how was the nest lost?

   *Predation by:_____ Water level change Other:_____ Unknown

   3a. Was there a 2nd nesting attempt? (Yes /No) A 3rd nesting attempt (Yes/No)

   If yes, did the nest fail to hatch? [2nd attempt (Yes/No); 3rd attempt (Yes/No)

   Did loons re-nest at the same location? [2nd attempt (Yes/No); 3rd attempt (Yes/No)

   If no, provide new location on map and label "2nd Attempt" and "3rd Attempt".

Protocol

- Complete each step as it applies to your observations

  3a. Was there a 2nd nesting attempt? Yes No

  A 3rd Nesting attempt Yes No

  If yes, did the nest fail to hatch? [2nd attempt (Yes/No)];
  [3rd attempt (Yes/No)]

  Did loons re-nest at the same location?
  [2nd attempt (Yes/No)];
  [3rd attempt (Yes/No)]
  If no, provide new location on map

Loon Territory Summary

Identify each loon territory by its name or unique location on your lake, and outline this area on your lake map. For example, if you do not have a territory name, you may name them by a unique geographic reference, such as North Bay and South Bay territories. **IF YOU HAVE MORE THAN 2 TERRITORIES, MAKE COPY OF THIS PAGE, fill out and return**

Total Territories on Lake: _____ # Territories

Loon Territory Description:_____

1. Were you able to locate the nesting site? Yes No

   If yes, please indicate the type of nesting site used:

   Island On/near mainland shore Artificial Nesting Platform Different Lake Other:____

2. What type of ownership is the land where the nest is located?

   Public Private Unknown

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   Did loons re-nest at the same location? [2nd attempt (Yes/No); 3rd attempt (Yes/No)

   If no, provide new location on map and label "2nd Attempt" and "3rd Attempt".

Protocol

- Fill in your form completely
- Lines left blank do not mean “0”, they mean no data
- Zero is important data too – we need the whole picture of what is happening out there.

Loon Season Summary

*** You must complete this table to have your data included in the report. If you do not see loons, write “0”.

Number of Territorial Pairs present on this lake:	
Number of Territorial Pairs with 1 or more nest attempt:	
Number of Territorial Pairs with successful hatch	
Total Chicks Hatched on this lake:	
Total Chicks Fledged (survived to 8 weeks):	
Number of Floaters present on this lake:	
Number of Nest Locations Determined:	

Number of Known Nest Attempts:	
Nest Location Name	# of Nest Attempts

Comments


Thank you for learning about loons!
Please help us spread the word about
how to protect loons and their habitat.