Fisheries and Climate Change

MN Department
of Natural Resources
Division of Fish & Wildlife

What are the most significant challenges you see associated with a changing climate? What information suggests this challenge is real and significant?

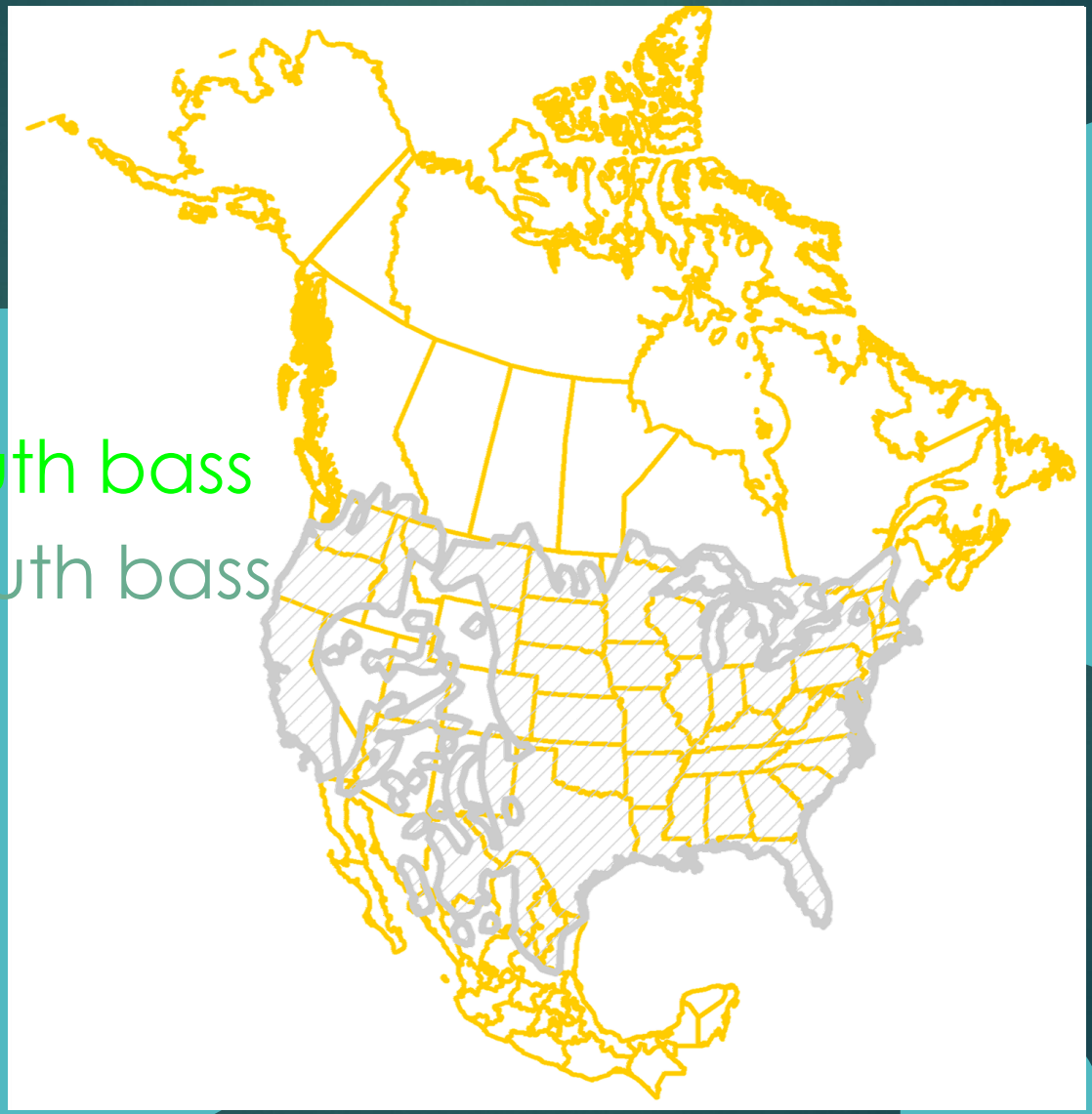
Challenge #1: Fish community composition is changing. This will effect angling opportunity, MN's fishing economy, and our outdoor culture.

Species range comparisons

Walleye

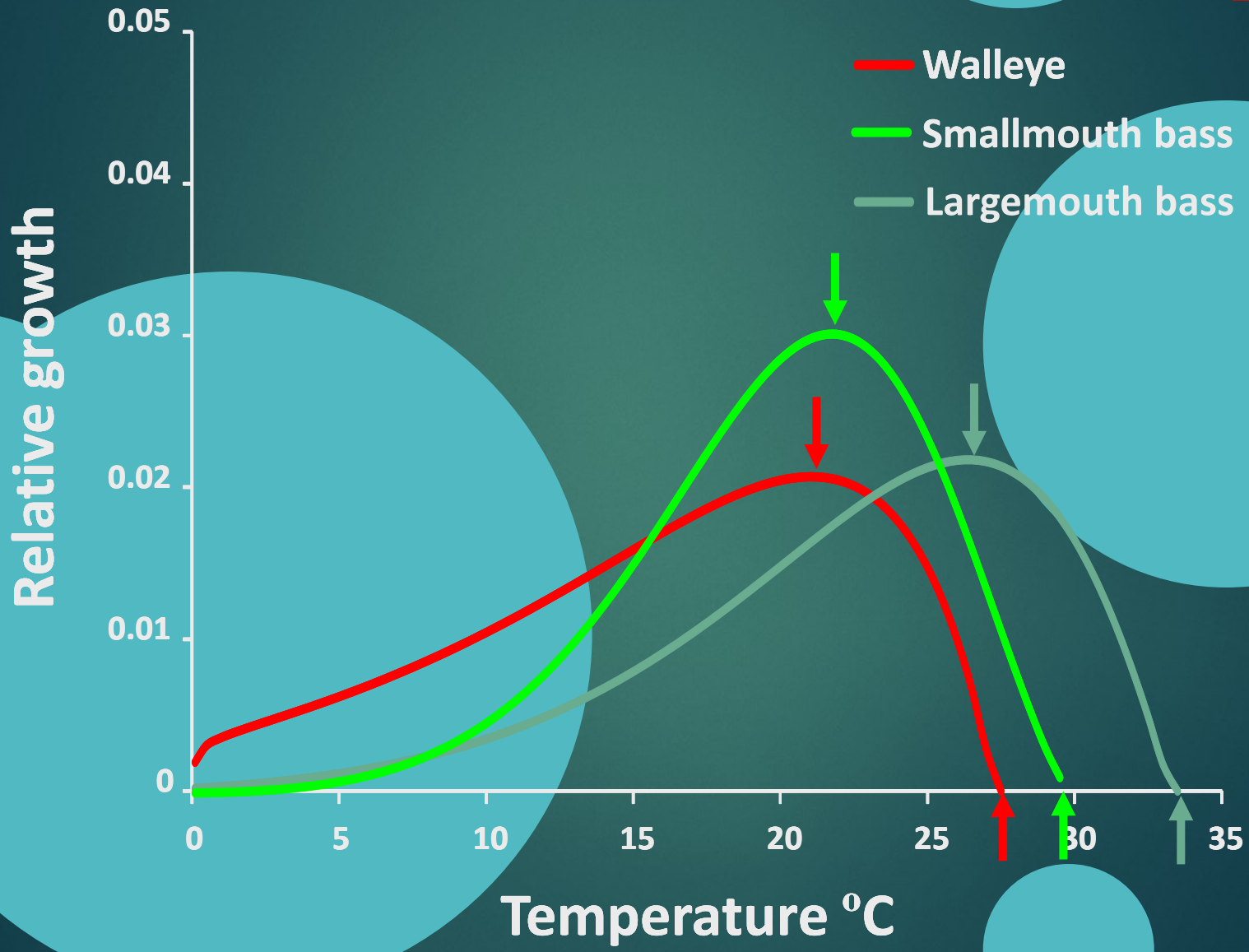
Smallmouth bass

Largemouth bass

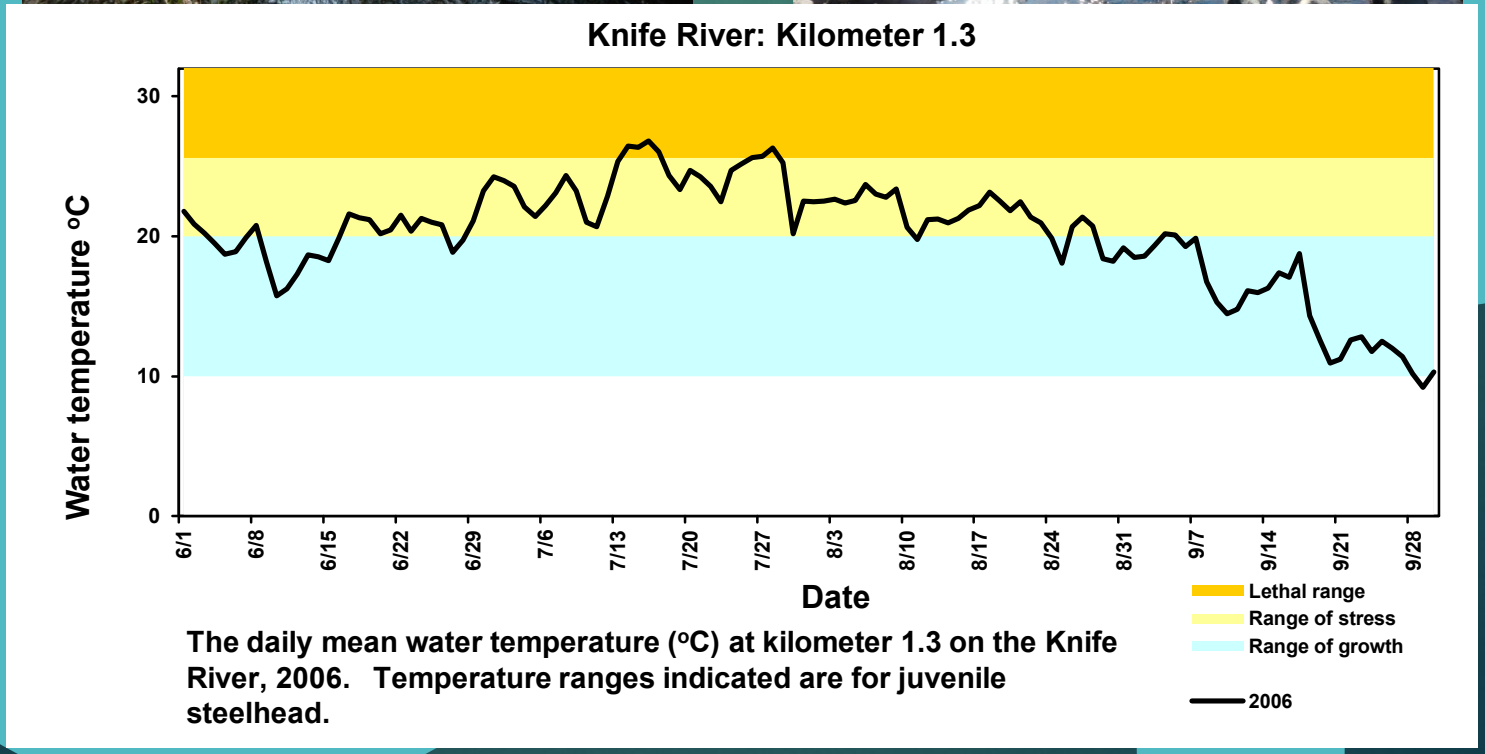


Walleye Mean CPUE
0
1
2
3
4
5
Bass Mean CPUE
0.4
0.5
0.6
0.7
1995
2000
2005
2010
Year
Walleye
Smallmouth bass
Largemouth bass

Bioenergetics



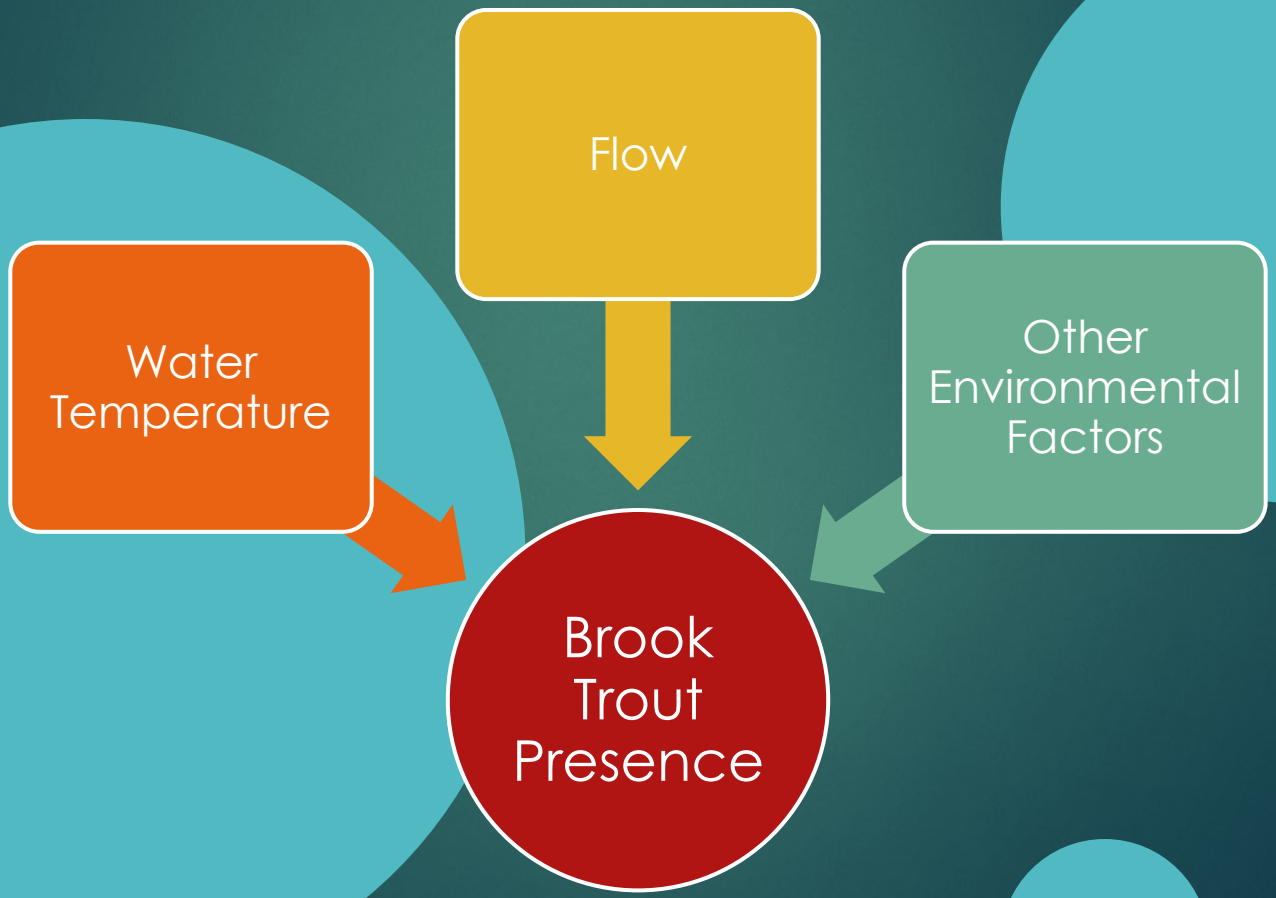
Stream Temperature



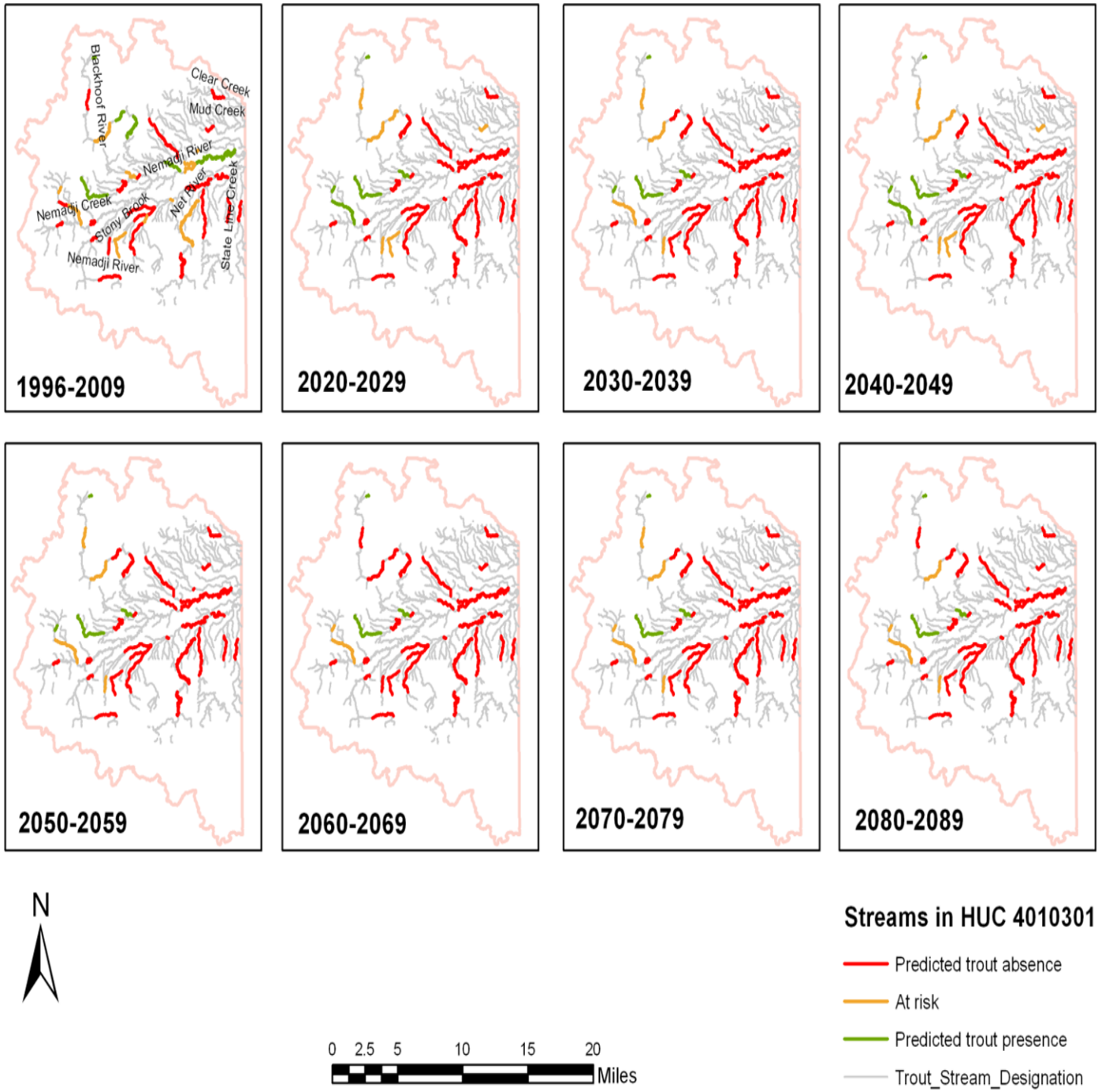
The daily mean water temperature (°C) at kilometer 1.3 on the Knife River, 2006. Temperature ranges indicated are for juvenile steelhead.

D. Schreiner

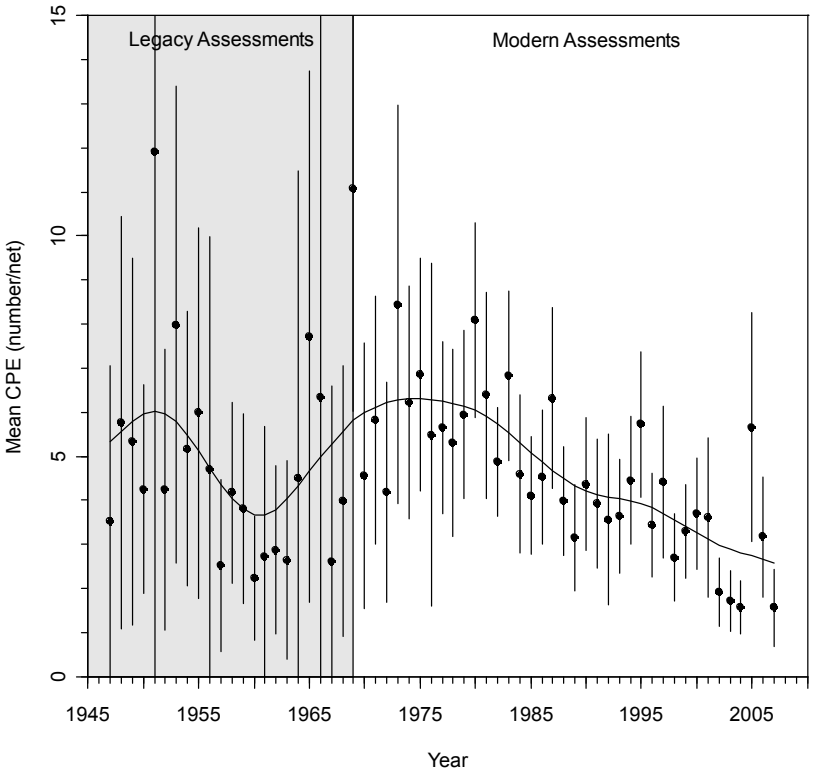
Vulnerability Assessment



Johnson et al.


Blackhoof River
Clear Creek
Mud Creek
Nemadji River
Nemadji Creek
Stony Brook
Net River
State Line Creek
Nemadji River
1996-2009
2020-2029
2030-2039
2040-2049
2050-2059
2060-2069
2070-2079
2080-2089
N
0 2.5 5 10 15 20
Miles
Streams in HUC 4010301
Predicted trout absence
At risk
Predicted trout presence
Trout_Stream_Designation

Statewide declines in cisco abundance starting in 1970's



StarTribune

Climate change is a culprit in walleye's decline

Article by: Josephine Marcotty
Star Tribune
May 2, 2015 - 9:50 PM

Lake Mille Lacs resort owners are angry, anglers are frustrated, and they all have an opinion on what's to blame for the shocking decline in walleye in Minnesota's favorite fishing destination.

But there's one culprit that gets scant attention: global warming.

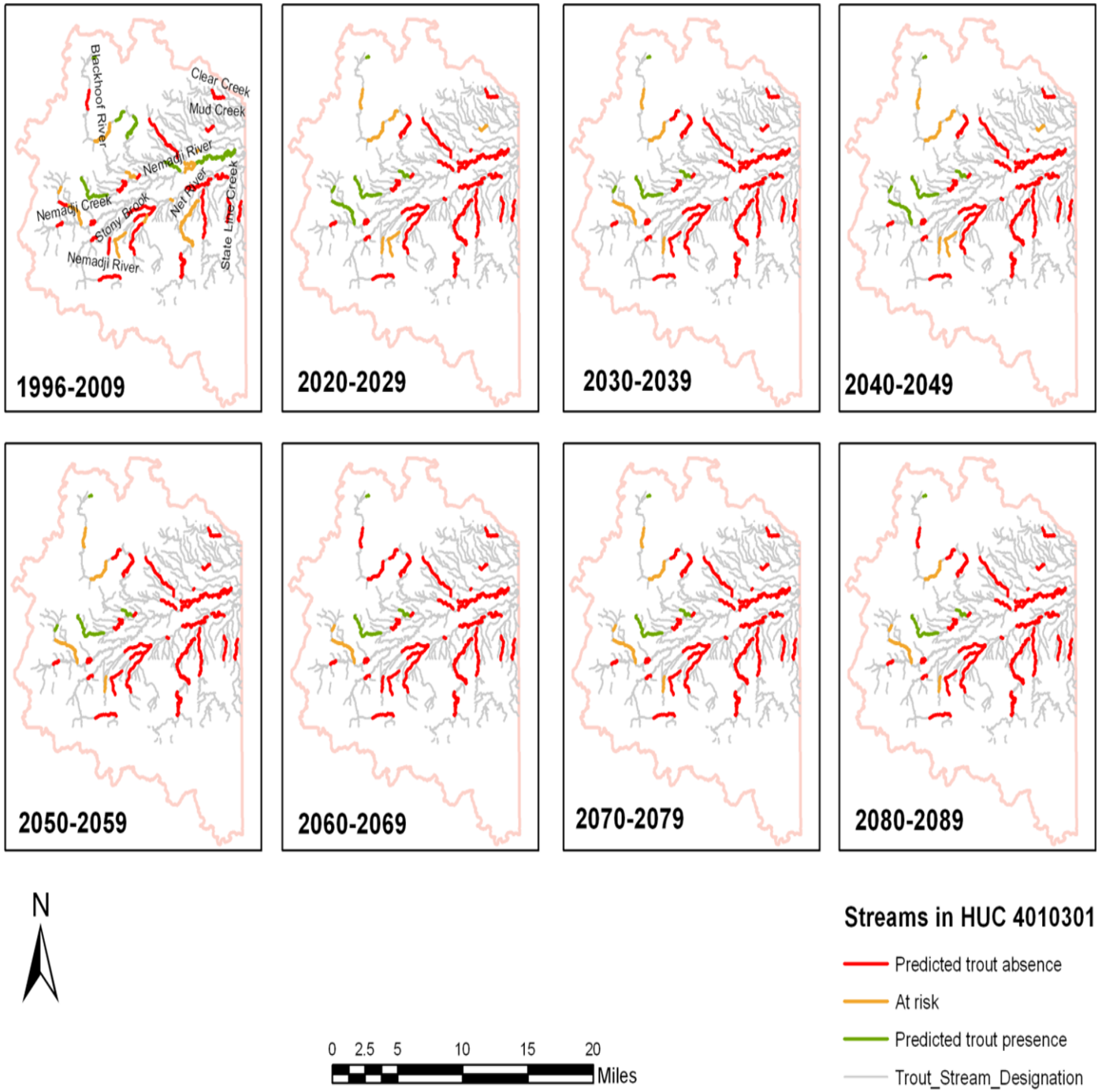
Tullibee, a cold-water loving fish that is a critical prey for walleye

DNR hoping to protect Minnesota lake trout 'refuges'

By Dave Orrick
dorrick@pioneerpress.com

POSTED: 05/09/2015 12:29:00 PM CDT | UPDATED: 2 DAYS AGO

Challenge #2: Natural resources should be managed from a long-term perspective (50 yr),and using a systems approach (ecosystems).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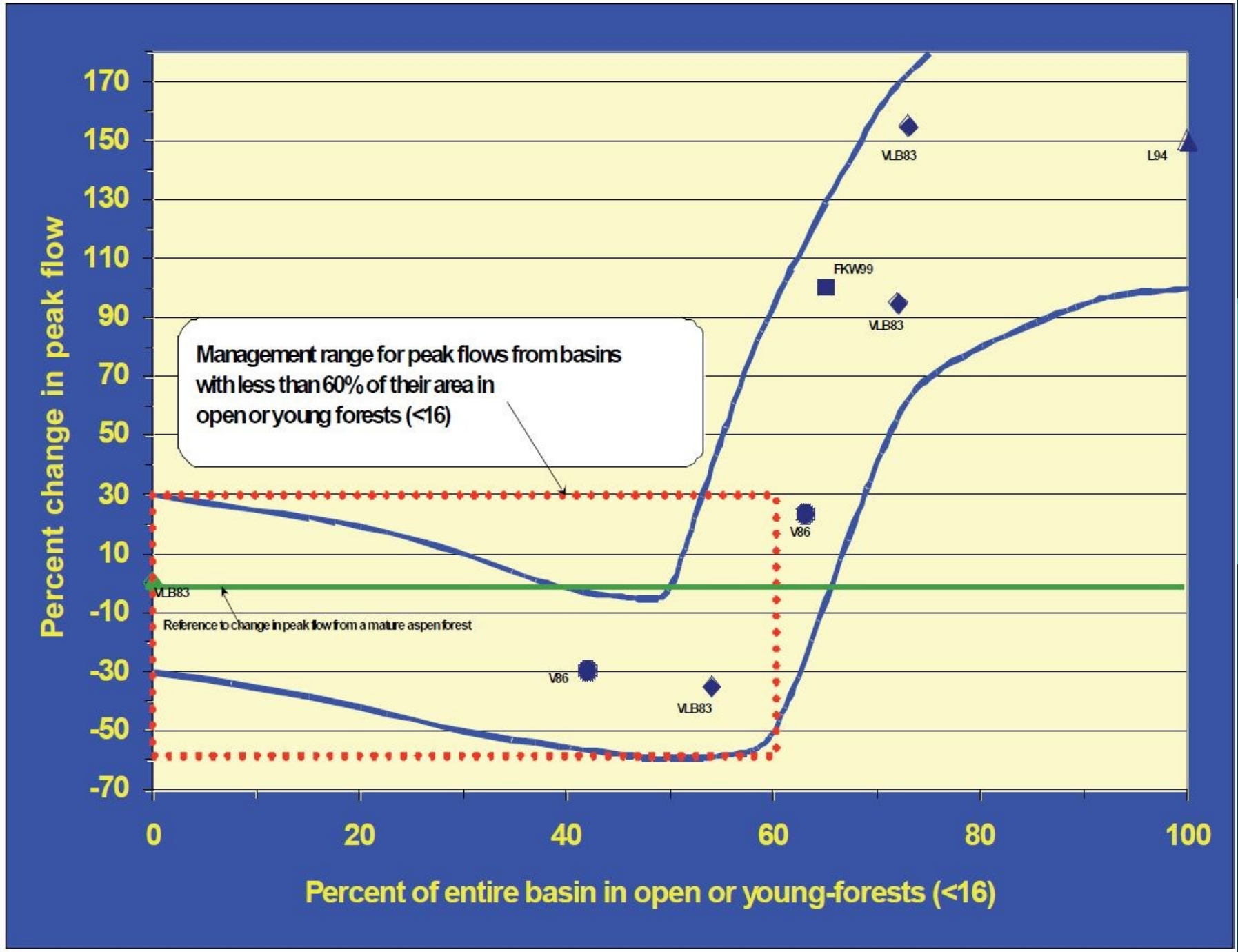

Percent change in peak flow
170
150
130
110
90
70
50
30
10
-10
-30
-50
-70
0
20
40
60
80
100
Percent of entire basin in open or young-forests (<16)
Management range for peak flows from basins with less than 60% of their area in open or young forests (<16)
Reference to change in peak flow from a mature aspen forest
VLB83
FKW99
VLB83
L94
V86
V86
VLB83

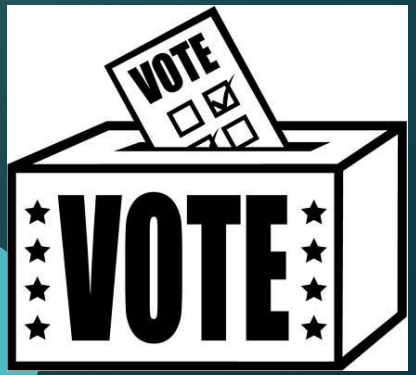
What opportunities are there to address these challenges to improve local quality of life?

Opportunity #1: Information = power and info

- Informed decision-making at all levels
- Consider changing present practices
- Accept changes to natural systems and change the way we manage

Opportunity #2: Manage for the future.

- Move natural resource management into a long-term planning and sustainability mode
- Include citizen interests in the planning process
- Be adaptive, but realistic



What actions can community members pursue to address challenges or realize opportunities?

Action #1 – Relentless information campaign

Action #2 – Find and empower local citizen champions