The COVID-19 Pandemic Revealed How Angling Nesting Bass Impacts Reproductive Success and Recruitment

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BASS REPRODUCTIVE ECOLOGY

TRADITIONAL THINKING

BECAUSE SPAWNING AND SURVIVAL ARE SO INFLUENCED BY ENVIRONMENTAL FACTORS,

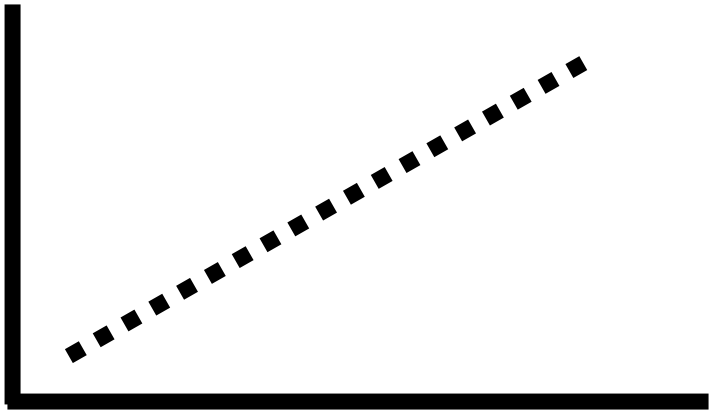
RECRUITMENT DOES **NOT** DEPEND UPON THE AMOUNT OF SUCCESSFUL REPRODUCTION.

SO…ANGLING NESTING BASS HAS NO IMPACT ON RECRUITMENT.

EVIDENCE?

STOCK-RECRUITMENT RELATIONSHIP

RECRUITMENT
(# 1+ BASS)



STOCK SIZE
(# NUMBER OF ADULT BASS)

STOCK-RECRUITMENT RELATIONSHIP

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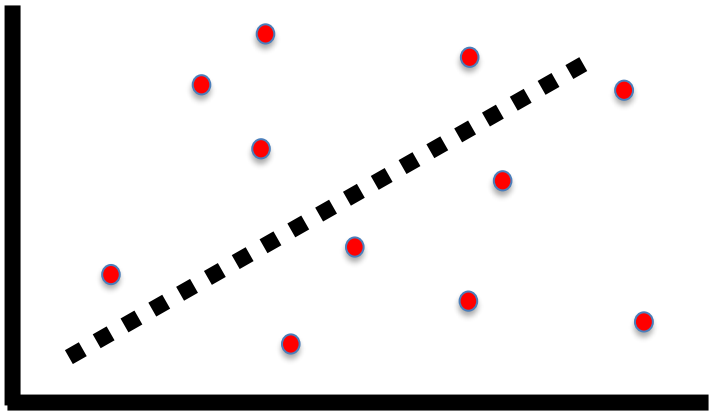


STOCK SIZE
(# NUMBER OF ADULT BASS)

WHY NO STOCK-RECRUITMENT RELATIONSHIP?

% MALES NESTING

% FEMALES/EGGS

BROOD PREDATORS

WEATHER EVENTS

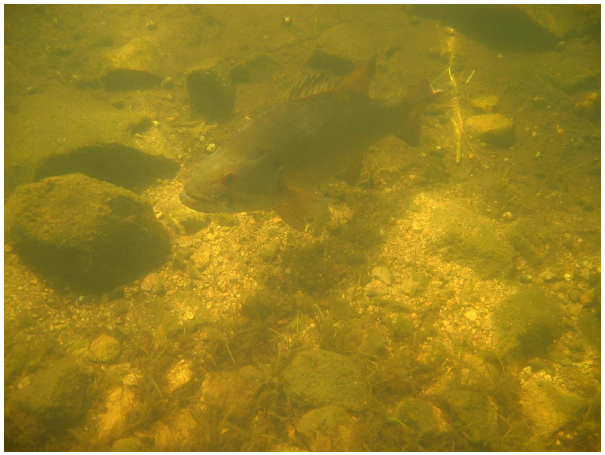
% NESTING SUCCESS

OUR HYPOTHESIS

EVEN THOUGH SPAWNING AND SURVIVAL ARE INFLUENCED BY ENVIRONMENTAL FACTORS,

RECRUITMENT STILL DEPENDS UPON THE AMOUNT OF SUCCESSFUL REPRODUCTION.

SO…BECAUSE ANGLING NESTING BASS DOES DECREASE REPRODUCTIVE SUCCESS, IT ALSO REDUCES RECRUITMENT.



OUR HYPOTHESIS DEPENDS ON A POSITIVE RELATIONSHIP BETWEEN:

REPRODUCTIVE SUCCESS AND RECRUITMENT

RECRUITMENT
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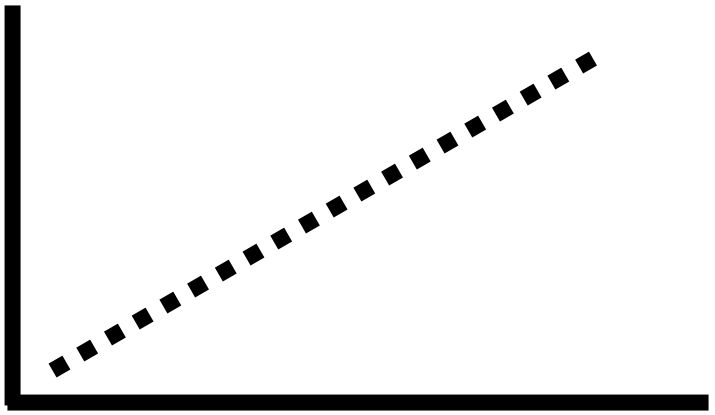
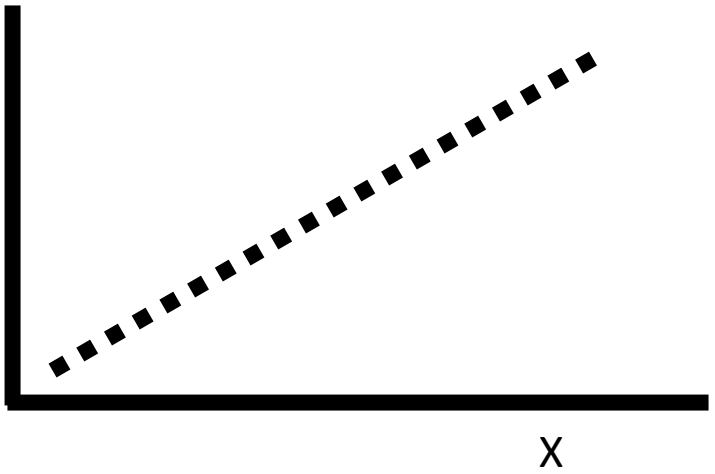


REPRODUCTIVE SUCCESS
(# INDEPENDENT FRY PRODUCED)

So…for a given lake:

During Year X:

RECRUITMENT
(# 1+ BASS)



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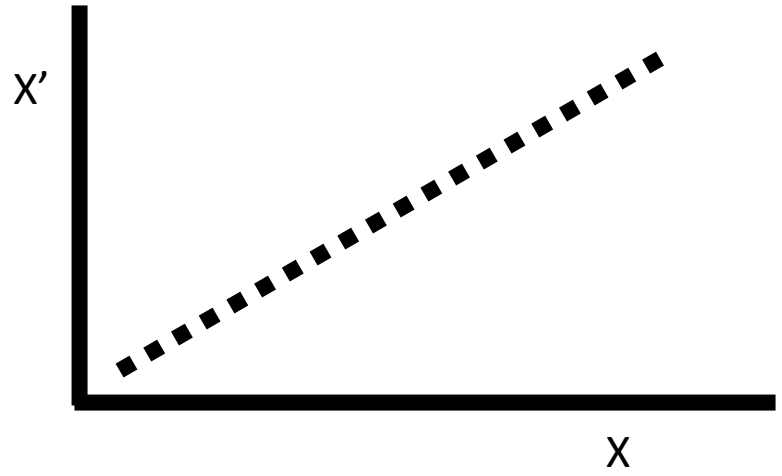

REPRODUCTIVE SUCCESS
(# INDEPENDENT FRY PRODUCED)

So…for a given lake:

During Year Y (Same bass population):

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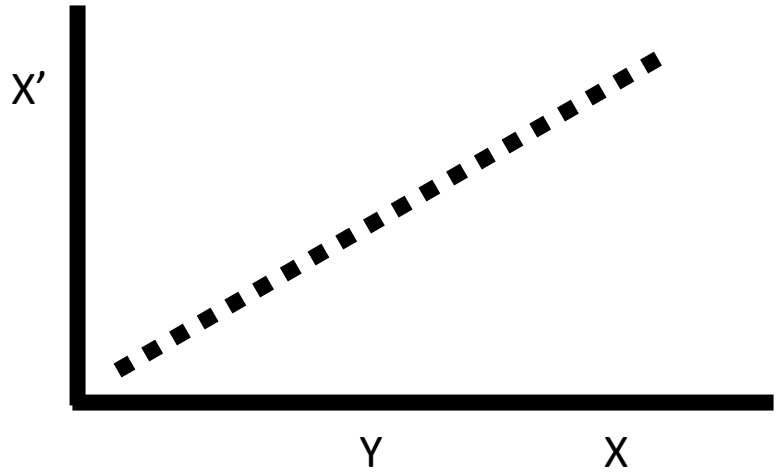

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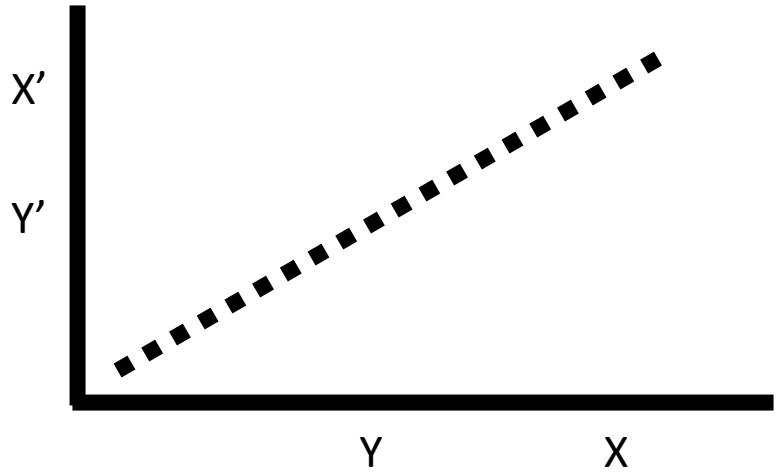

REPRODUCTIVE SUCCESS
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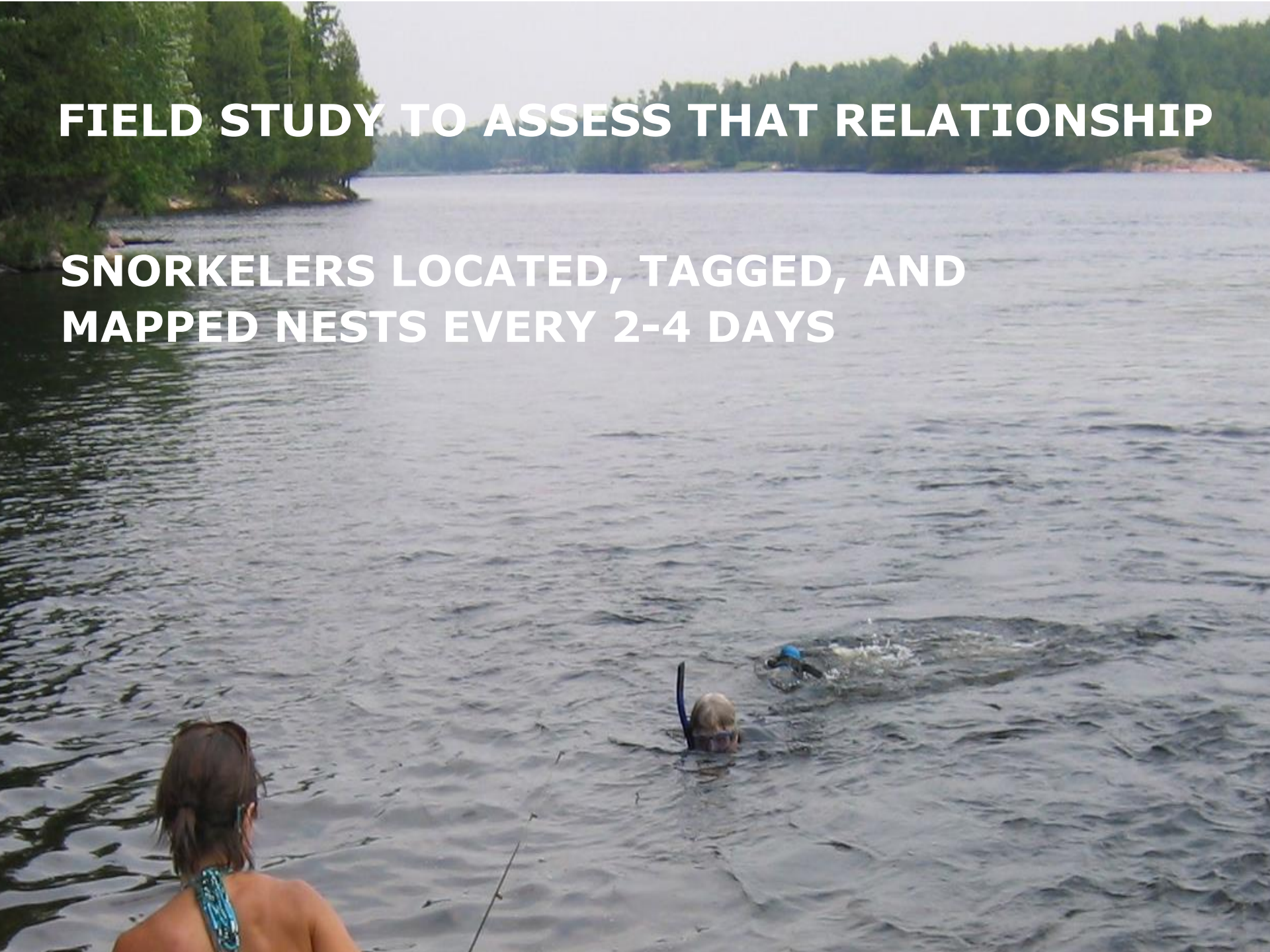
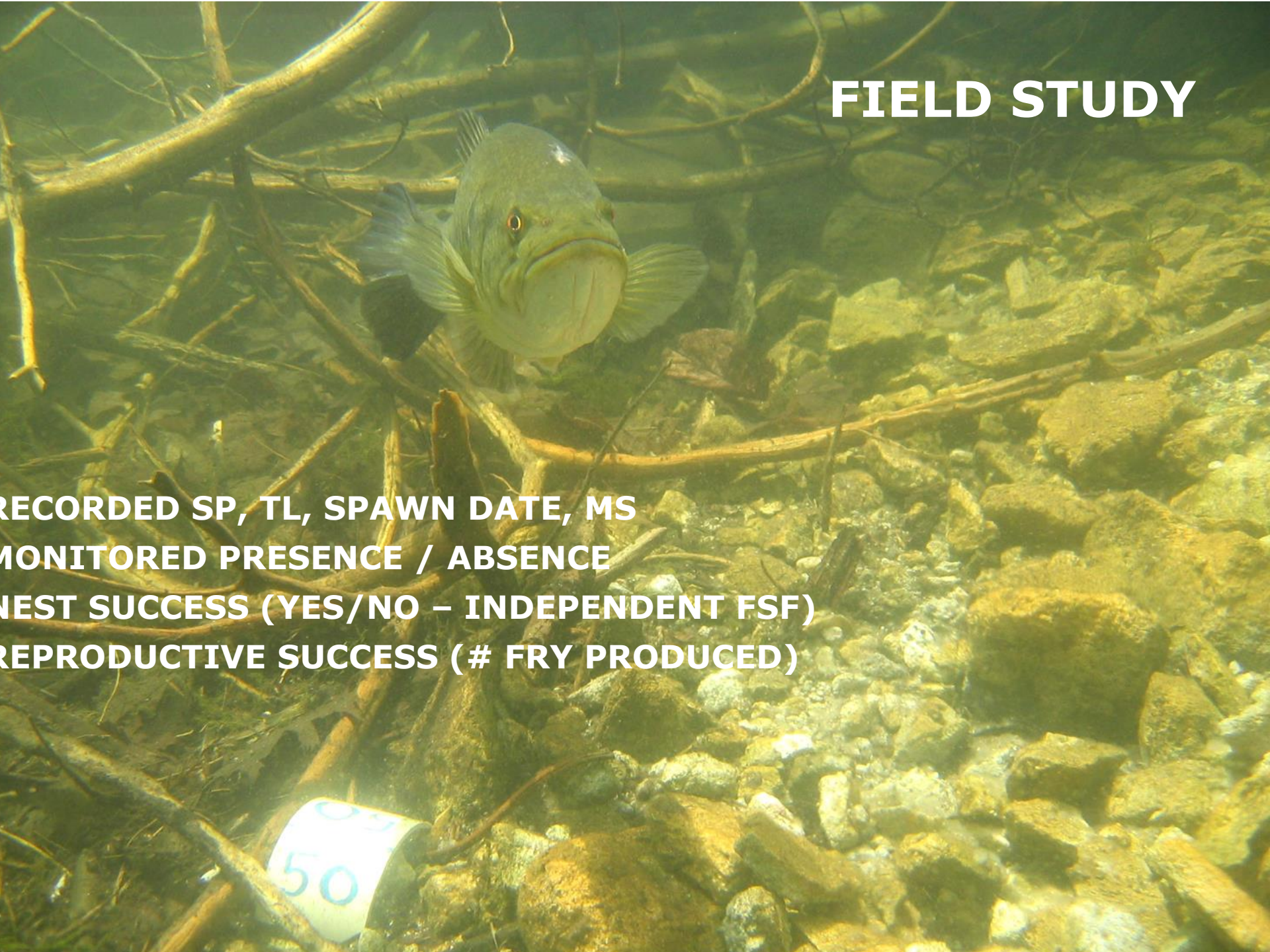

FIELD STUDY TO ASSESS THAT RELATIONSHIP
SNORKELERS LOCATED, TAGGED, AND MAPPED NESTS EVERY 2-4 DAYS



FIELD STUDY

RECORDED SP, TL, SPAWN DATE, MS

MONITORED PRESENCE / ABSENCE

NEST SUCCESS (YES/NO – INDEPENDENT FSF)

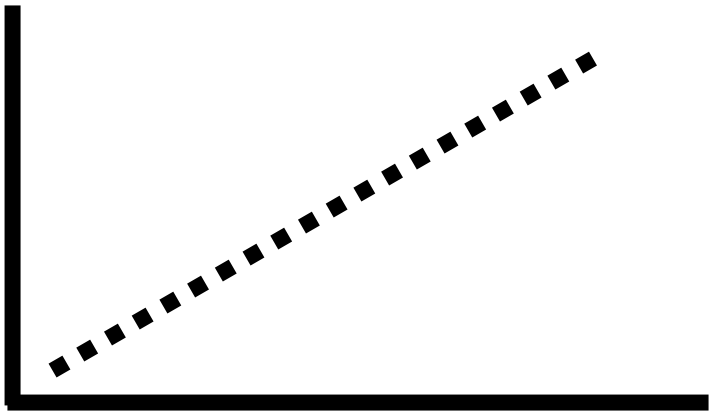
REPRODUCTIVE SUCCESS (# FRY PRODUCED)


FIELD STUDY
DURING THE NEXT SUMMER:
VISUALLY ASSESS 1+ BASS

OUR HYPOTHESIS DEPENDS ON A POSITIVE RELATIONSHIP BETWEEN:

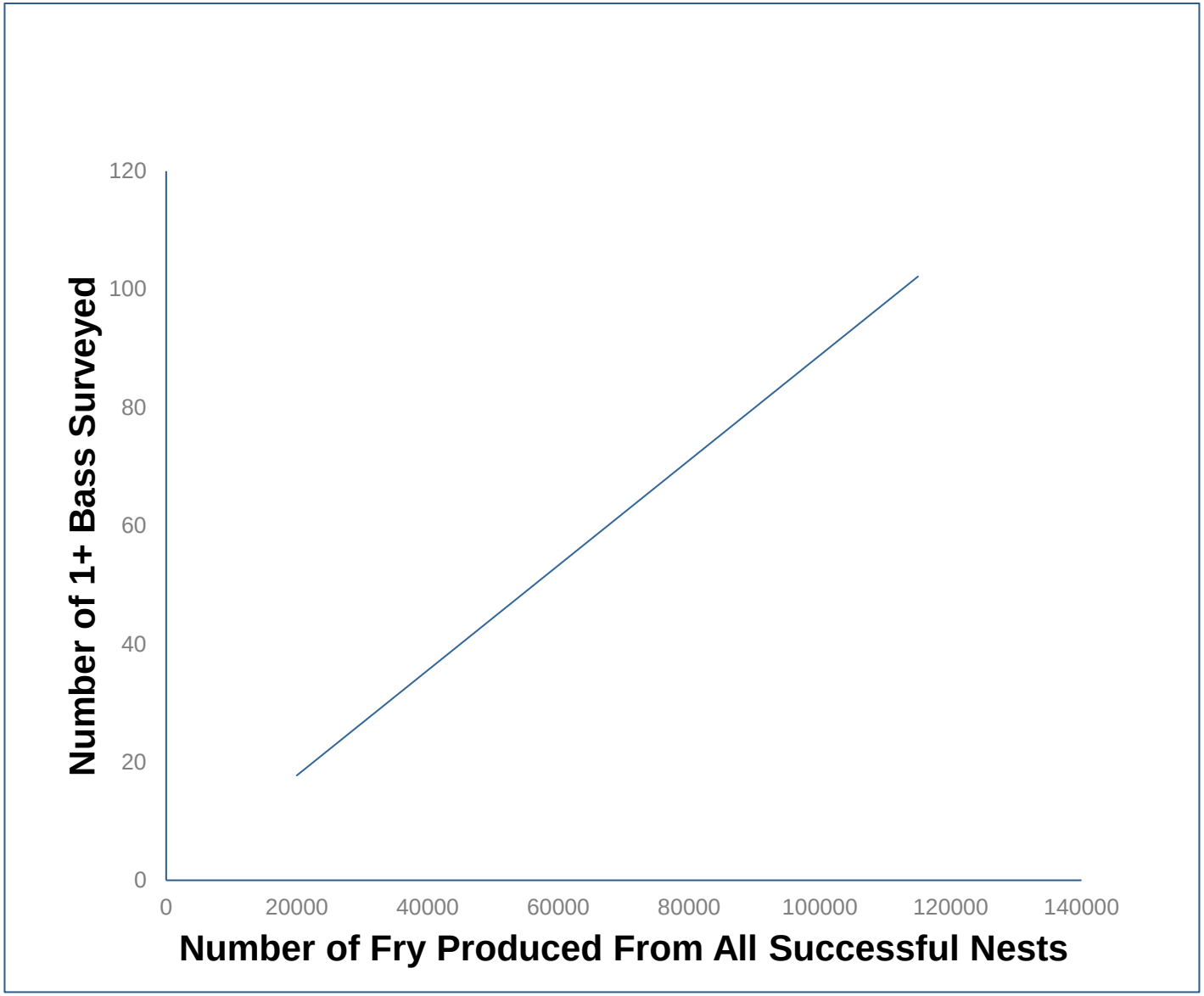
REPRODUCTIVE SUCCESS AND RECRUITMENT

RECRUITMENT
(# 1+ BASS)

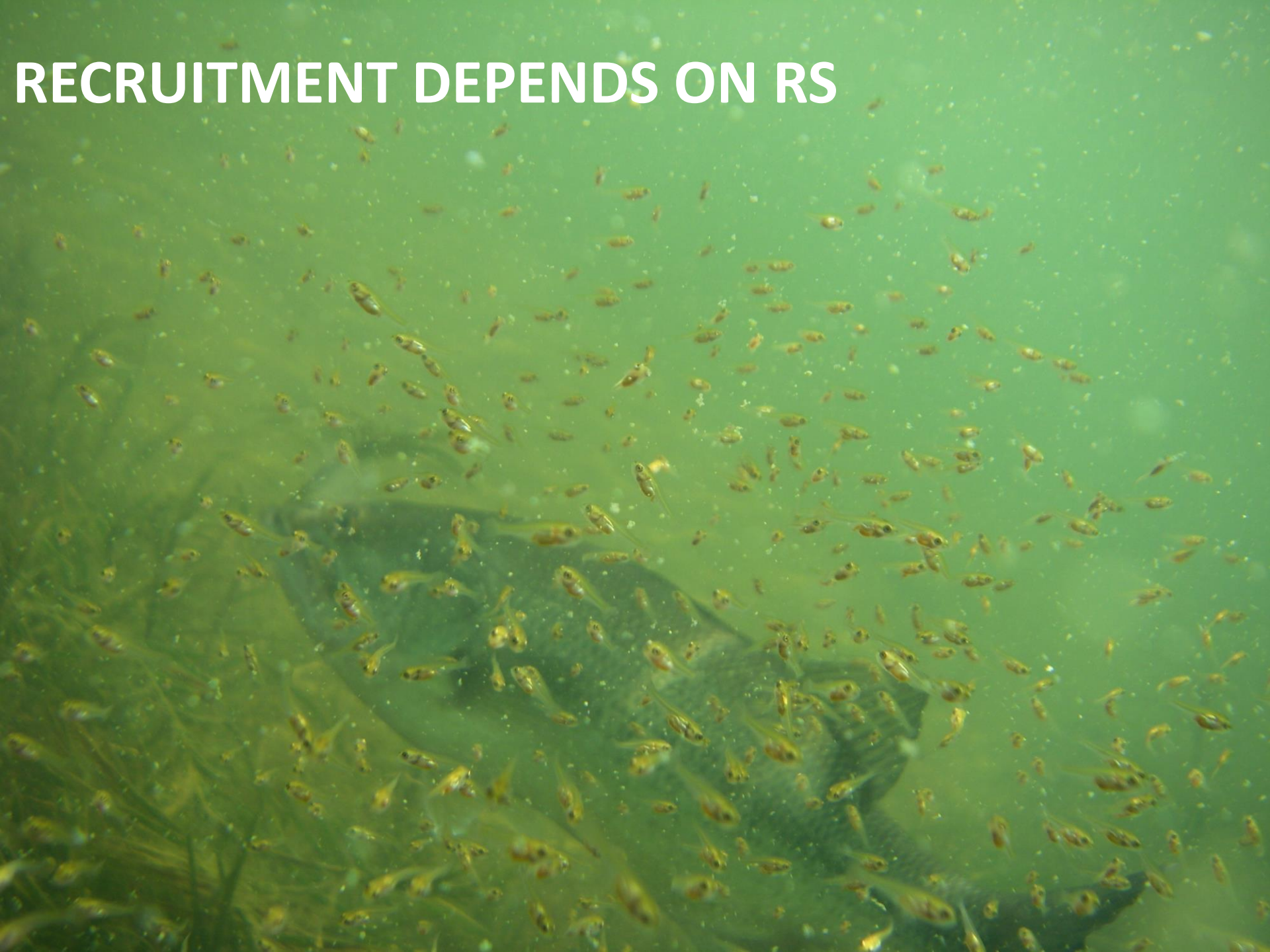


REPRODUCTIVE SUCCESS
(# INDEPENDENT FRY PRODUCED)

RECRUITMENT (1+ JUVS) vs FRY PRODUCED



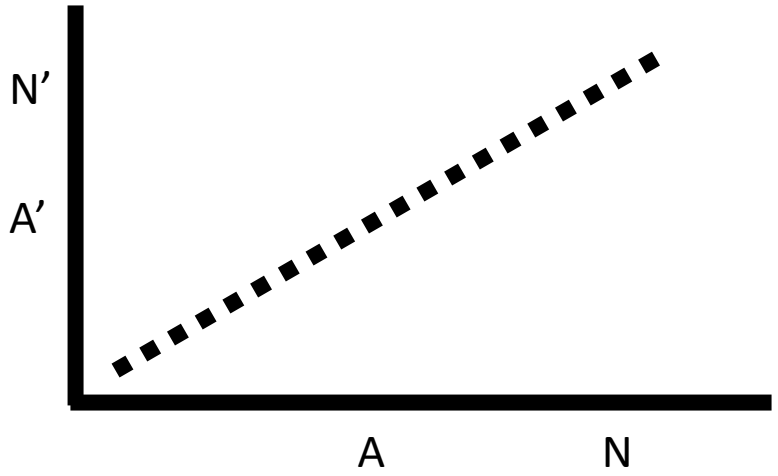
RECRUITMENT DEPENDS ON RS



OUR HYPOTHESIS ALSO PREDICTS THAT ANGLING WILL GIVE THE SAME RESULT

N = WITHOUT ANGLING A = WITH ANGLING (Predation and Abandonment)

RECRUITMENT
(# 1+ BASS)



REPRODUCTIVE SUCCESS
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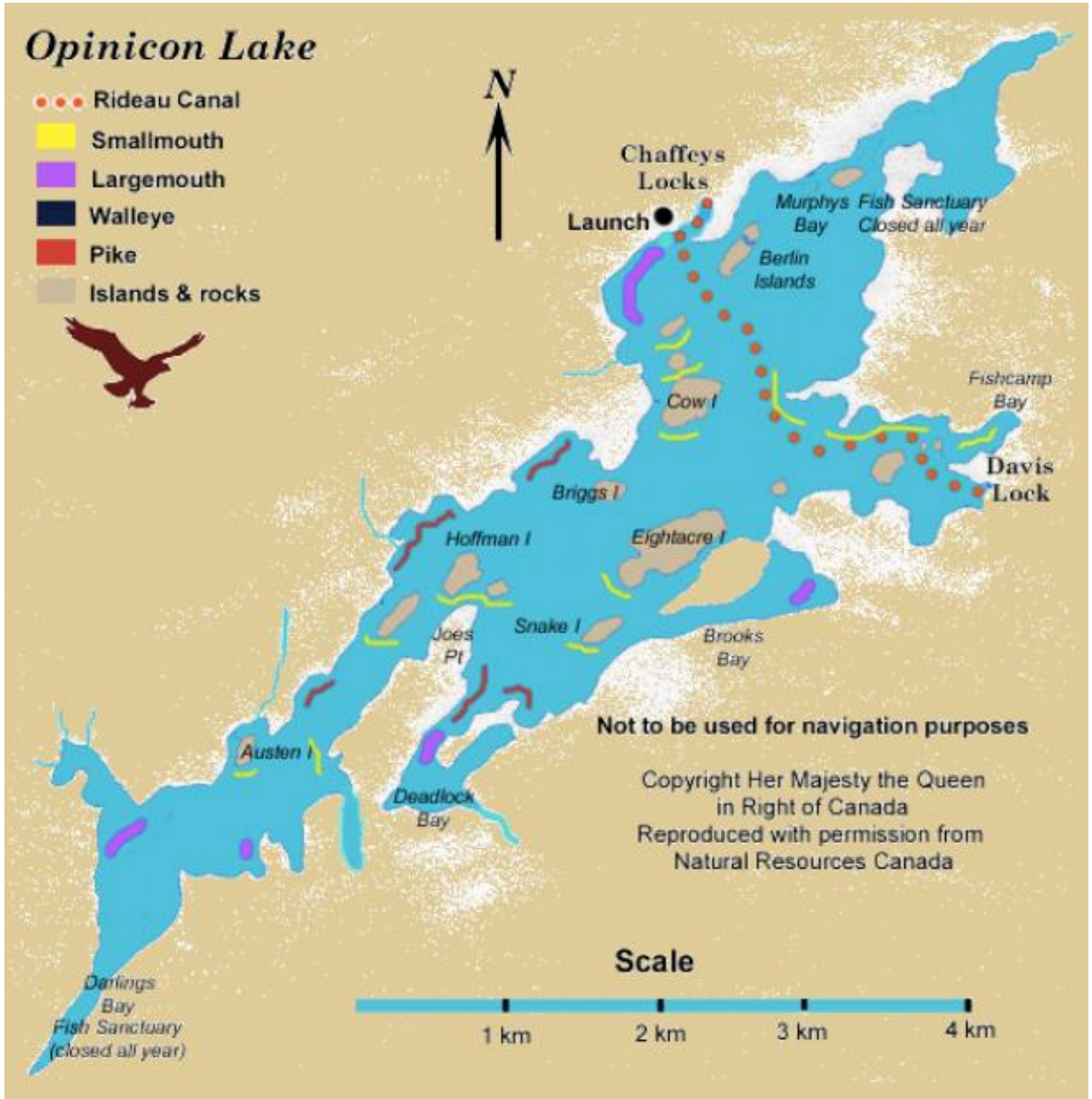
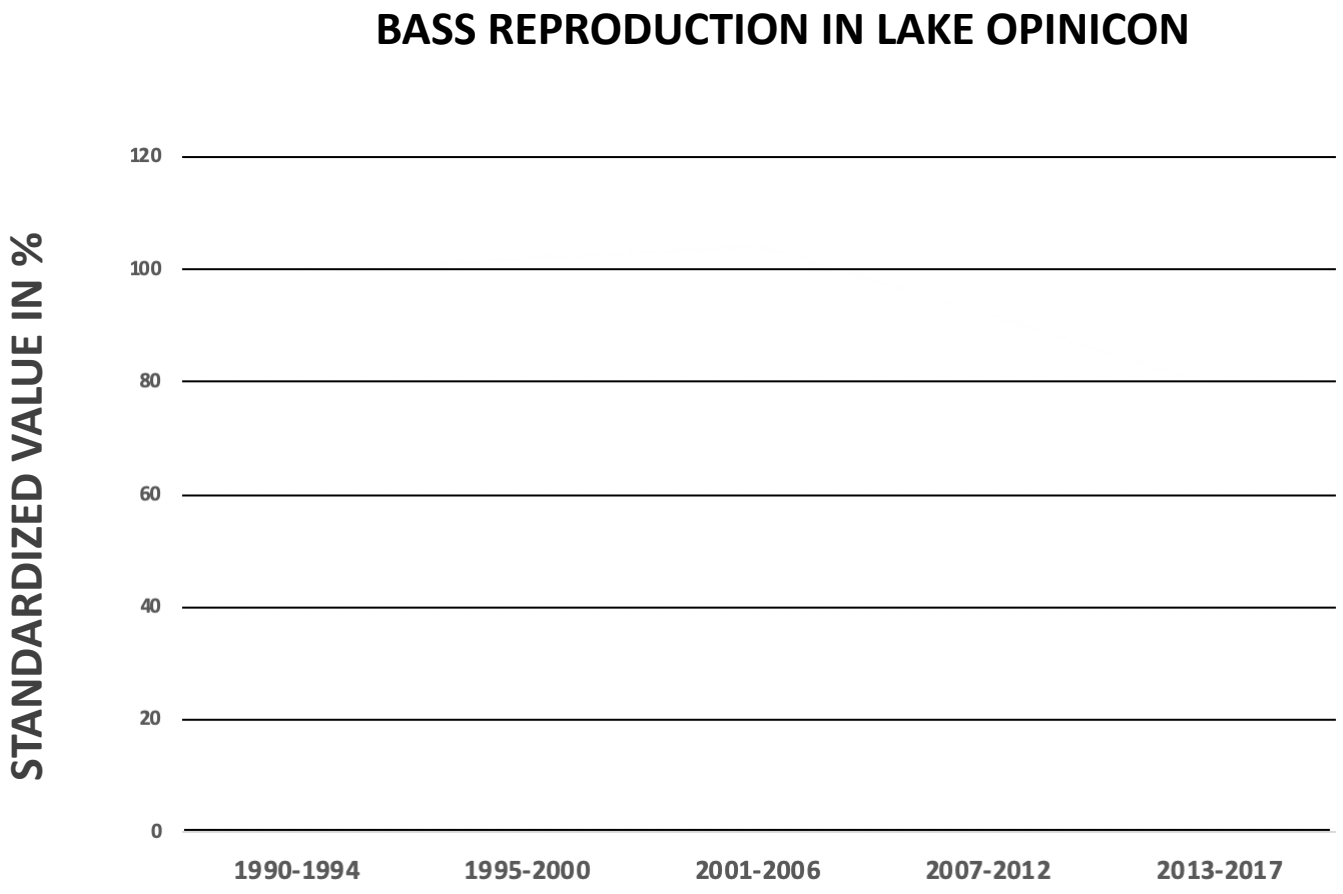
IS THERE EVIDENCE THAT ANGLING FOR NESTING BASS ACTUALLY IMPACTS RECRUITMENT?

Study Lake in Ontario




BASS REPRODUCTION IN LAKE OPINICON
STANDARDIZED VALUE IN %
120
100
80
60
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20
0
1990-1994
1995-2000
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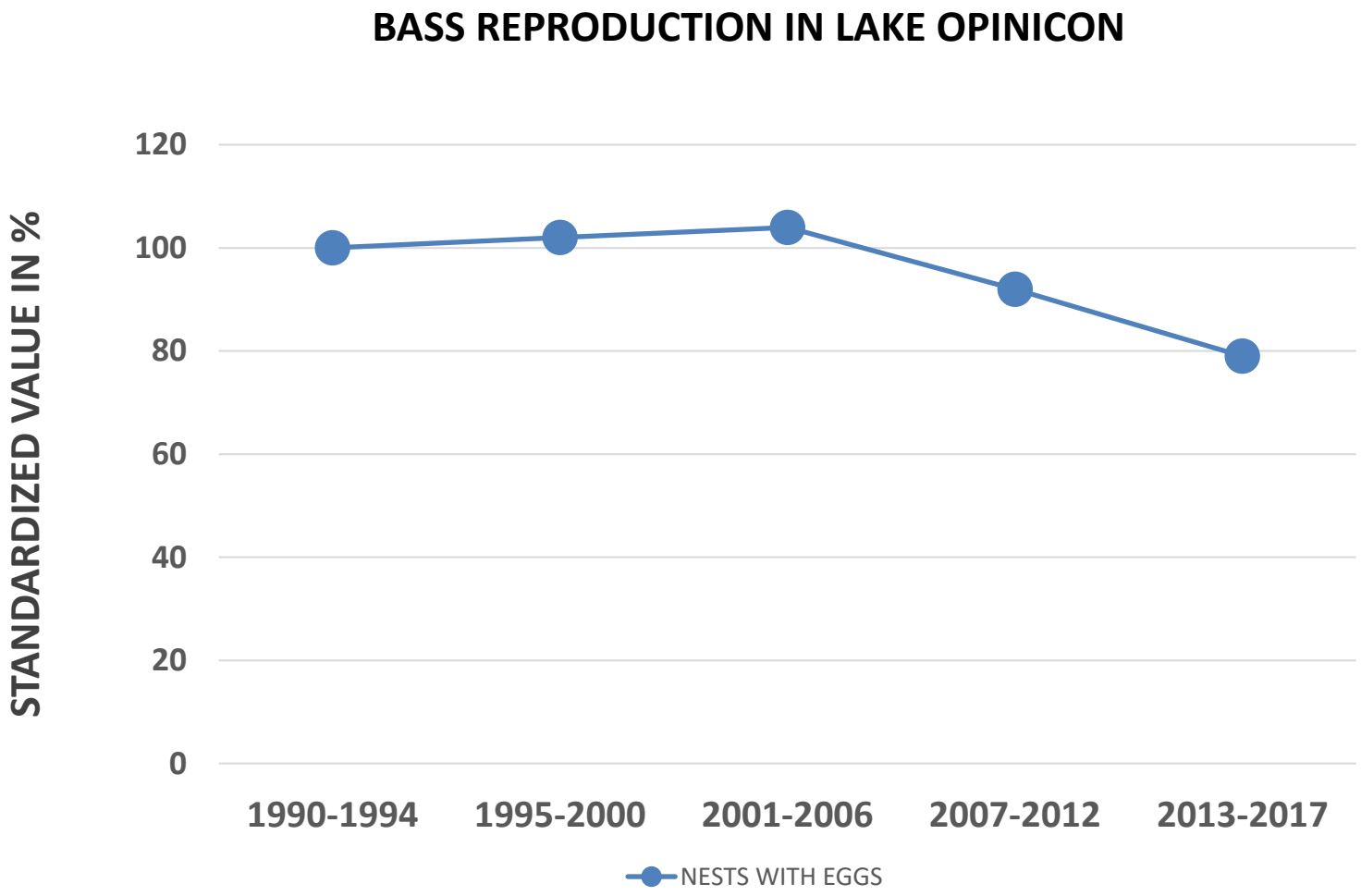
2007-2012
2013-2017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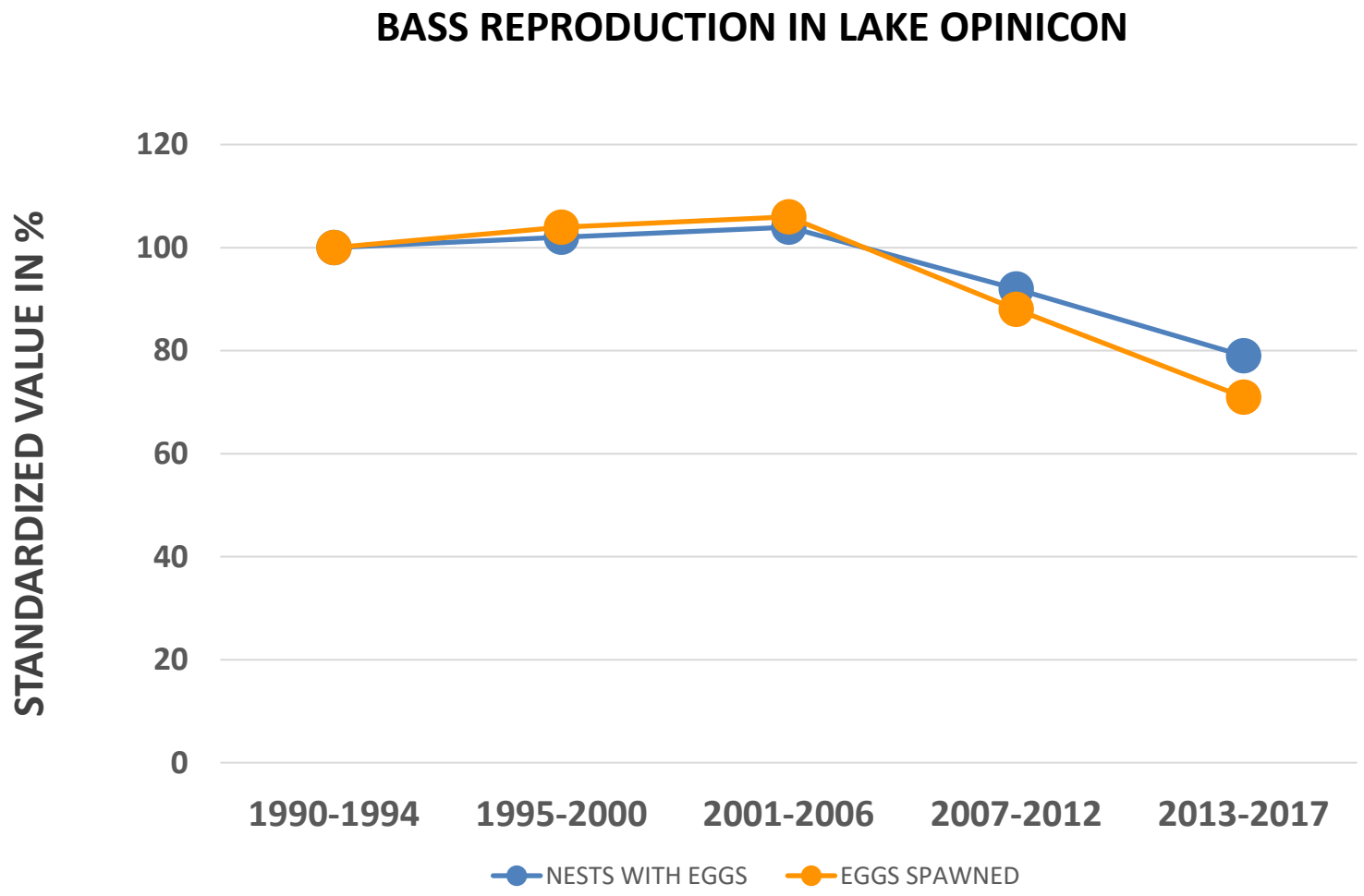
NESTS WITH EGGS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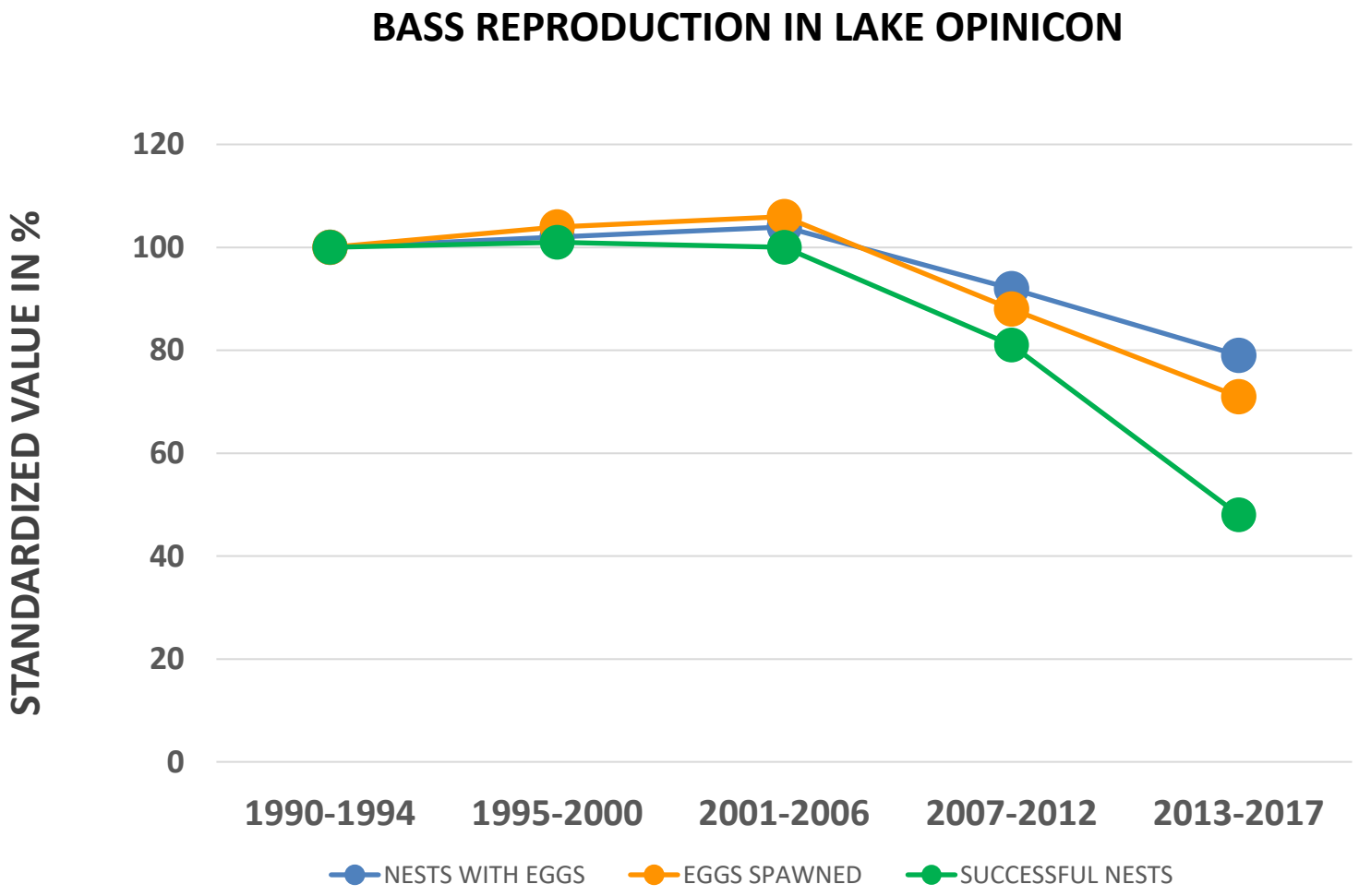
NESTS WITH EGGS
EGGS SPAWNED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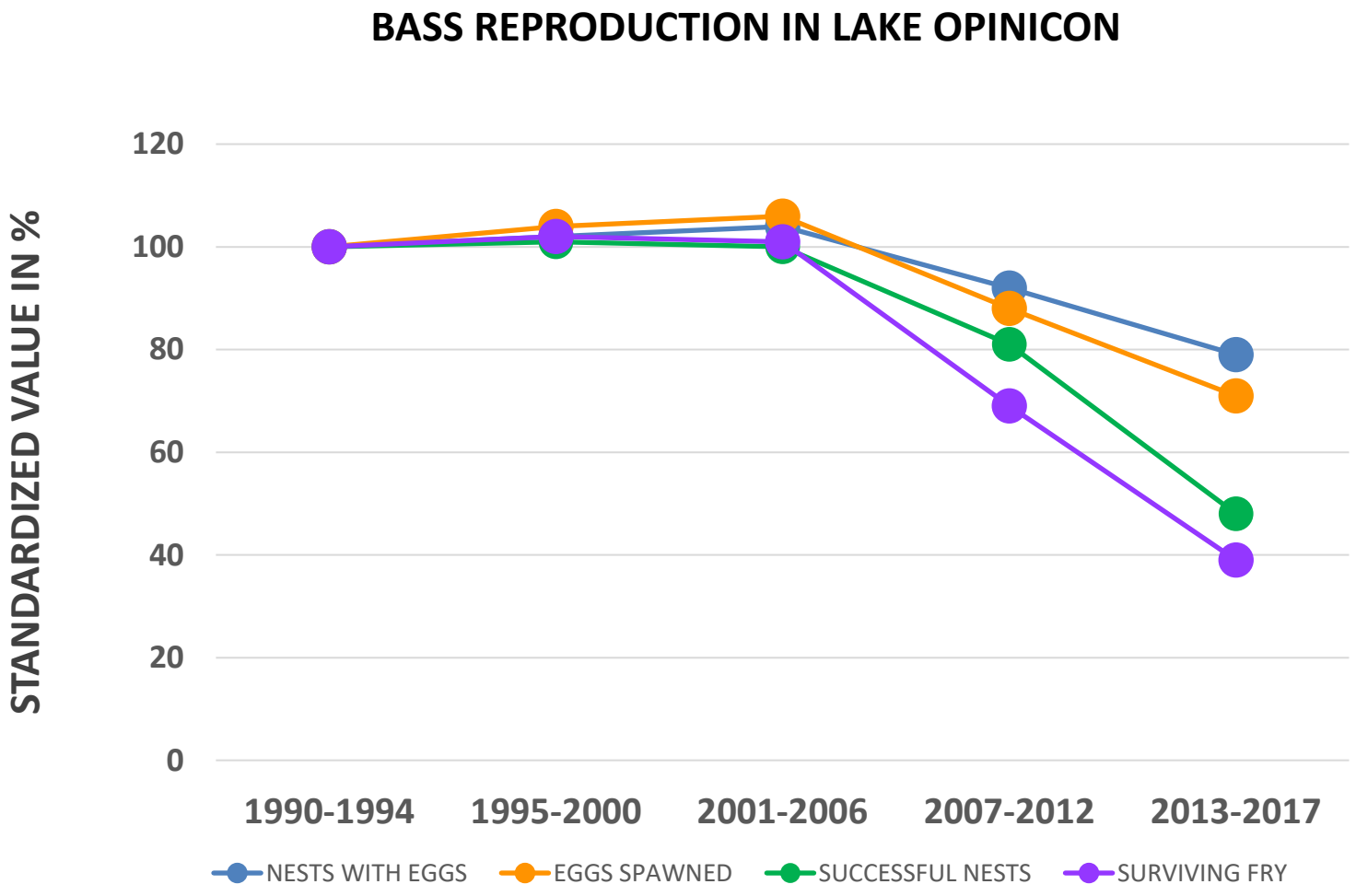
SUCCESSFUL NESTS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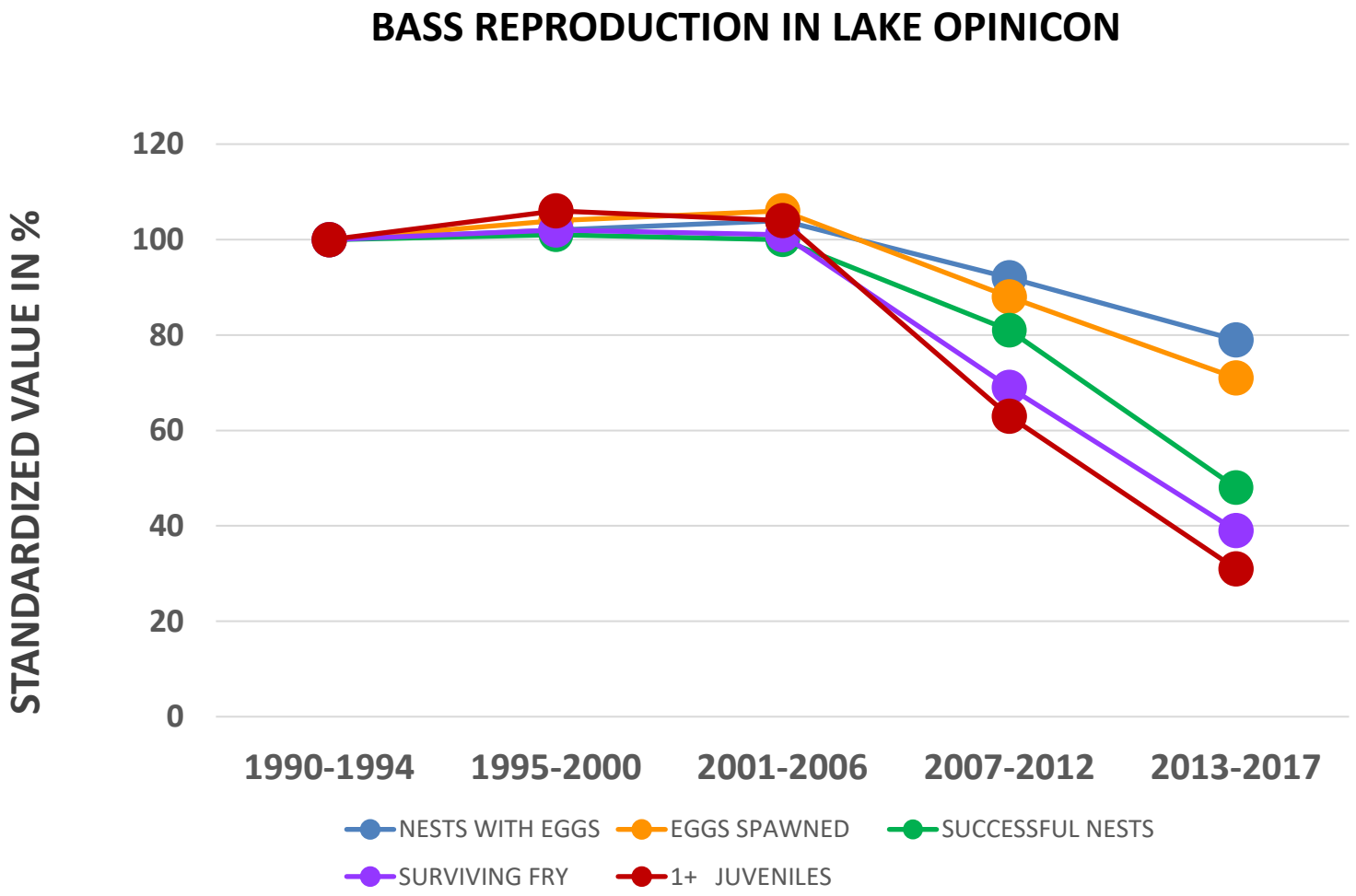
EGGS SPAWNED
SUCCESSFUL NESTS
SURVIVING FRY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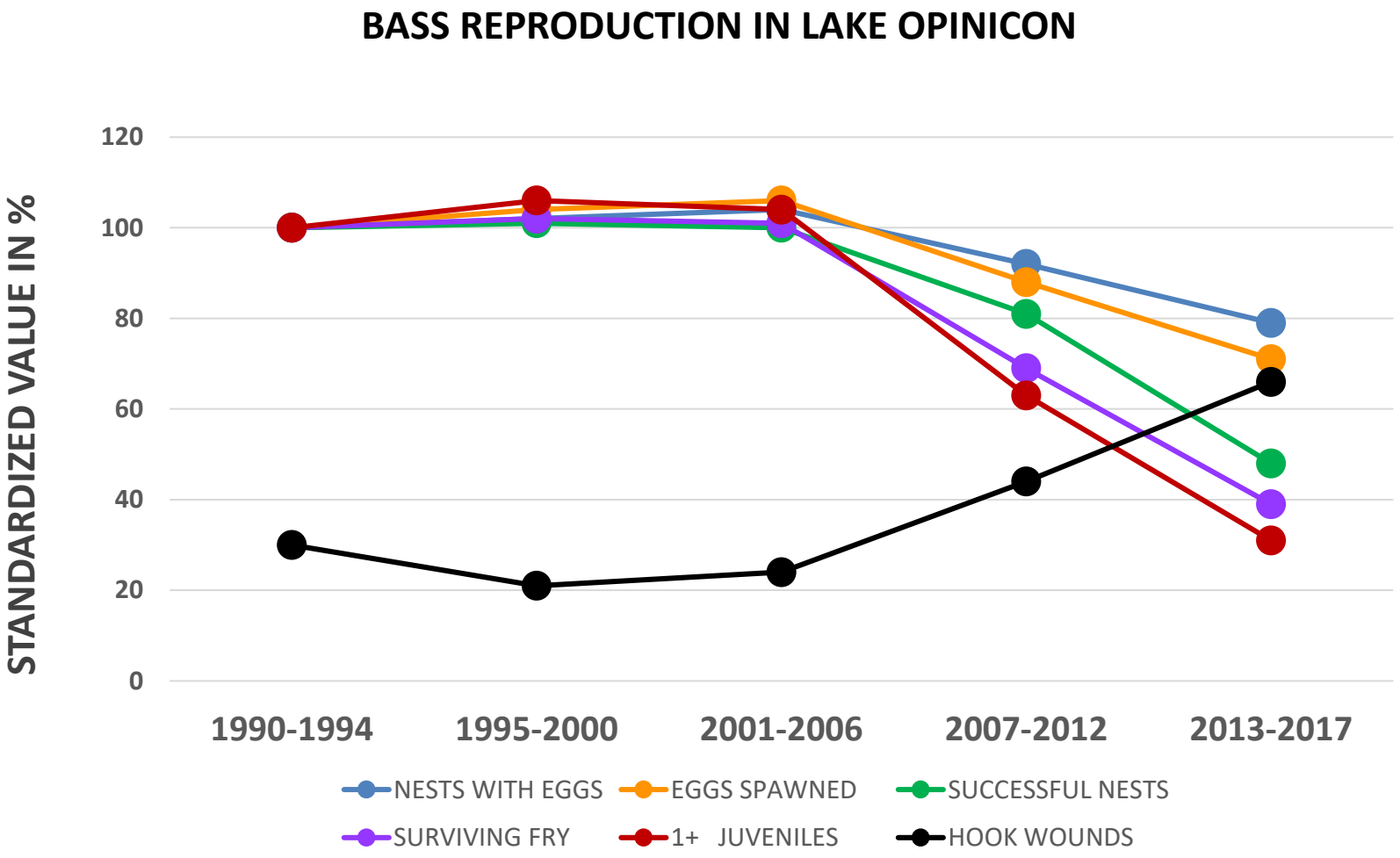
SUCCESSFUL NESTS
SURVIVING FRY
1+ JUVENILES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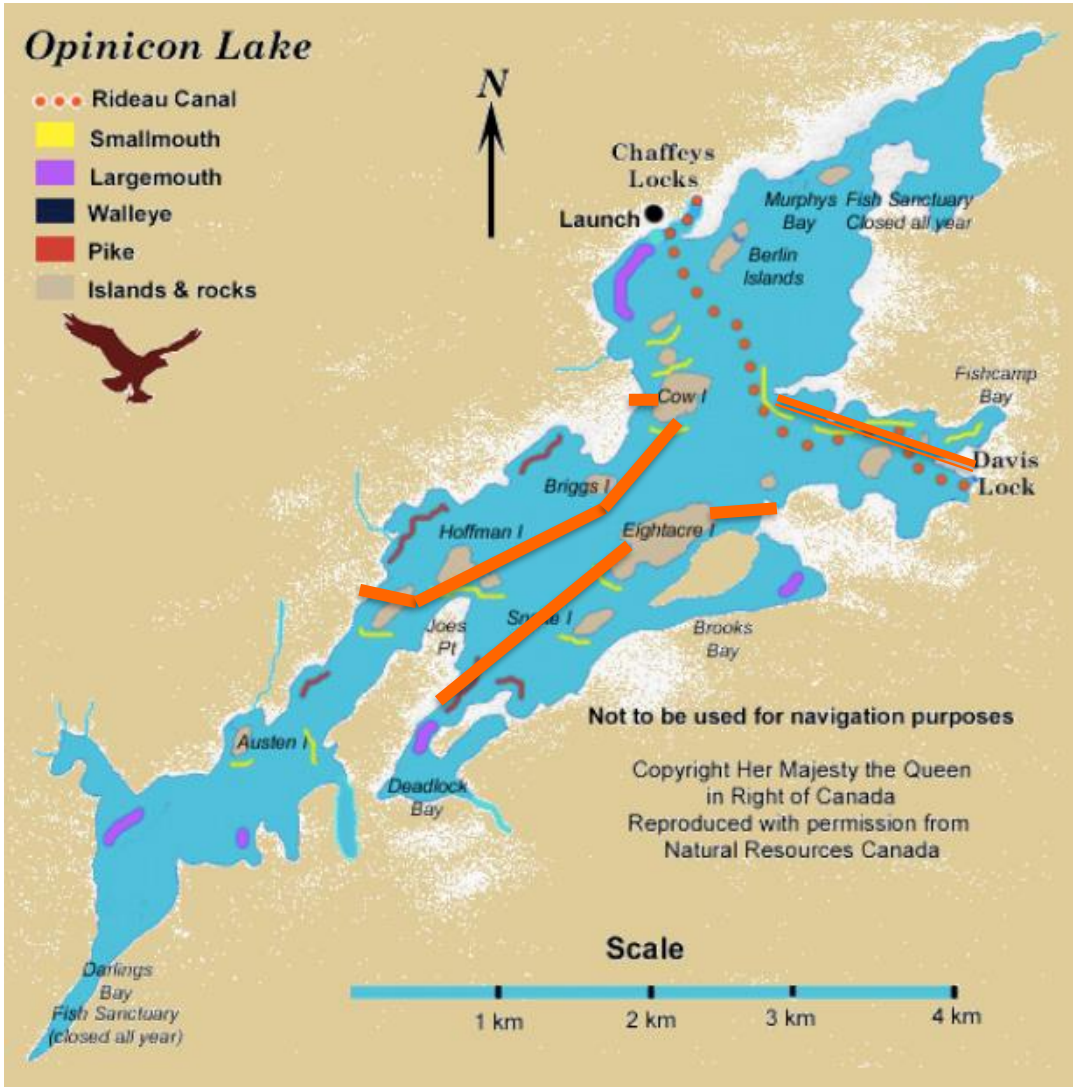
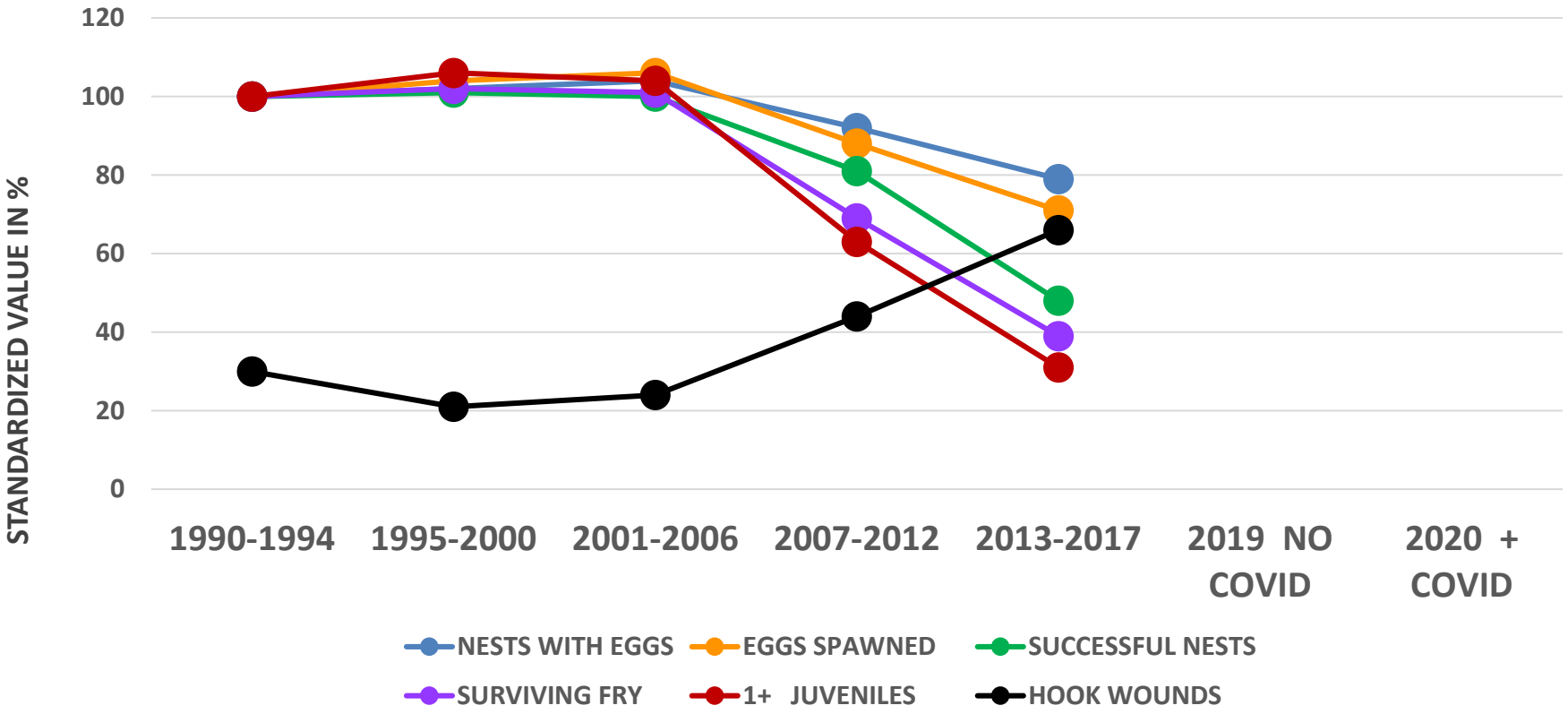
1+ JUVENILES
HOOK WOUNDS


REGULATORY
PROTECTION
PREDATION
ABANDONMENT

SOLUTION: BASS SPAWNING SANCTUARIES

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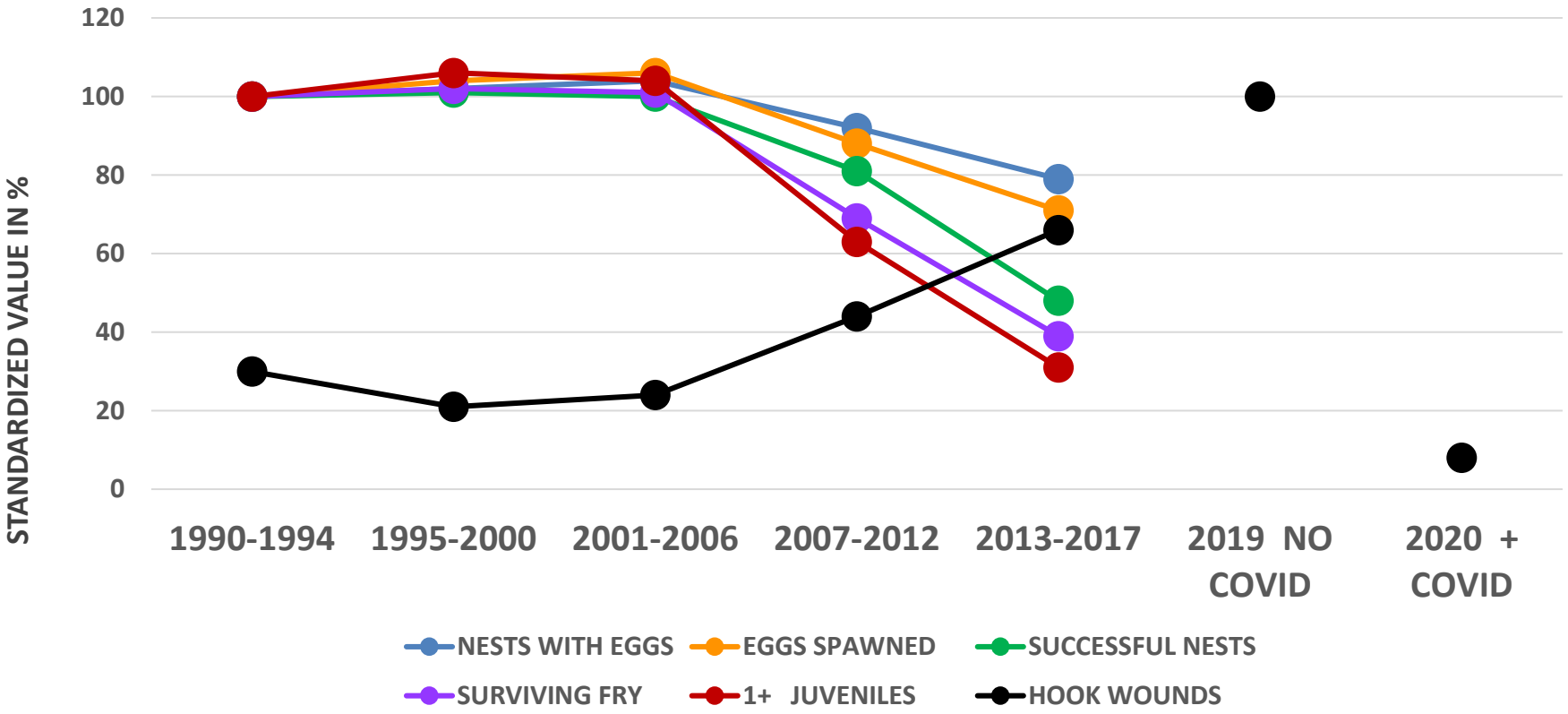
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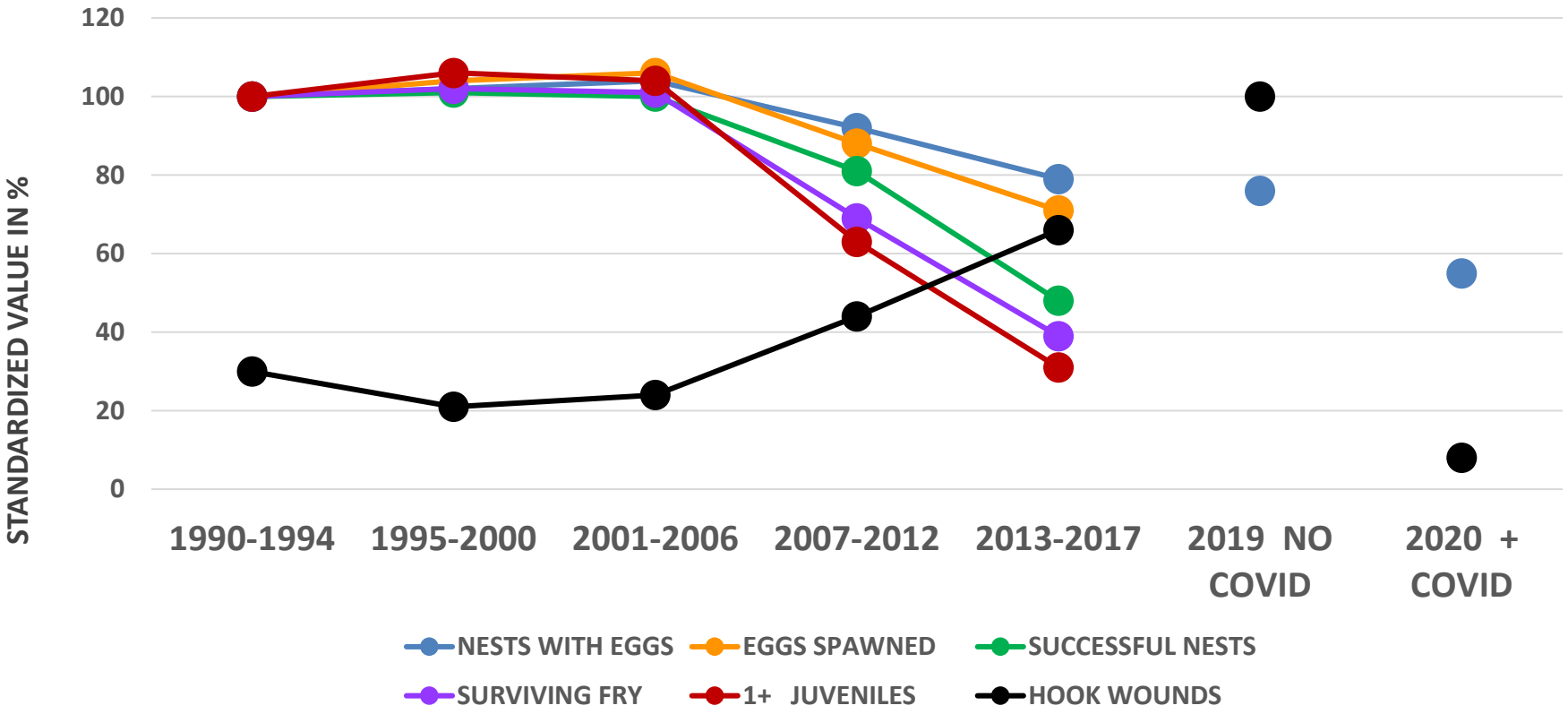
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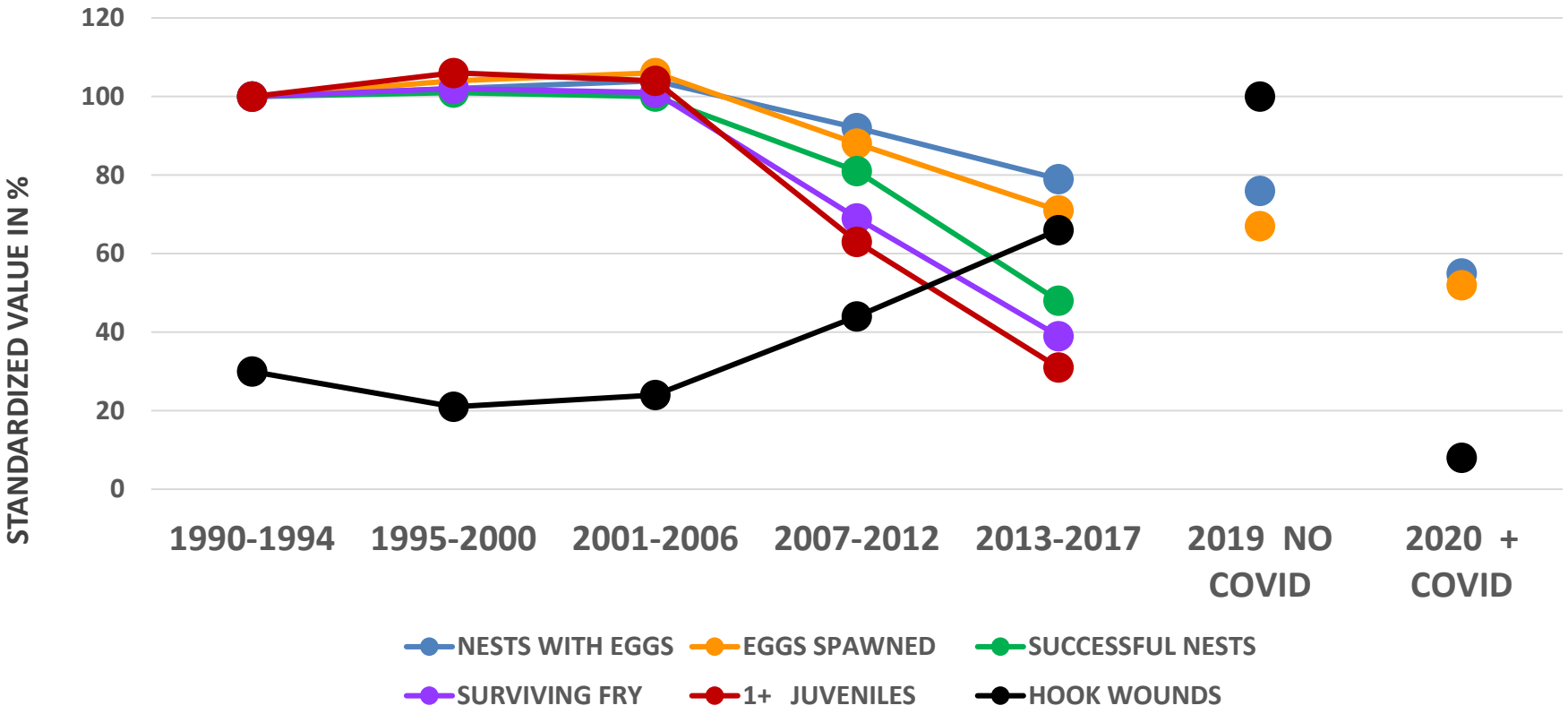
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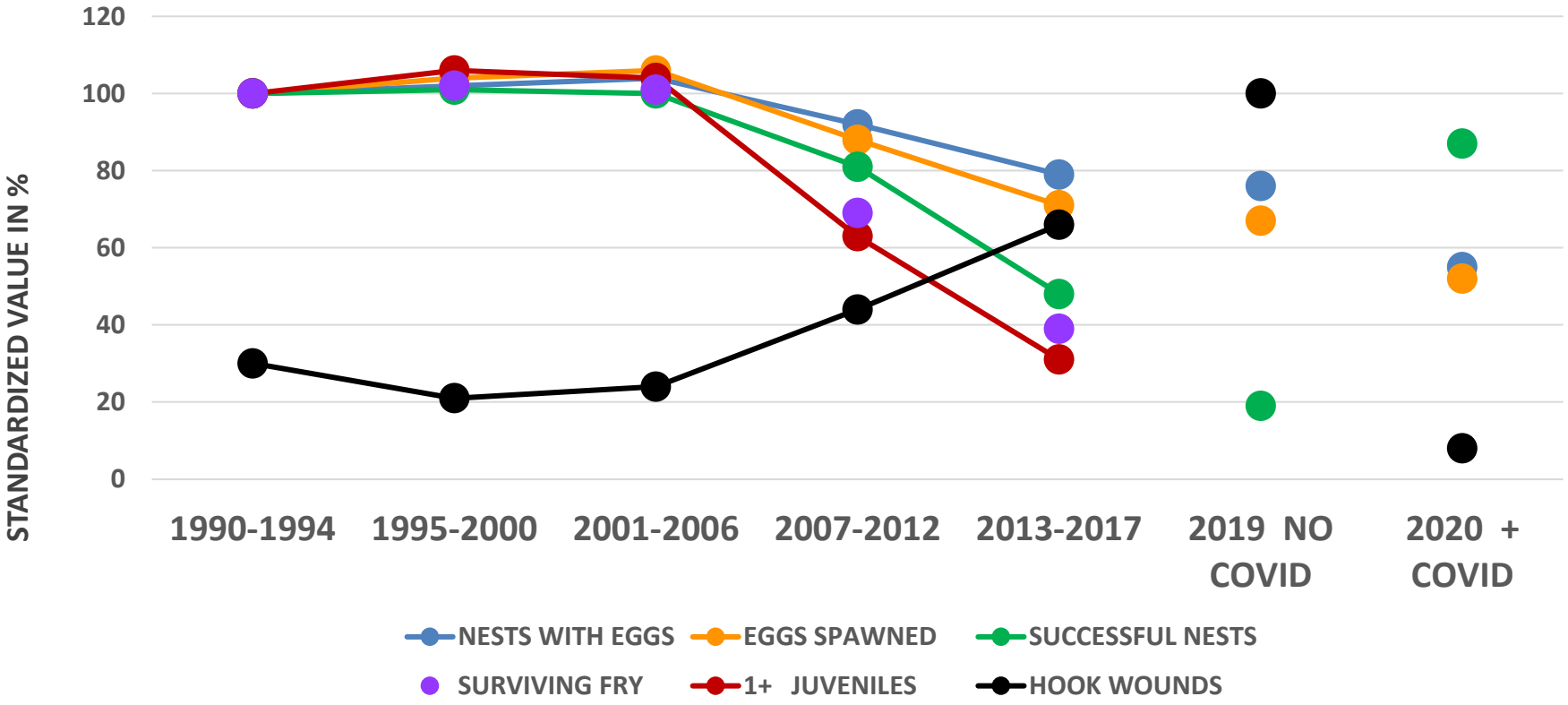
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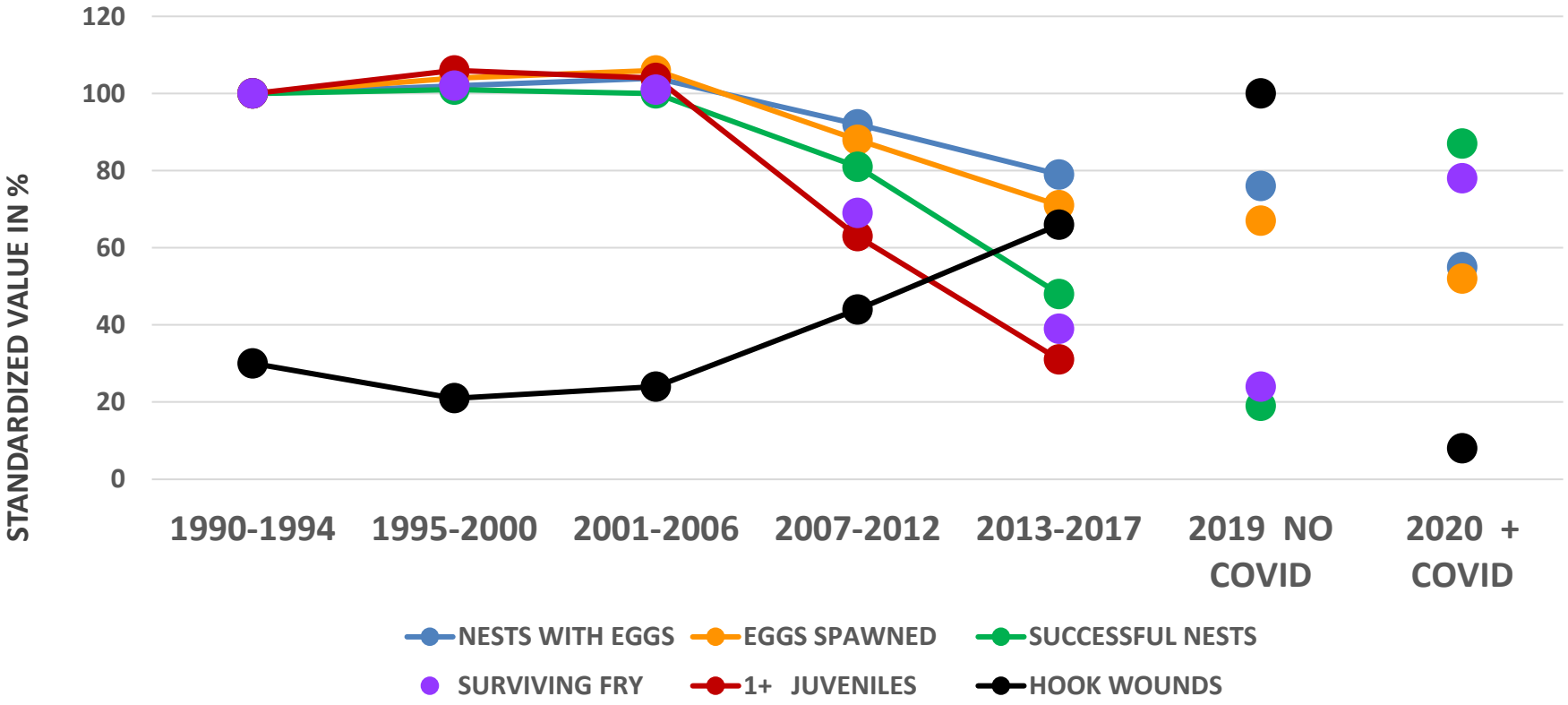
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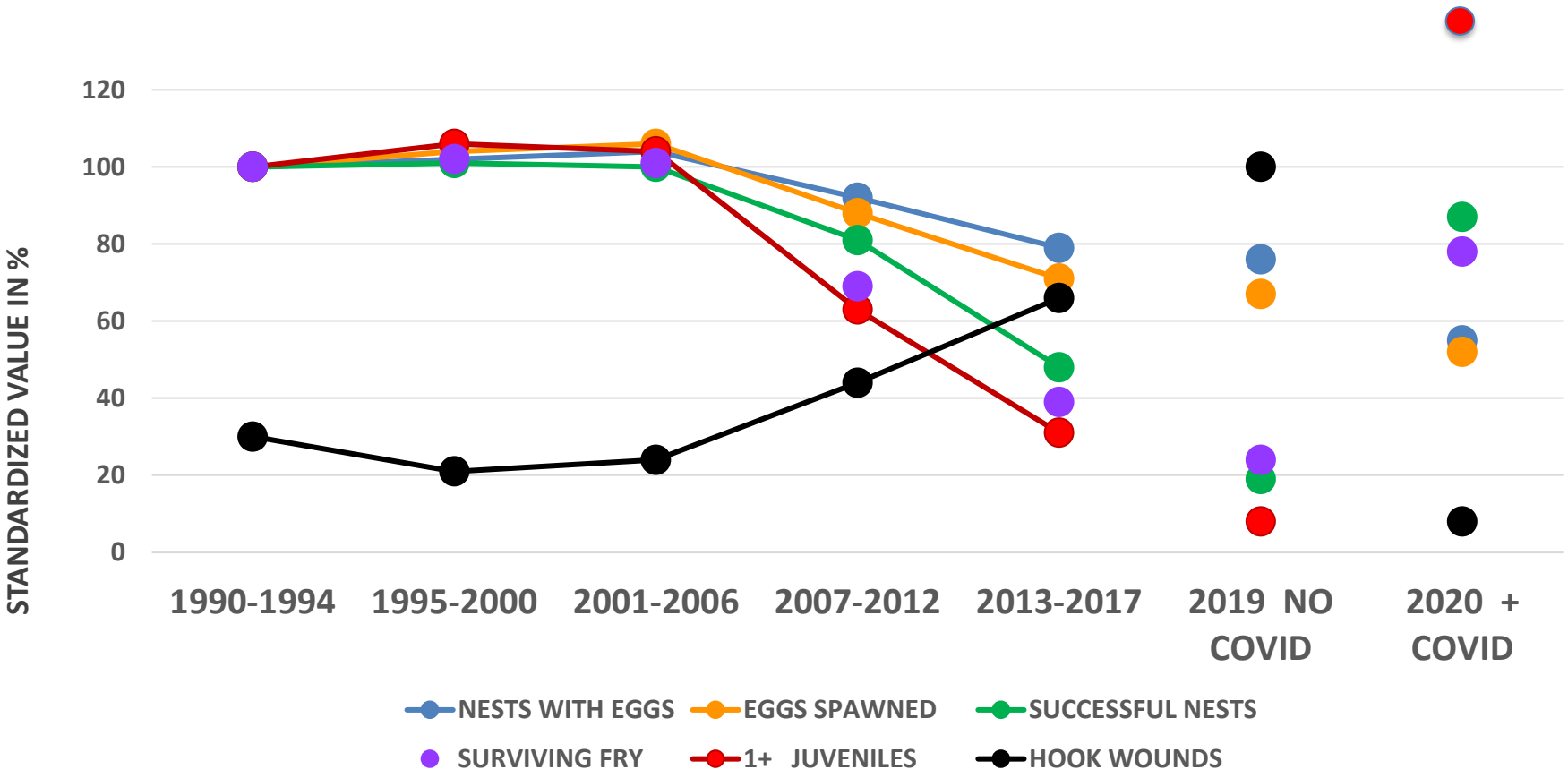
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HOW UNIVERSAL?

LATITUDINAL CHANGE:
- WATER CLARITY
- SPAWNING DURATION
- LIFE HISTORY

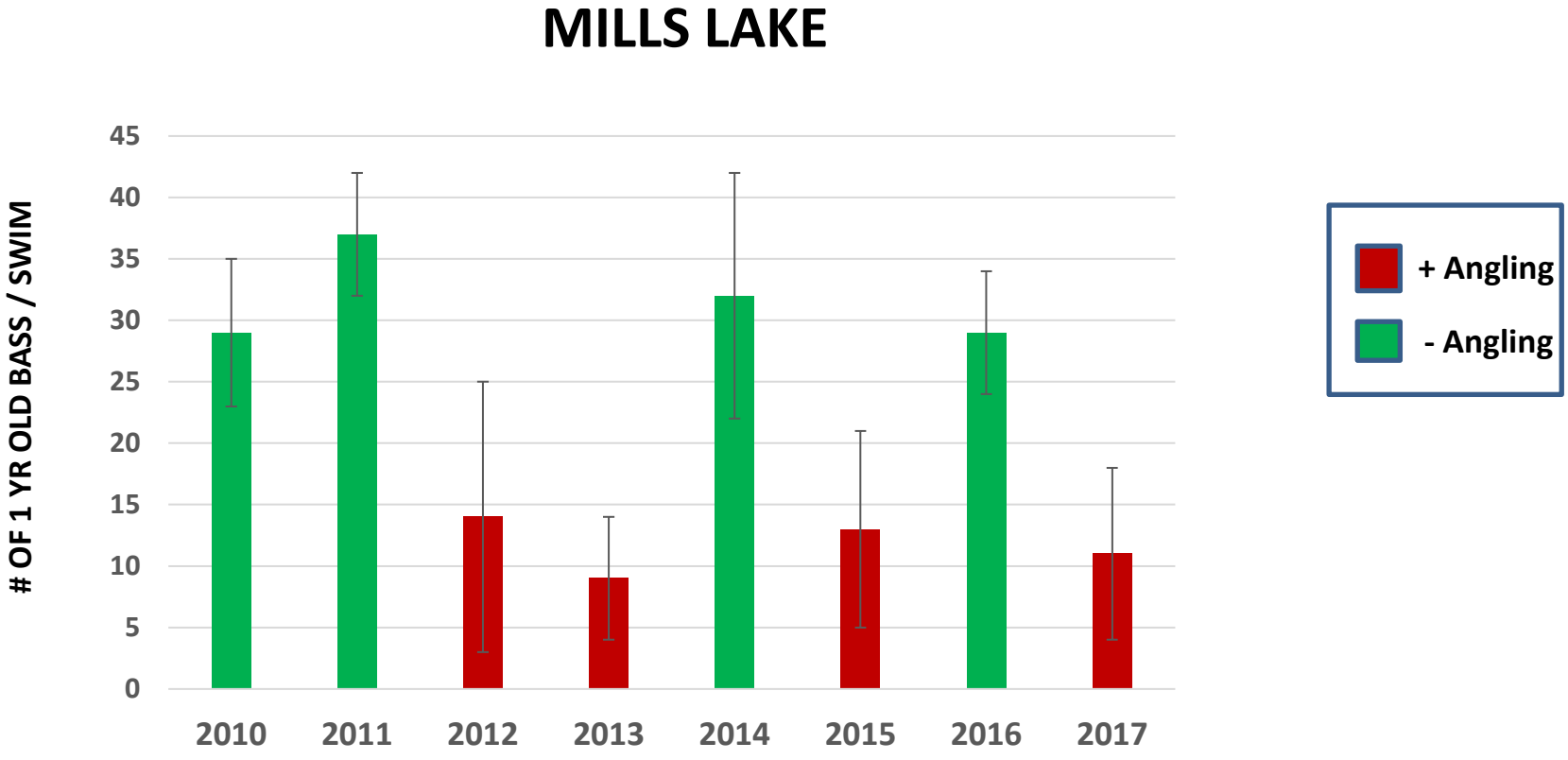
DO WE KNOW WHICH LAKES?

APPLICATION CAN BE
- LAKE SPECIFIC
- LIMITED DURATION

SHORT-TERM MANAGEMENT ACTIVITIES

LONG-TERM CONSERVATION STRATEGIES

RESULTS: Pattern of Recruitment Across Years



RESULTS: Angling Impact on Recruitment - All Lakes