



Adaptive Management Working Group Meeting 20 October 2020

Platte River Recovery Implementation Program

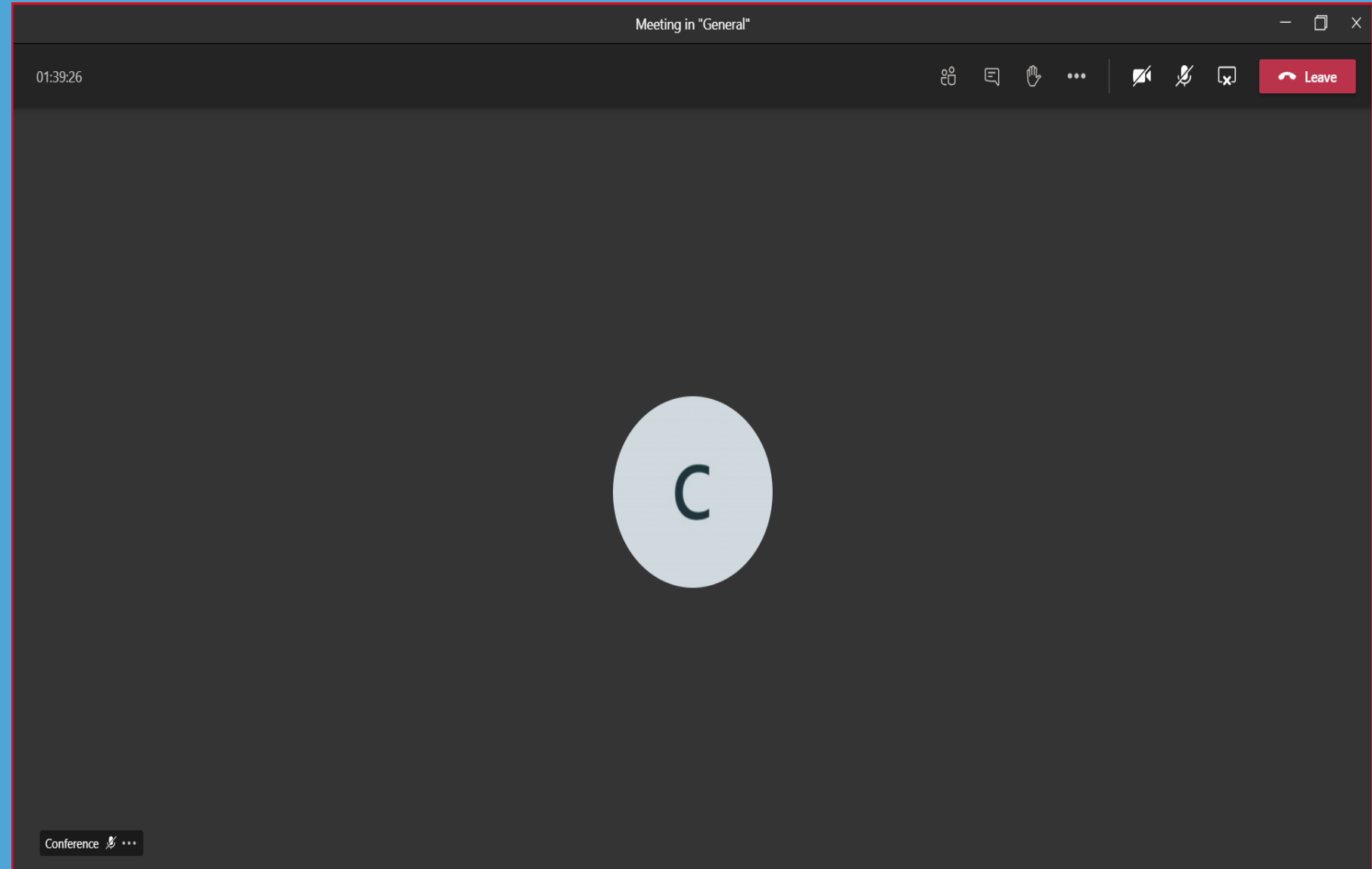


Virtual Tools Tutorial

• Microsoft Teams

SPEAK FREELY

- NO hands
- NO chat
- Use these for technical difficulties only please
- FOCUS view





PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP or Program)
Adaptive Management Working Group (AMWG) Virtual Meeting
 October 20, 2020

Attendees – Jeff Runge, USFWS; Jim Jenniges, NPPD; Dave Zorn, CNPID; Andy Caven, Crane Trust; Matt Rabbe, USFWS; Tom Econopouly, USFWS; Mike Drain, CNPID; Brandi Flyr, CPNRD; Brock Merrill, USBR; Jojo La, State of Colorado; Executive Director's Office (EDO) Staff

October 20, 2020 (4 hours)		
LOCAL MEETING TIMES New York: 2:00 PM EDT Nebraska: 1:00 PM CDT Wyoming: 12:00 NOON MDT Colorado: 12:00 NOON MDT <i>* See calendar invite for MS Teams meeting link (audio & video)</i>		
	START TIME (CDT)	MEETING DOCUMENTS
Coffee Time, 12:45-1:00 PM CDT – the Teams meeting will open early to allow for personal discussion and pleasantries over coffee. Not required but feel free to join us!		
WELCOME & ADMINISTRATIVE	Meeting Objective: Greetings, roll call, review agenda, re-cap of previous meeting.	
Roll call – Teams participant list	1:00 PM	n/a
Agenda - modifications	1:05 PM	Meeting Agenda
Previous Meeting Recap – AMWG meeting, 10/08/2020	1:10 PM	10/08/20 AMWG mte summary
VIRTUAL TOOLS TUTORIAL	Meeting Objective: Ensuring participant accessibility.	
TECHNICAL TOOLS ONBOARDING ○ Teams ○ Mural	1:20 PM	n/a
Clarification of AMWG Conflict Resolution and Roles	Meeting Objective: Clarifying conflict resolution process and member roles.	
Review and discussion of: ○ Conflict Resolution ○ Member Roles	1:30 PM	Conflict Resolution
TERNs & PLOVERS Management Objective	Meeting Objective: Evaluating objectives and gauging progress.	
Management Objective: ○ How do we interpret it? ○ Are we meeting it?	1:45 PM	Mgmt Objective MENTIPoll
TERNs & PLOVERS Performance Indicators	Meeting Objective: Evaluating measures of success.	
Performance Indicators ○ What are they? ○ What should they be? Based upon what? ○ Should we set quantitative targets, ranges?	2:00 PM	n/a



TERNs & PLOVERS Population Viability Analyses and Modeling	Meeting Objective: Linking performance indicators to management objectives.	
What can population modeling tell us? ○ Vortex and other PVA models ○ Overall species objectives for First Increment: Lutey 2002 ○ Population viability analysis modeling: Ryan et al. 1993, Plissner & Haag 2000, McGowan et al. 2014 ○ Performance indicators for modeling from other systems: Catlin et al. 2016, MRRP 2019 ESA Adaptive Mgmt Compliance Report, 2019 LT PP Annual Report for LPR, USFWS 2020 ○ Performance indicators for modeling from our system: Roche et al. 2016, Farrell et al. 2018	2:05 PM	Lutey 2002 Ryan et al. 1993 Plissner & Haag 2000 McGowan et al. 2014 Catlin et al. 2016 MRRP 2019 ESA AM Compliance Report 2019 LT PP Annual Report for LPR Roche et al. 2016 Farrell et al. 2018 USFWS 2020
What does PRRIP EDO population modeling for LT and PP tell us? ○ Which variables have the most impact on productivity, population viability, population size?	2:25 PM	n/a
Meeting Break (3:00 – 3:10 PM)		
TERNs & PLOVERS Performance Indicators	Meeting Objective: Deciding on future performance indicators.	
Performance Indicators ○ What should they be? Why? ○ Should they different for LT and PP? ○ Should we set quantifiable targets and/or ranges? ○ What should these targets (ranges) be? Over what temporal and spatial scales? AHR vs. site-specific vs per acre?	3:10 PM	Roche et al. 2016 Farrell et al. 2018
PREPARATION FOR NEXT MEETING	Meeting Objective: Prepare for next meeting.	
• Agenda items for next meeting • Homework – Factors with DIRECT impact on LT and PP performance indicators • Weather, Inundation • Predation (terrestrial and avian) • Renesting • Density-dependent limitations (carrying capacity) • Site age • What do we know about how site choice, site fidelity, past site-specific productivity effects current productivity? • Suggested literature from group?	4:30 AM	Szell and Woodrey 2003 Anteau et al. 2012 Farnsworth et al. 2017 Farrell et al. 2018 Robinson et al. 2019 Catlin et al. 2011 Saunders et al. 2017 Swift et al. 2020 Catlin PhD 2009 Aug 1 2019 LT PP CEM DRAFT
MEETING REVIEW & WRAP-UP ○ Action items ○ Meeting feedback & key insights ○ Upcoming meetings: • Tues, Nov. 3rd, 1-5 PM CDT Virtual	4:45 PM	n/a
AMWG VIRTUAL MEETING END	5:00 PM	





PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP or Program)

Adaptive Management Working Group (AMWG) Virtual Meeting

October 08, 2020

Attendees – Jeff Runge, USFWS; Jim Jenniges, NPPD; Dave Zorn, CNPPID; Andy Caven, Crane Trust; Matt Rabbe, USFWS; Mike Drain, CNPPID; Brock Merrill, USBR; Jojo La, State of Colorado; Jason Farnsworth, Malinda Henry, Patrick Farrell, Chad Smith – Executive Director's Office (EDO)

EDO Power Point presentation slides attached as PDF

Menti results attached as PDF

Welcome & Administrative

- Henry welcomed the group and discussed the general framework for the agenda today and meetings going forward.
- No agenda modifications.

Virtual Tools Tutorial

- Discussion of use of MS Teams.
- Discussion of use of AMWG room on PRRIP website.
- Discussion of use of Mural and Mentimeter as feedback and brainstorming tools in virtual meetings.
- Group participated in several Menti exercises.
- Helpful tools, look forward to how they are used in future meetings.
- Discussed options for large gallery mode to see more individuals on screen; appears you needed to be signed into a Teams account to use those features.

Terms of Reference

- Henry introduced the AMWG Terms of Reference.
- Would like to see a written process (described) for the AMWG; steps for voting, getting to "decisions", moving from AMWG to the TAC; role of each member of the AMWG including the role of those that are more policy-oriented; role of EDO as facilitators or subject-matter experts or decision makers. Would like to separate subject matter experts from decision makers.
- Bring some more framing and structure to this process.
- From an organizational structure standpoint, the first AMWG was an effort to work on issues (models, AMP, etc.) that were broader than typically dealt with by the TAC; many early models were related to flow and geomorphology; it wasn't so much a subcommittee of the TAC, it was an *ad hoc* committee for reporting to the GC; if this AMWG functions similarly, can we assume what we are doing here gets elevated to GC, not to TAC
- It was "sold" to the GC that the work of the group would at least be presented to the full TAC and get their feedback.
- This group won't be setting real policy, but will present options and ideas for the GC to consider in terms of policy decisions
- Last year we embarked on the process of updating the AMP, but what we saw internally was that the EDO was doing work and then asking for TAC and AMWG feedback; we didn't involve the technical experts as directly and deeply as we wanted them to be; the AMWG became a "super



TAC"; this group should dig into hypotheses and alternative hypotheses, wrestle with science issues, leave policy to the GC; not brute force, want things discussed at this level, find areas of agreement and disagreement, etc.

- Appreciate historical knowledge, but my expectation is we are not starting from scratch; need to know where things have already been decided to help set direction
- Expect this group will be able to dig deeply into issues of science, think about hypotheses, be open and vulnerable to discussion and allow for wide-ranging discussions; want people to speak freely and be creative thinkers

Where Are We Now?

- Smith summarized work to date on a revised AMP for the Extension.

Questions To Address

- Henry discussed EDO proposed process for moving through aspects of revised AMP.
- After reading ahead, SDM process worked because there was a clear problem statement and decision space identified; there are different scales of problems (i.e. things like low fledge rates); when we get into things like predator management, that is a different decision context with other problem statements, decision criteria, etc.
- This group may need to consider separation between the least tern and piping plover; given the proposed delisting of the least tern, wondering why we do not separate them out; could make argument that we will be in maintenance mode for least tern; question whether the actions for these two species are really the same? Can we explore that with this group?
- May have an answer on least tern very soon, which will help define what the Program should do
- Adding a problem statement is good; Will our current actions effectively "maintain" a metapopulation of PIPLs in the long term? Who is right Catlin et al? Plissner et al.? Or Lutey? Right below the management objective, we should work at framing the question.
- Practically speaking we can't change the management objective, but we can focus on remaining uncertainties and what we need to learn.
- We could spend an extensive amount of time on one aspect of the conceptual model that is not totally on point to the bigger issues, so we should stay focused on those big things.

Terns & Plovers – Management Objective

- Henry – what does improve mean? What time scale? How do we measure it; will work through this during the next meeting, idea of problem statement, performance indicators.
- Constraints over money and water.
- Menti exercise

Terns & Plovers – Performance Indicators

- Henry – should we set benchmarks? What is our reference point (in terms of literature or information)? How do we proceed in terms of measuring our goals?
- Original AMP has two indicators; increased nest pairs and increased fledge ratio; how do we use these, where do the new ones come from?
- Paper recommendation - Haig et al. 1988. Distribution and Dispersal in the Piping Plover. The Auk 105:630-638; another recommendation for performance indicators - "Population Connectivity"; Haig

Member Roles and Conflict Resolution

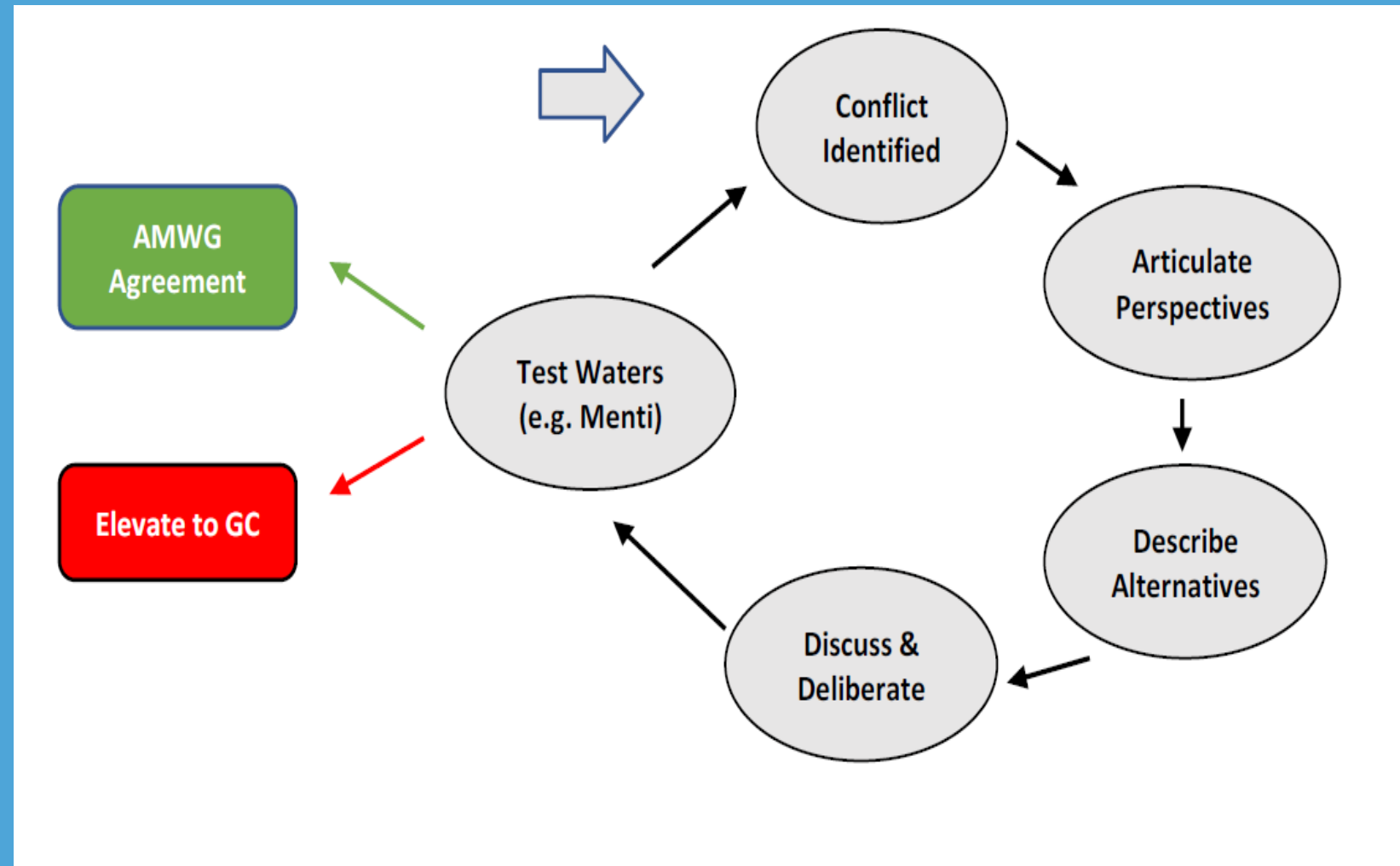


AMWG Members

Technical input
Communication

EDO

Facilitation
Technical support
Independent opinion



Terns and Plovers Management Objective



- *Improve production of the interior least tern and piping plover from the central Platte River.*



Is PRRIP meeting its Management Objective for LT and PP?

Yes

Kind of- Feels like we are starting to fall below acceptable levels of production for plovers.

Yes, relative to what it would have been without our actions.

Yes

Relative to the time when that statement was written yes. Can we continue to improve not? Not past some point.

Yes LTPP increased significantly and proportionally to increase habitat due to off channel habitat. Insensitive to river flows. We acquired 60 acre off channel.

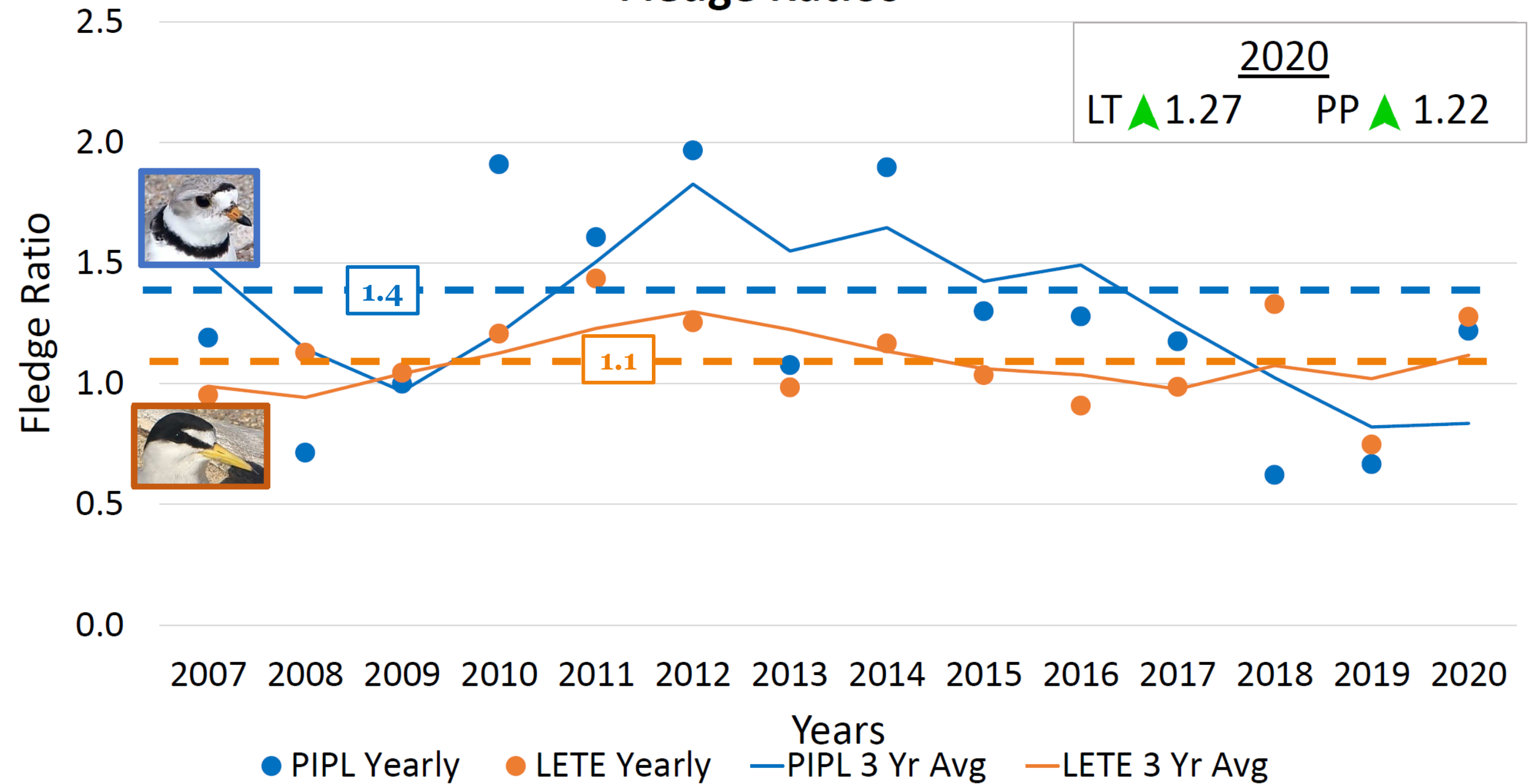
Yes

Depends on ones viewpoint. If you look from a habitat availability standpoint yes. If you look at fledge rates - so-so due to ups and downs from year to year particularly when it comes to plovers.

Yes and No (haha) Yes - There are more than when you started! However, are we CLEARLY sustaining a metapopulation that will persist into the long-term future? No - at least not for certain. Additionally, I think the "Lutey objective is too low"

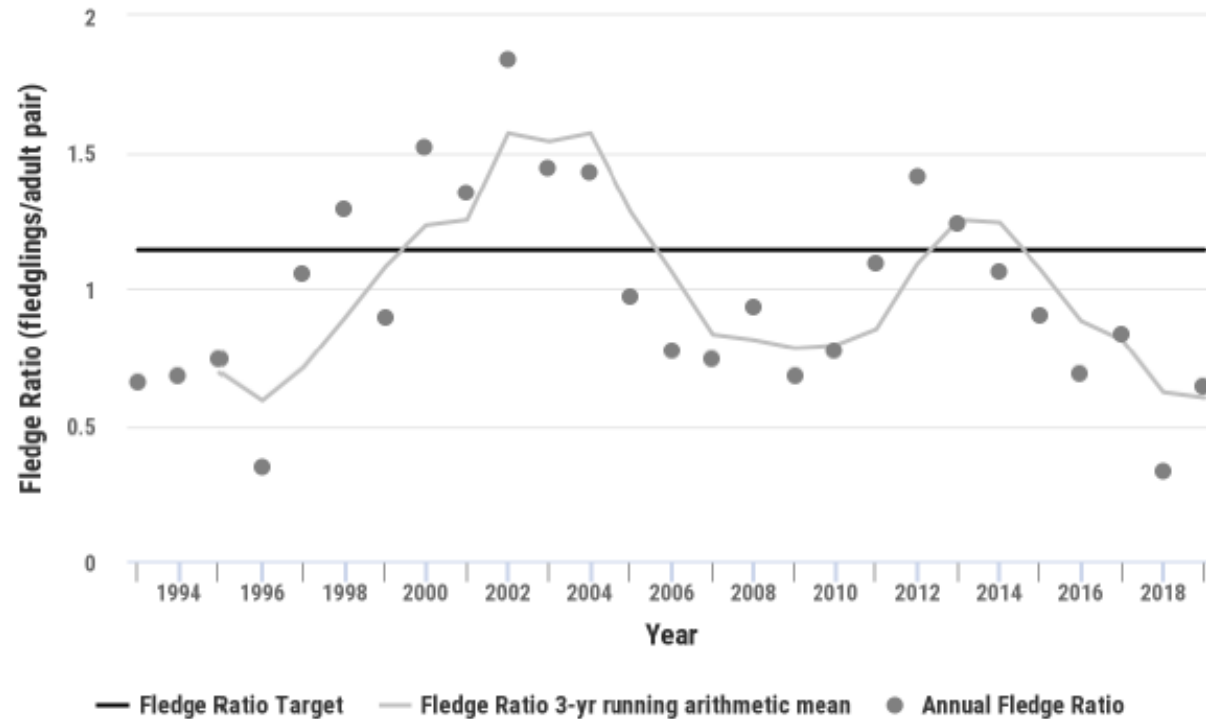
- **3 x Yes**
- **Yes, relative to what it would have been without our actions.**
- **Relative to the time when that statement was written yes. Can we continue to improve or not? Not past some point.**
- **Yes, LTPP increased significantly and proportionally to increase habitat due to off channel habitat. Insensitive to river flows. We acquired 60 acre off channel.**
- **Depends on ones viewpoint. If you look from a habitat availability standpoint yes. If you look at fledge rates – so-so due to ups and downs from year to year particularly when it comes to plovers.**
- **Kind of – Feels like we are starting to fall below acceptable levels of production for plovers.**
- **Yes and No (ha ha) Yes – There are more than when you started! However, are we CLEARLY sustaining a metapopulation that will persist into the long-term future? No – at least not for certain. Additionally, I think the “Lutey objective” is too low.**

Fledge Ratios

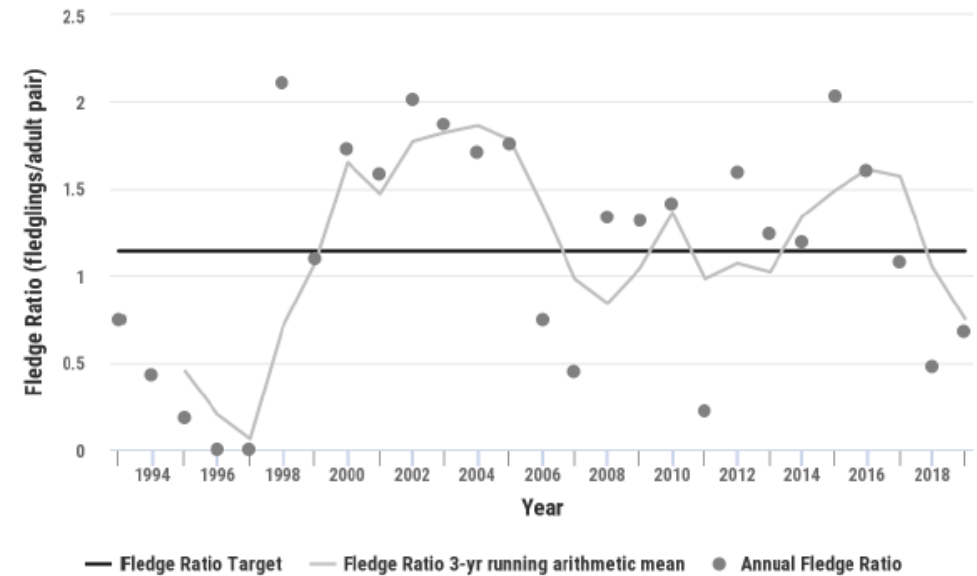


MRRP 2019 ESA AM Compliance Report Pg 27

Piping Plover Fledge Ratios - Northern Region (1993-2019)



Piping Plover Fledge Ratios - Southern Region (1993-2019)



b)

Figure 2-7. Plover fledgling counts and 3-year running average fledge ratios for a) the Northern Region and b) the Southern Region.

PRRIP 2019 LTPP Monitoring Report Pg 17

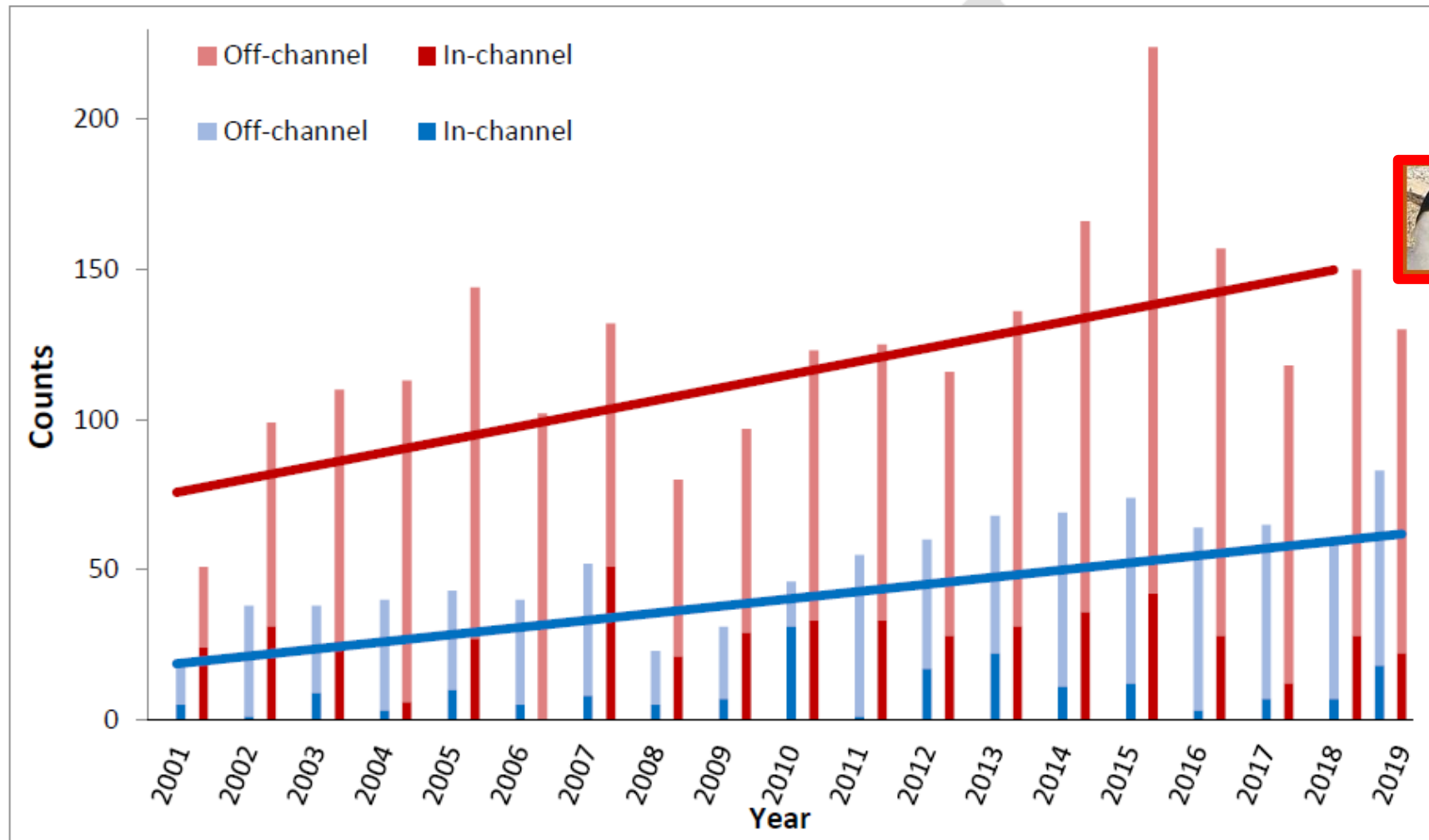
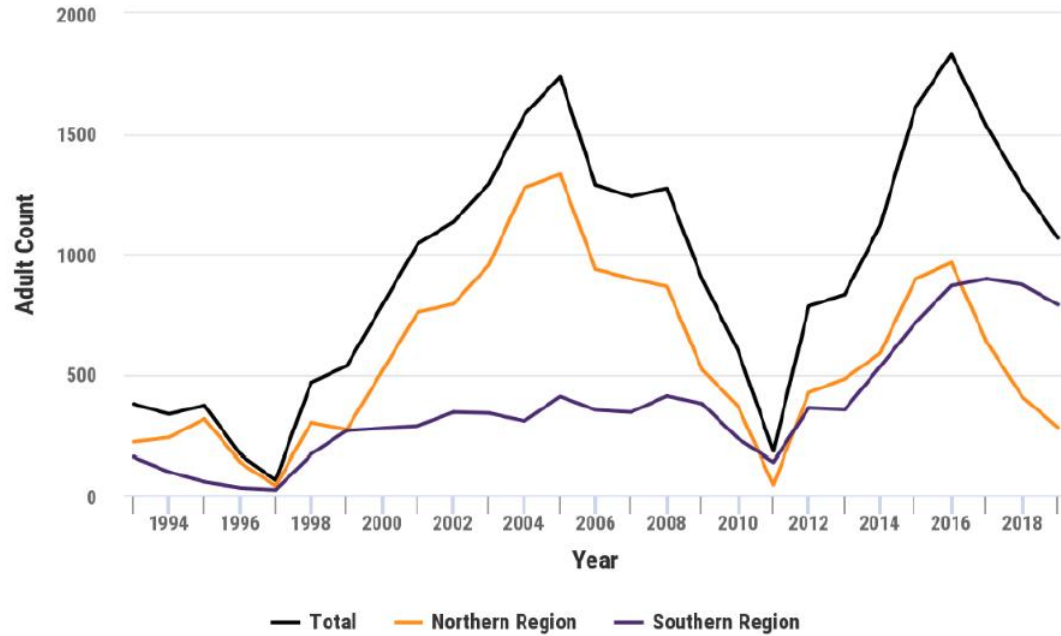


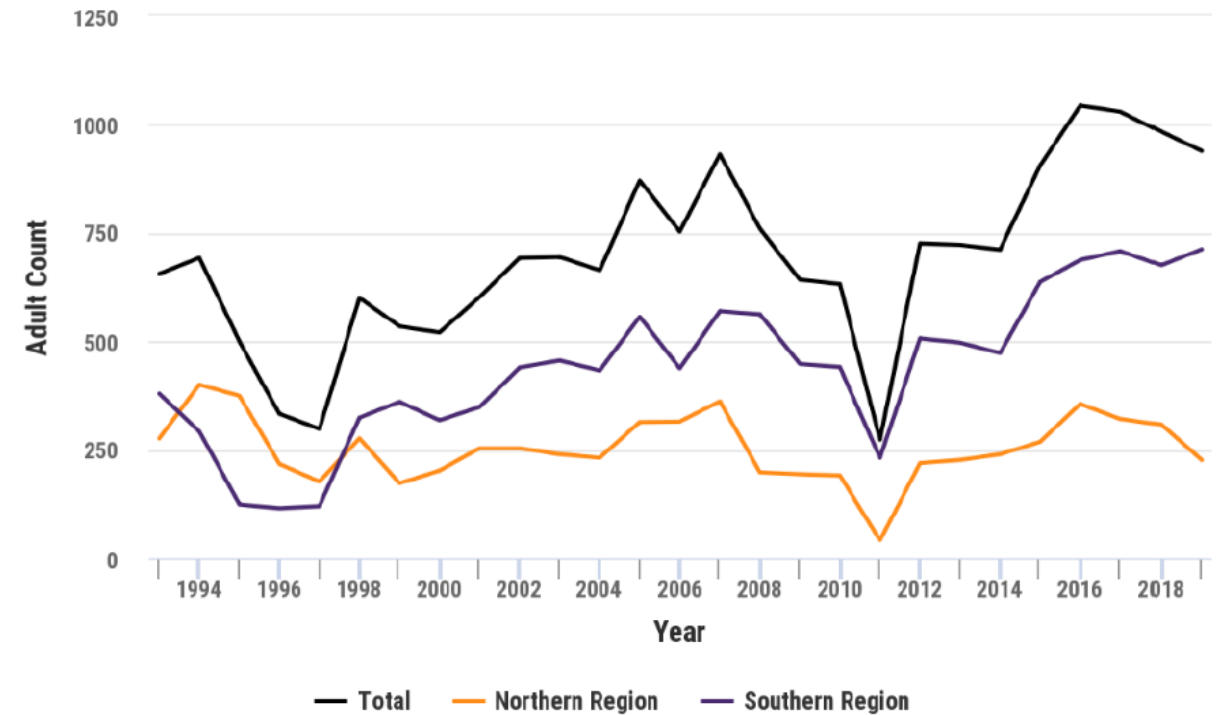
Figure 7. Trends (lines) in peak counts of least tern (red bars) and piping plover (blue bars) adults observed during mid-month and semi-monthly surveys of sandpits (light blue and light red bars) and the Platte River (dark blue and dark red bars) between Lexington and Chapman, Nebraska, 2001-2019.

MRRP 2019 ESA AM Compliance Report Pg 26

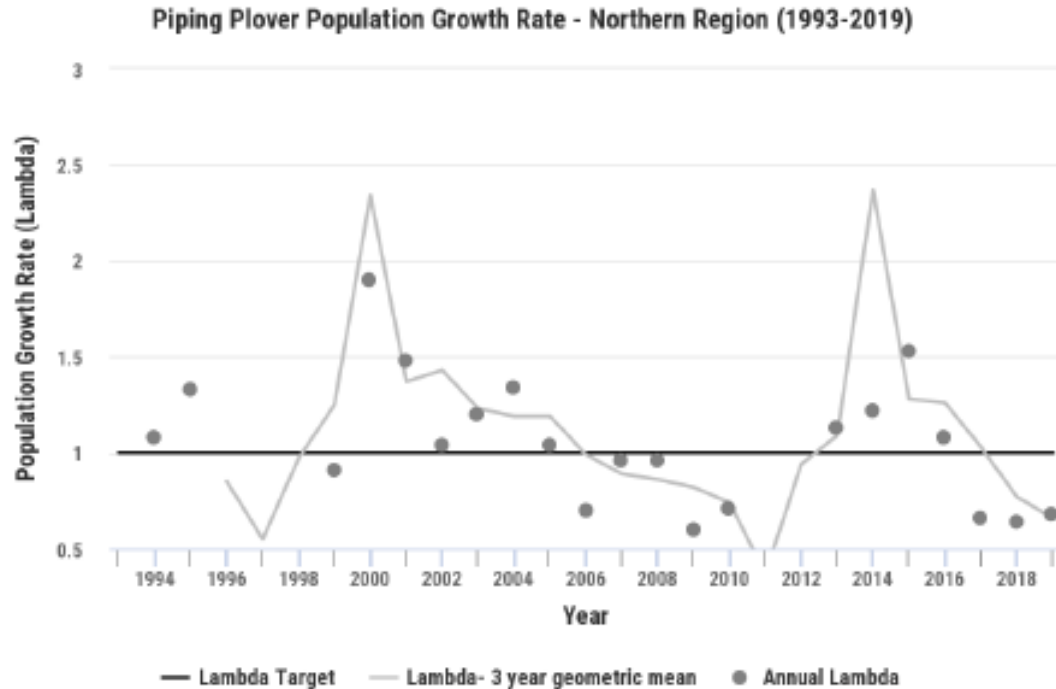
Piping Plover Adult Counts by Region



Least Tern Adult Counts by Region



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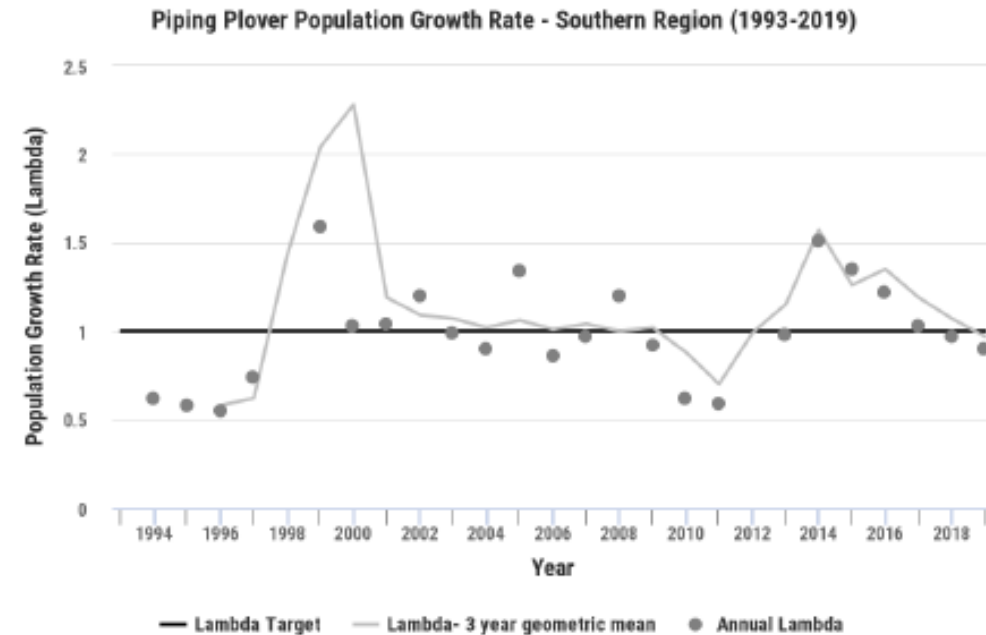


Lambda – finite rate of increase of the population in one year

$$N_{(t+1)}/N_t$$

r = instantaneous rate of increase

$$\ln (N_{(t+1)}/N_t)$$



b)

Figure 2-8. Annual (points) and running geometric mean (line) of the plover population growth rate for the a) Northern and b) Southern Regions. The horizontal line indicates the target of $\lambda = 1$. High annual values for the Northern Region in 1998 (7.4) and 2012 (9.6) are not shown for reasons of scale; these values reflect the low numbers of birds counted in the survey during floods and their subsequent return.

Terns and Plovers Performance Indicators



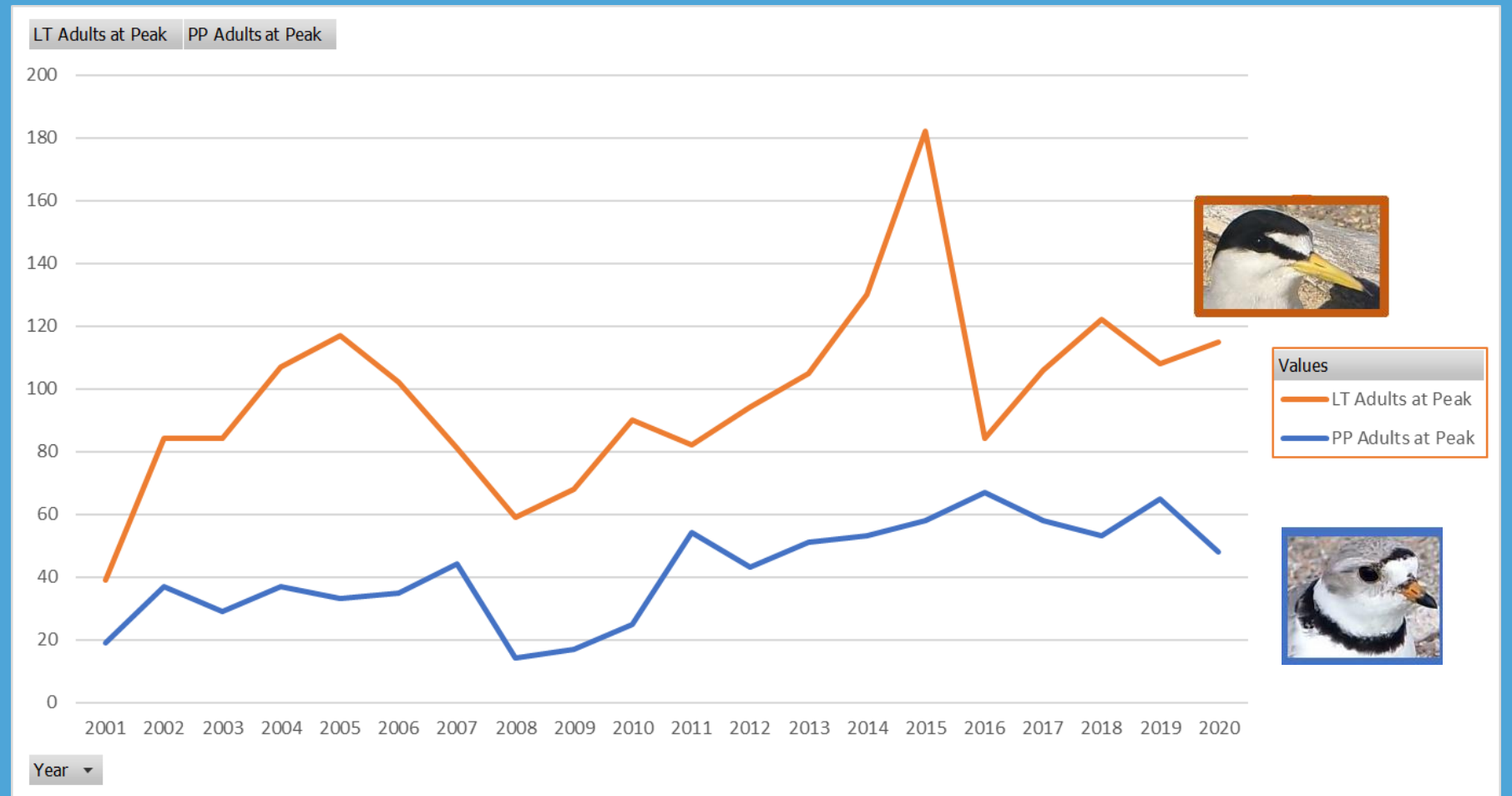
- *Fledge ratio*
- *Nesting pairs*
- *Nest and chick survival*
- *Nest location*
- *Nest density*



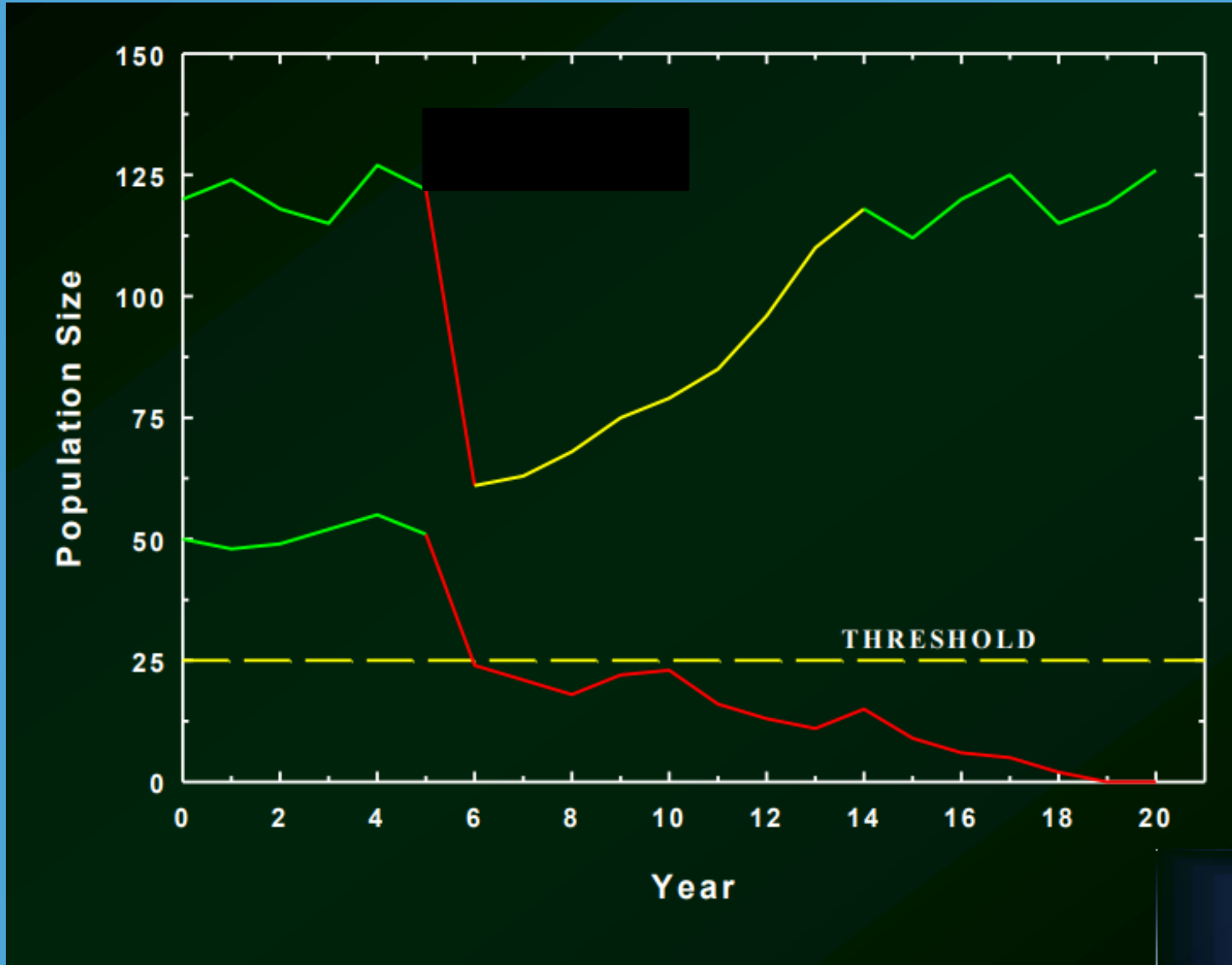
Population Viability Modeling

Population parameters fluctuate over time

When should we be concerned?

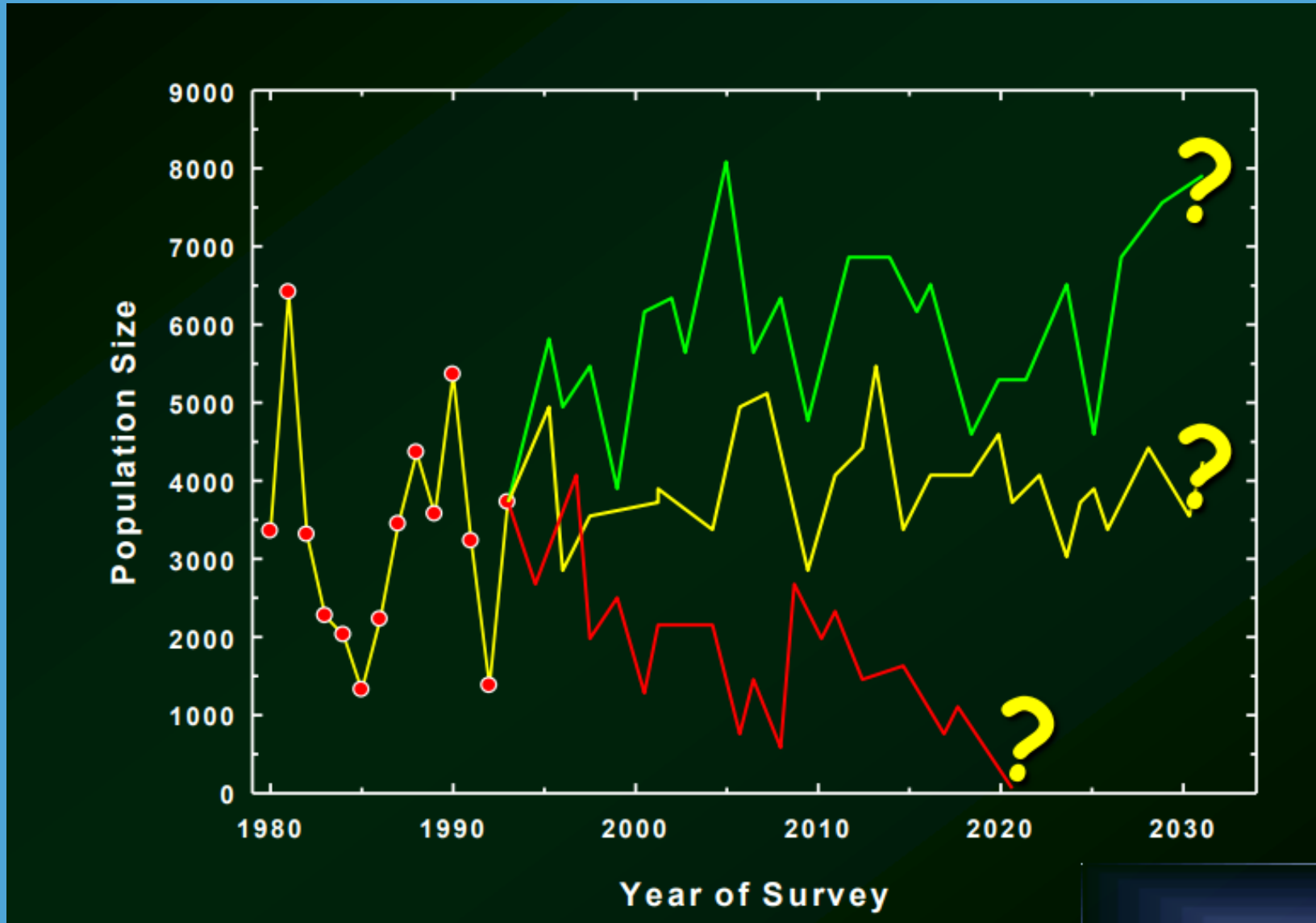


Population Viability Modeling



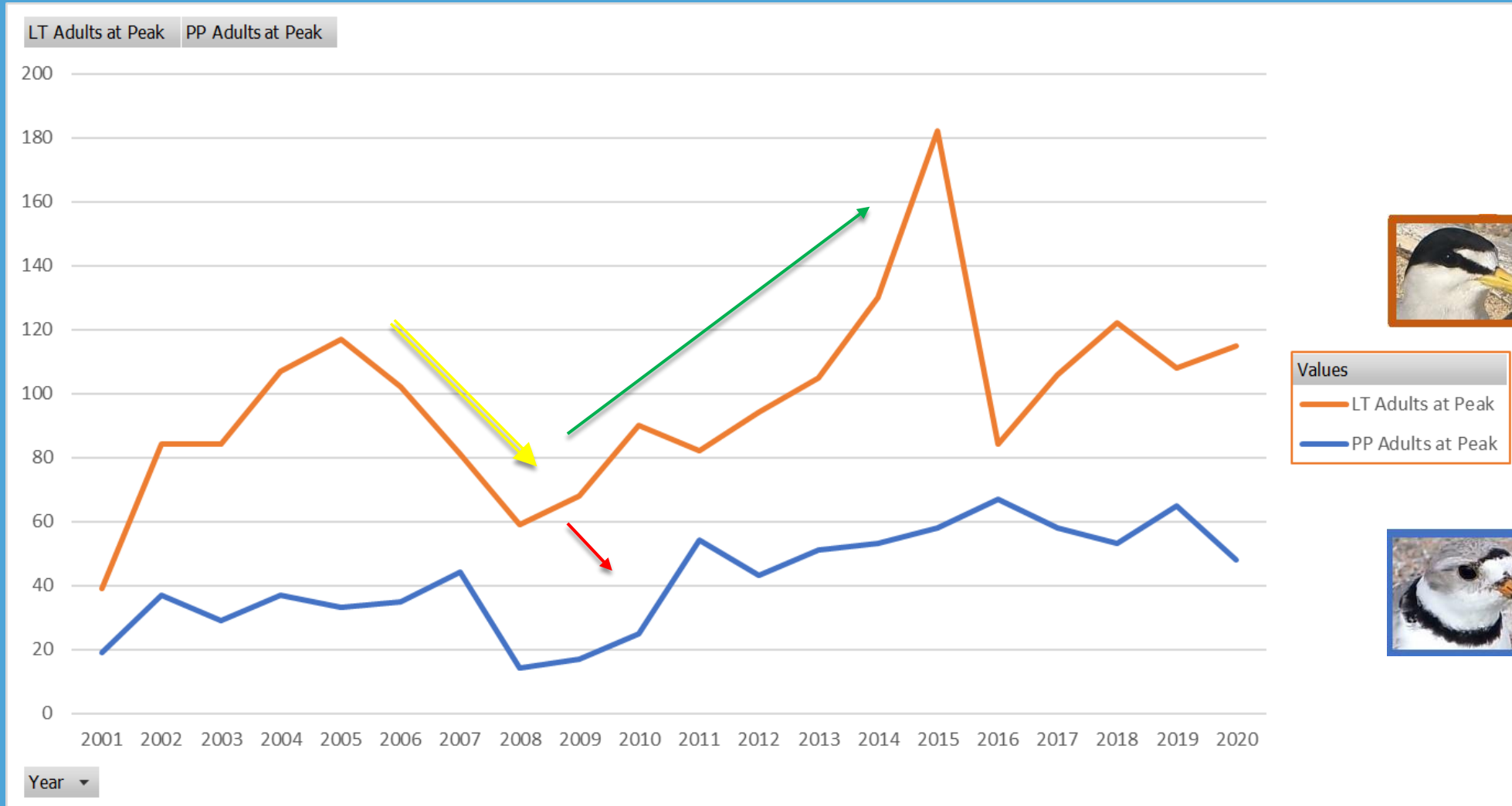
Minimum Viable
Population

Population Viability Modeling

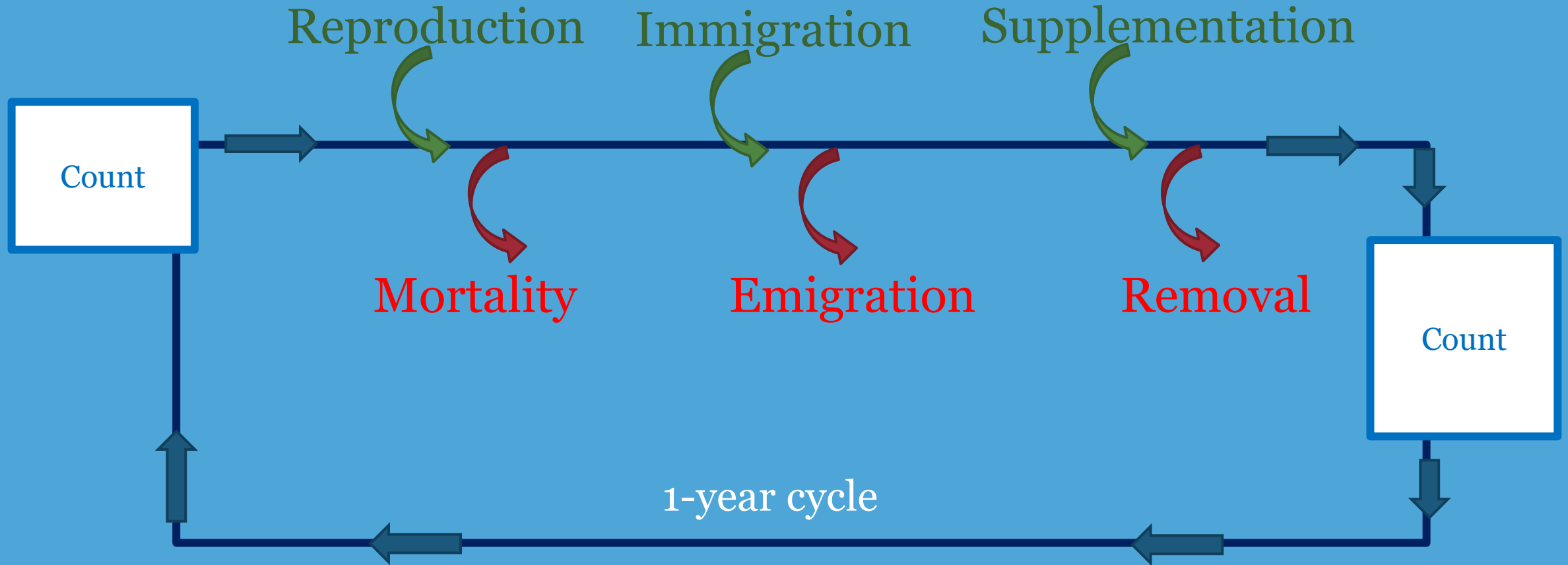


Population Viability Modeling

When should we be concerned?

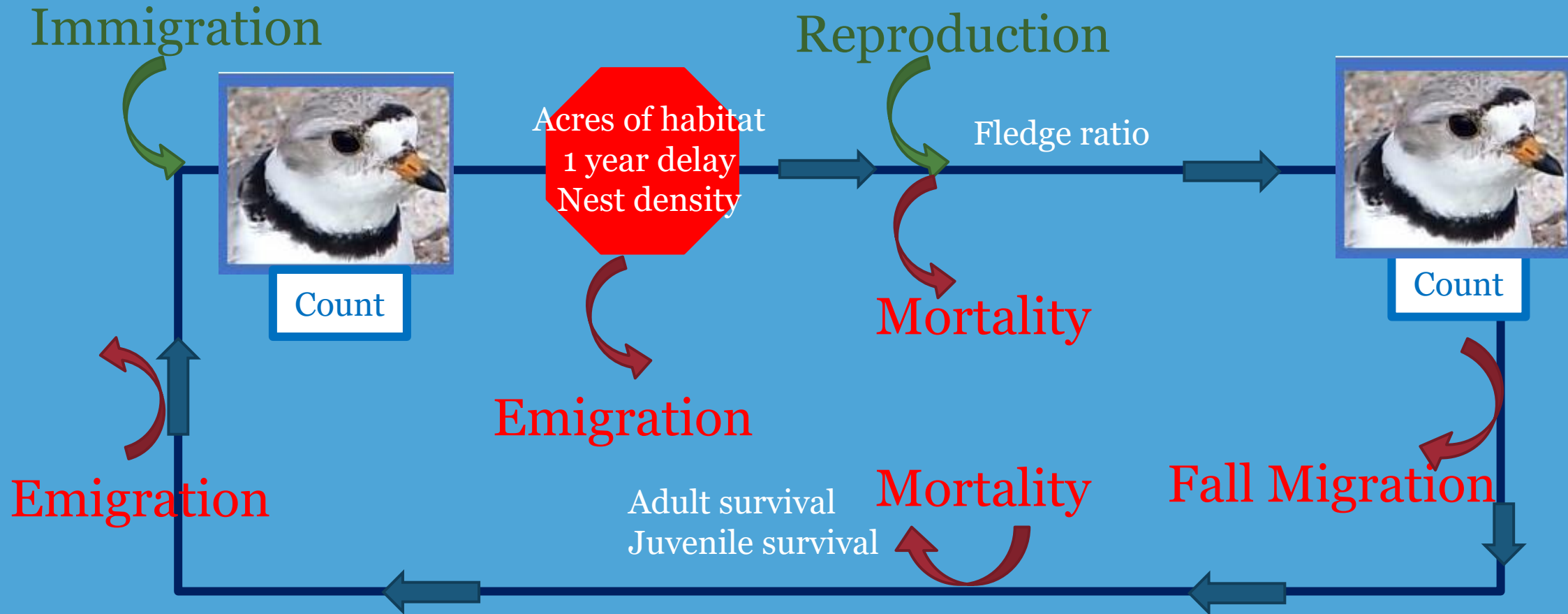


Population Viability Modeling



Run through 1 year cycles for 100 years
Do 1000, 5000, 10000 trials of this 100 year simulation

Population Viability Modeling

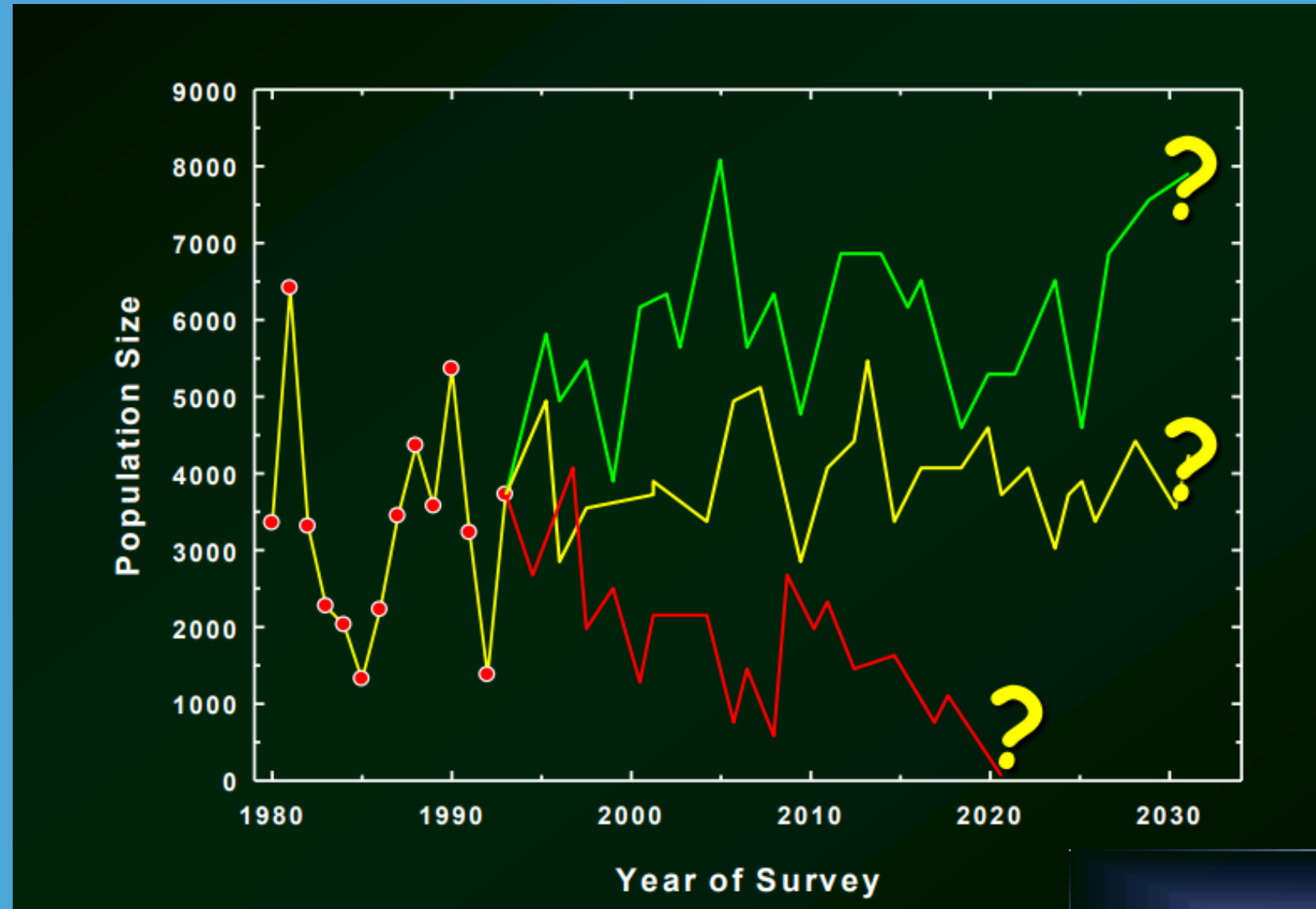


Run through 1 year cycles for 50 years

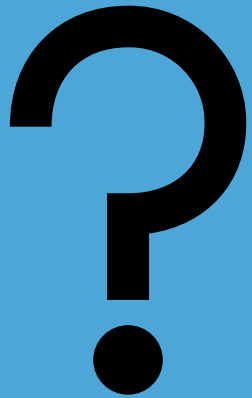
Do 1000, 5000, 10000 trials of this 50 year simulation

Population Viability Modeling

- Future population size
- Probability of extinction
- Population growth rate
- Links annually variable performance indicators to future population size and viability



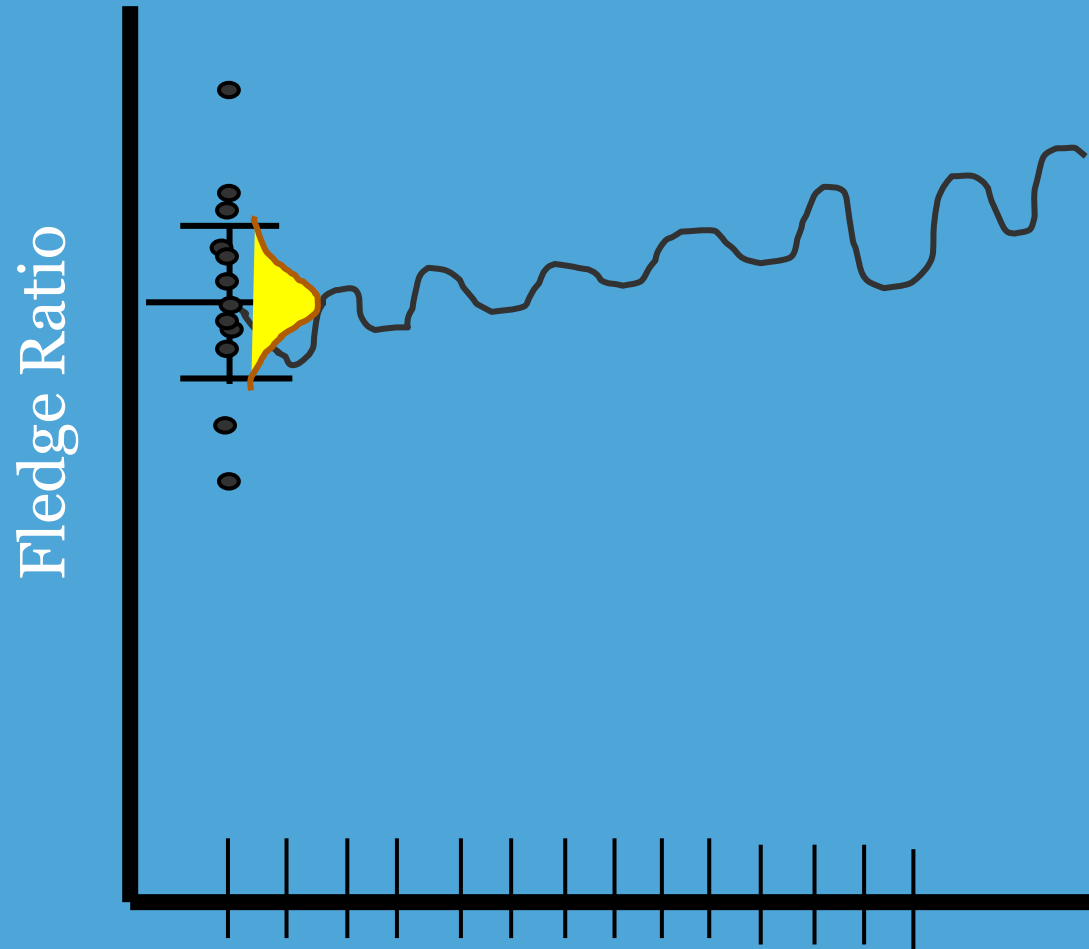
Population Viability Modeling



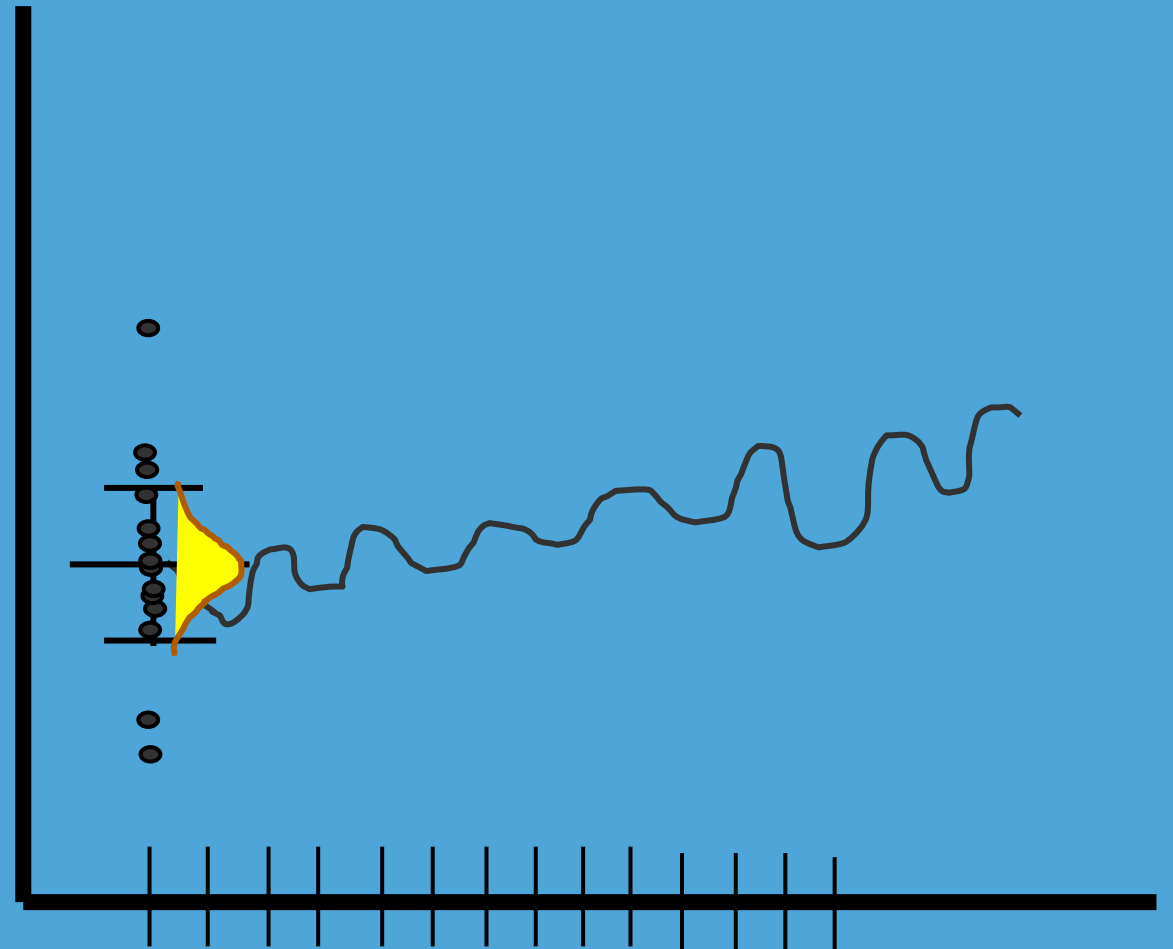
- QUESTIONS????



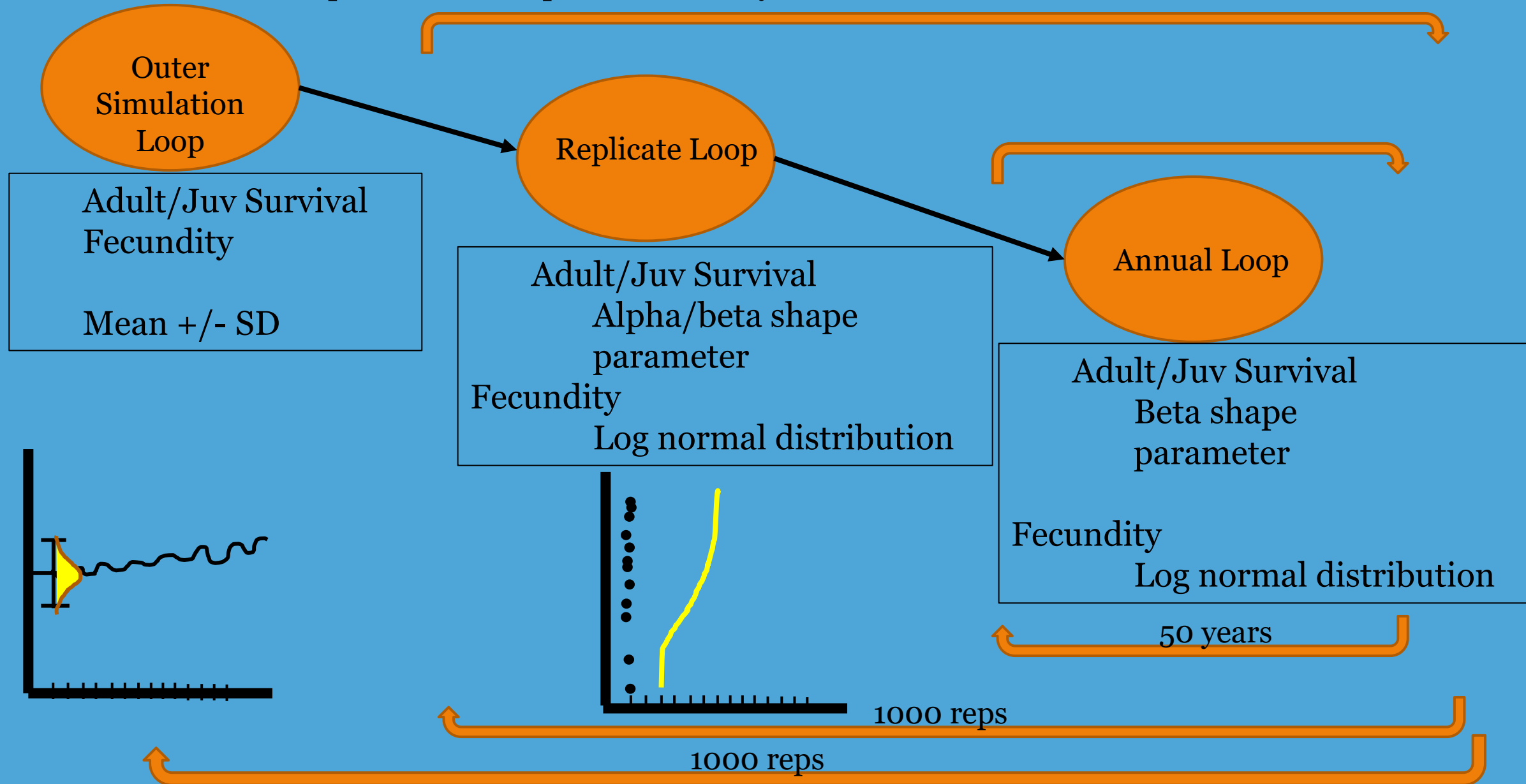
Population Viability Modeling



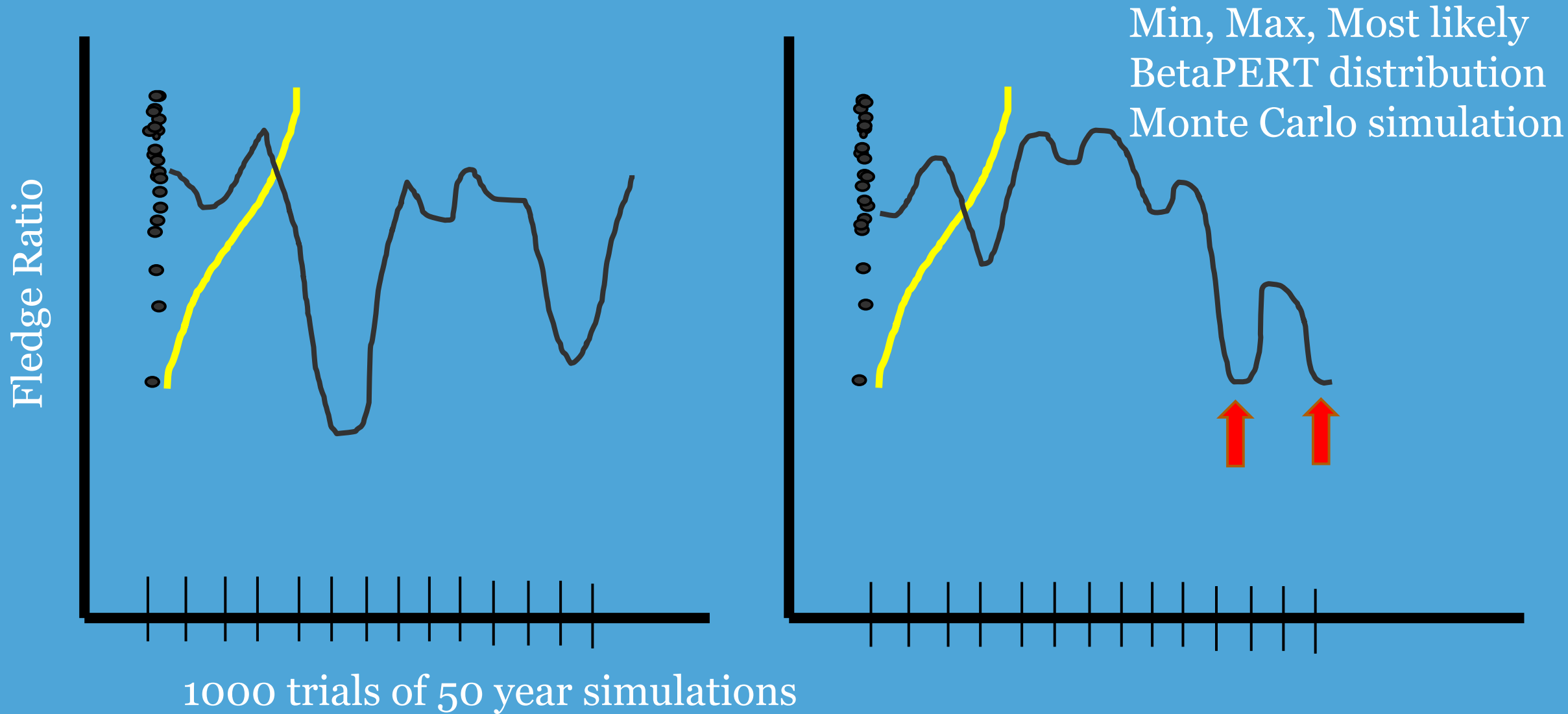
Repeated Simulations



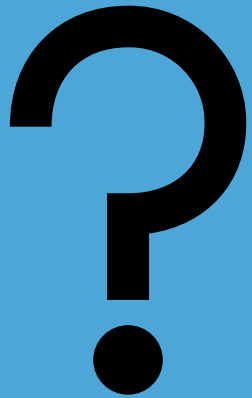
- McGowan et al. 2014
 - Spatial and Temporal Variability



EDO Population Viability Modeling



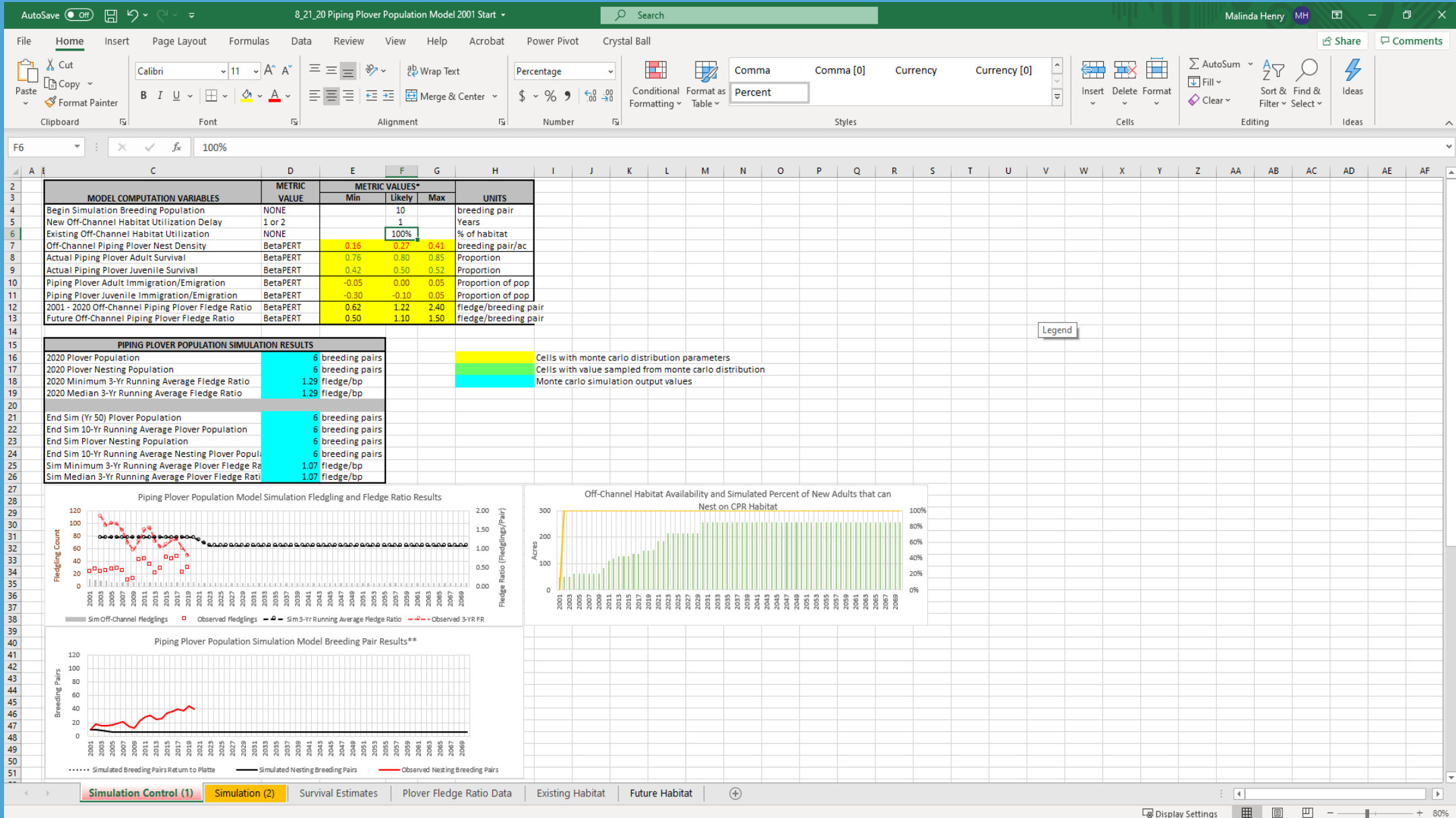
Population Viability Modeling



- QUESTIONS????



EDO Population Viability Modeling



AutoSave Off 8_21_20 Piping Plover Population Model 2001 Start Malinda Henry

File Home Insert Page Layout Formulas Data Review View Help Acrobat Power Pivot Crystal Ball

Define Assumption Define Decision Forecast Define Correlations Define Clear Cell Prefs

Copy Paste Freeze Clear Select Freeze Cell Prefs

Start Stop Reset Step Run Preferences Trials: 500 Save or Restore

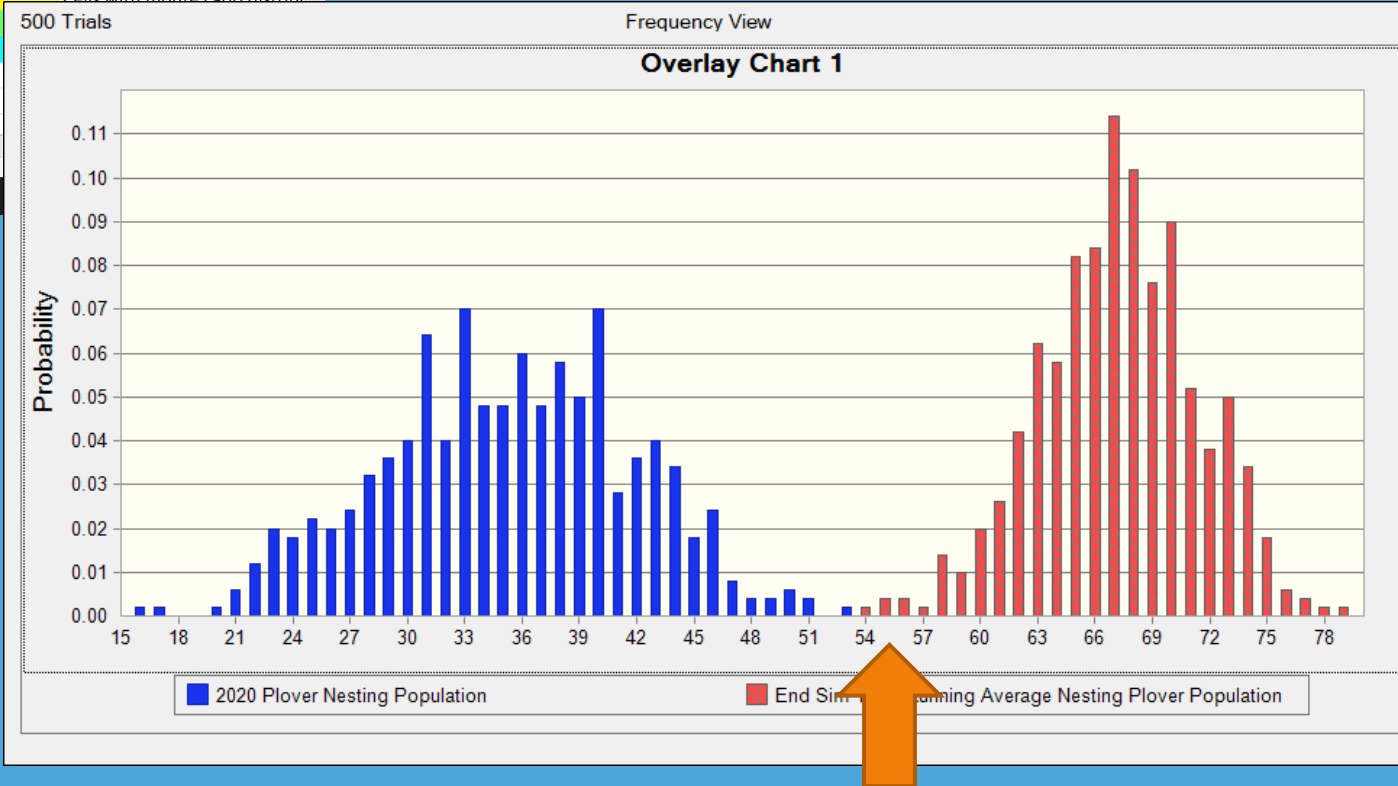
View Charts Create Report Extract Data OptQuest Predictor More Tools

Help Resources About

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Simulation Control (1) Simulation (2) Survival Estimates Plover Fledge Ratio Data Existing Habitat Future Habitat



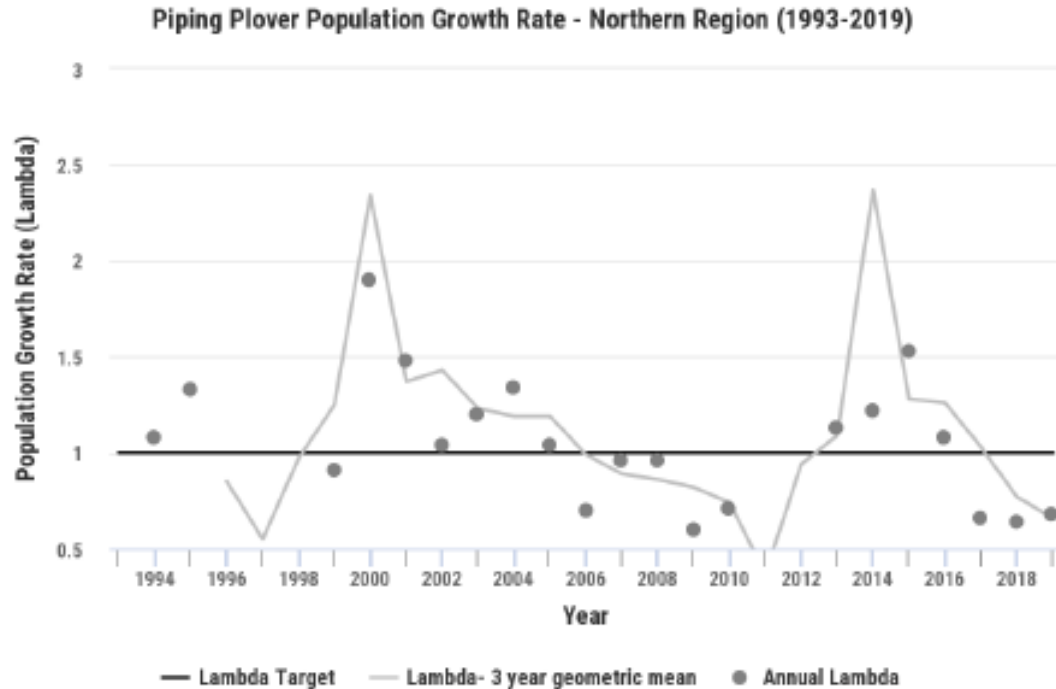
Terns and Plovers Performance Indicators



- *Fledge ratio*
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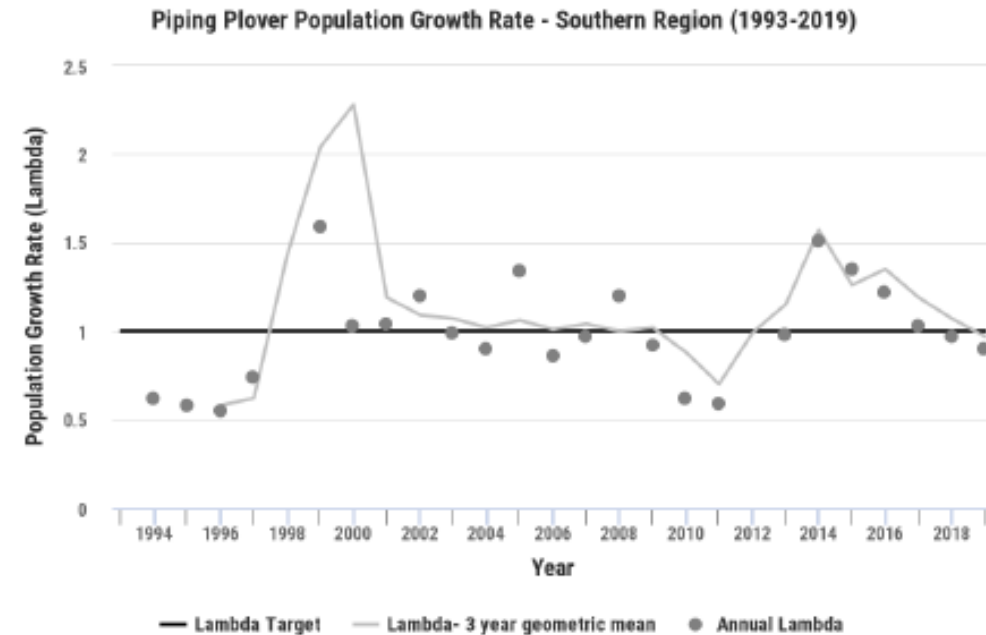


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Terns and Plovers Management Objective

- *Improve production of the interior least tern and piping plover from the central Platte River.*
- Do performance indicators linked to future population outcomes help us to agree on whether we are meeting our management objective?





Preparation for Next Meeting

PREPARATION FOR NEXT MEETING

Meeting Objective: Prepare for next meeting.

- Agenda items for next meeting
- Homework – Factors with DIRECT impact on LT and PP performance indicators
 - Weather, Inundation
 - Predation (terrestrial and avian)
 - Renesting
 - Density-dependent limitations (carrying capacity)
 - Site age
 - What do we know about how site choice, site fidelity, past site-specific productivity effects current productivity?
 - **Suggested literature from group?**

4:30 AM

[Szell and Woodrey 2003](#)
[Anteau et al 2012](#)
[Farnsworth et al 2017](#)
[Farrell et al 2018](#)
[Robinson et al 2019](#)
[Catlin et al 2011](#)
[Saunders et al 2017](#)
[Swift et al 2020](#)
[CatlinPhD2009](#)
[Aug 1 2019 LT PP](#)
[CEM DRAFT](#)

Meeting Review and Wrap-Up

- Action Items
- Meeting Feedback
- Key Insights

