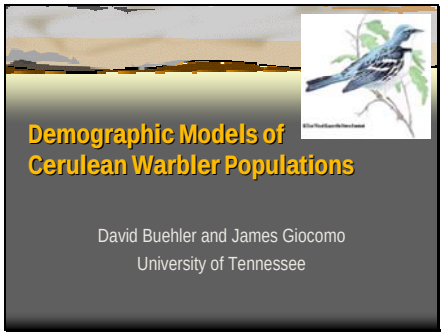
Appendix 5g Buehler

Slide 1



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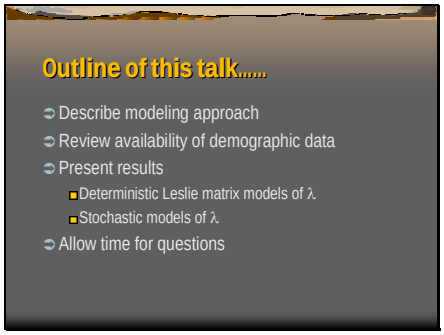

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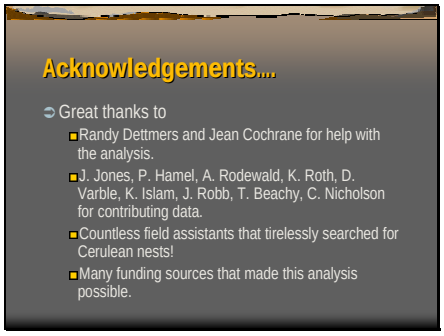

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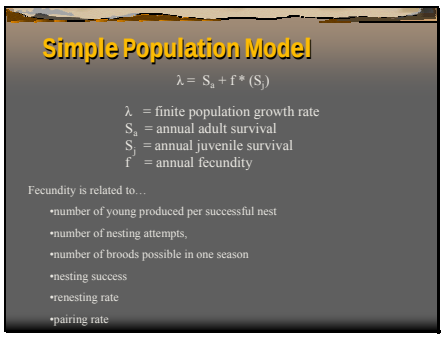

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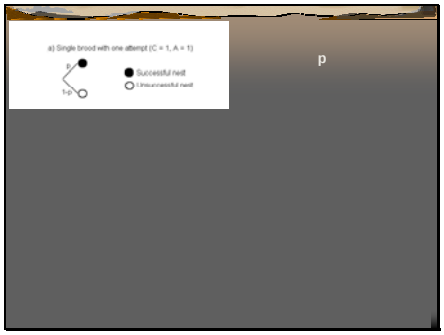
Slide 6



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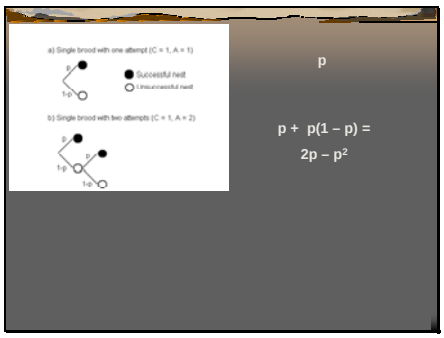

p

$p + p(1 - p) =$

$2p - p^2$

Slide 8

For Ceruleans

Number of Attempts (A)	Maximum Number of Broods (C) 1	2	3
1	p	-	-
2	$2p-p^2$	2p	-
3	$3p-3p^2+p^3$	$3p-p^3$	3p
4	$4p-6p^2+4p^3-p^4$	$4p-4p^3+2p^4$	$4p-p^4$

Slide 9

Assumptions

- 100% pairing success
- Immigration and emigration were offsetting
- Constant average annual rates of Mayfield (1975) nesting success, number of young per successful brood, and annual adult survival
- All individuals breed in their first breeding season after hatch year
- No age or sex-related differences in parameters

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Slide 10

Caveats

- This is a modeling exercise- not a perfect representation of reality!
- This modeling approach analyzes demographic effects on populations and does not address habitat loss on the breeding grounds.

Slide 11

Sensitivity Analysis
Average Input Conditions

Parameter	Low	Medium	High
Nest success (0-1)	0.2	0.4	0.6
Brood Size	3	3.4	3.75
Adult Survival (0-1)	0.54	0.59	0.64
Renesting rate (0-1)	0.8	0.9	1
Max number of attempts	2	3	4
Juv survival ratio	0.4	0.5	0.7

Slide 12

Sources of Field Data

Site	Years	Nests Monitored	Birds Banded	Source
ON- QU Biological Station	1995-2003	175	132	Jones et al.
TN- Cumberland Mtns	1996-99, 2005	69	10	Buehler et al.
Mississippi Alluvial Valley	1992-2005	82	119	Hamel
IN- Big Oaks NWR	2002-2005	93	45	Robb et al.
OH Hills	2004-2005	53	30	Rodewald et al.

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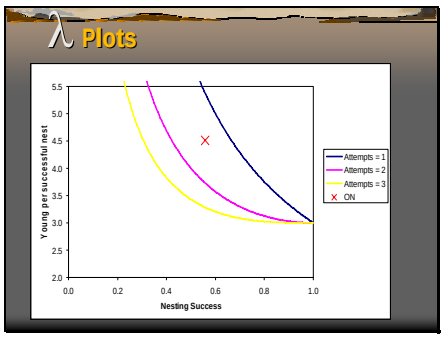

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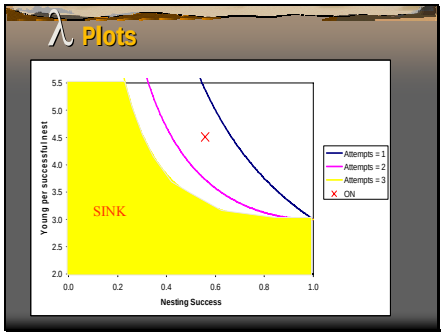

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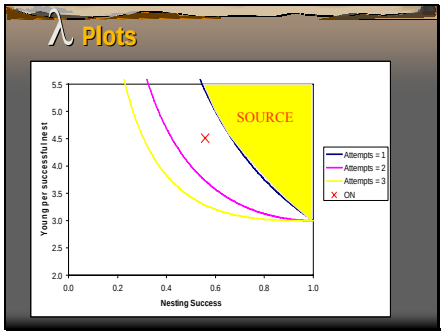

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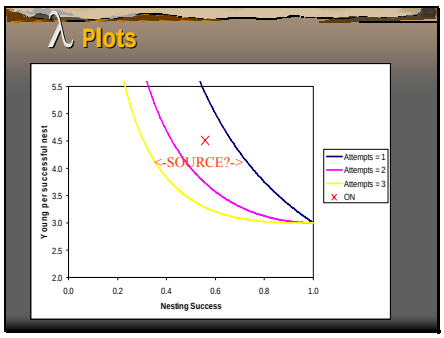

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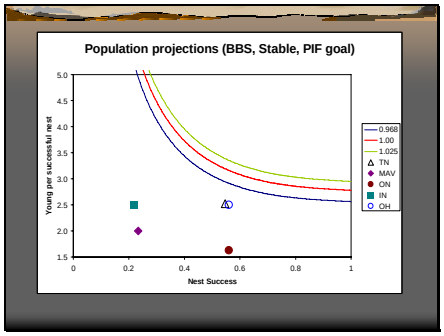

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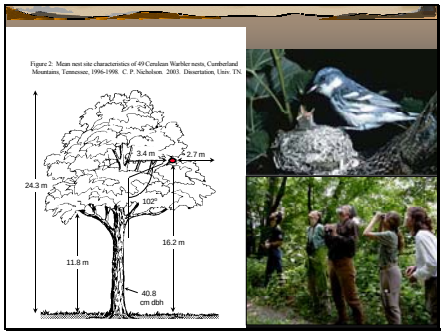

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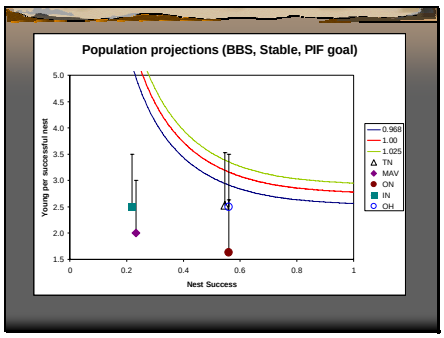

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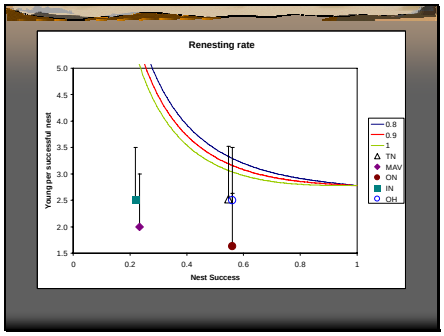

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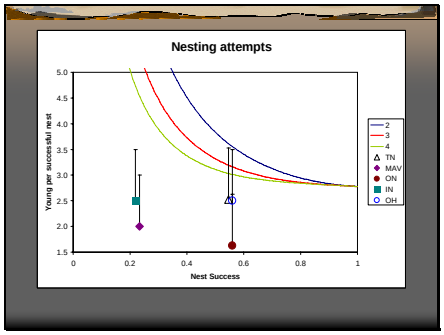

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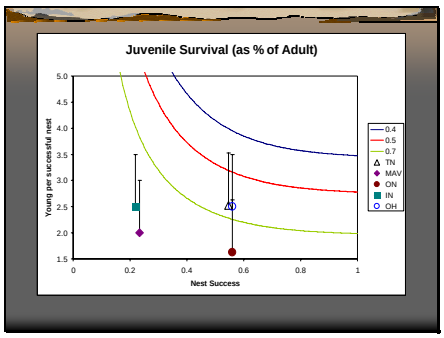

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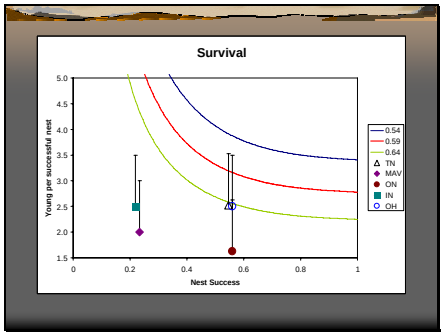

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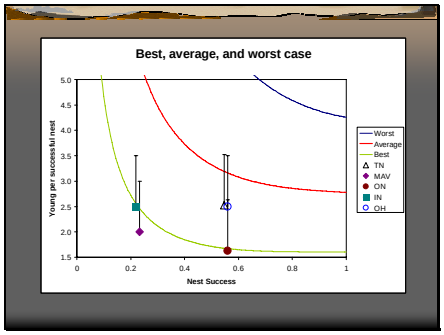

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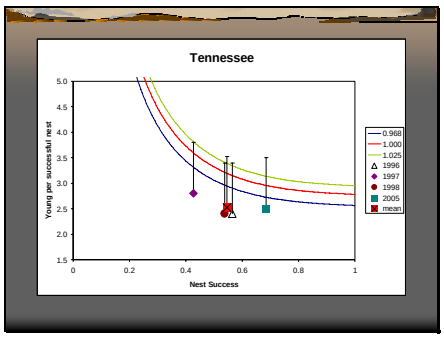

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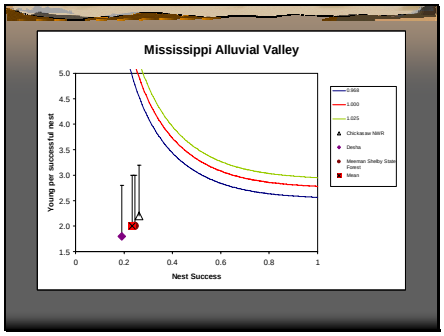

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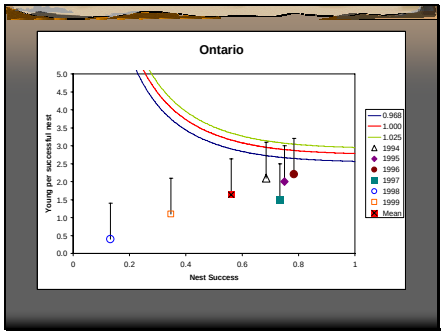

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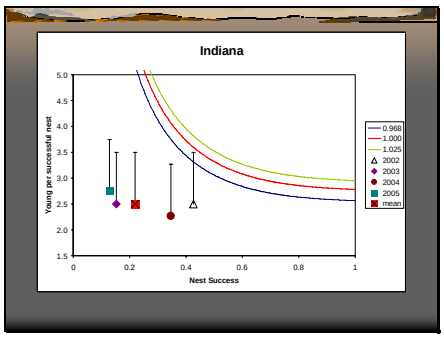

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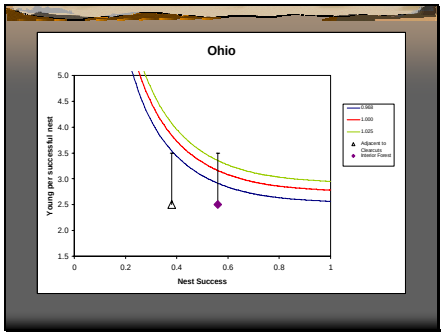

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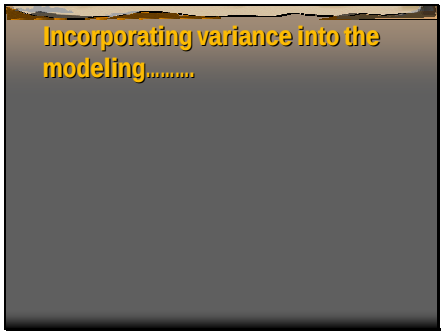

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Slide 31

Lessons learned from this exercise……

- We need more (and better) data on brood size, adult/juvenile survival, and immigration/emigration.
- Some populations (MAV, IN) appear to be sinks regardless of model inputs.
- Core populations (OH, TN) have the potential to be sources in "good" years.
- Increasing variability will reduce the time to "extinction" => implications of climate change?