Life history shifts in invasive populations: nature or nurture?

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Photo: SongoftheSea

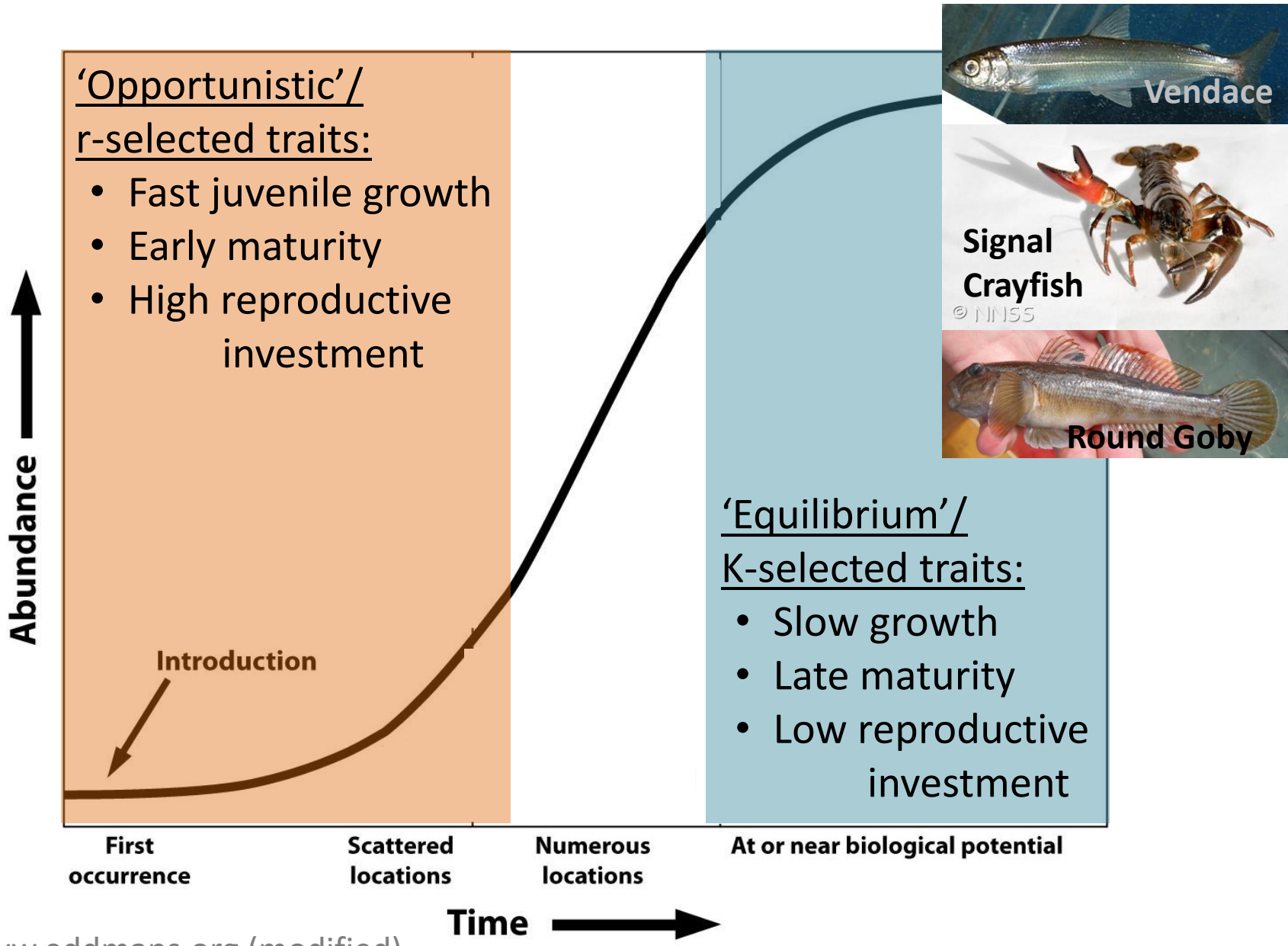
What are **Life History** traits?

- Traits related to growth, reproduction and mortality that affect an organism's fitness

Why do we care?

- Certain suites of traits are associated with successful invaders.

Plasticity & life history traits during an invasion



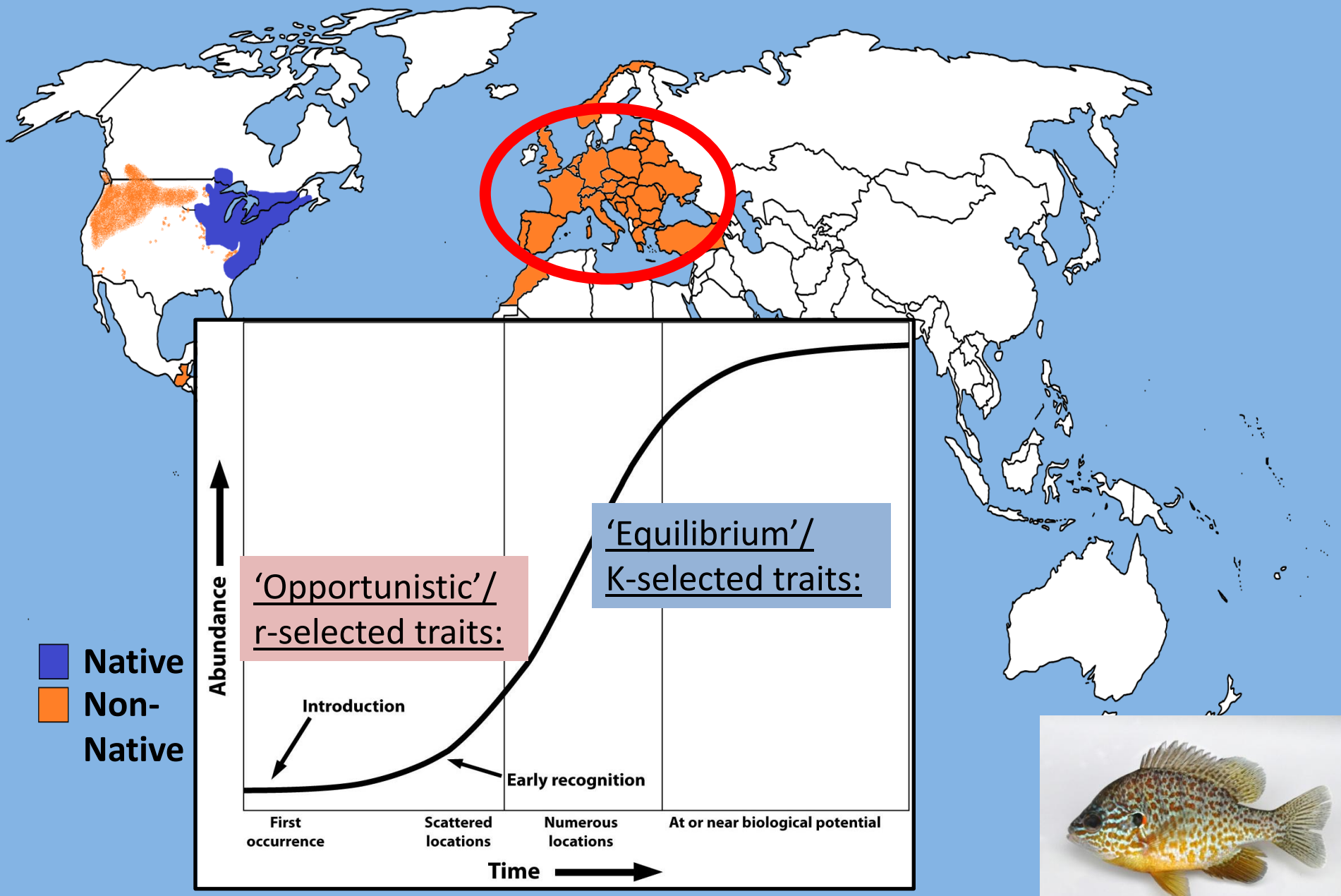
Source: www.eddmaps.org (modified)

Pumpkinseed

Photo credit: A Rooke

Introduced in late 1800s

Introduced in late 1800s



*Fox et al 2007

IN THE WILD

	Native North American	Non-native European
Juvenile Growth	→	Faster
Age @ Maturity	→	Younger
Length @ Maturity	→	Smaller
Reproductive Investment	→	Greater

Phenotypic or Genetic?

Study Populations

2 Native Canadian populations

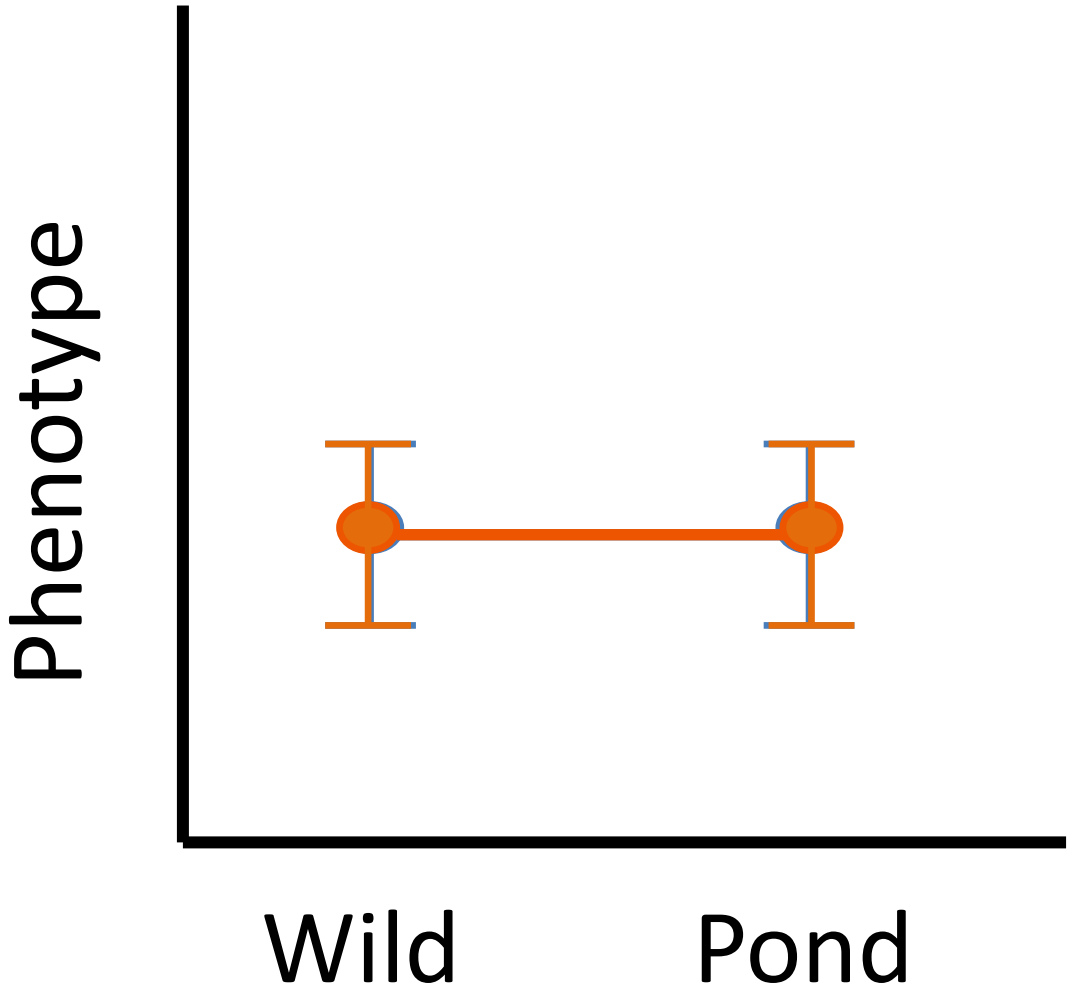
2 Non-native Spanish populations

Outdoor pond colonies established with adults in 2008 in central Ontario Canada

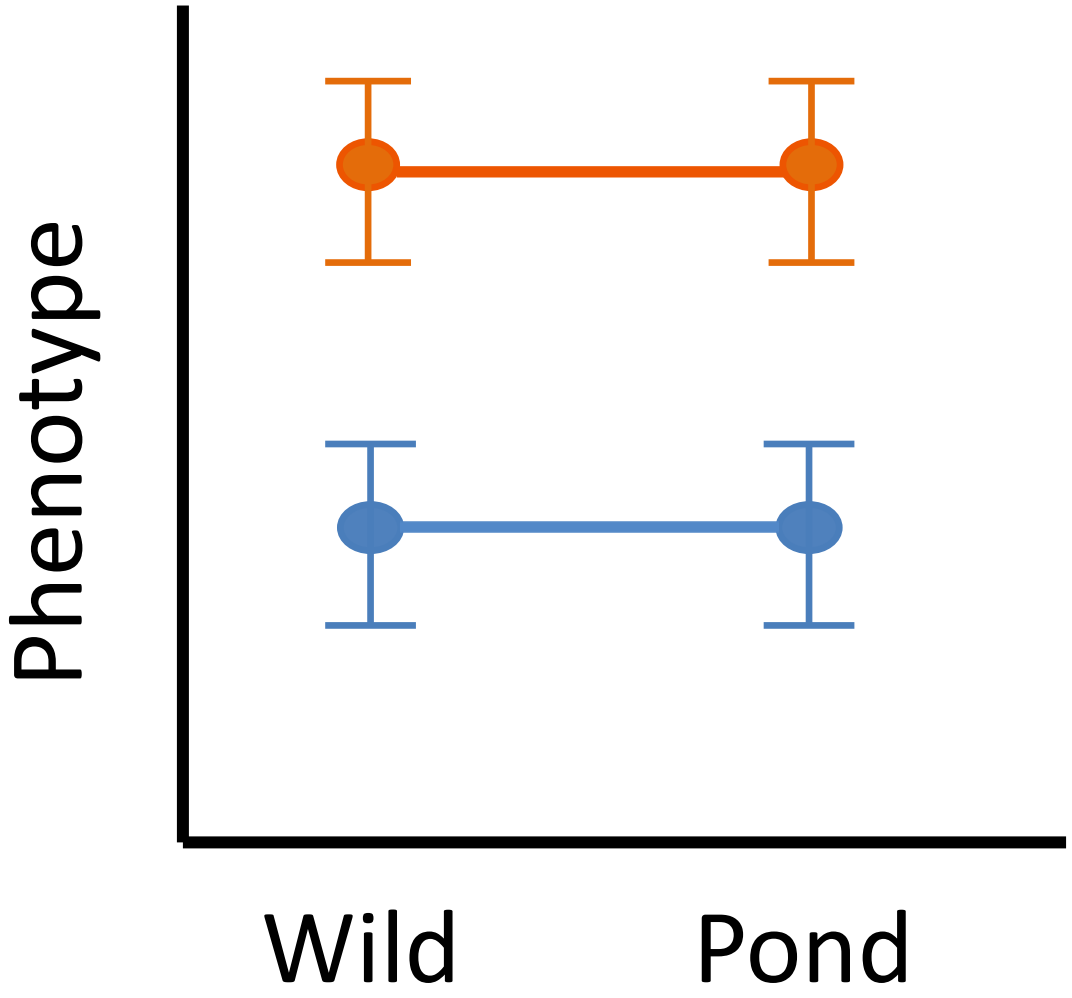
IN THE PONDS

	Native North American	Invasive Southern European
Juvenile Growth (Length at Age 2)		?
Length at Maturity		?
Reproductive Investment		?

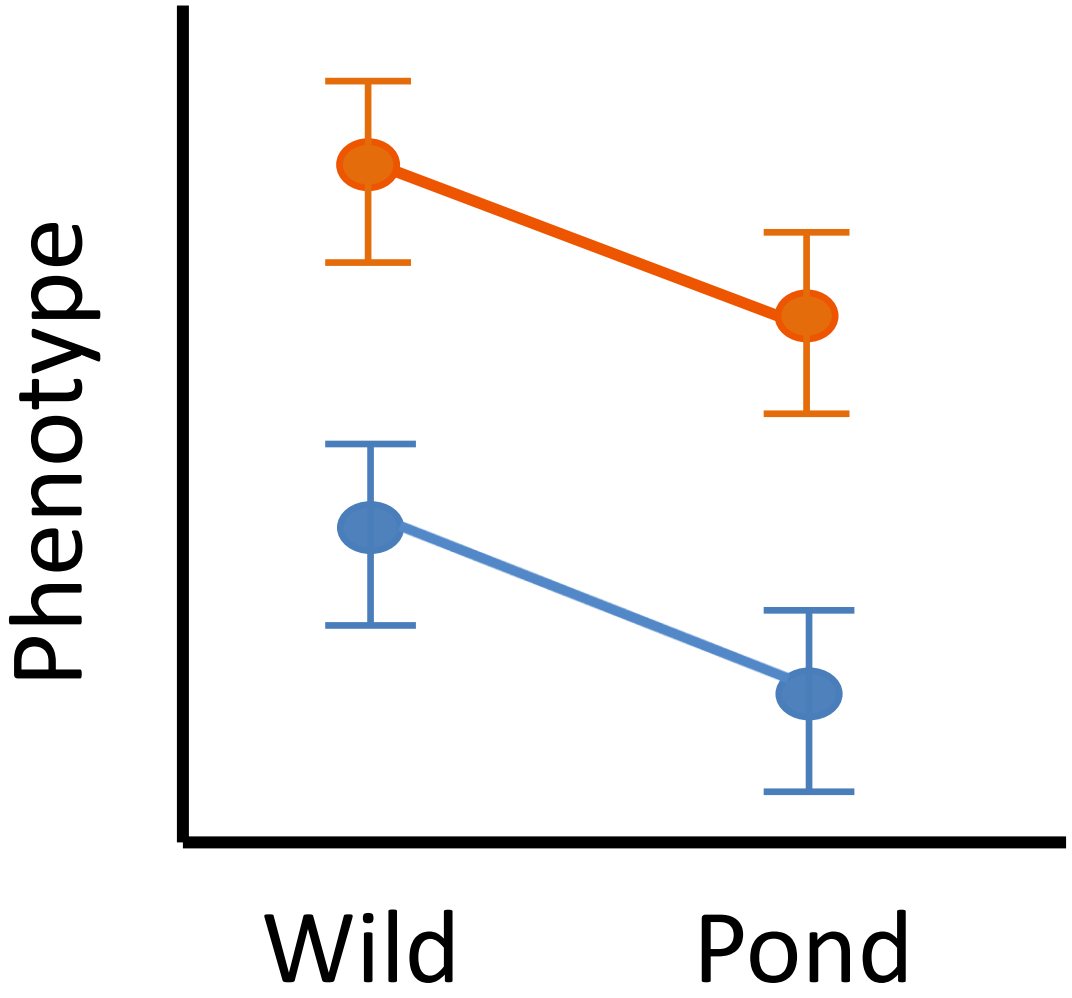
Interpreting Reaction Norms



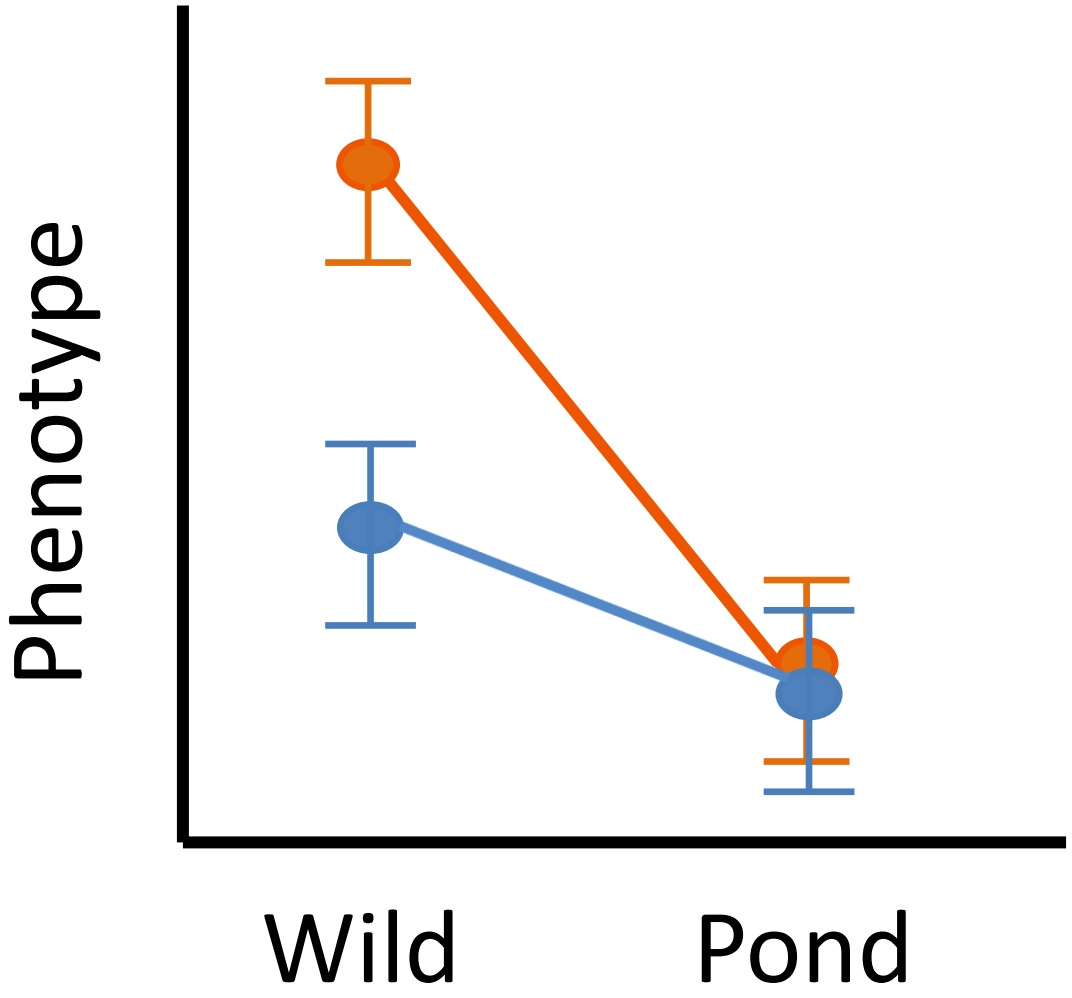
Interpreting Reaction Norms



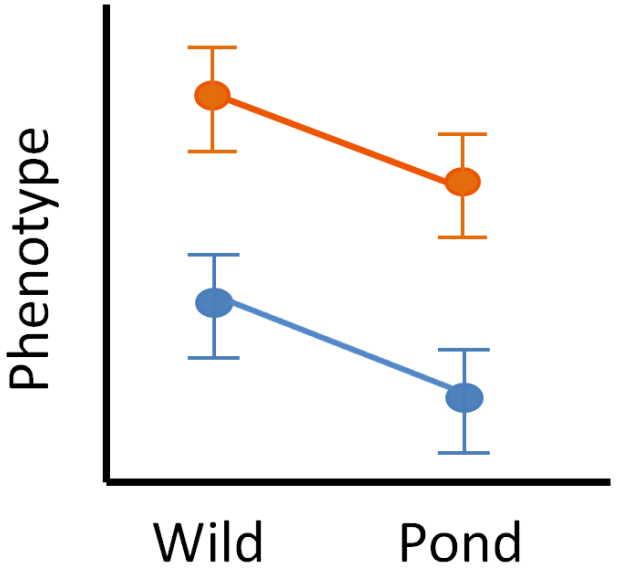
Interpreting Reaction Norms



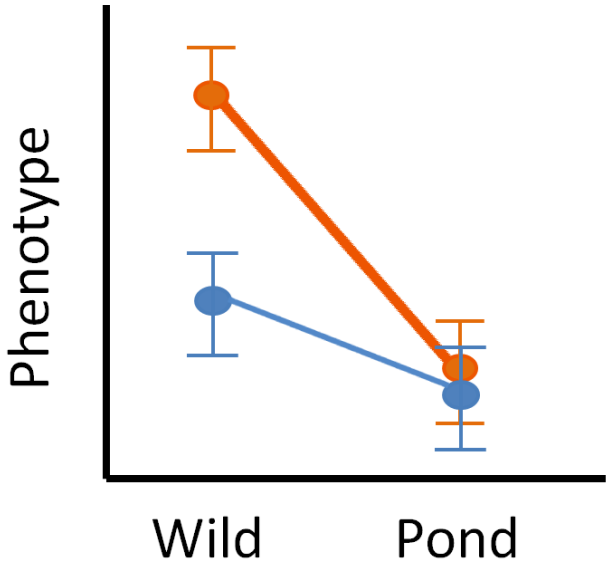
Interpreting Reaction Norms



Interpreting Reaction Norms



Genetic

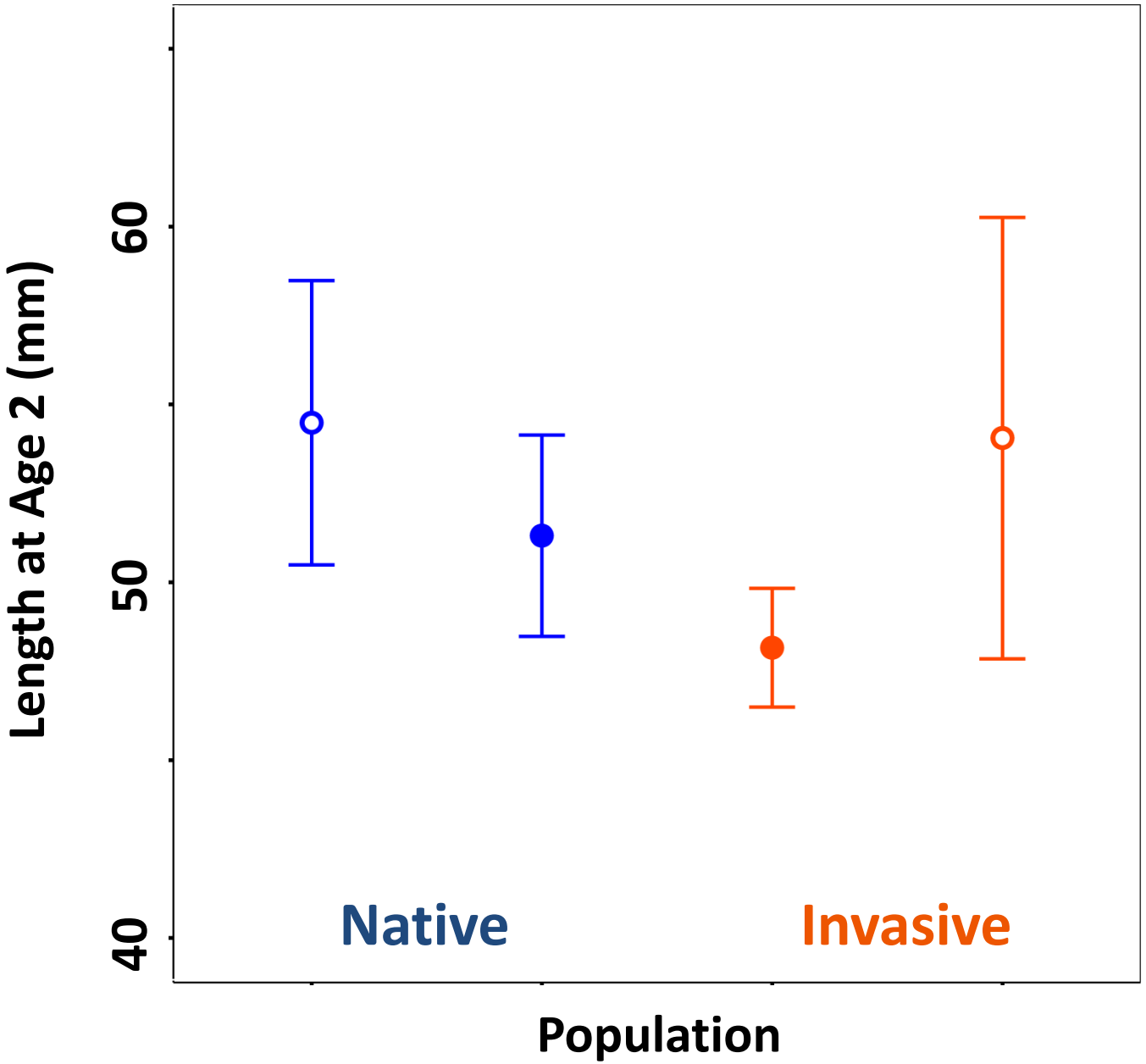


Phenotypic

IN THE PONDS

	Native North American	Invasive Southern European
Juvenile Growth (Length at Age 2)		?
Length at Maturity		?
Reproductive Investment		?

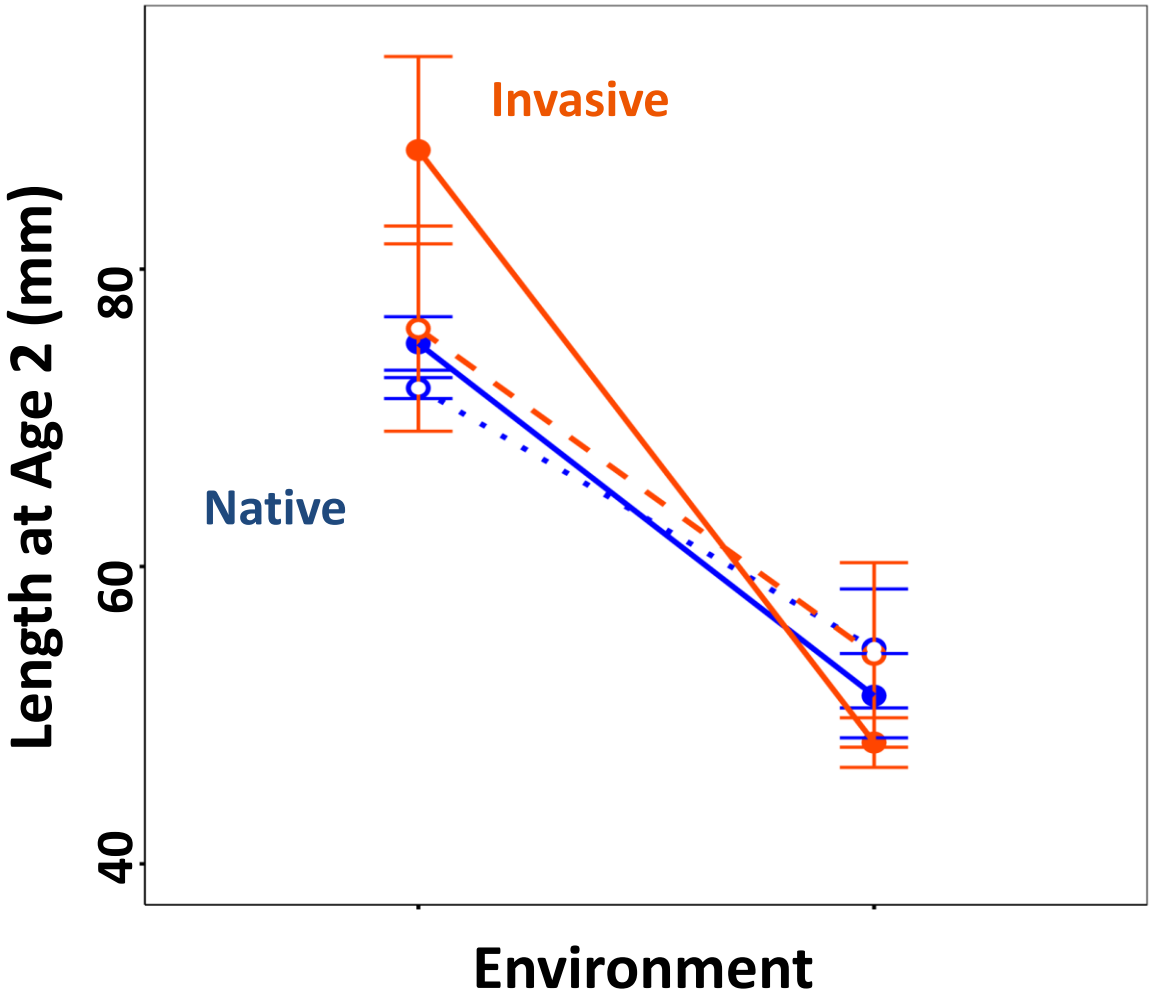
Juvenile Growth



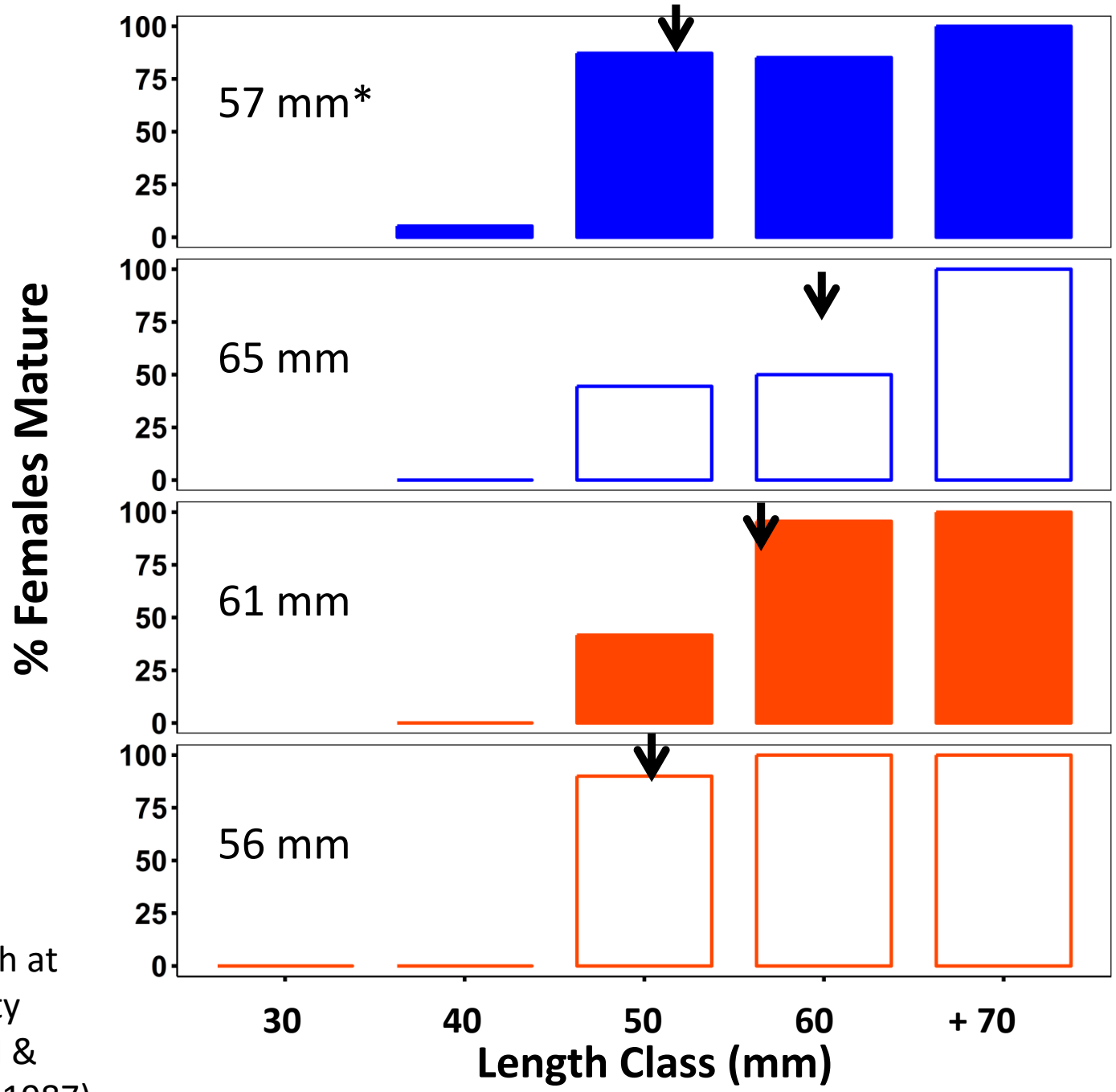
WILD PONDS

Juvenile Growth

(Length at Age 2)



	WILD		PONDS	
	Native	Invasive	Native	Invasive
Juvenile Growth (Length at Age 2)	→ Faster		=	
	Phenotypic ?			
Length at Maturity				

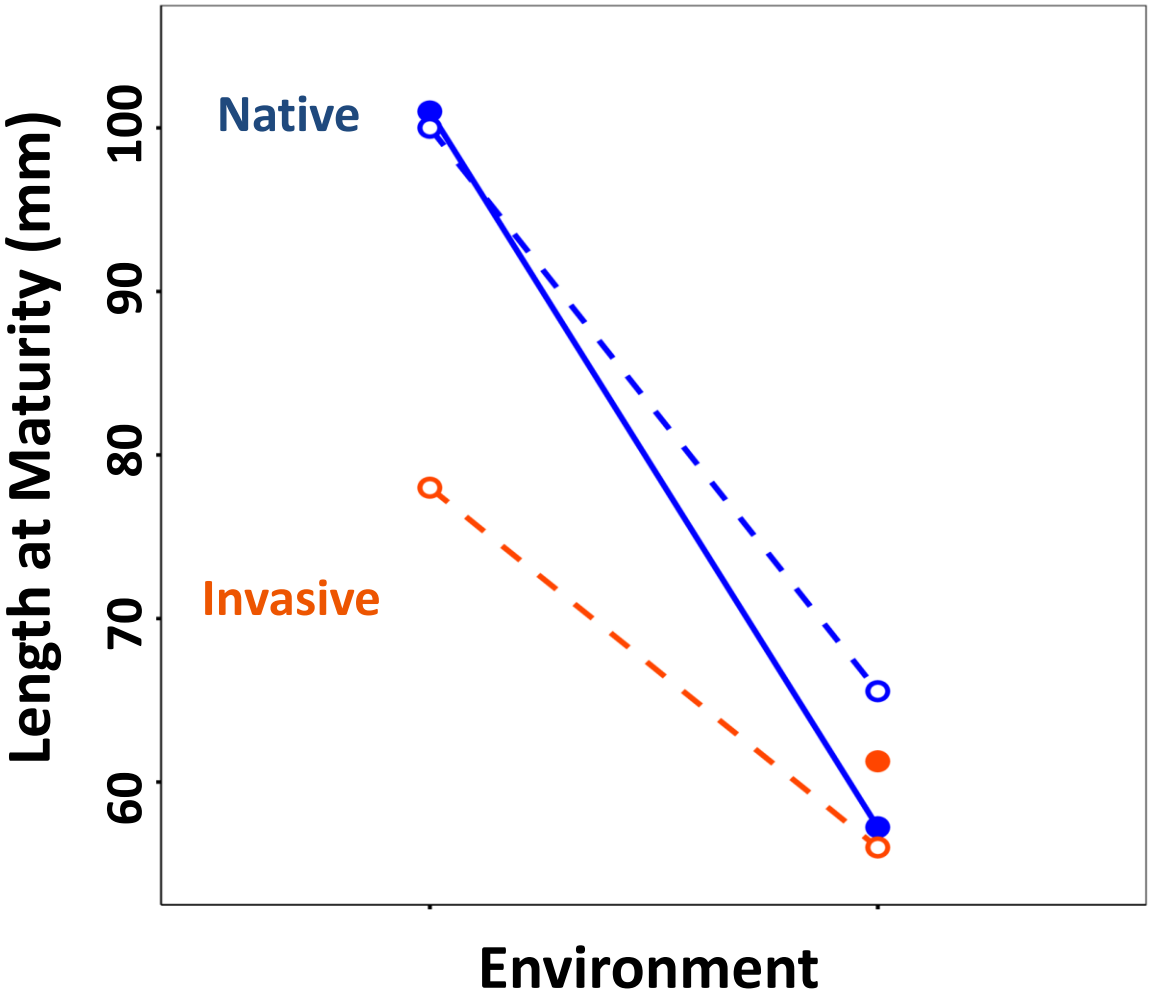


* Length at Maturity (Trippel & Harvey 1987)

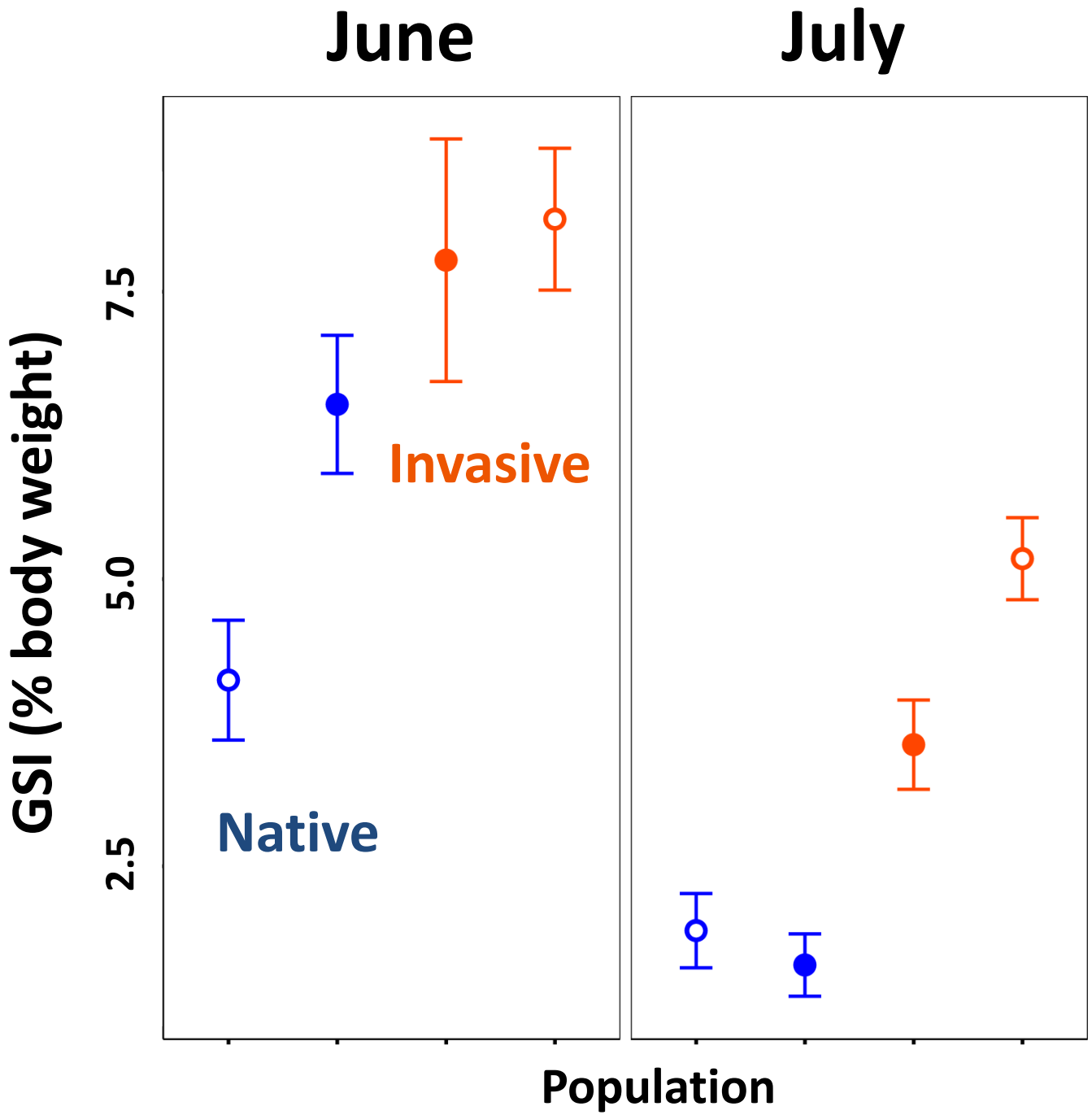
Juvenile Growth
(Length at Age 2)

Length at Maturity

WILD **PONDS**



	WILD		PONDS	
	Native	Invasive	Native	Invasive
Juvenile Growth (Length at Age 2)	→ Faster		=	
	Phenotypic ?			
Length at Maturity	→ Smaller		=	
	Phenotypic ?			
Reproductive Investment				

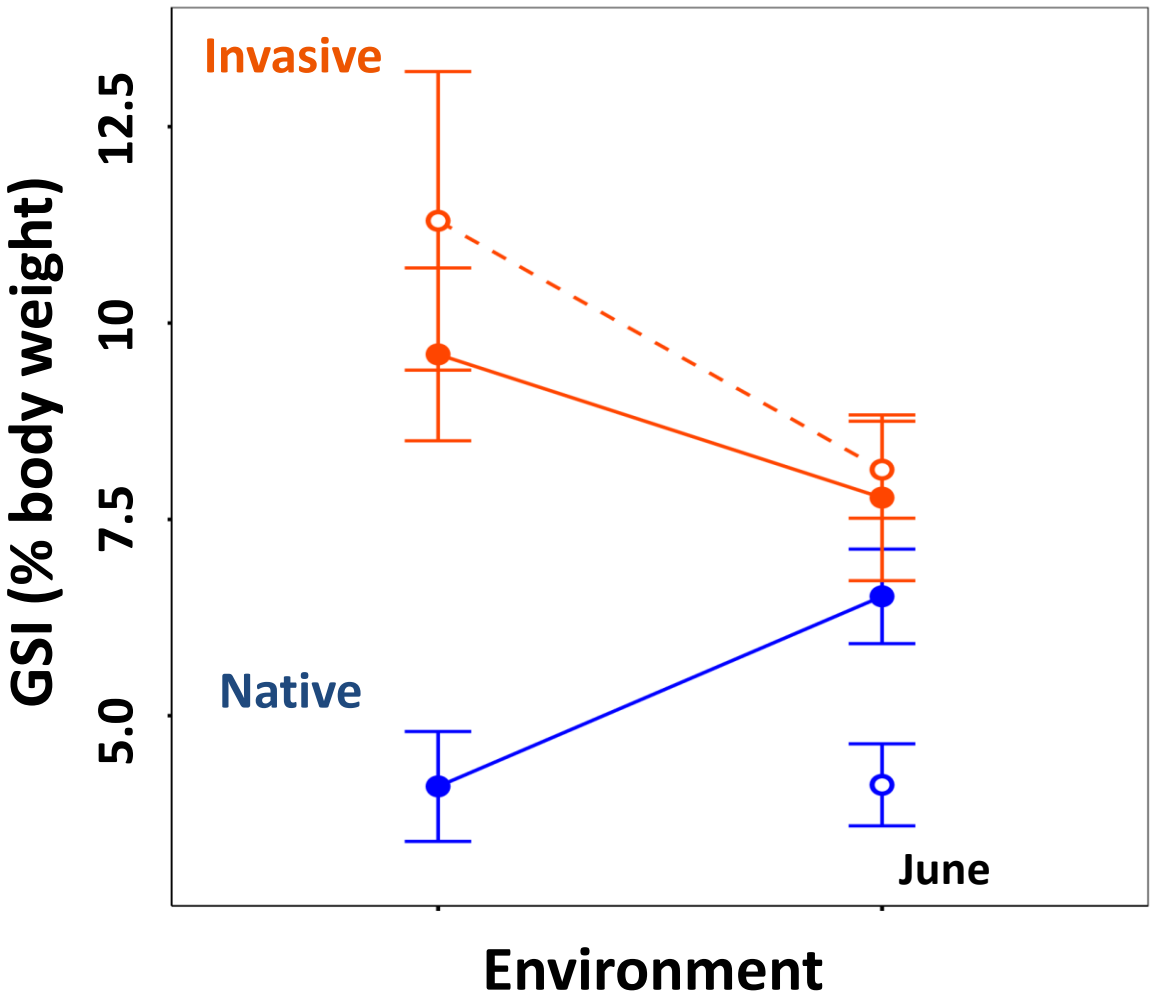

June
July
GSI (% body weight)
7.5
5.0
2.5
Invasive
Native
Population

Juvenile Growth
(Length at Age 2)

Length at Maturity

Reproductive Investment

WILD **PONDS**



	WILD		PONDS	
	Native	Invasive	Native	Invasive
Juvenile Growth (Length at Age 2)	→ Faster		=	
	Phenotypic			
Length at Maturity	→ Smaller		=	
	Phenotypic			
Reproductive Investment	→ Greater		→ Greater	
	Partially Genetic ?			

*Fox et al 2007

IN THE WILD

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Phenotypic or Genetic?

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University of Girona, Spain

Looking for a Postdoc in 2017? Let's talk!
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Ontario

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