

Does size really matter?

The optimum release size of rainbow trout fry
for small BC lakes



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Freshwater Fisheries
Society of BC

Outline

- Objective
- Management Uses
- Background
- Methods
- Results



Successful Stocking

- Species/ Strain
- **Stocking Size**
- Stocking Density
- Time of release



Objective

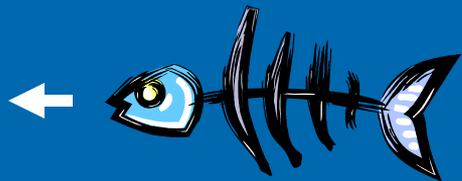
Observations: Survival of fry in lakes is highly variable

Problem: Variable fishery as a result of poor fry survival; increased demands for larger fish; unhappy anglers

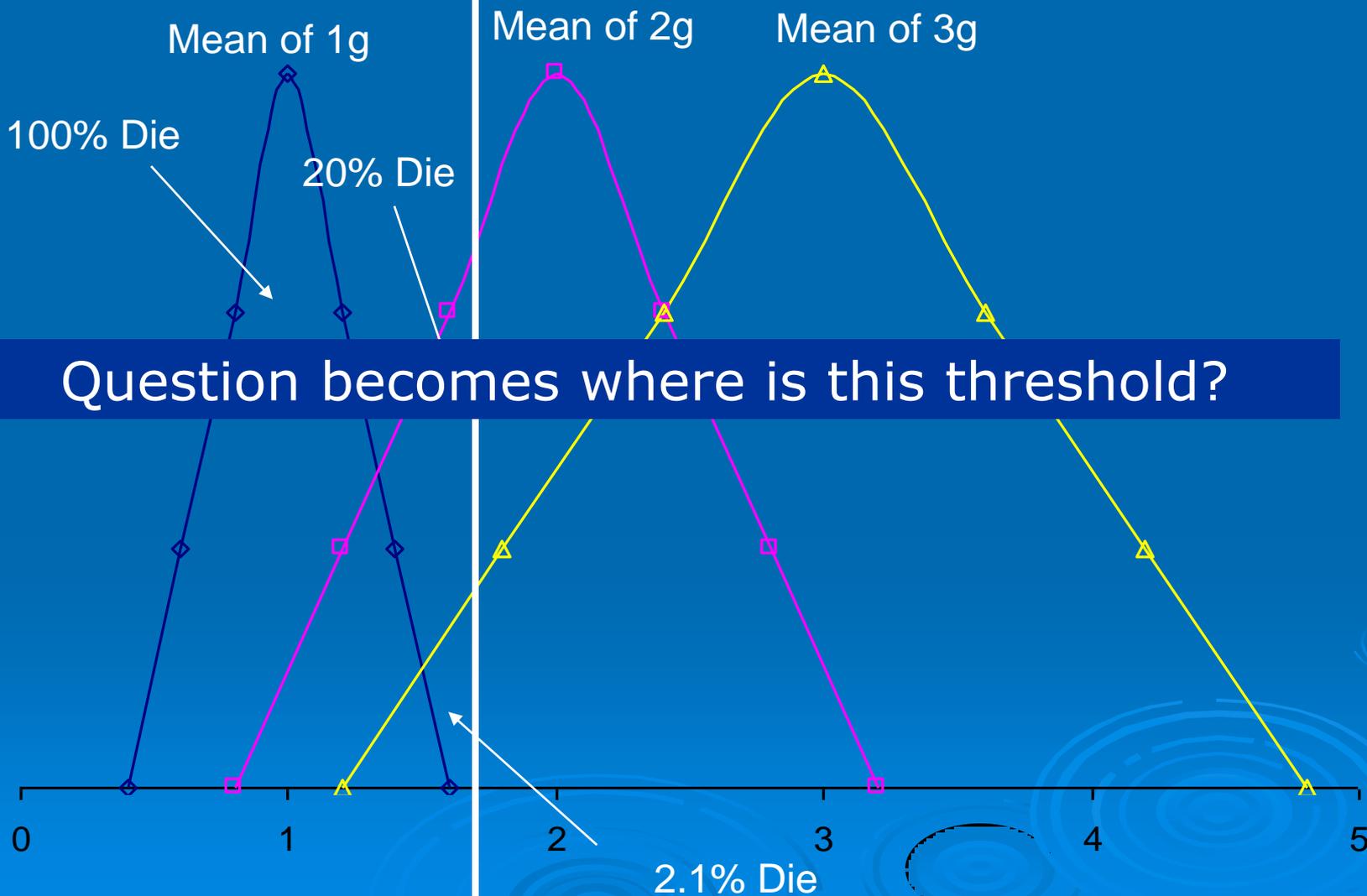
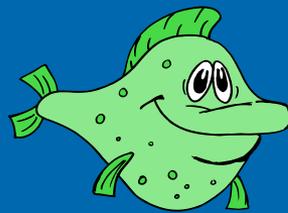
Solution: Determine optimum release size; survival increases; less pressure on hatcheries to produce yearlings & yearlings

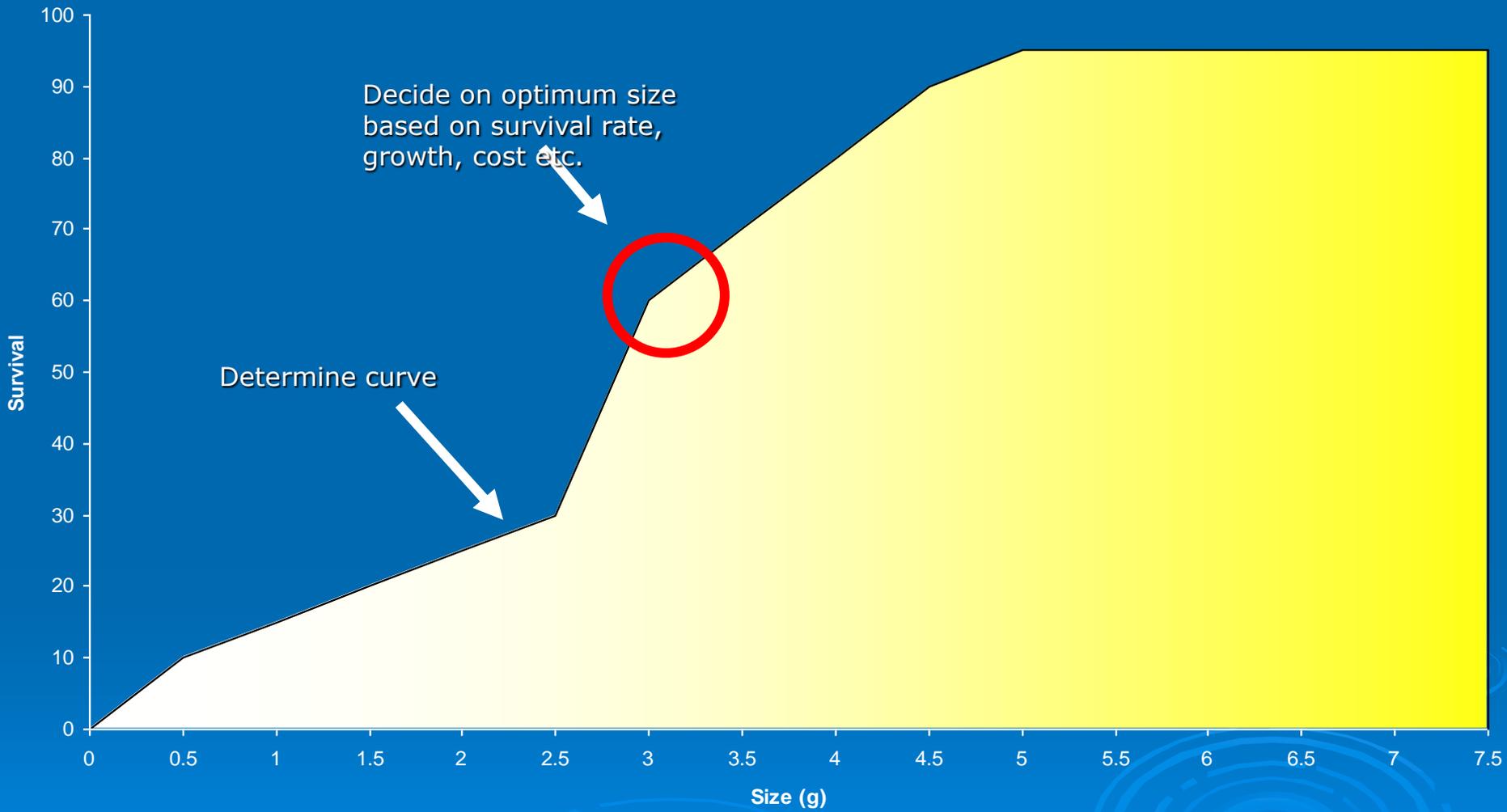
Result: Better fishery and happy anglers





Survival Threshold





NOTE: This is for visual purposes only – does not contain real data.

Background

- Barriers to survival:
 - Overwintering
 - Predation
- Both of these factors can be limited by increased size



Background

- Stringer (1980) – Relative Survival

Fry (0.2g): **Fall Fry** (~1g): Yearling (~10g)

10 : 2 : 1

- Biro et al. (2004) – Minimum Survival Size

50mm = ~1.32-1.5g

- Lea (2011) – Between Strain (PN & BW)

Fry (~0.3g): **Fall Fry** (0.66-0.85g)

PN > BW for survival



Experimental Design

Pennask 2n RB

Blackwater 2n RB

Lake 1
M&R
Spring Sample

1 g
2 g
3 g

2 g
3 g
5 g

Lake 5
M&R
Spring Sample

Lake 2

1 g
2 g
3 g

2 g
3 g
5 g

Lake 6

Lake 3

Fry
Vs
YE

Fry
Vs
YE

Lake 7

Lake 4

Fry
Vs
YE

Fry
Vs
YE

Lake 8



Method

Matching Sizes

1 – Fish put on growth curve for desired weight

Prior to Stocking (within one week):

2 – Each size group subsampled to determine variance

3 – Fish hand measured for select length

4 – Each size group subsampled to determine final level of variance

5 – Fish Clipped

6 – Fish Stocked



Experimental Design

Pennask 2n RB

Taylor
4 ha



Lodestone
3.9 ha



Clarke 2
4.6 ha



Clarke 3
5.6 ha



Blackwater 2n RB



Pete's
Pothole
2.3 ha



Crater
Pothole
3.3 ha



Cigar
3.8 ha



Bluey
Pothole 2
1.5 ha



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Method

In-Lake Assessments:

- 1 – One PN and One BW sampled in spring for lipids and survival
- 2 – All lakes netted with equal mesh/ ha for two nights in September
 - a) Total fishing time
 - b) Clip, length, weight (relative survival)
 - c) General growth within lake



Spring Sampling

Objective: small subsample of each group to measure lipid content after winter.

Results:

- Representatives from all sizes were captured
- Small sampling but showed no significant difference in survival.
- Lipid levels yet to be analyzed



Fall Sampling

	Pennask				Blackwater			
	Taylor	Lodestone	Clarke 2	Clarke 3	Pete's Pothole	Crater Pothole	Cigar	Bluey Pothole 2
Avg Size (g)	22.5	32.7	39.7	39.1	152.5	0	54.0	321.7
Total Catch	683	556	909	327	135	0	732	105
Age 1+ Fish	41	353	600	164	117	0	470	105
CPUE	0.72 / 4.22*	5.14	~3.50	1.55	1.04	0	4.07	1.86
Size ratio	X: 2.8 : 5.8	X: 3.5 : 11			1 : 1.6 : 1.5	-		
Fry to YE ratio			1 : 1.6	1 : 2.3			1:1	0 : 1



* Includes Redside Shiners
 ** Equal amount of mesh/ ha

BUT gillnet selectivity for smallest group – Yet to be fully accounted for



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Preliminary Results

Fry vs Fry

The greatest increase in survival is between 2 and 3g for both BW and PN

Fry vs YE

PN have ~50% higher survival rate when stocked as yearlings

Overall survival quite variable between lakes
(btwn 0 - ~90%)



Results

- 65,000 fish sorted
- 45,000 fish clipped & stocked
- 1,600 hrs of fishing effort in 8 lakes
- 3568 fish captured and evaluated

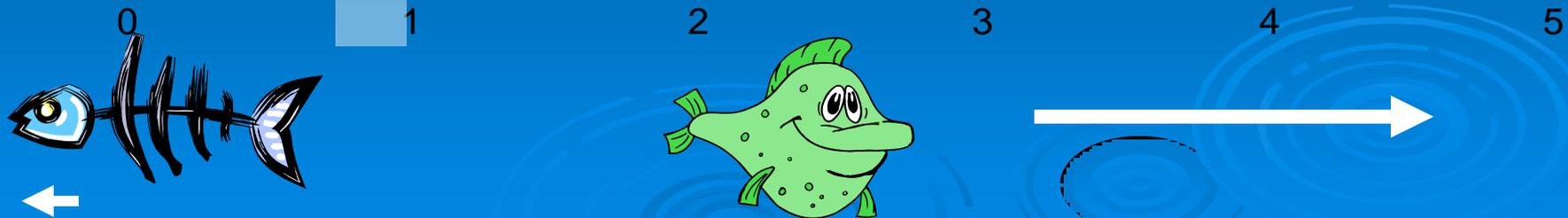


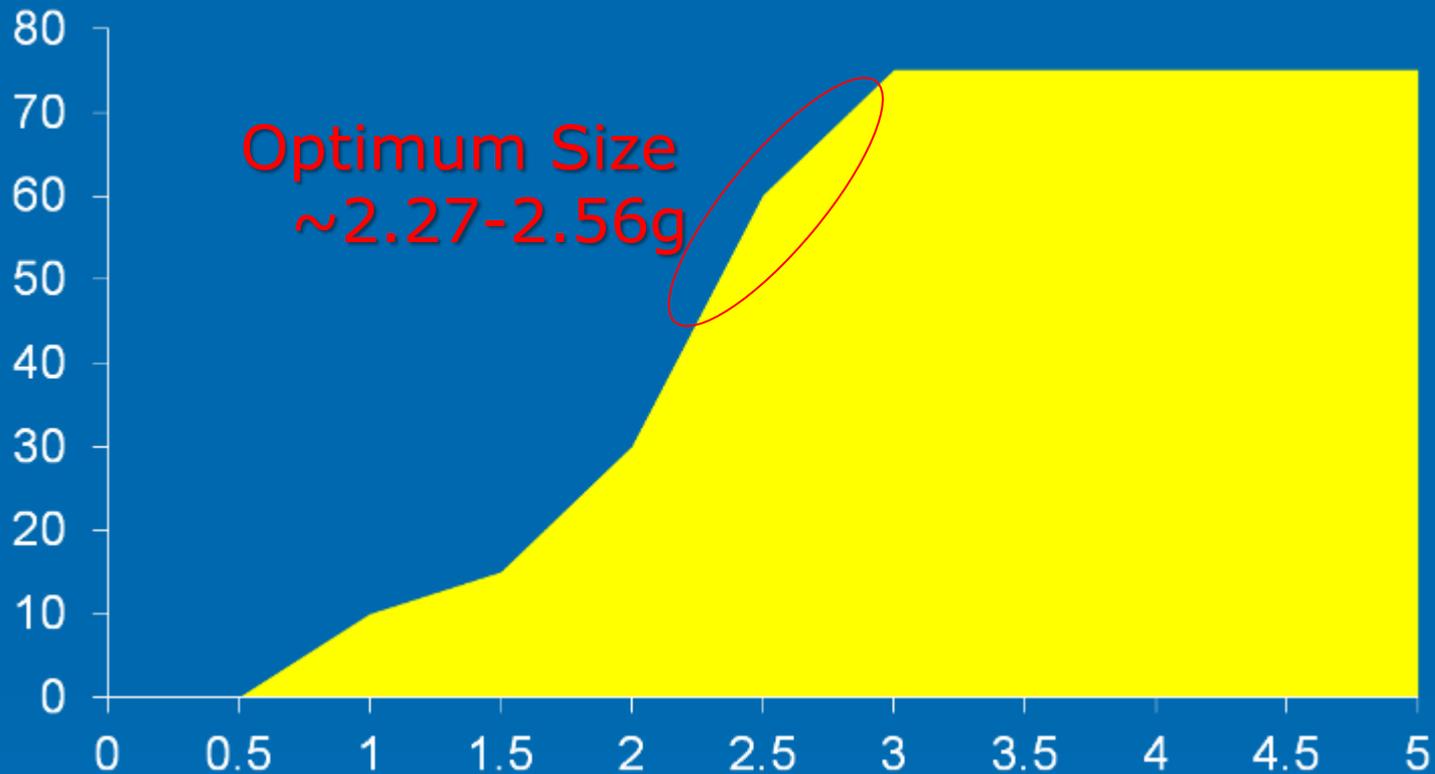
Size Matters !



Survival Threshold

$0.89g \pm 0.09$
Pennask RB





Still need to incorporate growth, cost, fisheries management objective to finalize the 'optimum size' for each lake



Thanks!

Summerland & Fraser Valley Trout Hatchery



Questions ?



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