



Freshwater Fisheries Society of BC

gofishbc.com

NWFCC 2012

**ADVANCED AND OUT-OF-SEASON
SPAWNING IN RAINBOW TROUT**



Freshwater Fisheries Society of BC

gofishbc.com



FFSBC

- Recreational fisheries supplier for BC
- Operations
 - 5 hatcheries throughout the province
 - Wild and Domestic strains
- Other Divisions
 - Science
 - Sport Fishing Development
 - Corporate Services
- Conservation and enhancement activities



FFSBC Brood

- Numerous wild-sourced stocks
 - Stocking rural and wilderness lakes
- One domestic stock
 - “Fraser Valley” Rainbow Trout
 - Supports our urban stocking programme
 - Fast growing, good fighters
 - Captive breeding programme



Captive Broodstock

- Named 'Fraser Valley Rainbow; FVRB'
- 20+ generations in captivity
- Fall-spawning
- 3 & 4 yr olds used
- Breeding plan used for genetic diversity



FVRB Catchable Stocking



- FVRB used to supply the catchable program
- Put-and-take fisheries
- L2F, Urban Lakes
- Create immediate fishery after winter kill



Freshwater Fisheries Society of BC

gofishbc.com

FVRB Culture Cycle

- 13 – 18 month culture cycle
- Release size 225g (~ 1/2 pound)
- Two stocking times: Spring & Fall
- One spawning time Oct - Nov



At Issue

1. Two stocking seasons, one spawning period
2. Different lengths of rearing times
3. Hold back or rush growth
4. Health implications
5. Not cost effective



Ideally

- Advance spawning to produce Fall catchables
- Out-of-season spawning to produce Spring catchables
- 14 month rearing cycle for both groups



Solution: Shift Spawning

- Advancing photoperiod = advancing spawning date: **ADV**
- *Really* advancing spawning is out of phase by 6 months: **OS**
- Normal Photoperiod: **NP**



Advanced Photoperiod (ADV)



- 50 – 4 yr old fish
- 40 female + 10 male
- 160LPM, 10-11C
- Fed 0.8% BW/Day
- 18L:6D March 15
- 8L:16D July 15
- Starve as of Aug 1
- Induced Sept 7
- Spawn mid/late Sept



Normal Photoperiod (NP)

- NP throughout rearing and spawning period
- Same rearing conditions
- Same feeding regime



Out of Season (OS)



- After ADV spawning, fish returned to circular
- Continuous 24-hr light from Oct 1 – March 1
- Fed 0.8% BW/Day
- Back to 8L:16D March 1
- Starve as of March 15
- Induced April 10
- Spawned late April



ADV and OS - Induced

- Two groups induced to spawn
- LHRHa Implants
- >85% fish spawn within 14 days
- Compresses & synchronizes
- Fish are culled

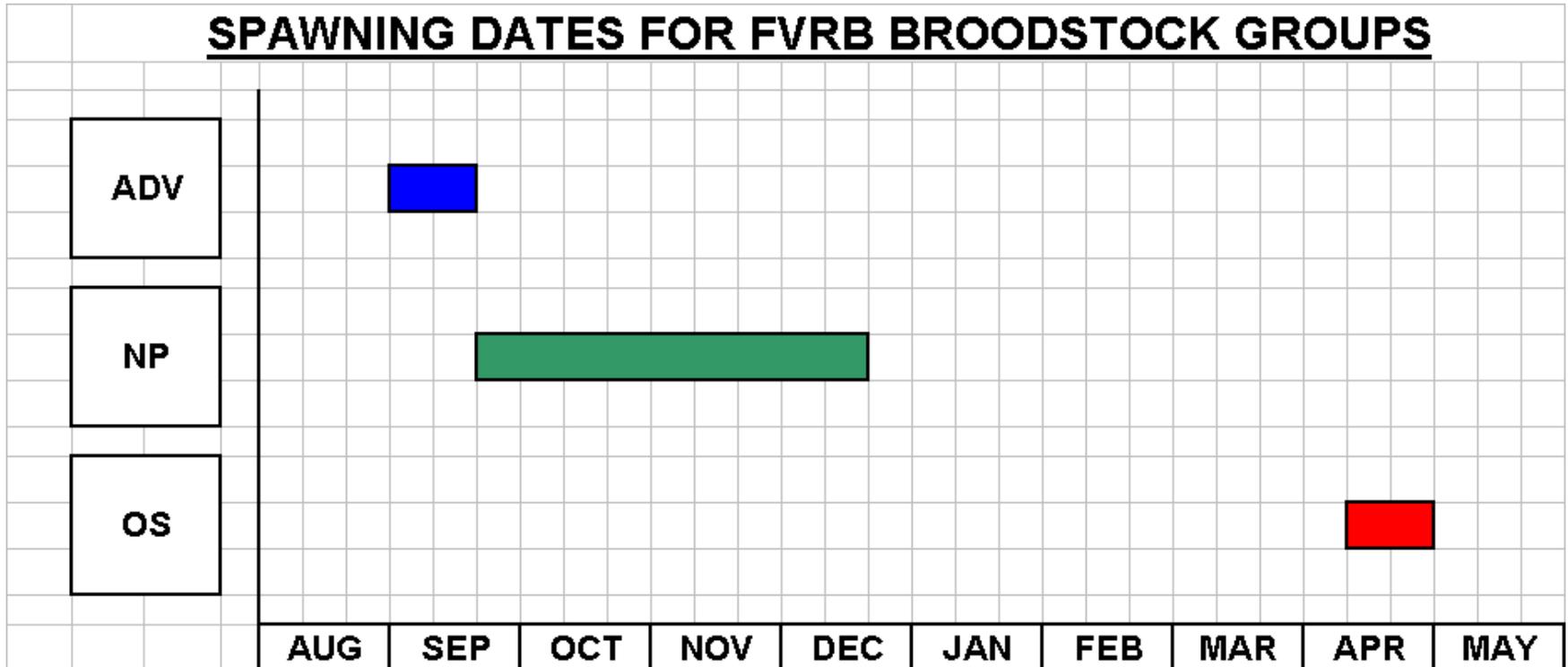


Results

- NP groups spawned Sep 21 – Dec 23
– Peak Oct 28
- ADV spawned Sept 12 – 21
– Peak Sept 18
- OS spawned April 20 – 26
– Peak April 26



Results



Egg Results – All Groups

	ADV	NP	OS
Eyed Eggs	91%	85%	88%
Fry	89%	80%	79%
Round Weight	4.2kg	4.1kg	4.5kg
Fecundity	4,372	4,117	6,300

Note: OS fish were incised; all others were air spawned
12% more eggs (5,500 eggs if air spawned)



Results – ADV Group

- Standard rearing schedule
- >Target Wt (225g)
- Month early
- More angler opportunity, bigger
- Better winter adaptation for fish



Results – NP Group



- No impact on current program
- Situation normal
- Stocked throughout spring and fall



Results – OS Group

- Shipped EE May 29
- Ponded into 5' circ
- 20L:4D; 14h feeding
- 40g by Nov 30
- SGR = 2.5%
- FCR = 0.69
- On target for SCA release at 225g



Results – OS Group contd...



- 4 month cut to rearing cycle
- Transported as eggs, not fish (save \$\$\$)
- Reduced water use
- Reduced labour costs
- Eliminates 'chilling' water
- Improved fish quality



Additional Benefits

- Fecundity of 3 yr brood ~ 3,500 eggs
- Fecundity of 4 yr brood ~ 4,400 eggs
- Spring OS spawn ~ 6,300 eggs
- If we keep a female for 3 spawnings
= 15,000 eggs per female
(over a 18 month period)



This Year

- Repeating the work
- Fish are bigger
- Fecundity is up
- Egg survival is excellent
- Adding a delayed group – long summer



Take Home Message



- Optimized spawning time with photoperiod manipulation
- Synchronized spawning with rearing cycle
- Optimized spawner productivity





Freshwater Fisheries Society of BC

gofishbc.com