NWFCC 2012
ADVANCED AND OUT-OF-SEASON SPAWNING IN RAINBOW TROUT
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
FVRB Culture Cycle

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

SPAWNING DATES FOR FVRB BROODSTOCK GROUPS

- ADV: August
- NP: October to December
- OS: April

Freshwater Fisheries Society of BC
gofishbc.com
## Egg Results – All Groups

<table>
<thead>
<tr>
<th></th>
<th>ADV</th>
<th>NP</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyed Eggs</td>
<td>91%</td>
<td>85%</td>
<td>88%</td>
</tr>
<tr>
<td>Fry</td>
<td>89%</td>
<td>80%</td>
<td>79%</td>
</tr>
<tr>
<td>Round Weight</td>
<td>4.2kg</td>
<td>4.1kg</td>
<td>4.5kg</td>
</tr>
<tr>
<td>Fecundity</td>
<td>4,372</td>
<td>4,117</td>
<td>6,300</td>
</tr>
</tbody>
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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