Differences in Fishery Selectivity on Male and Female Snake River Fall Chinook Salmon

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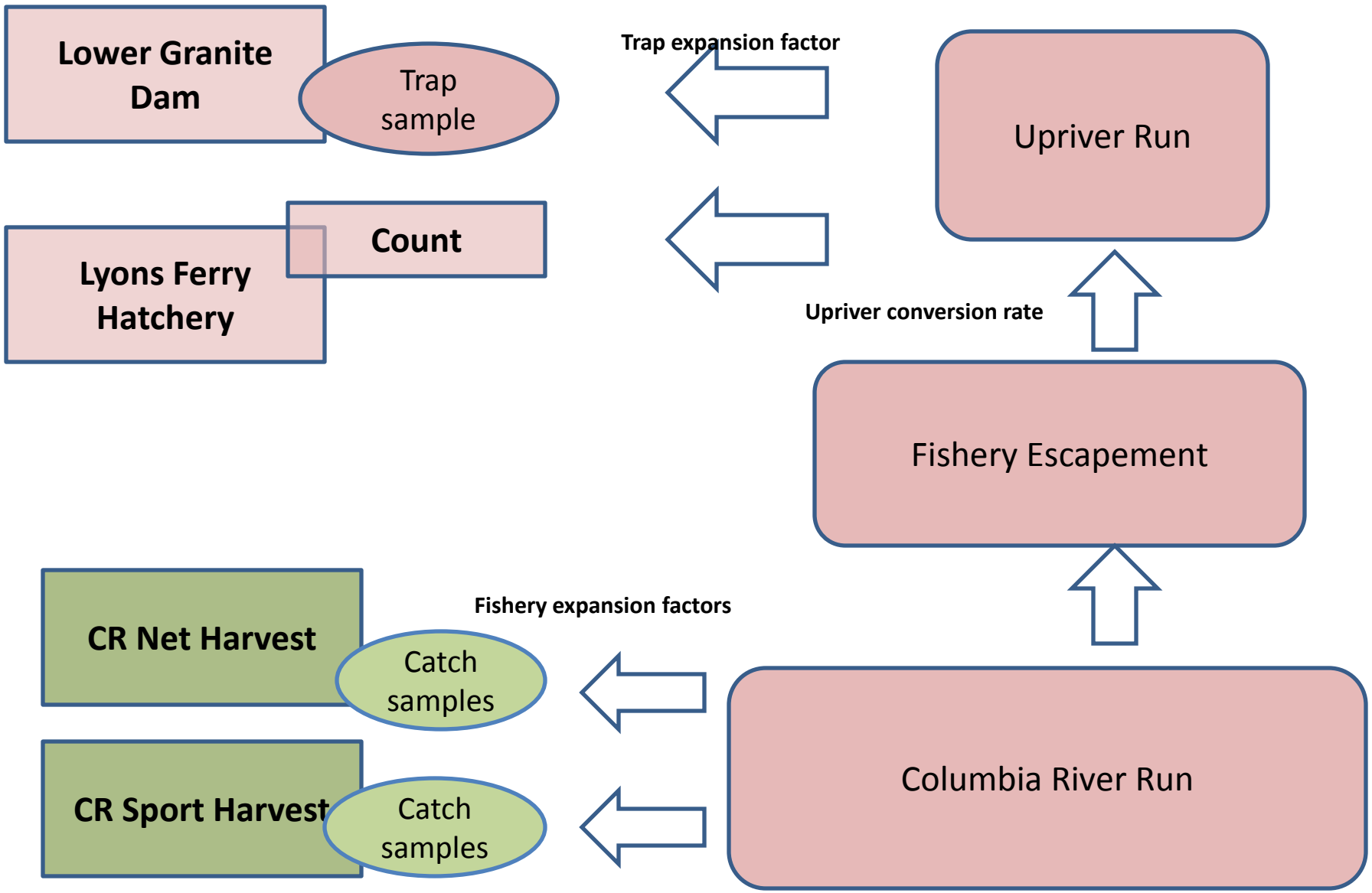
Background

- ICTRT viability criteria includes assessment of selective impacts
  - Emphasis on quantitative metrics
- Approach: Contrast length frequency distributions of selected origin cwt returns in fisheries with representative samples of run after fisheries or hatchery returns

Requirements

- Hatchery or natural origin marking program with cwt groups applied across consecutive years
- Representative sampling in fisheries
- Representative sampling of escapement past fisheries
- Sufficient number of recoveries in fishery, escapement

Run Year Estimation

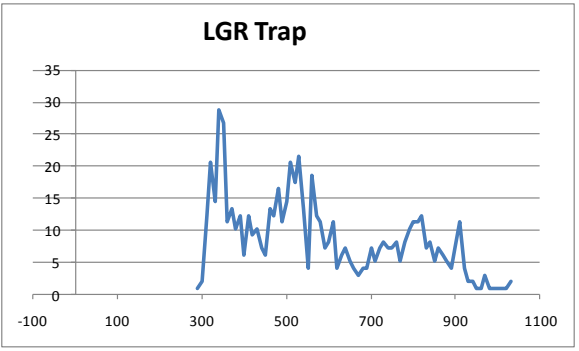


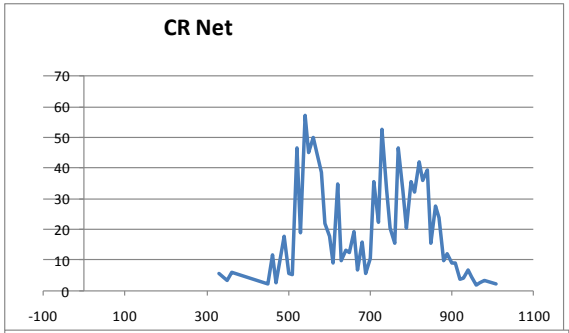
	LGR Trap			Past LGR			RUN TO LGR		
	Adults	Jack(<53)	Total	Adults	Jack(<53)	Total	Ad	Jack(<53)	Total
2000			2,833				**3,635**	**6,947**	**10,582**
2001	2,469	750	3,219	5,070	3,810	8,880	**7,539**	**4,560**	**12,099**
2002	1,841	362	2,203	7,831	4,334	12,165	**9,672**	**4,696**	**14,368**
2003	487	265	752	8,422	5,594	14,016	**8,909**	**5,859**	**14,768**

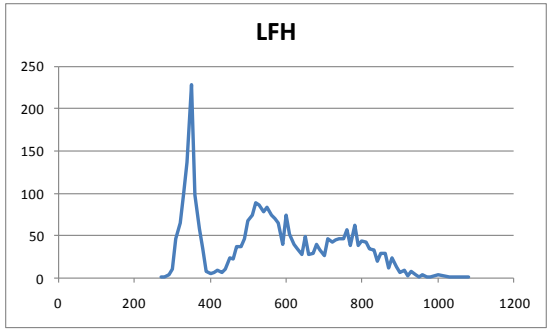
	Sampling Rate		
	Adult	Jack(<53)	Total
2000	*0.27*	*0.27*	**0.27**
2001	0.33	0.16	0.27
2002	0.19	0.08	0.15
2003	*0.05*	*0.05*	**0.05**

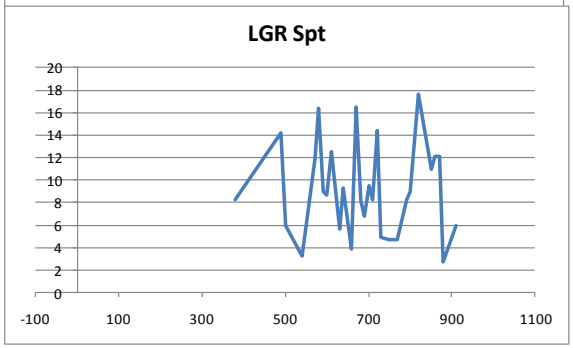
Source:	***2000***	Table 1: 2001 WDFW LFH Fall Chinook LSRCP Rept
	2001	Table 44: 2001-2002 WDFW LFH Fall Chinook LSRCP Report
	2002	Table 46: 2001-2002 WDFW LFH Fall Chinook LSRCP Report
	2003	Table 29: 2003-2004 WDFW LFH Fall Chinook LSRCP Report

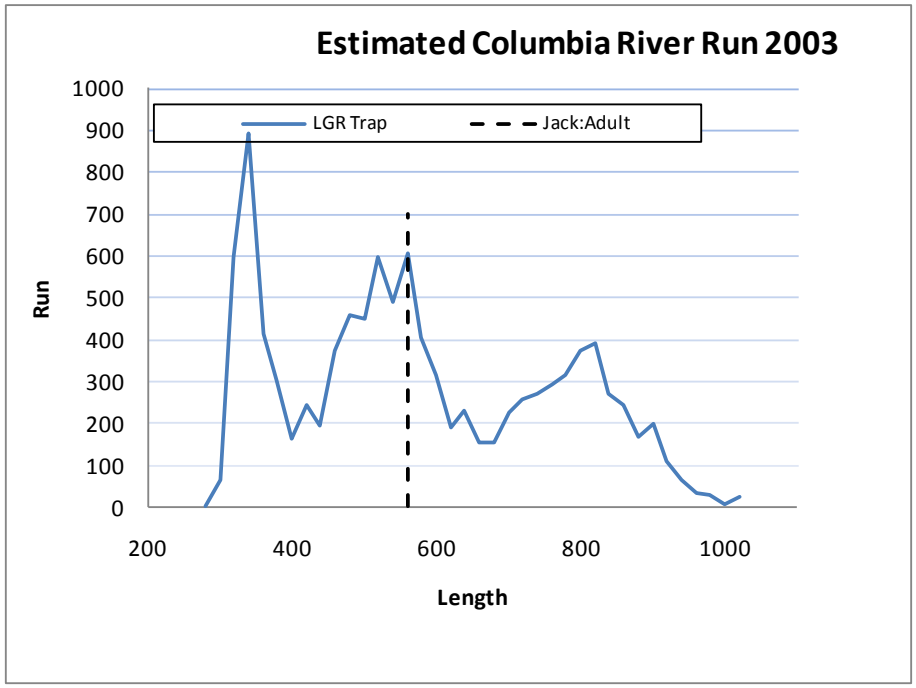
Conversion Rates	TAC Rept	per dam	Five Dams
2000	0.59	0.93	0.69
2001	0.45	0.89	0.57
2002	0.78	0.97	0.84
2003	0.68	0.95	0.76

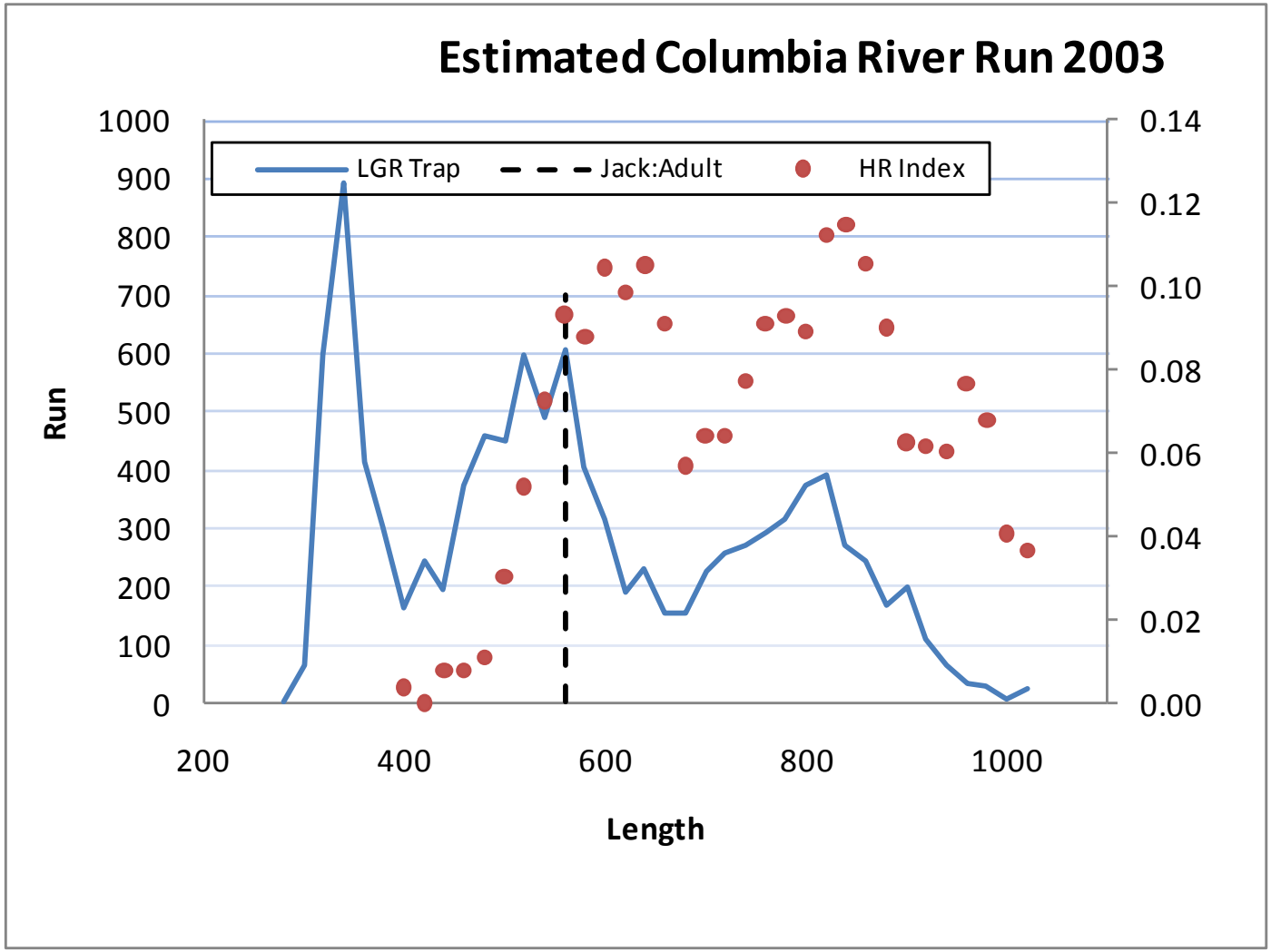

LGR Trap
35
30
25
20
15
10
5
0
-100
100
300
500
700
900
1100

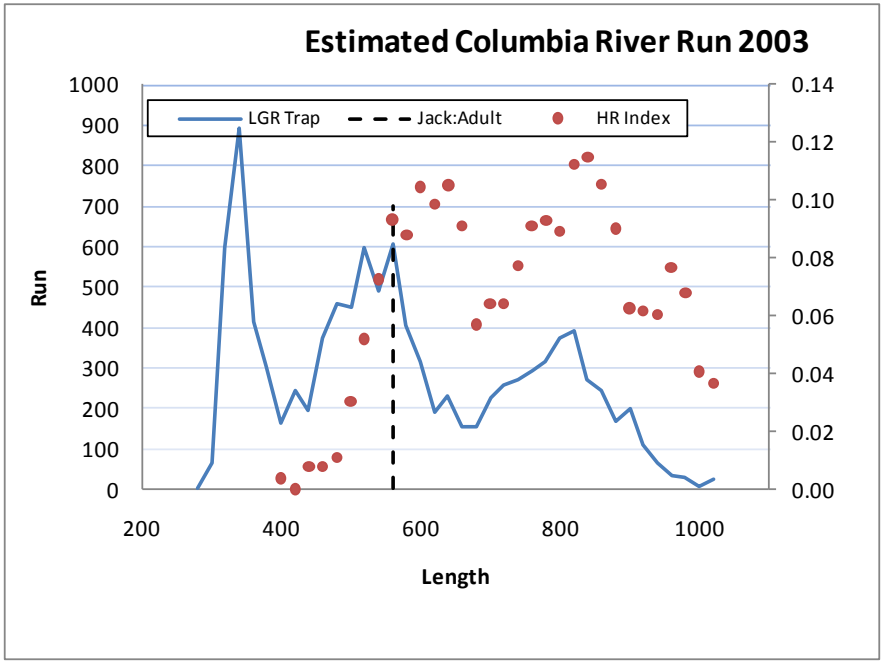

CR Net
70
60
50
40
30
20
10
0
-100
100
300
500
700
900
1100

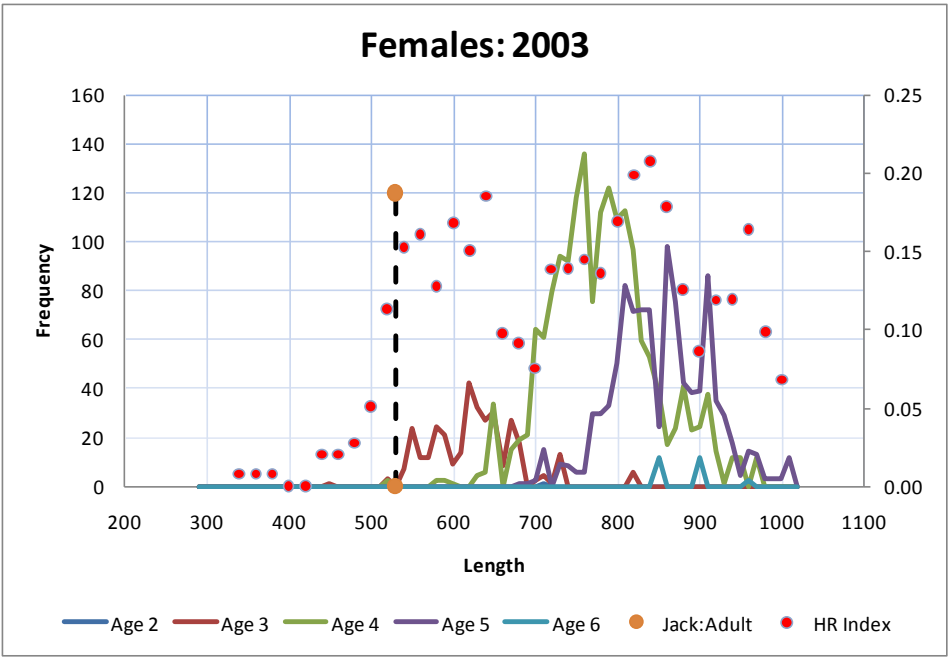

LFH
250
200
150
100
50
0
0
200
400
600
800
1000
1200

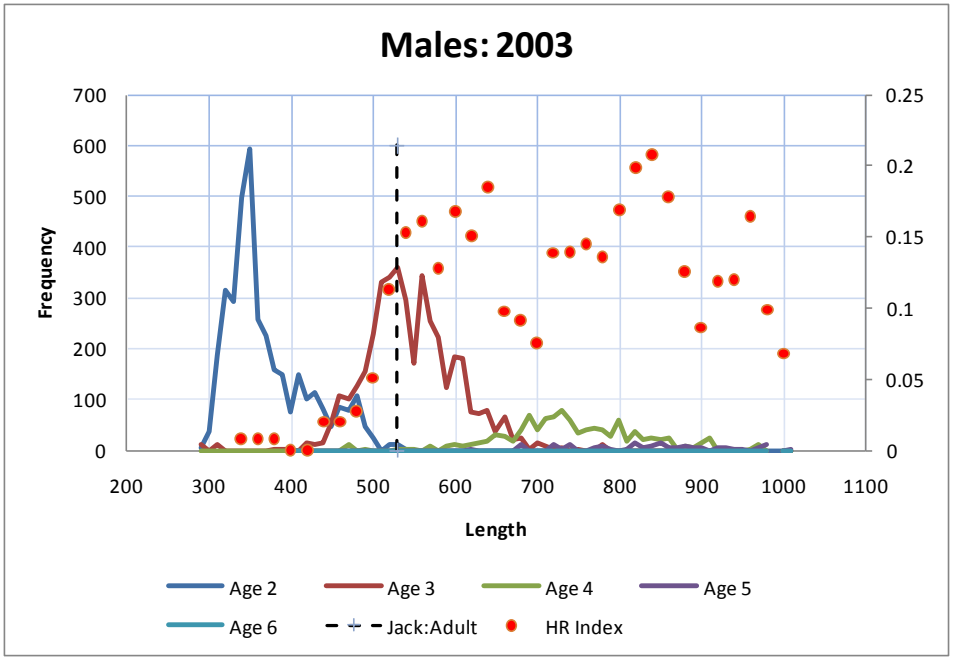

LGR Spt
20
18
16
14
12
10
8
6
4
2
0
-100
100
300
500
700
900
1100

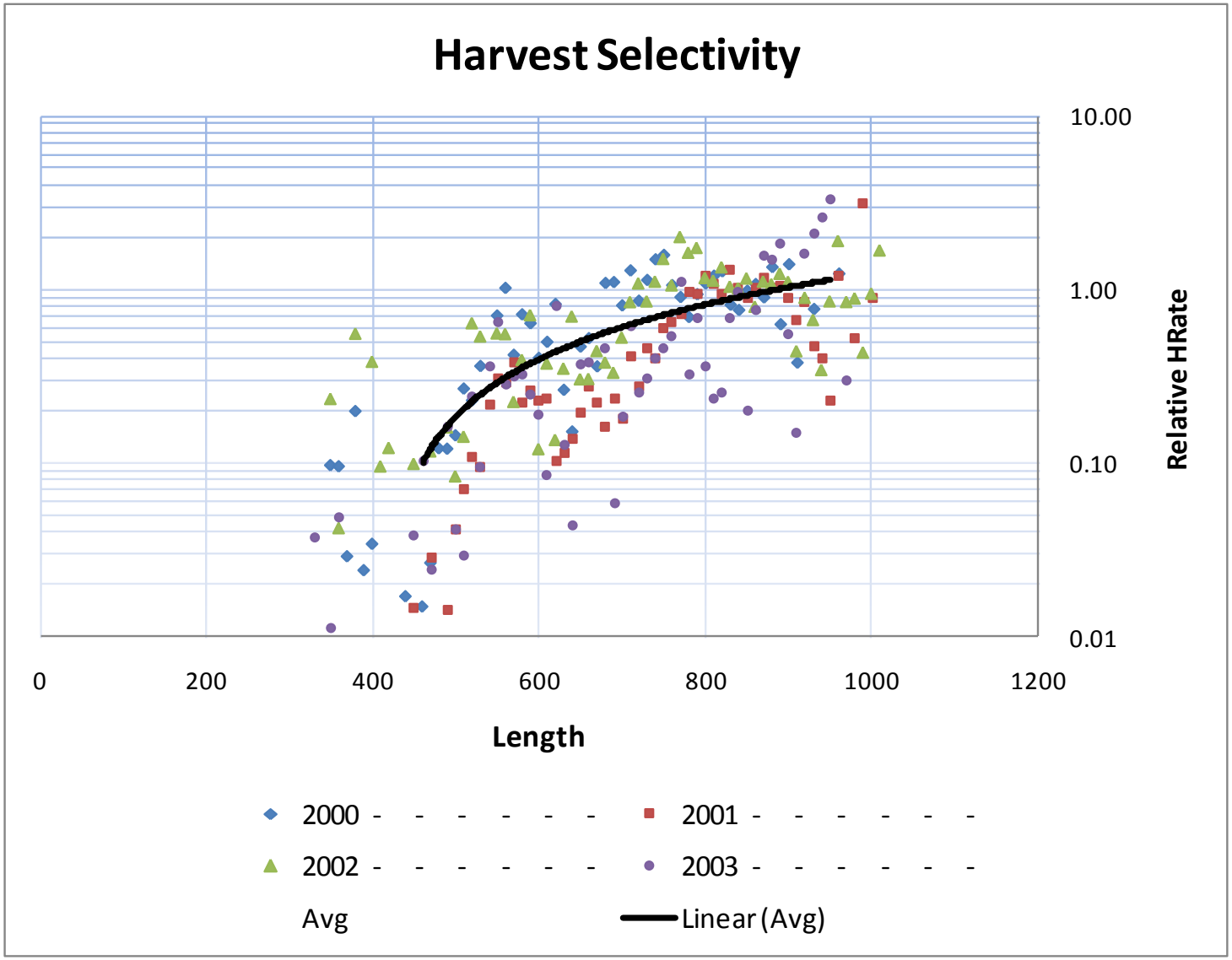

Estimated Columbia River Run 2003
LGR Trap
Jack:Adult
Run
1000
900
800
700
600
500
400
300
200
100
0
200
400
600
800
1000
Length


Estimated Columbia River Run 2003
LGR Trap
Jack:Adult
HR Index
Run
Length
1000
900
800
700
600
500
400
300
200
100
0
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
200
400
600
800
1000


Estimated Columbia River Run 2003
LGR Trap
Jack:Adult
HR Index
Run
Length
1000
900
800
700
600
500
400
300
200
100
0
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
200
400
600
800
1000


Females: 2003
Frequency
Length
160
140
120
100
80
60
40
20
0
0.25
0.20
0.15
0.10
0.05
0.00
200
300
400
500
600
700
800
900
1000
1100
Age 2
Age 3
Age 4
Age 5
Age 6
Jack:Adult
HR Index

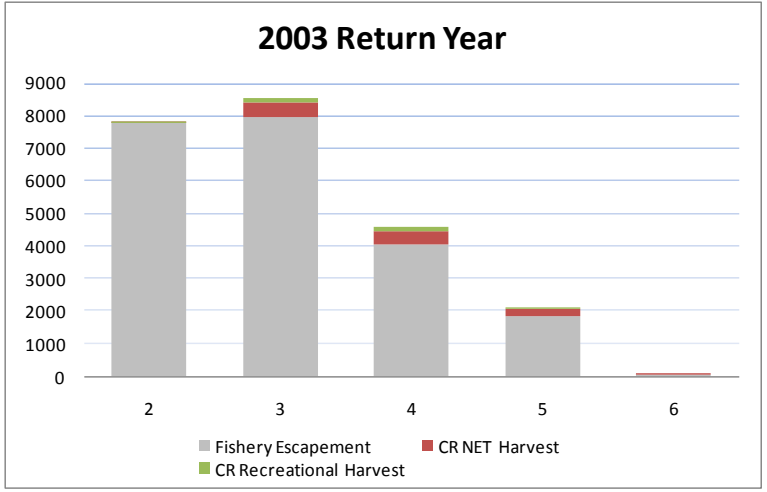

Males: 2003
Frequency
Length
700
600
500
400
300
200
100
0
0.25
0.2
0.15
0.1
0.05
0
200
300
400
500
600
700
800
900
1000
1100
Age 2
Age 3
Age 4
Age 5
Age 6
Jack:Adult
HR Index

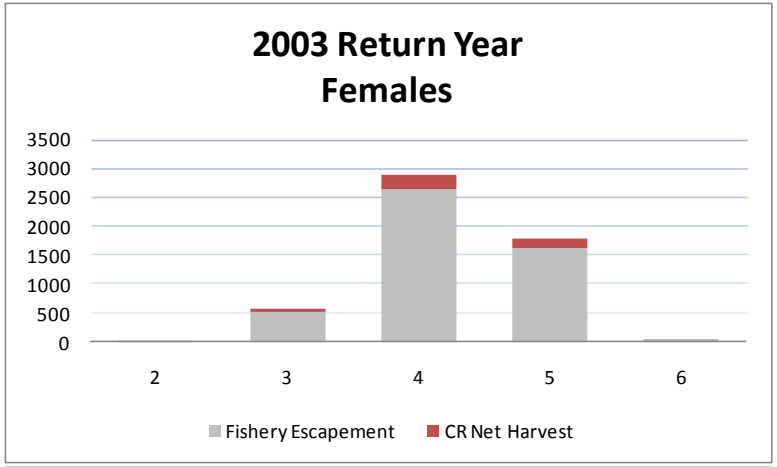

Harvest Selectivity
10.00
1.00
0.10
0.01
Relative HRate
0
200
400
600
800
1000
1200
Length
2000
2001
2002
2003
Avg
Linear (Avg)

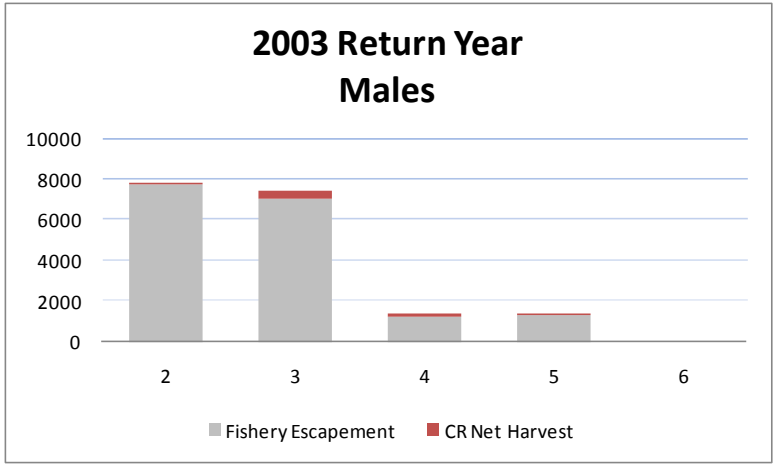
Estimated Harvest Rates by age

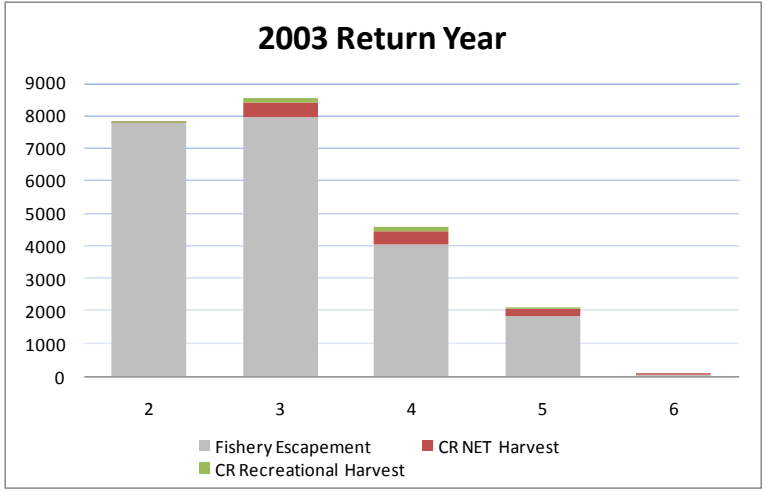
Males ONLY	Ages			
	2	**3**	**4**	**5**
2000	0.01	0.09	0.21	0.14
2001	0.00	0.03	0.43	0.10
2002	0.01	0.02	0.19	0.03
2003	0.00	0.05	0.13	0.05
Average	**0.01**	**0.05**	**0.24**	**0.08**

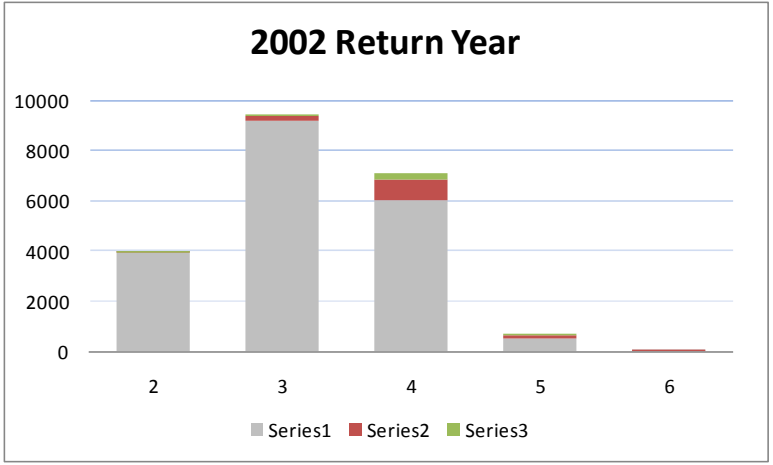
Females ONLY	Ages			
	3	**4**	**5**	**6**
2000	0.13	0.14	0.10	0.08
2001	0.05	0.28	0.25	0.25
2002	0.03	0.11	0.20	0.21
2003	0.09	0.09	0.09	0.00
AVERAGE	**0.08**	**0.15**	**0.16**	**0.14**

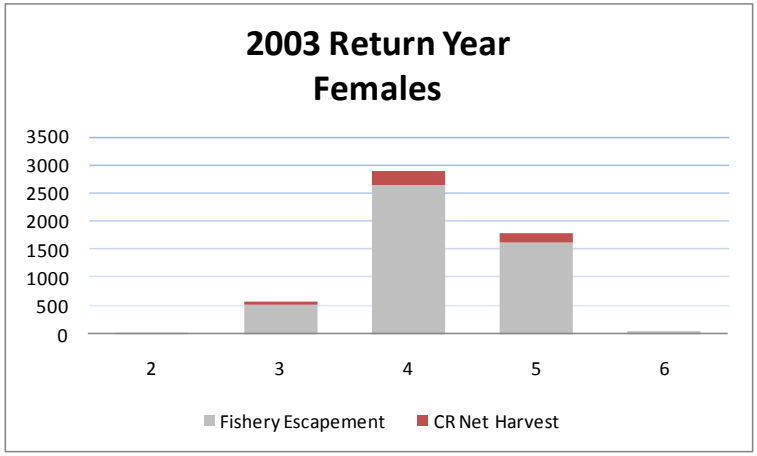

2003 Return Year
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2
3
4
5
6
Fishery Escapement
CR NET Harvest
CR Recreational Harvest

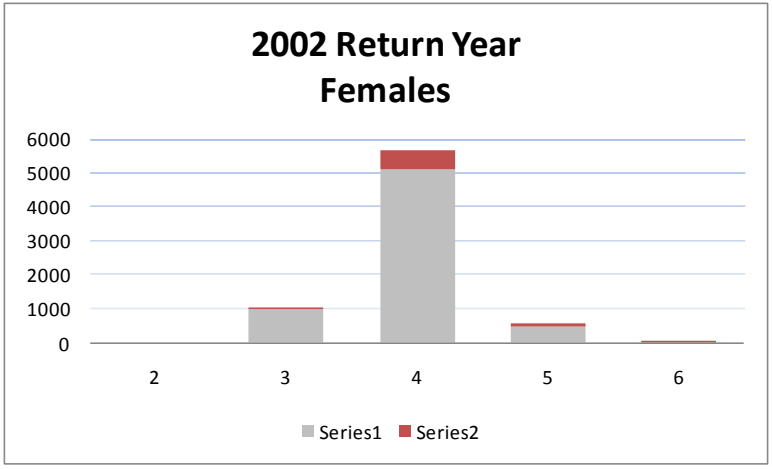

2003 Return Year
Females
3500
3000
2500
2000
1500
1000
500
0
2
3
4
5
6
Fishery Escapement
CR Net Harvest

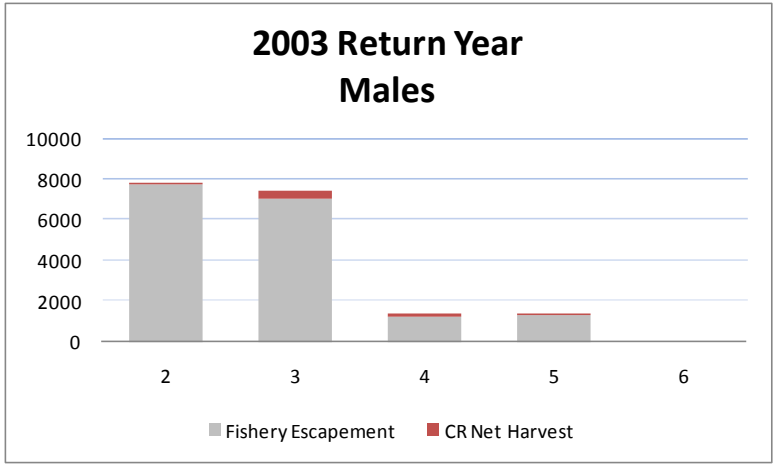

2003 Return Year
Males
10000
8000
6000
4000
2000
0
2
3
4
5
6
Fishery Escapement
CR Net Harvest

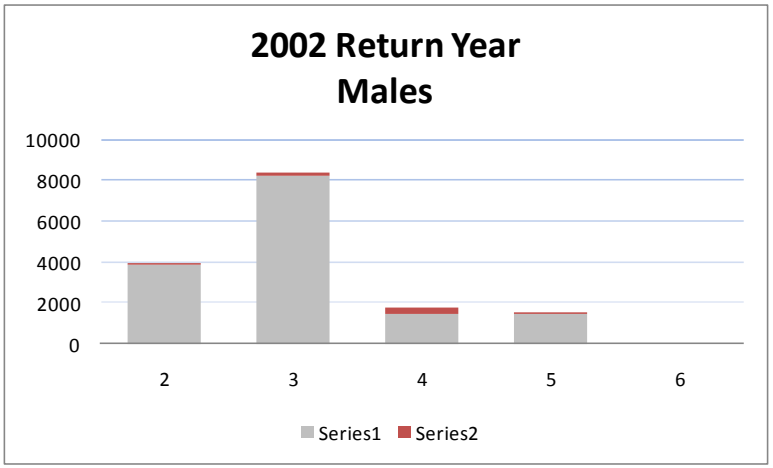

2003 Return Year
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2
3
4
5
6
Fishery Escapement
CR NET Harvest
CR Recreational Harvest


2002 Return Year
10000
8000
6000
4000
2000
0
2
3
4
5
6
Series1
Series2
Series3

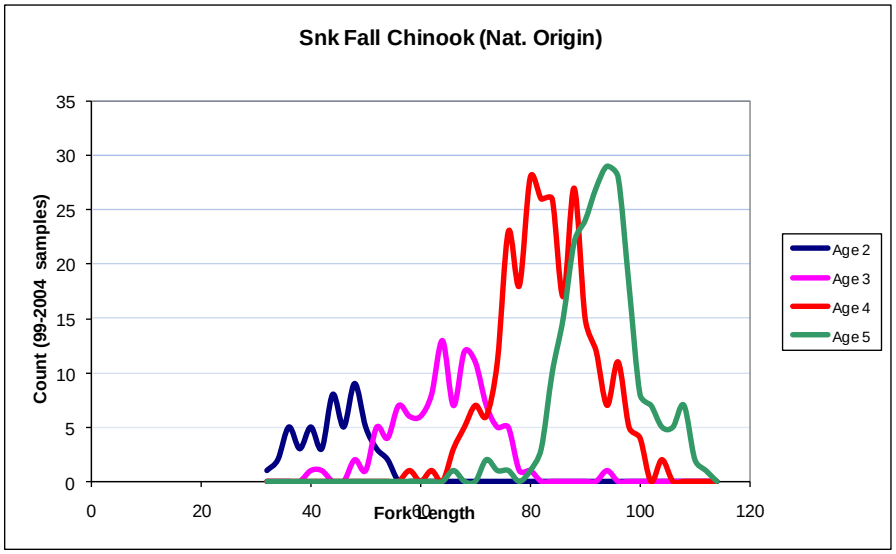

2003 Return Year
Females
3500
3000
2500
2000
1500
1000
500
0
2
3
4
5
6
Fishery Escapement
CR Net Harvest

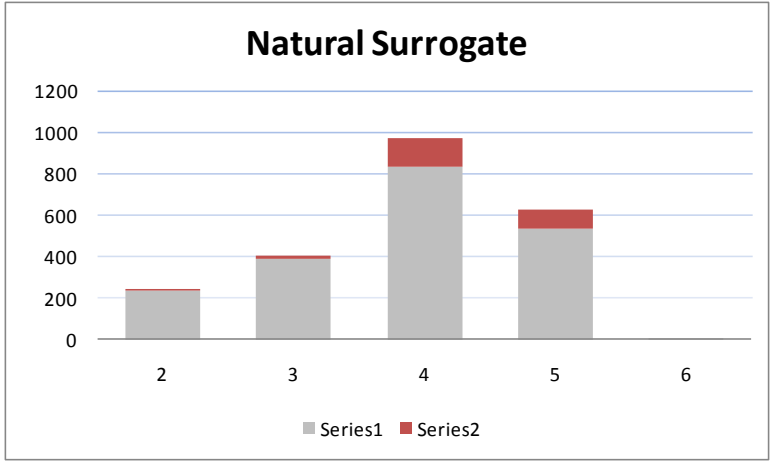

2002 Return Year
Females
6000
5000
4000
3000
2000
1000
0
2
3
4
5
6
Series1
Series2

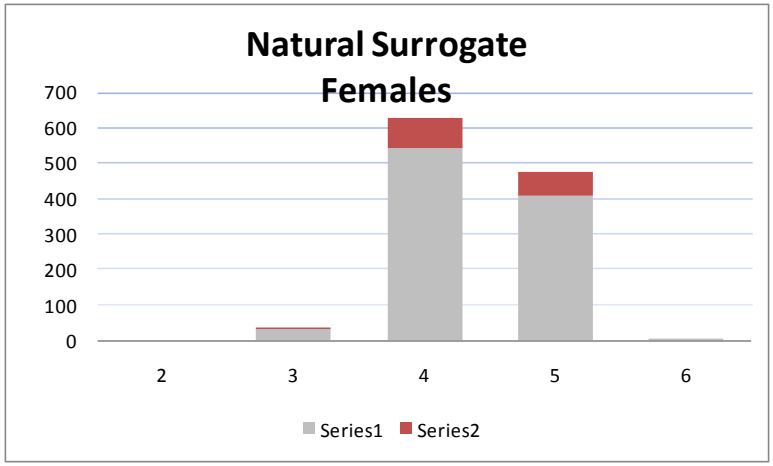

2003 Return Year
Males
10000
8000
6000
4000
2000
0
2
3
4
5
6
Fishery Escapement
CR Net Harvest

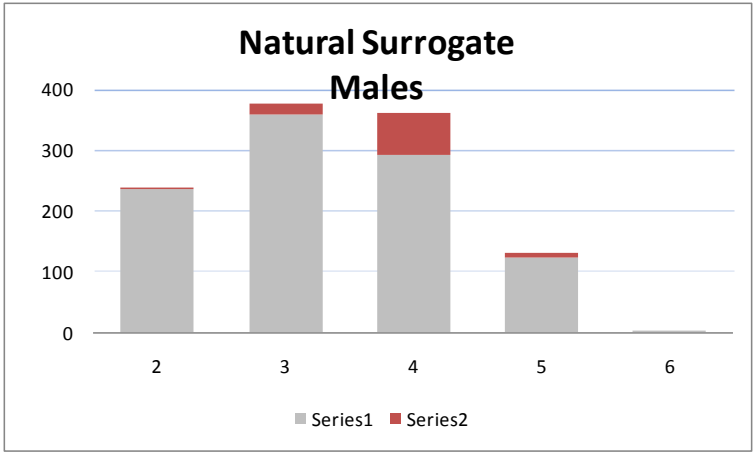

2002 Return Year
Males
10000
8000
6000
4000
2000
0
2
3
4
5
6
Series1
Series2

Applying average harvest rate
At age to natural age structure









Summary

- Reminder: This analysis is limited to in-river impacts
- Relatively consistent general pattern of selectivity with length, considerable variation around basic pattern among years – variations in fisheries, sampling error, etc.
- Translates into systematic differences in harvest impacts by age.
- Similar harvest impacts at age for male and female returns
- Impact on relative age composition greatest for males