

FWS COLUMBIA RIVER 2012 CHINOOK MASS MARKING

1/6/2012

Species: Chinook
Area: Columbia River
Brood: 2011
Release Year: 2012 and 2013
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	405,000	405,000	9,690,000	0	10,500,000	Y	Y	
FWS	Little White Salmon NFH	Spring Creek - Tule Falls	200,000	0	1,500,000	0	1,700,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	1,500,000	0	1,700,000	Y	Y	YN-Prosser release
Total Fall Chinook			1,005,000	605,000	14,290,000	0	15,900,000			
FWS	Entiat NFH	Entiat - Summers 1+	200,000	0	200,000	0	400,000	Y	Y	
Total Summer Chinook			200,000	0	200,000	0	400,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,045,000	0	1,120,000	Y	Y	
FWS	Carson NFH	Carson - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Carson NFH	Hood River - Springs 1+	50,000	0	0	0	50,000	Y	Y	Hood River release, new program in 2009
FWS	Willard NFH	Little White Salmon - Springs 1+	25,000	0	232,000	0	257,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	693,000	0	768,000	Y	Y	
FWS	Little White Salmon NFH	White R. - Wenatchee Springs 1+	0	150,000	0	0	150,000	N	N	White River/Wenatchee R. ESA restoration program
FWS	Warm Springs NFH	Warm Springs - Springs 1+	820,000	0	0	0	820,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	220,000	0	980,000	0	1,200,000	Y	Y	
FWS	Winthrop NFH	Methow - Springs 1+	400,000	0	0	0	400,000	Y	Y	BKD reduced production from normal 600K level
FWS	Kooskia NFH	Kooskia - Springs 1+	100,000	0	550,000	50,000	700,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,935,000	150,000	4,630,000	50,000	6,765,000			
Total Chinook			3,140,000	755,000	19,120,000	50,000	23,065,000			
Total Chinook Production			23,065,000							
Total Percent Marked			97%							

FWS COLUMBIA RIVER 2010 CHINOOK MASS MARKING

1/8/2010

Species: Chinook
Area: Columbia River
Brood: 2009
Release Year: 2010 and 2011
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	360,000	360,000	9,790,000	0	10,510,000	Y	Y	Numbers reduced under Spr. Cr. Reprogramming
FWS	Little White Salmon NFH	Little White Salmon - Tule Falls	150,000	0	1,550,000	0	1,700,000	Y	Y	New release location under Spr. Cr. Reprogramming
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	1,500,000	0	1,700,000	Y	Y	YN-Prosser release
Total Fall Chinook			910,000	560,000	14,440,000	0	15,910,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,045,000	0	1,120,000	Y	Y	
FWS	Carson NFH	Carson - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Carson NFH	Hood River - Springs 1+	50,000	0	0	0	50,000	Y	Y	Hood River release, new program in 2009
FWS	Willard NFH	Little White Salmon - Springs 1+	75,000	0	400,000	0	475,000	Y	Y	Drano Lake release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	475,000	0	550,000	Y	Y	
FWS	Little White Salmon NFH	White R. - Wenatchee Springs 1+	0	150,000	0	0	150,000	N	N	White River/Wenatchee restoration program
FWS	Warm Spings NFH	Warm Springs - Springs 1+	552,000	0	0	0	552,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	220,000	0	980,000	0	1,200,000	Y	Y	Program reduction from 1.625 M
FWS	Winthrop NFH	Methow - Springs 1+	600,000	0	0	0	600,000	Y	N	AD marking started in 2010
FWS	Kooskia NFH	Kooskia - Springs 1+	100,000	0	625,000	0	725,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,917,000	150,000	4,655,000	0	6,722,000			
Total Chinook			2,827,000	710,000	19,095,000	0	22,632,000			
Total Chinook Production			22,632,000							
Total Percent Marked			97%							

FWS COLUMBIA RIVER 2011 CHINOOK MASS MARKING

3/14/2011

Species: Chinook
Area: Columbia River
Brood: 2010
Release Year: 2011 and 2012

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	405,000	405,000	9,690,000	0	10,500,000	Y	Y	
FWS	Little White Salmon NFH	Spring Creek - Tule Falls	150,000	0	1,550,000	0	1,700,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	1,500,000	0	1,700,000	Y	Y	YN-Prosser release
Total Fall Chinook			955,000	605,000	14,340,000	0	15,900,000			
FWS	Entiat NFH	Entiat - Summers 1+	200,000	0	0	0	200,000	Y	Y	
Total Summer Chinook			200,000	0	0	0	200,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,045,000	0	1,120,000	Y	Y	
FWS	Carson NFH	Carson - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Carson NFH	Hood River - Springs 1+	50,000	0	0	0	50,000	Y	Y	Hood River release, new program in 2009
FWS	Willard NFH	Little White Salmon - Springs 1+	75,000	0	182,000	0	257,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	693,000	0	768,000	Y	Y	
FWS	Little White Salmon NFH	White R. - Wenatchee Springs 1+	0	150,000	0	0	150,000	N	N	White River/Wenatchee R. ESA restoration program
FWS	Warm Springs NFH	Warm Springs - Springs 1+	500,000	0	0	0	500,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	220,000	0	980,000	0	1,200,000	Y	Y	
FWS	Winthrop NFH	Methow - Springs 1+	200,000	400,000	0	0	600,000	Y	Y	Methow R. ESA restoration
FWS	Kooskia NFH	Kooskia - Springs 1+	100,000	0	500,000	50,000	650,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,465,000	550,000	4,530,000	50,000	6,595,000			
Total Chinook			2,620,000	1,155,000	18,870,000	50,000	22,695,000			
Total Chinook Production			22,695,000							
Total Percent Marked			95%							

FWS COLUMBIA RIVER 2009 CHINOOK MASS MARKING

1/23/2009

Species: Chinook
Area: Columbia River
Brood: 2008
Release Year: 2009 and 2010

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	360,000	360,000	9,790,000	0	10,510,000	Y	Y	Numbers reduced under Spring Creek Reprogramming
FWS	Little White Salmon NFH	Little White Salmon - Tule Falls	150,000	0	1,550,000	0	1,700,000	Y	Y	New release location, part of Spr. Cr. Reprogramming
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	1,500,000	0	1,700,000	Y	N	YN-Prosser release
Total Fall Chinook			910,000	560,000	14,440,000	0	15,910,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,045,000	0	1,120,000	Y	Y	
FWS	Carson NFH	Carson - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Carson NFH	Hood River - Springs 1+	50,000	0	0	0	50,000	Y	N	Hood River release, new program
FWS	Willard NFH	Little White Salmon - Springs 1+	75,000	0	400,000	0	475,000	Y	Y	Drano Lake release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	475,000	0	550,000	Y	Y	
FWS	Little White Salmon NFH	White River - Wenatchee Springs 1+	0	85,000	0	0	85,000	N	N	White River/Wenatchee restoration program
FWS	Warm Spings NFH	Warm Springs - Springs 1+	675,000	0	0	0	675,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	200,000	0	1,000,000	0	1,200,000	Y	Y	Program reduction from 1.625 M
FWS	Winthrop NFH	Methow - Springs 1+	0	500,000	0	0	500,000	N	N	Restoration program
FWS	Kooskia NFH	Kooskia - Springs 1+	110,000	0	540,000	0	650,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,430,000	585,000	4,590,000	0	6,605,000			
Total Chinook			2,340,000	1,145,000	19,030,000	0	22,515,000			
Total Chinook Production			22,515,000							
Total Percent Marked			95%							

FWS COLUMBIA RIVER 2008 CHINOOK MASS MARKING

1/15/2008

Species: Chinook
Area: Columbia River
Brood: 2007
Release Year: 2008 and 2009

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	450,000	450,000	14,200,000	0	15,100,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	0	650,000	850,000	N	N	YN-Prosser release, broodstock shortfall, ~1/2 of normal 1.7M program
WDFW	Priest Rapids	Priest Rapids - URB Falls	0	0	0	0	0	N	N	Broodstock shortfall, no fish for program in 2008
Total Fall Chinook			850,000	650,000	15,800,000	650,000	17,950,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,095,000	0	1,170,000	Y	Y	
FWS	Willard NFH	Little White Salmon - Springs 1+	50,000	0	400,000	0	450,000	Y	Y	Drano Lake release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	475,000	0	550,000	Y	Y	
FWS	Little White Salmon NFH	White River - Wenatchee Springs 1+	0	150,000	0	0	150,000	N	N	White River restoration program
FWS	Carson NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Warm Springs NFH	Warm Springs - Springs 1+	750,000	0	0	0	750,000	Y	Y	Fish loss, production will be lower
FWS	Leavenworth NFH	Leavenworth - Springs 1+	200,000	0	1,425,000	0	1,625,000	Y	Y	
FWS	Entiat NFH	Entiat - Springs 1+	0	0	0	0	0	N	Y	Spring Chinook program discontinued
FWS	Winthrop NFH	Methow - Springs 1+	0	600,000	0	0	600,000	N	N	Restoration program
FWS	Kooskia NFH	Kooskia NFH - Springs 1+	125,000	0	475,000	0	600,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,445,000	750,000	5,000,000	0	7,195,000			
Total Chinook			2,295,000	1,400,000	20,800,000	650,000	25,145,000			
Total Chinook Production			25,145,000							
Total Percent Marked			92%							

FWS COLUMBIA RIVER 2007 CHINOOK MASS MARKING

1/26/2007

Species: Chinook
Area: Columbia River
Brood: 2006
Release Year: 2007 and 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	450,000	450,000	14,200,000	0	15,100,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	Decision pending, funding uncertain
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	0	1,500,000	1,700,000	N	N	YN-Prosser release
WDFW	Priest Rapids	Priest Rapids - URB Falls	0	0	1,700,000	0	1,700,000	N	Y	Marking not planned in 2007
Total Fall Chinook			850,000	650,000	17,500,000	1,500,000	20,500,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,095,000	0	1,170,000	Y	Y	
FWS	Willard NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Drano Lake release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	675,000	0	750,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Warm Spings NFH	Warm Springs - Springs 1+	750,000	0	0	0	750,000	Y	Y	Fish loss, production will be lower
FWS	Leavenworth NFH	Leavenworth - Springs 1+	400,000	0	1,225,000	0	1,625,000	Y	Y	
FWS	Entiat NFH	Entiat - Springs 1+	100,000	0	300,000	0	400,000	Y	Y	
FWS	Winthrop NFH	Methow - Springs 1+	0	600,000	0	0	600,000	N	N	Restoration program
FWS	Kooskia NFH	Kooskia NFH - Springs 1+	100,000	0	500,000	0	600,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			1,720,000	600,000	5,125,000	0	7,445,000			
Total Chinook			2,570,000	1,250,000	22,625,000	1,500,000	27,945,000			
Total Chinook Production			27,945,000							
Total Percent Marked			90%							

FWS COLUMBIA RIVER 2006 CHINOOK MASS MARKING

2/6/2006

Species: Chinook
Area: Columbia River
Brood: 2005
Release Year: 2006 and 2007
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	450,000	450,000	14,100,000	0	15,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	0	1,500,000	1,700,000	N	N	YN-Prosser release
WDFW	Priest Rapids	Priest Rapids - URB Falls	0	0	1,700,000	0	1,700,000	Y	N	Marked by FWS
Total Fall Chinook			850,000	650,000	17,400,000	1,500,000	20,400,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,095,000	0	1,170,000	Y	Y	
FWS	Willard NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Drano L. rel. (from Carson in '05)
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	675,000	0	750,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	40,000	0	170,000	0	210,000	Y	Y	Umatilla R. release
FWS	Warm Springs NFH	Warm Springs - Springs 1+	750,000	0	0	0	750,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	800,000	0	825,000	0	1,625,000	Y	Y	
FWS	Entiat NFH	Entiat - Springs 1+	400,000	0	0	0	400,000	Y	Y	
FWS	Winthrop NFH	Methow - Springs 1+	0	600,000	0	0	600,000	N	N	Restoration program
FWS	Kooskia NFH	Kooskia NFH - Springs 1+	100,000	0	500,000	0	600,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			2,460,000	600,000	4,595,000	0	7,655,000			
Total Chinook			3,310,000	1,250,000	21,995,000	1,500,000	28,055,000			
Total Chinook Production			28,055,000							
Total Percent Marked			90%							

FWS COLUMBIA RIVER 2005 CHINOOK MASS MARKING

4/27/2005

Species: Chinook
Area: Columbia River
Brood: 2004
Release Year: 2005 and 2006

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Spring Creek NFH	Spring Creek - Tule Falls	450,000	450,000	14,100,000	0	15,000,000	Y	N	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	200,000	1,600,000	0	2,000,000	Y	N	
FWS	Little White Salmon NFH	Little White Salmon - URB Falls	200,000	0	0	1,500,000	1,700,000	N	N	YN-Prosser Release
WDFW	Priest Rapids	Priest Rapids - URB Falls	0	0	0	1,700,000	1,700,000	N	N	Marked by FWS
Total Fall Chinook			850,000	650,000	15,700,000	3,200,000	20,400,000			
FWS	Carson NFH	Carson - Springs 1+	75,000	0	1,095,000	0	1,170,000	Y	Y	
FWS	Carson NFH	Carson - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Drano Lake Release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	75,000	0	675,000	0	750,000	Y	Y	
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	50,000	0	200,000	0	250,000	Y	Y	Walla Walla R. Release
FWS	Little White Salmon NFH	Little White Salmon - Springs 1+	40,000	0	170,000	0	210,000	Y	Y	Umatilla R. Release
FWS	Warm Springs NFH	Warm Springs - Springs 1+	750,000	0	0	0	750,000	Y	Y	
FWS	Leavenworth NFH	Leavenworth - Springs 1+	800,000	0	825,000	0	1,625,000	Y	Y	
FWS	Entiat NFH	Entiat - Springs 1+	400,000	0	0	0	400,000	Y	Y	
FWS	Winthrop NFH	Methow - Springs 1+	0	600,000	0	0	600,000	N	N	
FWS	Kooskia NFH	Kooskia NFH - Springs 1+	100,000	0	500,000	0	600,000	Y	Y	
FWS	Dworshak NFH	Dworshak - Springs 1+	120,000	0	930,000	0	1,050,000	Y	Y	
Total Spring Chinook			2,460,000	600,000	4,595,000	0	7,655,000			
Total Chinook			3,310,000	1,250,000	20,295,000	3,200,000	28,055,000			
Total Chinook Production			28,055,000							
Total Percent Marked			84%							

FWS NORTH COAST AND PUGET SOUND 2012 CHINOOK MASS MARKING

1/6/2012

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2011
Release Year: 2012
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River Falls	260,000	0	2,114,023	0	2,374,023	Y	Y	
FWS	Makah NFH	Makah Falls		0	100,000	0	100,000	Y	Y	Educket Cr. Release
FWS	Quinault NFH	Cook Creek/Quinault Falls	0	0	0	0	0	N/A	N/A	600K program terminated in 2011 per HSRG recommendations.
Total Chinook			260,000	0	2,214,023	0	2,474,023			
Total Chinook Production			2,474,023							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2011 CHINOOK MASS MARKING

3/14/2011

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2010
Release Year: 2011

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)
			Ad Clipped	Unclipped	Ad Clipped	Unclipped			

Comments

FWS Makah NFH Sooes River Falls

260,000

0

1,940,000

0

2,200,000

Y

Y

FWS Quinault NFH

Cook Creek/Quinault Falls

0

0

0

0

0

N

Y

600K program terminated per HSRG recommendations.

Total Chinook

260,000

0

1,940,000

0

2,200,000

Total Chinook Production

2,200,000

Total Percent Marked

100%

FWS NORTH COAST AND PUGET SOUND 2010 CHINOOK MASS MARKING

1/8/2010

Species: Chinook
 Area: North Coast and Puget Sound
 Brood: 2009
 Release Year: 2010

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River Falls	260,000	0	1,940,000	0	2,200,000	Y	Y	
FWS	Quinault NFH	Cook Creek/Quinault Falls	200,000	0	400,000	0	600,000	Y	Y	
Total Chinook			460,000	0	2,340,000	0	2,800,000			
Total Chinook Production			2,800,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2009 CHINOOK MASS MARKING

2/5/2009

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2008
Release Year: 2009

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River Falls	260,000	0	1,940,000	0	2,200,000	Y	Y	
FWS	Quinault NFH	Cook Creek/Quinault Falls	200,000	0	400,000	0	600,000	Y	Y	
Total Chinook			460,000	0	2,340,000	0	2,800,000			
Total Chinook Production			2,800,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2008 CHINOOK MASS MARKING

1/15/2008

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2007
Release Year: 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River Falls	260,000	0	240,000	0	500,000	Y	Y	Shortfall from normal 2.4M program.
FWS	Quinault NFH	Cook Creek/Quinault Falls	200,000	0	400,000	0	600,000	Y	Y	
Total Chinook			460,000	0	640,000	0	1,100,000			
Total Chinook Production			1,100,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2007 CHINOOK MASS MARKING

1/26/2007

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2006
Release Year: 2007
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah Falls	260,000	0	1,940,000	0	2,200,000	Y	Y	Decision pending, funding uncertain
FWS	Makah NFH	Makah Falls	0	0	100,000	0	100,000	Y	Y	Educket Cr. release, funding uncertain
FWS	Quinalt NFH	Quinalt Falls	200,000	0	400,000	0	600,000	Y	Y	Decision pending, funding uncertain
Total Chinook			460,000	0	2,440,000	0	2,900,000			
Total Chinook Production			2,900,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2005 CHINOOK MASS MARKING

4/27/2005

Species: Chinook
Area: North Coast and Puget Sound
Brood: 2004
Release Year: 2005

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah	260,000	0	1,940,000	0	2,200,000	Y	N	Educket Cr. Release
FWS	Makah NFH	Makah	0	0	100,000	0	100,000	Y	N	
FWS	Quinalt NFH	Quinalt	200,000	0	400,000	0	600,000	Y	N	
Total Chinook			460,000	0	2,440,000	0	2,900,000			
Total Chinook Production			2,900,000							
Total Percent Marked			100%							

FWS SACRAMENTO RIVER 2012 CHINOOK MASS MARKING

1/6/2012

Species: Chinook
Area: Sacramento River
Brood: 2011 and 2012
Release Year: 2012 and 2013

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Central Valley Fall Chinook	2011	Apr. 2012	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT
				Dec. 2012/Jan. 2013								
FWS	Coleman NFH	Central Valley Late-fall Chinook	2011/2012	2013	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2011	Feb. 2012	200,000	0	0	0	200,000	Y	Y	100% mark and CWT
Total Chinook					4,200,000	0	0	9,000,000	13,200,000			
Total Chinook Production					13,200,000							
Total Percent Marked					32%							

FWS SACRAMENTO RIVER 2011 CHINOOK MASS MARKING

3/14/2011

Species: Chinook
Area: Sacramento River
Brood: 2010 and 2011
Release Year: 2011 and 2012
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments	
					Ad Clipped	Unclipped	Ad Clipped	Unclipped					
FWS	Coleman NFH	Central Valley Fall Chinook	2010	Apr. 2011 Dec. 2011/Jan.	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT	
FWS	Coleman NFH	Central Valley Late-fall Chinook	2011	2012	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2010	Feb. 2011	200,000	0	0	0	200,000	Y	Y	100% mark and CWT	
Total Chinook					4,200,000	0	0	9,000,000	13,200,000				
Total Chinook Production					13,200,000								
Total Percent Marked					32%								

FWS SACRAMENTO RIVER 2010 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2009 and 2010
Release Year: 2010 and 2011
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Central Valley Fall Chinook	2009	Apr. 2010 Dec. 2010/Jan. 2011	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT; actual production will not meet pre-season targets - anticipated to be 11,300,000
FWS	Coleman NFH	Central Valley Late-fall Chinook	2010	Feb. 2010	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2009	Feb. 2010	200,000	0	0	0	200,000	Y	Y	100% mark and CWT
Total Chinook					4,200,000	0	0	9,000,000	13,200,000			
Total Chinook Production					13,200,000							
Total Percent Marked					32%							

FWS SACRAMENTO RIVER 2009 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2008 and 2009
Release Year: 2009 and 2010
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments	
					Ad Clipped	Unclipped	Ad Clipped	Unclipped					
FWS	Coleman NFH	Central Valley Fall Chinook	2008	April 2009/May 2009	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT; actual production was 14,021,000	
FWS	Coleman NFH	Central Valley Late-fall Chinook	2009	Dec 2009/Jan. 2010	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT; actual production was 1,155,000	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2008	Feb. 2009	200,000	0	0	0	200,000	Y	Y	100% mark and CWT; actual production was 146,000	
Total Chinook					4,200,000	0	0	9,000,000	13,200,000				
Total Chinook Production					13,200,000								
Total Percent Marked					32%								

FWS SACRAMENTO RIVER 2008 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2007 and 2008
Release Year: 2008 and 2009
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments	
					Ad Clipped	Unclipped	Ad Clipped	Unclipped					
FWS	Coleman NFH	Central Valley Fall Chinook	2007	April 2008/June 2008 Dec 2008/Jan. 2009	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT; actual production was 12,701,000	
FWS	Coleman NFH	Central Valley Late-fall Chinook	2008	2009	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT; actual production was 1,108,000	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2007	Feb. 2008	200,000	0	0	0	200,000	Y	Y	100% mark and CWT; actual production was 72,000	
Total Chinook					4,200,000	0	0	9,000,000	13,200,000				
Total Chinook Production					13,200,000								
Total Percent Marked					32%								

FWS SACRAMENTO RIVER 2007 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2006 and 2007
Release Year: 2007 and 2008

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments	
					Ad Clipped	Unclipped	Ad Clipped	Unclipped					
FWS	Coleman NFH	Central Valley Fall Chinook	2006	Apr. 2007	3,000,000	0	0	9,000,000	12,000,000	Y	Y	General Production received 25% Constant-fractional mark and CWT; actual production was 12,316,000, including 200,000 fry that were 100% marked and CWTd and released in March for a fish screen evaluation	
FWS	Coleman NFH	Central Valley Late-fall Chinook	2007	Nov. 2007/Jan. 2008	1,000,000	0	0	0	1,000,000	Y	Y	General Production received 100% mark and CWT; actual production was 1,061,000, including 78,000 fry that were 100% marked and CWTd and released from May-June, 2007 at the request of researchers	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2006	Feb. 2007	200,000	0	0	0	200,000	Y	Y	100% mark and CWT; actual production was 196,000	
Total Chinook					4,200,000	0	0	9,000,000	13,200,000				
Total Chinook Production					13,200,000								
Total Percent Marked					32%								

FWS SACRAMENTO RIVER 2006 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2005 and 2006
Release Year: 2006 and 2007
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Central Valley Fall Chinook	2005	Apr. 2006	0	0	0	12,000,000	12,000,000	Y	Y	General Production were not marked or tagged due to lack of funding; actual production was 13,355,000, including 200,000 fry that were 100% marked and CWTd and released in March for a fish screen evaluation General Production received 100% mark and CWT; actual production was 1,165,000, including 52,000 fry that were 100% marked and CWTd and released from May-June, 2006 at the request of researchers 100% mark and CWT; actual production was 173,000
FWS	Coleman NFH	Central Valley Late-fall Chinook	2006	Nov. 2006/Jan. 2007	1,000,000	0	0	0	1,000,000	Y	Y	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2005	Feb. 2006	200,000	0	0	0	200,000	Y	Y	
Total Chinook					1,200,000	0	0	12,000,000	13,200,000			
Total Chinook Production					13,200,000							
Total Percent Marked					9%							

FWS SACRAMENTO RIVER 2005 CHINOOK MASS MARKING

12/28/2009

Species: Chinook
Area: Sacramento River
Brood: 2004 and 2005
Release Year: 2005 and 2006
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Central Valley Fall Chinook	2004	Apr. 2005	0	0	0	12,000,000	12,000,000	Y	Y	General Production were not marked or tagged due to lack of funding; actual production was 11,854,000, including 147,000 fry that were marked and CWTd and released February-March for a fish screen evaluation General Production received 100% mark and CWT; actual production was 1,003,000, including 87,000 fry that were marked and CWTd and released from April-June, 2005 at the request of researchers 100% mark and CWT; actual production was 168,000
FWS	Coleman NFH	Central Valley Late-fall Chinook	2005	Dec. 2005/Jan. 2006	1,000,000	0	0	0	1,000,000	Y	Y	
FWS	Livingston Stone NFH	Sacramento River Winter Chinook	2004	Feb. 2005	200,000	0	0	0	200,000	Y	Y	
Total Chinook					1,200,000	0	0	12,000,000	13,200,000			
Total Chinook Production					13,200,000							
Total Percent Marked					9%							

FWS COLUMBIA RIVER 2012 COHO MASS MARKING

1/6/2012

Species: Coho
Area: Columbia River
Brood: 2011
Release Year: 2013

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	300,000	0	350,000	Y	Y	
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Clear Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Lapwai Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek/Yakima R. - 1+	0	210,000	240,000	0	450,000	Y	Y	Yakima R. Release - YN restoration
FWS	Willard NFH	Wenatchee R. - 1+	0	550,000	0	0	550,000	N	N	Wenatchee R. Release - YN restoration
ODFW	Cascade Hatchery	Wenatchee R. - 1+	0	650,000	0	0	650,000	N	N	Wen. R. Rel. - (Tagged by FWS) YN restoration
FWS	Winthrop NFH	Wenatchee R. - 1+	0	250,000	0	0	250,000	N	N	YN restoration program
Total Coho			25,000	1,745,000	540,000	490,000	2,800,000			
Total Coho Production			2,800,000							
Total Percent Marked			20%							

FWS COLUMBIA RIVER 2011 COHO MASS MARKING

3/14/2011

Species: Coho
Area: Columbia River
Brood: 2010
Release Year: 2012
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	300,000	0	350,000	Y	Y	
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Clear Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Lapwai Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek/Yakima R. - 1+	0	210,000	240,000	0	450,000	Y	Y	Yakima R. Release - YN restoration
FWS	Willard NFH	Wenatchee R. - 1+	0	550,000	0	0	550,000	N	N	Wenatchee R. Release - YN restoration
ODFW	Cascade Hatchery	Wenatchee R. - 1+	0	700,000	0	0	700,000	N	N	Wen. R. Rel. - (Tagged by FWS) YN restoration
FWS	Winthrop NFH	Wenatchee R. - 1+	0	250,000	0	0	250,000	N	N	YN restoration program
Total Coho			25,000	1,795,000	540,000	490,000	2,850,000			
Total Coho Production			2,850,000							
Total Percent Marked			20%							

FWS COLUMBIA RIVER 2010 COHO MASS MARKING

1/8/2010

Species: Coho
Area: Columbia River
Brood: 2009
Release Year: 2011

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	300,000	0	350,000	Y	Y	
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	0	125,000	0	150,000	Y	Y	CEDC Youngs Bay release
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Clear Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Clearwater River - 1+	0	30,000	0	245,000	275,000	N	N	Lapwai Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	0	425,000	50,000	500,000	Y	Y	Yakima R. Release - YN
FWS	Willard NFH	Wenatchee R. - 1+	0	550,000	0	0	550,000	N	N	Wenatchee R. Release - YN restoration
ODFW	Cascade Hatchery	Wenatchee R. - 1+	0	700,000	0	0	700,000	N	N	Wen. R. Rel. - (Tagged by FWS) YN restora
FWS	Winthrop NFH	Wenatchee R. - 1+	0	250,000	0	0	250,000	N	N	YN restoration program
Total Coho			75,000	1,585,000	850,000	540,000	3,050,000			
Total Coho Production			3,050,000							
Total Percent Marked			30%							

FWS COLUMBIA RIVER 2009 COHO MASS MARKING

1/23/2009

Species: Coho
Area: Columbia River
Brood: 2008
Release Year: 2010

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	300,000	0	350,000	Y	Y	
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	0	125,000	0	150,000	Y	Y	CEDC Youngs Bay release
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	30,000	0	245,000	275,000	N	N	Clear Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	30,000	0	245,000	275,000	N	N	Lapwai Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	0	450,000	0	450,000	Y	Y	Yakima R. Release - YN
FWS	Willard NFH	Wenatchee - 1+	0	550,000	0	0	550,000	N	N	Wenatchee R. Release - YN restoration
ODFW	Cascade Hatchery	Wenatchee - 1+	0	700,000	0	0	700,000	N	N	Wen. R. Rel. - (Tagged by FWS) YN restoration
FWS	Entiat NFH	Wenatchee - 1+	50,000	200,000	0	0	250,000	N	N	YN restoration program
FWS	Winthrop NFH	Wenatchee - 1+	0	250,000	0	0	250,000	N	N	YN restoration program
Total Coho			100,000	1,785,000	875,000	490,000	3,250,000			
Total Coho Production			3,250,000							
Total Percent Marked			30%							

FWS COLUMBIA RIVER 2008 COHO MASS MARKING

1/15/2008

Species: Coho
Area: Columbia River
Brood: 2007
Release Year: 2009

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	350,000	0	400,000	Y	Y	
FWS	Eagle Creek NFH	Eagle Creek - 1+	30,000	30,000	0	215,000	275,000	N	N	Potlatch R. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek - 1+	30,000	30,000	0	215,000	275,000	N	N	Lapwai Cr. Release - NPT restoration
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	0	450,000	0	450,000	Y	Y	Yakima R. Release - YN
FWS	Willard NFH	Wenatchee - 1+	0	1,000,000	0	0	1,000,000	N	N	Wenatchee R. Release - YN restoration
ODFW	Cascade Hatchery	Wenatchee - 1+	0	950,000	0	0	950,000	N	N	Wen. R. Rel. - (Tagged by FWS) YN restoration
FWS	Entiat NFH	Wenatchee - 1+	0	200,000	50,000	0	250,000	N	N	YN restoration program
FWS	Winthrop NFH	Wenatchee - 1+	0	500,000	0	0	500,000	N	N	YN restoration program
FWS	Kooskia NFH	Dworshak - 1+	0	120,000	0	160,000	280,000	N	N	NPT restoration program
Total Coho			85,000	2,855,000	850,000	590,000	4,380,000			
Total Coho Production			4,380,000							
Total Percent Marked			21%							

FWS COLUMBIA RIVER 2007 COHO MASS MARKING

1/26/2007

Species: Coho
Area: Columbia River
Brood: 2006
Release Year: 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	450,000	0	500,000	Y	Y	
FWS	Eagle Creek NFH	Eagle Creek - 1+	60,000	60,000	0	155,000	275,000	N	N	Potlatch R. Release - NPT
FWS	Eagle Creek NFH	Eagle Creek - 1+	60,000	60,000	0	155,000	275,000	N	N	Lapwai Cr. Release - NPT
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	0	500,000	0	500,000	Y	Y	Yakima R. Release - YN
FWS	Willard NFH	Wenatchee - 1+	0	550,000	0	0	550,000	N	N	Wenatchee R. Release - YN
ODFW	Cascade Hatchery	Wenatchee - 1+	0	700,000	0	0	700,000	N	N	Wen. R. Rel. - YN (Tagged by FWS)
YN	Prosser Hatchery	Yakima - 1+	0	0	0	500,000	500,000	N	N	LV Clip - YN (Marked by FWS)
FWS	Winthrop NFH	Wenatchee - 1+	0	250,000	0	0	250,000	N	N	YN restoration program
FWS	Kooskia NFH	Dworshak - 1+	0	120,000	0	160,000	280,000	N	N	NPT restoration program
Total Coho			145,000	1,765,000	950,000	970,000	3,830,000			
Total Coho Production			3,830,000							
Total Percent Marked			29%							

FWS COLUMBIA RIVER 2005 COHO MASS MARKING

4/27/2005

Species: Coho
Area: Columbia River
Brood: 2004
Release Year: 2006

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek - 1+	25,000	25,000	450,000	0	500,000	Y	Y	
FWS	Eagle Creek NFH	Eagle Creek - 1+	50,000	50,000	0	175,000	275,000	N	N	Potlatch R. Release - NPT
FWS	Eagle Creek NFH	Eagle Creek - 1+	50,000	50,000	0	175,000	275,000	N	N	Lapwai Cr. Release - NPT
FWS	Eagle Creek NFH	Eagle Creek - 1+	0	0	600,000	0	600,000	Y	Y	Yakima R. Release - YN
FWS	Willard NFH	Wenatchee - 1+	300,000	300,000	0	0	600,000	N	N	Wenatchee R. Release - YN
ODFW	Cascade Hatchery	Wenatchee - 1+	0	700,000	0	0	700,000	N	N	Wen. R. Rel. - YN (Tagged by FWS)
YN	Prosser Hatchery	Yakima - 1+	0	0	0	500,000	500,000	N	N	LV Clip - YN (Marked by FWS)
FWS	Winthrop NFH	Wenatchee - 1+	0	200,000	0	0	200,000	N	N	YN
FWS	Kooskia NFH	Dworshak - 1+	0	120,000	0	160,000	280,000	N	N	NPT
Total Coho			425,000	1,445,000	1,050,000	1,010,000	3,930,000			
Total Coho Production			3,930,000							
Total Percent Marked			38%							

FWS NORTH COAST AND PUGET SOUND 2012 COHO MASS MARKING

1/6/2012

Species: Coho

Area: North Coast and Puget Sound

Brood: 2011

Release Year: 2013

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	40,000	0	40,000	Y	Y	Educket Creek program
FWS	Makah NFH	Sooes River	55,000	55,000	90,000	0	200,000	Y	Y	
FWS	Quinault NFH	Cook Creek	80,000	80,000	500,000	0	660,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	72,000	72,000	416,000	0	560,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	40,000	0	0	0	40,000	Y	Y	Quilcene Bay Net Pens
Total Coho			247,000	207,000	1,046,000	0	1,500,000			
Total Coho Production			1,500,000							
Total Percent Marked			86%							

FWS NORTH COAST AND PUGET SOUND 2011 COHO MASS MARKING

3/14/2011

Species: Coho
Area: North Coast and Puget Sound
Brood: 2010
Release Year: 2012

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	40,000	0	40,000	Y	Y	Educket Creek program
FWS	Makah NFH	Sooes River	40,000	40,000	160,000	0	240,000	Y	Y	
FWS	Quinalt NFH	Cook Creek	80,000	80,000	500,000	0	660,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	40,000	40,000	220,000	0	300,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	40,000	0	160,000	0	200,000	Y	Y	Quilcene Bay Net Pens
Total Coho			200,000	160,000	1,080,000	0	1,440,000			
Total Coho Production			1,440,000							
Total Percent Marked			89%							

FWS NORTH COAST AND PUGET SOUND 2010 COHO MASS MARKING

1/8/2010

Species: Coho
Area: North Coast and Puget Sound
Brood: 2009
Release Year: 2011

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT			Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments	
			Ad Clipped	Unclipped	Ad Clipped	Unclipped	Total Production				
FWS	Makah NFH	Sooes River	0	0	40,000	0	40,000	Y	Y	Educket Creek program	
FWS	Makah NFH	Sooes River	40,000	40,000	160,000	0	240,000	Y	Y		
FWS	Quinault NFH	Cook Creek	80,000	80,000	500,000	0	660,000	Y	Y		
FWS	Quicene NFH	Big Quilcene River	40,000	40,000	220,000	0	300,000	Y	Y	Quilcene Bay Net Pens	
FWS	Quicene NFH	Big Quilcene River	40,000	0	160,000	0	200,000	Y	Y		
Total Coho			200,000	160,000	1,080,000	0	1,440,000				
Total Coho Production			1,440,000								
Total Percent Marked			89%								

FWS NORTH COAST AND PUGET SOUND 2009 COHO MASS MARKING

2/5/2009

Species: Coho
Area: North Coast and Puget Sound
Brood: 2008
Release Year: 2010
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	40,000	0	40,000	Y	Y	Educket Creek program
FWS	Makah NFH	Sooes River	40,000	40,000	160,000	0	240,000	Y	Y	
FWS	Quinault NFH	Cook Creek	80,000	80,000	500,000	0	660,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	40,000	40,000	320,000	0	400,000	Y	Y	Quilcene Bay Net Pens
FWS	Quicene NFH	Big Quilcene River	45,000	0	155,000	0	200,000	Y	Y	
Total Coho			205,000	160,000	1,175,000	0	1,540,000			
Total Coho Production			1,540,000							
Total Percent Marked			90%							

FWS NORTH COAST AND PUGET SOUND 2008 COHO MASS MARKING

1/15/2008

Species: Coho
Area: North Coast and Puget Sound
Brood: 2007
Release Year: 2009
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	40,000	0	40,000	Y	Y	Educket Creek program
FWS	Makah NFH	Sooes River	40,000	40,000	160,000	0	240,000	Y	Y	
FWS	Quinalt NFH	Cook Creek	80,000	80,000	500,000	0	660,000	Y	Y	
FWS	Quicene NFH	Big Quilcene River	40,000	40,000	320,000	0	400,000	Y	Y	Quilcene Bay Net Pens
FWS	Quicene NFH	Big Quilcene River	45,000	0	155,000	0	200,000	Y	Y	
Total Coho			205,000	160,000	1,175,000	0	1,540,000			
Total Coho Production			1,540,000							
Total Percent Marked			90%							

FWS NORTH COAST AND PUGET SOUND 2007 COHO MASS MARKING

1/26/2007

Species: Coho
Area: North Coast and Puget Sound
Brood: 2006
Release Year: 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah	40,000	40,000	120,000	0	200,000	Y	Y	
FWS	Makah NFH	Makah	0	0	40,000	0	40,000	Y	Y	Educket Cr. release
FWS	Quinalt NFH	Quinalt	80,000	80,000	500,000	0	660,000	Y	Y	
FWS	Quicene NFH	Quilcene	48,000	48,000	304,000	0	400,000	Y	Y	
FWS	Quicene NFH	Quilcene	45,000	0	155,000	0	200,000	Y	Y	Quilcene Bay release
Total Coho			213,000	168,000	1,119,000	0	1,500,000			
Total Coho Production			1,500,000							
Total Percent Marked			89%							

FWS NORTH COAST AND PUGET SOUND 2005 COHO MASS MARKING

4/27/2005

Species: Coho
Area: North Coast and Puget Sound
Brood: 2004
Release Year: 2006

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah	40,000	40,000	170,000	0	250,000	Y	Y	
FWS	Makah NFH	Makah	0	0	50,000	0	50,000	Y	Y	Educket Cr. Release
FWS	Quinalt NFH	Quinalt	80,000	80000	440,000	0	600,000	Y	Y	
FWS	Quinalt NFH	Quinalt	0	0	60,000	0	60,000	Y	Y	Camp 7 Pond Release
FWS	Quicene NFH	Quilcene	48,000	48,000	304,000	0	400,000	Y	Y	
FWS	Quicene NFH	Quilcene	45,000	0	155,000	0	200,000	Y	Y	Quilcene Bay Release
Total Coho			213,000	168,000	1,179,000	0	1,560,000			
Total Coho Production			1,560,000							
Total Percent Marked			89%							

FWS COLUMBIA RIVER 2012 STEELHEAD MASS MARKING

1/6/2012

Species: Steelhead
 Area: Columbia River
 Brood: 2012
 Release Year: 2013

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Winthrop NFH	Wells/Methow	100,000	0	0	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	180,000	0	1,820,000	0	2,000,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	0	0	200,000	200,000	N	N	Lolo Cr., M. Fk. Clearwater R. Restoration
FWS	Hagerman NFH	Salmon River	80,000		1,020,000	0	1,100,000	Y	Y	Marked by IDFG
Total steelhead			380,000	0	2,840,000	200,000	3,420,000			
Total Steelhead Production			3,420,000							
Total Percent Marked			94%							

FWS COLUMBIA RIVER 2011 STEELHEAD MASS MARKING

3/14/2011

Species: Steelhead
Area: Columbia River
Brood: 2011
Release Year: 2012

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Winthrop NFH	Wells/Methow	100,000	0	0	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	180,000	0	1,720,000	0	1,900,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	0	0	200,000	200,000	N	N	Lolo Cr., M. Fk. Clearwater R. Restoration
FWS	Hagerman NFH	Salmon River	80,000		1,020,000	0	1,100,000	Y	Y	Marked by IDFG
Total steelhead			380,000	0	2,740,000	200,000	3,320,000			
Total Steelhead Production			3,320,000							
Total Percent Marked			94%							

FWS COLUMBIA RIVER 2010 STEELHEAD MASS MARKING

1/8/2010

Species: Steelhead
Area: Columbia River
Brood: 2010
Release Year: 2011

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek	0	0	90,000	0	90,000	Y	Y	ADRV clip
FWS	Winthrop NFH	Wells/methow	100,000	0	0	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	180,000	0	2,000,000	0	2,180,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	0	0	220,000	220,000	N	N	Lolo Cr., M. Fk. Clearwater R. Re
FWS	Hagerman NFH	Salmon River	80,000		1,020,000	0	1,100,000	Y	Y	Marked by IDFG
Total steelhead			380,000	0	3,110,000	220,000	3,710,000			
Total Steelhead Production			3,710,000							
Total Percent Marked			94%							

FWS COLUMBIA RIVER 2009 STEELHEAD MASS MARKING

1/23/2009

Species: Steelhead
Area: Columbia River
Brood: 2009
Release Year: 2010
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek	0	0	100,000	0	100,000	Y	Y	ADRV clip
FWS	Winthrop NFH	Wells/methow	100,000	0	0	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	180,000	0	1,720,000	0	1,900,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	200,000	0	0	200,000	N	N	Lolo Cr., Middle Fk. Clearwater Release
FWS	Hagerman NFH	Salmon River	80,000		1,020,000	0	1,100,000	Y	Y	Marked by IDFG
Total steelhead			380,000	200,000	2,840,000	0	3,420,000			
Total Steelhead Production			3,420,000							
Total Percent Marked			94%							

FWS COLUMBIA RIVER 2008 STEELHEAD MASS MARKING

1/15/2008

Species: Steelhead
Area: Columbia River
Brood: 2008
Release Year: 2009
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek	0	0	100,000	0	100,000	Y	Y	ADRV clip
FWS	Winthrop NFH	Wells	0	0	100,000	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	150,000	0	1,750,000	0	1,900,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	200,000	0	0	200,000	N	N	S. Fk. Clearwater Release
FWS	Hagerman NFH	Salmon River	80,000		1,120,000	0	1,200,000	Y	Y	Marked by IDFG
Total steelhead			250,000	200,000	3,070,000	0	3,520,000			
Total Steelhead Production			3,520,000							
Total Percent Marked			94%							

FWS COLUMBIA RIVER 2007 STEELHEAD MASS MARKING

1/26/2007

Species: Steelhead
Area: Columbia River
Brood: 2007
Release Year: 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek	0	0	150,000	0	150,000	Y	Y	ADRV clip
FWS	Winthrop NFH	Wells	100,000	0	0	0	100,000	Y	Y	
FWS	Abernathy FTC	Abernathy	20,000	0	0	0	20,000	Y	Y	
FWS	Dworshak NFH	Dworshak	120,000	0	1,880,000	0	2,000,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	200,000	0	0	200,000	N	N	S. Fk. Clearwater Release
FWS	Hagerman NFH	Salmon River	80,000		1,120,000	0	1,200,000	Y	Y	Marked by IDFG
Total steelhead			320,000	200,000	3,150,000	0	3,670,000			
Total Steelhead Production			3,670,000							
Total Percent Marked			95%							

FWS COLUMBIA RIVER 2005 STEELHEAD MASS MARKING

4/27/2005

Species: Steelhead
Area: Columbia River
Brood: 2005
Release Year: 2006

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Eagle Creek NFH	Eagle Creek	150,000	0	0	0	150,000	Y	Y	
FWS	Dworshak NFH	Dworshak	120,000	0	1,780,000	0	1,900,000	Y	Y	1.2M Released On-station
FWS	Dworshak NFH	Dworshak	0	200,000	0	0	200,000	N	N	S. Fk. Clearwater Release
IDFG	Clearwater Anad. Hatchery	Dworshak	0	150,000	0	0	150,000	N	N	Tagged by FWS
Total steelhead			270,000	350,000	1,780,000	0	2,400,000			
Total Steelhead Production			2,400,000							
Total Percent Marked			85%							

FWS NORTH COAST AND PUGET SOUND 2012 STEELHEAD MASS MARKING

1/6/2012

Species: Steelhead
 Area: North Coast and Puget Sound
 Brood: 2012
 Release Year: 2013
 Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	158,000	0	158,000	Y	Y	
FWS	Makah NFH	Sooes River	0	0	22,000	0	22,000	Y	Y	Educket Cr. release
FWS	Quinalt NFH	Cook Creek/Quinalt	0	0	200,000	0	200,000	Y	Y	
FWS	Quinalt NFH	Cook Creek/Quinalt	0	0	0	0	0	N/A	Y	Hoh R. direct stream release. Program discontinued in BY 2011 due to IHNIV.
FWS	Quinalt NFH	Cook Creek/Quinalt	0	0	0	0	0	N/A	Y	Chalaat Ck. Transfer. Program discontinued in BY 2011 due to IHNIV.
Total Steelhead			0	0	380,000	0	380,000			
Total Steelhead Production			380,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2011 STEELHEAD MASS MARKING

3/14/2011

Species: Steelhead
Area: North Coast and Puget Sound
Brood: 2011
Release Year: 2012

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	158,000	0	158,000	Y	Y	
FWS	Makah NFH	Sooes River	0	0	22,000	0	22,000	Y	Y	Educket Cr. release
FWS	Quinalt NFH	Cook Creek/Quinalt	20,000	0	180,000	0	200,000	Y	Y	
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40,000	0	50,000	Y	Y	Hoh R. direct stream release. Program may be discontinued in BY 20011 due to IHNV.
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40,000	0	50,000	Y	Y	Chalaat Ck. Transfer. Program may be discontinued in BY 2011 due to IHNV.
Total Steelhead			40,000	0	440,000	0	480,000			
Total Steelhead Production			480,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2010 STEELHEAD MASS MARKING

1/8/2010

Species: Steelhead

Area: North Coast and Puget Sound

Brood: 2010

Release Year: 2011

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	158000	0	158,000	Y	Y	
FWS	Makah NFH	Sooes River	0	0	22000	0	22,000	Y	Y	Educket Cr. release
FWS	Quinault NFH	Cook Creek/Quinault	20,000	0	170000	0	190,000	Y	Y	53K of this produciton destroyed due to IHNV.
FWS	Quinault NFH	Cook Creek/Quinault	10,000	0	40000	0	50,000	Y	Y	Hoh R. direct stream release
FWS	Quinault NFH	Cook Creek/Quinault	10,000	0	40000	0	50,000	Y	Y	Chalaat Ck. transfer
Total Steelhead			40,000	0	430,000	0	470,000			
Total Steelhead Production			470,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2009 STEELHEAD MASS MARKING

2/5/2009

Species: Steelhead
Area: North Coast and Puget Sound
Brood: 2009
Release Year: 2010
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	158000	0	158,000	Y	N	
FWS	Makah NFH	Sooes River	0	0	22000	0	22,000	Y	N	Educket Cr. release
FWS	Quinalt NFH	Cook Creek/Quinalt	20,000	0	170000	0	190,000	Y	N	
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40000	0	50,000	Y	Y	Hoh R. direct stream release
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40000	0	50,000	Y	Y	Chalaat Ck. transfer
Total Steelhead			40,000	0	430,000	0	470,000			
Total Steelhead Production			470,000							
Total Percent Marked			100%							

FWS NORTH COAST AND PUGET SOUND 2008 STEELHEAD MASS MARKING

1/15/2008

Species: Steelhead
Area: North Coast and Puget Sound
Brood: 2008
Release Year: 2009
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Sooes River	0	0	0	158,000	158,000	N	N	
FWS	Makah NFH	Sooes River	0	0	0	22,000	22,000	N	N	Educket Cr. release
FWS	Quinalt NFH	Cook Creek/Quinalt	20,000	0	0	170,000	190,000	N	N	
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40000	0	50,000	Y	Y	Hoh R. direct stream release
FWS	Quinalt NFH	Cook Creek/Quinalt	10,000	0	40000	0	50,000	Y	Y	Chalaat Ck. transfer
Total Steelhead			40,000	0	80,000	350,000	470,000			
Total Steelhead Production			470,000							
Total Percent Marked			26%							

FWS NORTH COAST AND PUGET SOUND 2007 STEELHEAD MASS MARKING

1/26/2007

Species: Steelhead
Area: North Coast and Puget Sound
Brood: 2007
Release Year: 2008
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah	0	0	0	158,000	158,000	N	Y	
FWS	Makah NFH	Makah	0	0	0	22,000	22,000	N	Y	Educket Cr. release
FWS	Quinalt NFH	Quinalt	20,000	0	0	170,000	190,000	N	Y	
FWS	Quinalt NFH	Quinalt	10,000	0	40000	0	50,000	Y	Y	Hoh R. direct stream release
FWS	Quinalt NFH	Quinalt	10,000	0	40000	0	50,000	Y	Y	Chalaat Ck. transfer
Total Steelhead			40,000	0	80,000	350,000	470,000			
Total Steelhead Production			470,000							
Total Percent Marked			26%							

FWS NORTH COAST AND PUGET SOUND 2005 STEELHEAD MASS MARKING

4/27/2005

Species: Steelhead
Area: North Coast and Puget Sound
Brood: 2005
Release Year: 2006

Agency	Hatchery	Stock	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
			Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Makah NFH	Makah	0	0	175,000	0	175,000	Y	Y	
FWS	Makah NFH	Makah	0	0	25,000	0	25,000	Y	Y	Educket Cr. Release
FWS	Quinault NFH	Quinault	20,000	0	170,000	0	190,000	Y	Y	
Total Steelhead			20,000	0	370,000	0	390,000			
Total Steelhead Production			390,000							
Total Percent Marked			100%							

FWS SACRAMENTO RIVER 2012 STEELHEAD MASS MARKING

1/6/2012

Species: Steelhead
 Area: Sacramento River
 Brood: 2012
 Release Year: 2013

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				

FWS	Coleman NFH	Battle Creek Steelhead	2012	Jan 2013	0	0	600,000	0	600,000	Y	Y	
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Total Steelhead					0	0	600,000	0	600,000			
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Total Steelhead Production	600,000
Total Percent Marked	100%

FWS SACRAMENTO RIVER 2011 STEELHEAD MASS MARKING

3/14/2011

Species: Steelhead
Area: Sacramento River
Brood: 2011
Release Year: 2012
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2011	Jan 2012	0	0	600,000	0	600,000	Y	Y	
Total Steelhead					0	0	600,000	0	600,000			

Total Steelhead Production 600,000
Total Percent Marked 100%

FWS SACRAMENTO RIVER 2010 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2010
Release Year: 2011
Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2010	Jan 2011	0	0	600,000	0	600,000	Y	Y	
		Total Steelhead			0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

FWS SACRAMENTO RIVER 2009 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2009
Release Year: 2010

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2009	Jan 2010	0	0	600,000	0	600,000	Y	Y	Actual production was 594,000
Total Steelhead					0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

FWS SACRAMENTO RIVER 2008 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2008
Release Year: 2009

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2008	Jan 2009	0	0	600,000	0	600,000	Y	Y	Actual production was 667,000
Total Steelhead					0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

FWS SACRAMENTO RIVER 2007 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2007
Release Year: 2008

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2007	Jan 2008	0	0	600,000	0	600,000	Y	Y	Actual production was 641,000
Total Steelhead					0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

FWS SACRAMENTO RIVER 2006 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2006
Release Year: 2007

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclipped	Ad Clipped	Unclipped				
FWS	Coleman NFH	Battle Creek Steelhead	2006	Jan 2007	0	0	600,000	0	600,000	Y	Y	Actual production was 673,000
Total Steelhead					0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

FWS SACRAMENTO RIVER 2005 STEELHEAD MASS MARKING

12/28/2009

Species: Steelhead
Area: Sacramento River
Brood: 2005
Release Year: 2006

Program Levels: Actual releases and marking levels may be somewhat higher or lower depending on actual rearing cycle.

Agency	Hatchery	Stock	Brood Year	Approx. Release Date	Number of fish to be released with a CWT		Number of fish to be released without a CWT		Total Production	Proposed to be marked this year (Y/N)	Marked in previous year (Y/N)	Comments
					Ad Clipped	Unclassipped	Ad Clipped	Unclassipped				
FWS	Coleman NFH	Battle Creek Steelhead	2005	Jan 2006	0	0	600,000	0	600,000	Y	Y	Actual production was 607,000
Total Steelhead					0	0	600,000	0	600,000			
Total Steelhead Production					600,000							
Total Percent Marked					100%							

**BRIEFING ON THE ANALYSES INFORMING DECISIONS AFFECTING 2013-2014
GROUNDFISH HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES**

The Council is scheduled to decide preferred groundfish harvest specifications and preliminary preferred management measures for the 2013-2014 management period under Agenda Items I.3 and I.8. Final decisions will be made at the June Council meeting. The Council will receive an informational briefing from Council staff at the outset of the April meeting to better understand the results of impact analyses conducted over the winter. Specific issues and considerations for resolving these issues will be highlighted in the briefing.

The key materials that will be the substance of the informational briefing are provided under Agenda Item I.3. Agenda Item I.3.a, Attachment 1 lists key decisions the Council is scheduled to make at this meeting with reference to portions of the preliminary draft Environmental Impact Statement (DEIS) where the analysis and discussion informing these decisions can be found. Excerpts from the preliminary DEIS are also provided to focus the Council on those analyses particularly important for decision-making at this meeting.

No advisory body or public comment is solicited for this informational briefing; however, all interested parties are encouraged to attend to better understand the process, issues, and analyses. It is hoped that this informational briefing will be helpful to the Council and its advisors and will expedite discussion and decision-making under Agenda Items I.3 and I.8.

Reference Materials:

1. Agenda Item I.3, Tentative Adoption of 2013-2014 Biennial Harvest Specifications and Management Measures.
2. Informational Report 2, Supplemental Attachment 1.

PFMC
03/20/2012

COMMISSIONERS:

JAMES BALSIGER
JUNEAU, AK
RALPH G. HOARD
SEATTLE, WA
PHILLIP LESTENKOF
ST. PAUL, AK
MICHAEL PEARSON
OTTAWA, ON
LAURA RICHARDS
NANAIMO, B.C.
GARY ROBINSON
VANCOUVER, B.C.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA
AND THE UNITED STATES OF AMERICA

Supplemental Informational Report 3

April 2012

RECEIVED

MAR 26 2012

PFMC

March 20, 2012

Mr. Roy Elicker, Director
Oregon Department of Fish and Wildlife
3406 Cherry Ave NE
Salem, OR 97303

Dear Mr. Elicker:

At the January 2012 International Pacific Halibut Commission (IPHC) Annual Meeting, the Commission adopted a management measure for an Alaskan sport fishery that involved a reverse slot limit for the size of halibut that could be legally retained. In this instance, fish between 45-68 inches must be discarded and all other sizes may be retained. The Commission's consideration of this regulation highlighted the issue of the mortality of fish which must be discarded by regulation, or which are discarded because the angler wishes to continue fishing in search of a larger sized fish for retention. The latter is a common occurrence during recreational fishing for halibut. The former is similar to the effect of regulations in the commercial halibut fishery, wherein there is a minimum legal size limit for retention.

Halibut discarded for any reason suffer some degree of discard mortality. For fish discarded in the commercial fishery, the IPHC has a detailed process to estimate and account for the resulting mortality and this mortality is deducted from yield available to the fishery. However, no such estimation or accounting process exists for discards within the recreational fisheries for halibut. The new slot limit regulation has prompted the Commission to request the development of data collection programs from all agencies involved with management of recreational fisheries for halibut, which will permit the estimation of discard mortality by these fisheries. At present the Commission has such information available for a very limited number of recreational fisheries and this information could be used to provide estimates of discard mortality by other recreational fisheries in other areas. However, it would be more appropriate and accurate to obtain such information directly for each fishery and IPHC regulatory area.

Accordingly, the Commission requests that the Oregon Department of Fish and Wildlife develop and implement the necessary data collection programs to permit estimation of such discard mortality. Specifically, data on the quantities and sizes of halibut discarded by these fisheries is required. Ideally, these programs would be operational for 2012

recreational fisheries. We would be happy to work with your staff in this development and Gregg Williams (gregg@iphc.int) is the IPHC staff contact for this process.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Leaman", with a stylized, flowing script.

Bruce M. Leaman, Ph.D.
Executive Director

cc: IPHC Commissioners
Mr. Steve Williams (ODFW)
Ms. Lynn Mattes (ODFW)
Dr. Don McIsaac (PFMC)

COMMISSIONERS:

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INTERNATIONAL PACIFIC HALIBUT COMMISSION

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AND THE UNITED STATES OF AMERICA

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2320 W. COMMODORE WY, STE 300
SEATTLE, WA 98199-1287

TELEPHONE
(206) 634-1838

FAX:
(206) 632-2983

March 20, 2012

Mr. Phil Anderson, Director
Washington Department of Fish and Wildlife
600 Capitol Way N.
Olympia, WA 98501

Dear Mr. Anderson:

At the January 2012 International Pacific Halibut Commission (IPHC) Annual Meeting, the Commission adopted a management measure for an Alaskan sport fishery that involved a reverse slot limit for the size of halibut that could be legally retained. In this instance, fish between 45-68 inches must be discarded and all other sizes may be retained. The Commission's consideration of this regulation highlighted the issue of the mortality of fish which must be discarded by regulation, or which are discarded because the angler wishes to continue fishing in search of a larger sized fish for retention. The latter is a common occurrence during recreational fishing for halibut. The former is similar to the effect of regulations in the commercial halibut fishery, wherein there is a minimum legal size limit for retention.

Halibut discarded for any reason suffer some degree of discard mortality. For fish discarded in the commercial fishery, the IPHC has a detailed process to estimate and account for the resulting mortality and this mortality is deducted from yield available to the fishery. However, no such estimation or accounting process exists for discards within the recreational fisheries for halibut. The new slot limit regulation has prompted the Commission to request the development of data collection programs from all agencies involved with management of recreational fisheries for halibut, which will permit the estimation of discard mortality by these fisheries. At present the Commission has such information available for a very limited number of recreational fisheries and this information could be used to provide estimates of discard mortality by other recreational fisheries in other areas. However, it would be more appropriate and accurate to obtain such information directly for each fishery and IPHC regulatory area.

Accordingly, the Commission requests that the Washington Department of Fish and Wildlife develop and implement the necessary data collection programs to permit estimation of such discard mortality. Specifically, data on the quantities and sizes of halibut discarded by these fisheries is required. Ideally, these programs would be

operational for 2012 recreational fisheries. We would be happy to work with your staff in this development and Gregg Williams (gregg@iphc.int) is the IPHC staff contact for this process.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Leaman", with a stylized, flowing script.

Bruce M. Leaman, Ph.D.
Executive Director

cc: IPHC Commissioners
Ms. Michelle Culver (WDFW)
Ms. Heather Reed (WDFW)
Dr. Don McIsaac (PFMC)

COMMISSIONERS:

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(206) 634-1838

FAX:
(206) 632-2883

March 20, 2012

Mr. Charlton H. Bonham, Director
California Department of Fish and Game
1416 Ninth St., 12th Floor
Sacramento, CA 95814

Dear Mr. Bonham:

At the January 2012 International Pacific Halibut Commission (IPHC) Annual Meeting, the Commission adopted a management measure for an Alaskan sport fishery that involved a reverse slot limit for the size of halibut that could be legally retained. In this instance, fish between 45-68 inches must be discarded and all other sizes may be retained. The Commission's consideration of this regulation highlighted the issue of the mortality of fish which must be discarded by regulation, or which are discarded because the angler wishes to continue fishing in search of a larger sized fish for retention. The latter is a common occurrence during recreational fishing for halibut. The former is similar to the effect of regulations in the commercial halibut fishery, wherein there is a minimum legal size limit for retention.

Halibut discarded for any reason suffer some degree of discard mortality. For fish discarded in the commercial fishery, the IPHC has a detailed process to estimate and account for the resulting mortality and this mortality is deducted from yield available to the fishery. However, no such estimation or accounting process exists for discards within the recreational fisheries for halibut. The new slot limit regulation has prompted the Commission to request the development of data collection programs from all agencies involved with management of recreational fisheries for halibut, which will permit the estimation of discard mortality by these fisheries. At present the Commission has such information available for a very limited number of recreational fisheries and this information could be used to provide estimates of discard mortality by other recreational fisheries in other areas. However, it would be more appropriate and accurate to obtain such information directly for each fishery and IPHC regulatory area.

Accordingly, the Commission requests that the California Department of Fish and Game develop and implement the necessary data collection programs to permit estimation of such discard mortality. Specifically, data on the quantities and sizes of halibut discarded by these fisheries is required. Ideally, these programs would be operational for 2012

recreational fisheries. We would be happy to work with your staff in this development and Gregg Williams (gregg@iphc.int) is the IPHC staff contact for this process.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. Leaman', with a stylized, flowing script.

Bruce M. Leaman, Ph.D.
Executive Director

cc: IPHC Commissioners
Ms. Marija Vojkovich (CDFG)
Ms. Marci Yaremko (CDFG)
Dr. Don McIsaac (PFMC)

7 P.M. TUESDAY BOREN ROOM PRESENTATION ON
FISHERIES OBSERVING USING VIDEO-BASED ELECTRONIC MONITORING

Presenter: Howard McElderry

Affiliation: Archipelago Marine Research Ltd., Victoria, BC Canada

Abstract:

Successfully managed fisheries must ensure that harvesting practices fit within long-term resource conservation targets and sustainability goals. In meeting these objectives, fisheries data systems must become more comprehensive. Fishery observer programs help fulfill this need, but this approach may not be the most cost effective or practical in many instances. Technology-based fishery monitoring, or electronic monitoring (EM), has emerged over the past decade as a promising new tool for commercial fisheries. EM provides a continuous fishing trip record from sensors (e.g., GPS, winch hydraulics) and multi-camera CCTV imagery of fishing operations. At the completion of a trip, analysis software is used to interpret the data record very quickly, to produce detailed fishery data in a fraction of the original elapsed time. The efficacy of this technology has been examined in several studies, spanning diverse geographies, fisheries, fishing methods, fishing vessels, and monitoring issues. It has been successfully applied in monitoring a range of issues including fishing locations and times, catches (released and retained), fishing effort, protected species interactions, and mitigation measures. The utility of EM imagery for catch monitoring is dependent upon catch complexity, onboard catch-handling methods, and crew willingness.

This presentation will provide an introduction to the technology and examples of its use in groundfish fisheries. This informal presentation is intended to provide background information about this technology as Council begins discussions on its applications for West Coast groundfish fisheries.

PFMC

04/01/12

**The West Coast Salmon Genetic Stock Identification Collaboration
Annual Report, 2011**

This document describes the activities conducted in 2011. The Research Methods Report, with detailed information on protocol and techniques, is now a stand alone document. This document can be found either at www.pacificfishtrax.org or by request from the Washington Trollers Association, the Oregon Salmon Commission, or the California Salmon Council (contact information below).

Background

Two major objectives of salmon fishery management are ensuring commercial and recreational access to healthy fish populations while also protecting weak stocks. Given limited understanding of the behavior and migration patterns of individual salmon stocks, it is difficult to manage salmon populations as distinct units. As a result, ocean salmon managers are sometimes compelled to institute large time/area closures to protect the weakest stocks while foregoing harvest opportunities on more abundant runs. In 2006 this problem became acute when managers were forced to close most of Oregon and California's ocean troll salmon fishery to protect poorly performing Klamath River Chinook salmon. The result was the loss of hundreds of jobs and millions of dollars in fishery-related income and declaration of a fishery disaster by the states of California and Oregon and the US Department of Commerce. In 2008, the problem became more acute when low returns of Sacramento River fall-run Chinook salmon forced a catastrophic closure of all Chinook salmon fishing south of Cape Falcon, Oregon and declaration of another fishery disaster. Economic losses in Oregon and California are estimated at up to \$150 million.

The concept for the West Coast Salmon Genetic Stock Identification (WCS-GSI) Collaboration emerged in 2005 during discussions with members of Oregon's Congressional delegation on developing approaches to address the Klamath salmon disaster. Independent projects in California, Oregon, and Washington united in 2007 to develop strategies to achieve common goals and objectives. Sampling protocols developed in 2006 have produced four years of fine-scale fish distribution data and fishing effort to support long term ecosystem-based fisheries science and management. Federal salmon fishery disaster relief, the National Marine Fisheries Service (NMFS), the Pacific Salmon Commission, the Oregon Watershed Enhancement Board, and other state and federal funds provide support for these projects. In 2008 and 2009, the WCS-GSI Collaboration was unable to collect data due to widespread fishery closures. In 2010 and 2011, the Collaboration has produced coordinated and standardized data for fisheries in Washington, Oregon, and California.

The WCS-GSI Collaboration provides a mechanism for collecting vast amounts of ecological data directly from the fishing fleet, and at temporal and spatial scales that greatly improve resolution over existing data collection systems. This information is improving our understanding of the ocean ecology of Chinook salmon. Further, the project is assisting in elucidating factors that drive stock-specific oceanic distribution patterns and identifying key information needs for Ecosystem Based Fishery Management.

Objectives

The vision of the WCS-GSI Collaboration is to support a working partnership between fishermen, scientists, and fisheries managers in Washington, Oregon, and California that benefits fish and strengthens west coast salmon fisheries by protecting weak stocks, providing sustainable harvest, and improving economic opportunities and fishing practices through better understanding of stock specific

ocean distribution and migration patterns of salmon. This vision is supported by three main project goals:

- 1) Improve understanding of the ocean ecology of salmon by integrating stock-specific distribution patterns over space and time with biological and environmental data;
- 2) Integrate multiple disciplines to develop and apply new scientific technology to improve fisheries management strategies across geo-political boundaries; and
- 3) Improve and stabilize economic opportunities for fishermen and coastal communities.

Overview and Summary of 2011 Activities

Standardized Sampling

2011 was the second year of coordinated and standardized sampling on a multi-state scale. In total, 11,227 fish samples were collected and 10,775 were genotyped across all states. This represents a 17% increase in the number of samples collected from 2010. The greatest increase was seen in Washington state, which increased its samples from <100 to 755 samples between 2010 and 2011. At-sea sampling was conducted from May through August in Washington, from May to September in Oregon, and May to October in California. All sampling was conducted during regular commercial fishing activities. The sampling goal in California and Oregon was to collect 200 fish per week in each fishery management area; however, this goal was achieved in only a few weeks because catch rates were relatively low. However, catch rates increased from 2010 (2.3-5.4 fish per boat day) to 2011 (3.9-11.2 fish per boat day). Additionally, in the Klamath Management Zone (KMZ), recreational fishermen in California voluntarily collected samples. In Washington, 2,000 samples were collected dockside in Westport and Neah Bay to be compared with the at-sea samples.

Management area	Fish	N genotyped	Boat days	Fish/Boat day
Cape Falcon to Florence south jetty (NOC)	987	984	215	4.6
Florence south Jetty to Humbug Mountain (SOC)	1345	1327	323	4.2
Humbug Mountain to CA/OR border (KMZ-OR)	104	104	27	3.9
OR/CA border to Humboldt south jetty (KMZ-CA)	551	462	49	11.2
Horse Mountain to Point Arena (Ft. Bragg)	3836	3802	397	9.7
Point Arena to Point Reyes (SF-N)	1940	1938	334	5.8
Point Reyes to Pigeon Point (SF-S)	1425	1400	279	5.1
Pigeon Point to Mexican Border (Monterey)	342	342	140	2.4
Totals	10530	10359	1764	

Table 1. Summary of Chinook salmon encounters (legal sized), number genotyped, days fished, and fish per boat-day in seven Oregon and California fishery management areas sampled from May through October 2011. This table does not include Washington data.

Financial Participation

The WCS-GSI Collaboration contracted with 134 vessel operators. The exact number of fishermen who participated is unknown due to unknown numbers of associated crew. This represented 78 vessels in California, 50 vessels in Oregon, and 6 vessels in Washington. In all states the samples were collected by commercial fishermen. Total compensation for fishermen, fleet managers, and port liaisons was more than \$352,000 in 2011.

Sampling Methods for Data Collection

All sampling was conducted using standardized protocols that have been developed and approved by the WCS-GSI Collaboration. Fishermen were required to attend training for proper data collection techniques. Boats were equipped with sampling kits for biological data and samples, and portable GPS units to record catch locations and effort tracks. Fishermen collected tissue and scale samples from each fish. As all sampling during 2011 was during retention fisheries, sampling was limited to legal-sized fish. Please see Research Methods for sampling protocol details in Oregon and California.

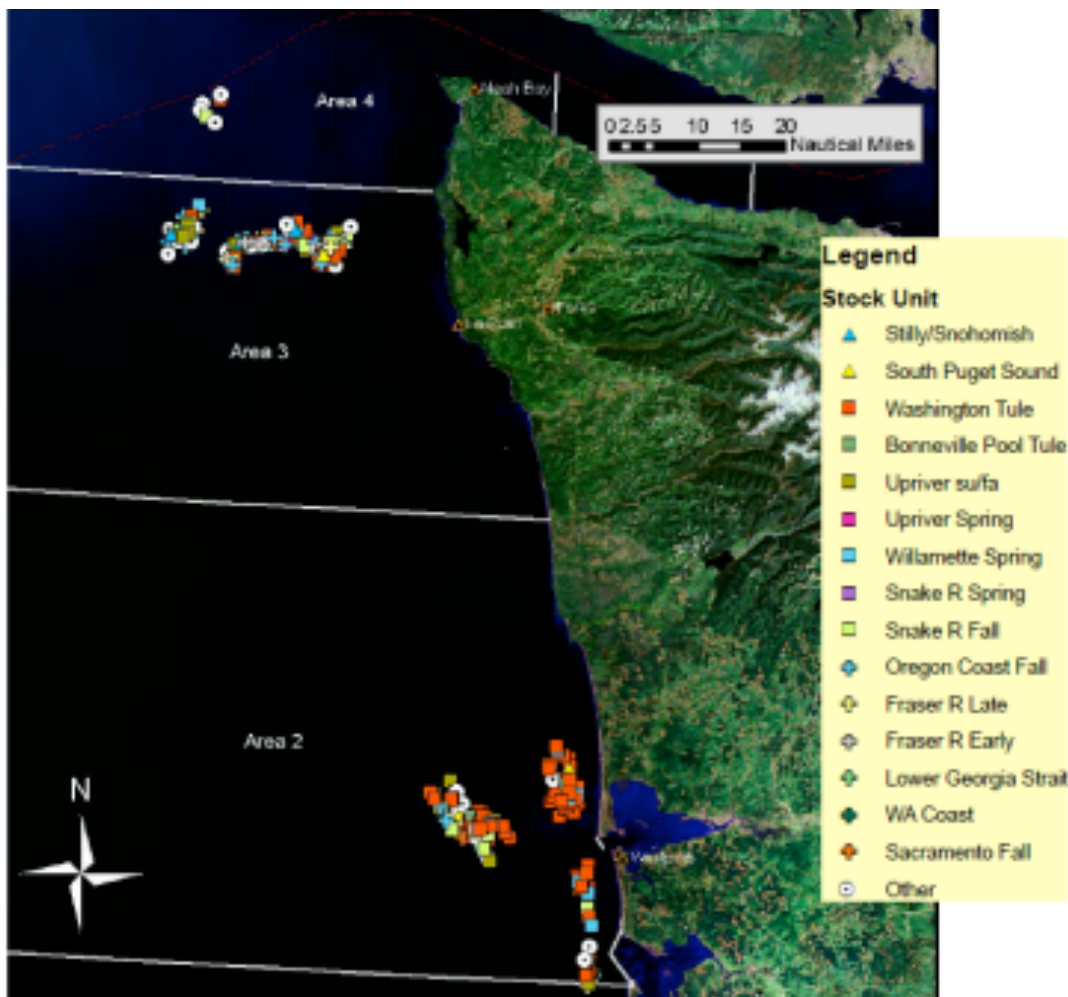


Figure 1. Washington State 2011 Results. Distribution of catch of various stocks of Chinook salmon caught the Washington coast. This represents 755 individual samples.

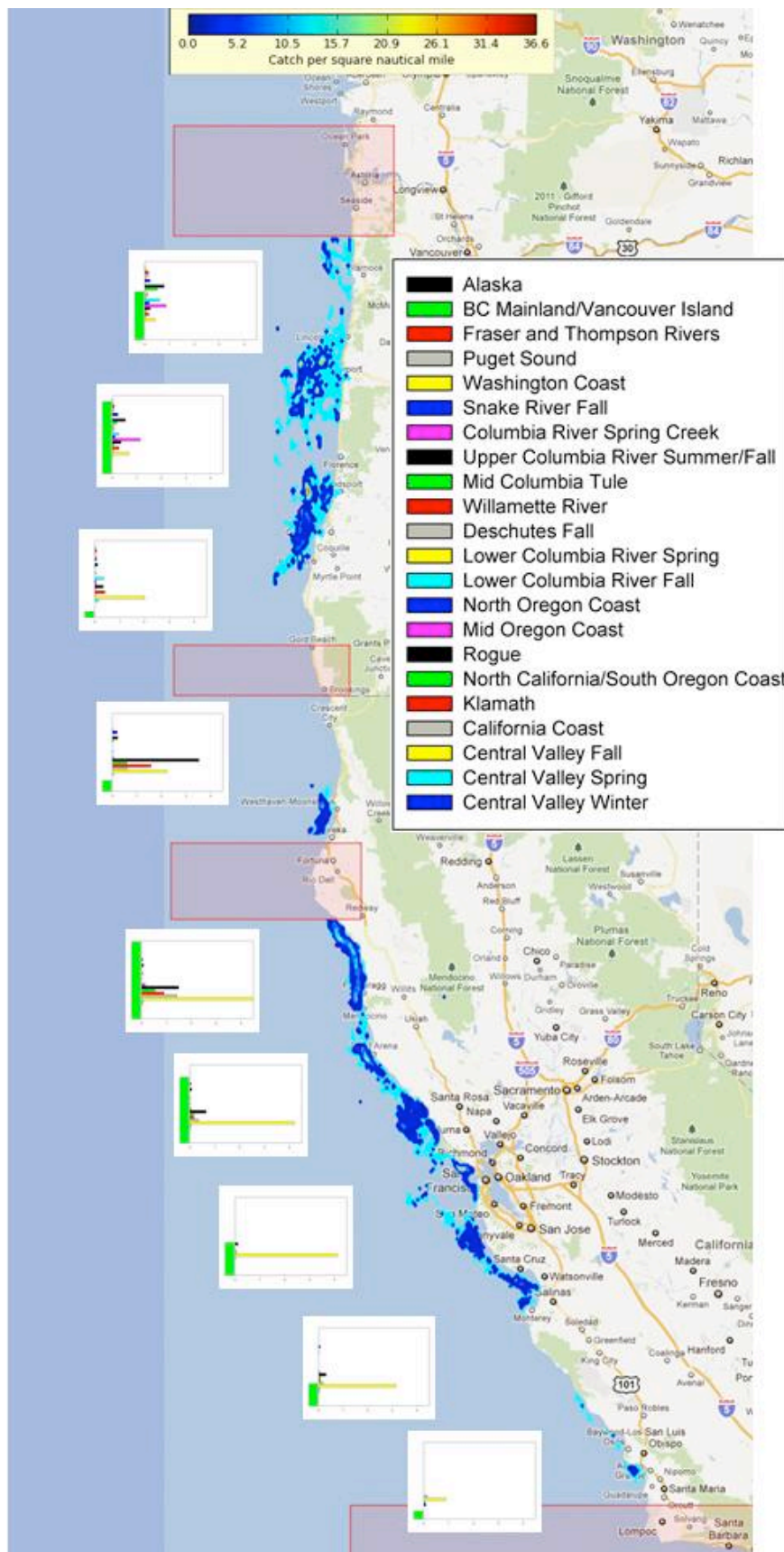


Figure 2. Oregon and California 2011 Results. Horizontal bars show stock-specific catch per unit effort (CPUE) from Santa Barbara, CA to Tillamook, OR. The vertical green bar displays sampling effort. Locations of effort (light blue) and catch (dark blue) are mapped. Scales are linear. This chart represents over 10,000 samples. (Note: catch data in red boxes are not mapped to protect privacy where fewer than three fishermen participated.)

Research Permits

All sampling in 2011 was conducted during the course of normal commercial fishing operations as approved by the Pacific Fishery Management Council (PFMC). No research permits were needed or issued.

Genetic Stock Identification (GSI)

NMFS Southwest Fisheries Science Center (SWFSC) and Oregon State University (OSU) genetic laboratories genotyped 10,775 tissue samples collected in 2011. SWFSC has developed genetic analysis techniques based on single nucleotide polymorphisms (SNPs) to improve discrimination of stocks in fisheries managed by PFMC and provide stock identification data more quickly and at a lower cost. Samples processed by the SWFSC were analyzed using SNPs while OSU continued to use the GAPS microsatellite baseline. The transition of genetic techniques from microsatellites to SNPs by OSU is anticipated to decrease sample processing time and costs. Please see Appendix A, Research Methods, for more details on Genetic Stock Identification processes.

Scale Aging

Circuli patterns on scales were used to determine the age of Chinook salmon sampled from the ocean troll fisheries. In Oregon, only fish that were assigned to a river of origin with a high probability ($\geq 90\%$) were aged, and these samples were processed by the Oregon Department of Fish & Wildlife (ODFW). In Washington, samples were aged by the Washington Department of Fish and Wildlife (WDFW). In California, samples have not yet been processed due to funding constraints. Procedures for scale aging employed by ODFW and CDFG can be found in Appendix A, Research Methods.

Coded-wire-tag (CWT) evaluation of GSI and scale aging accuracy

The accuracy of individual stock assignments was evaluated as a “blind test” by OSU first providing ODFW personnel with individual assignment results prior to receiving CWT data. ODFW personnel matched snout identification numbers and barcodes to determine the true population of origin, and then provided these data to OSU Genetics Laboratory for evaluation.

Salmon Distribution and Abundance Analysis

The data collected in 2011 are being used for analysis of Chinook salmon distribution and abundance in the ocean using a relatively novel method: displaying stock distributions using catch per unit effort (CPUE) for each stock or reporting unit. CPUE can provide a better representation of relative abundance than simple stock composition.

Traceability and other biological sampling

Barcode-tags can be used for traceability, tracking whole fish from harvester to processor to market, and ultimately, to the consumer. Uniquely tagged fish also allow for the collection of additional information as fish are transferred from the boat and through processing and marketing channels. Unfortunately, traceability marketing projects were not conducted in 2011.

Fish Trax

2012 saw major enhancements to the Fish Trax™ system. Led by the Community Seafood Initiative (CSI), the electronic fishery information system continues to expand and improve. CSI is working with multiple fisheries around the country and internationally so the decision to drop geographic identifiers from the name was made. Hence, the system is now called Fish Trax™ instead of Pacific Fish Trax. A new logo and website (www.fishtrax.org) was created in 2011. The Fish Trax™ name was also

trademarked. The Pacific Fish Trax (www.pacificfishtrax.org) site will continue to be operational until it is fully integrated into the Fish Trax™ site in 2012. Additionally, Project CROOS and the WCS-GSI Collaboration will have unique pages within the Fish Trax™ site.

In addition to the front-end changes, significant progress was made on developing and implementing web-based portals to serve different audiences. The Fish Trax™ Fishermen's Portal was more fully developed and is currently operational for both California and Oregon fishermen who participated in sampling during any of the four years that the project has been operational. The web-based portal allows a fisherman to securely view his or her own harvest data associated with the sampling program. The data is viewed via a map display and the fisherman can filter the data with a variety of queries that include time and area fished, river of origin, and size of fish, to name a few. Nautical charts and depth contour charts are also available. All of the data can be viewed in tabular form in addition to visualized on the map. Users can also compare personal harvest data with the aggregate data from the program. An important feature requested by fishermen is now operational - the user can overlay oceanographic data, in this case sea surface temperature and chlorophyll levels, over their own data to identify patterns and determine more efficient fishing behavior where appropriate.

The Fish Trax™ Public Portal is operational and can be found at <https://fp.pacificfishtrax.org/portal/>. This web-based portal is available to fishermen, managers and the general public – anyone who is interested in learning more about the project and the data that has been collected. This portal allows the user to view all the data collected in the project from Oregon and California in aggregate form. The data is displayed visually on a map and can also be viewed in tabular form. The same filters as the Fish Trax™ Fishermen's Portal are available to the user as well as the oceanographic overlays. In order to protect an individual fisherman's privacy, the "Rule of Three" is always incorporated to the aggregate data on both the Fishermen's Portal and the Public Portal.

In 2011 work on a Fish Trax™ Manager's Portal was begun. We are working with fisheries managers and advisors at the Pacific Fishery Management Council to determine which features are necessary in order for the portal to be useful for actual management. This portal will be further developed in 2012. The Fish Trax™ Find Your Fish portal is currently active on the www.pacificfishtrax.org site and will be incorporated into the www.fishtrax.org site in 2012. If we can secure additional funding in 2012 we will implement a marketing project for fishermen participating in the program.

Electronic At-sea Data-entry Systems

We developed and tested two prototype at-sea data entry systems and conducted an at-sea trial in August 2010. Based on this experience and the availability of new technology we created a prototype user interface based on a Barnes and Noble Nook Touch e-reader. The advantage of this platform is that it uses an e-ink display that is visible in full sunlight and uses very little power. Disadvantages are related to the limited hardware and software available for the Nook. In 2012 funds are available from the Southern Endowment Fund of the Pacific Salmon Commission to prototype and test a system based on the design we developed in 2011.

Fisheries Information System workshops

A fisheries information system workshop was held in Portland, OR (May 2011), and a symposium and workshop were held at the 2011 annual meeting of the American Fisheries Society in Seattle, WA. More than 150 people attended the two conferences. There were a combined 36 presentations on a wide range of fishery information systems including applications for management, science, and marketing. The workshop discussions focused on the value and growing need for these systems and the key

challenges in addressing costs, privacy, management, and information sharing standards. A summary report and set of recommendations combining the results from both workshops will be available in spring 2012.

Oceanographic Research

In 2011 we collected oceanographic data using temperature and temperature/depth recorders attached to the troll lines of some fishing vessels. There are several logistical and data management challenges to effectively using these data. Our intention is to create water column temperature profiles and sea surface temperature (SST) maps. Temperature profiles will be used to analyze temperature preferences based on capture depth. Sea surface temperature maps will be used to identify fronts and other surface temperature features, and to ground-truth satellite-based SST maps. Satellites cannot measure SST through cloud cover. In situ measurements potentially could be used to fill in missing satellite data. These oceanographic data will be directly linked to stock-specific catch data, which could allow elucidation of environmental variables affecting stock distribution and abundance.

Point Reyes

Recent genetic stock identification (GSI) data from 2007 and 2010 suggest that, in many months, the proportion of northern Chinook stocks (i.e., Klamath, Rogue, and California Coastal ESU) in waters north of Point Reyes is comparatively higher than just to the south. If indeed there is a persistent break in the stock mixture proportions at Point Reyes, recognition of Point Reyes as a boundary within the San Francisco management area (SFMA) may allow for crafting fisheries that can more finely target abundant stocks and avoid stocks of concern. We are investigating (1) how Chinook stocks are distributed relative to Point Reyes, and (2) how Chinook stocks migrate past Point Reyes using a combination of GSI and acoustic tagging techniques. A line of 12 functioning long-term acoustic receivers currently exists off Point Reyes as part of the Pacific Ocean Shelf Tracking Project (POST). We intend to utilize this POST line, in conjunction with GSI for the tagged fish, to determine the stock-specific movement behavior of Chinook salmon stocks contributing to fisheries in the SFMA.

Research on Chinook bycatch landed in Pacific Whiting Fisheries

In partnership with the NMFS IFQ Catch Monitor Program (formerly Shoreside Hake Catch Monitor and At-Sea Hake Observation Programs) and the commercial Pacific Whiting fleet, Chinook salmon landed as bycatch in the Pacific Hake fishery were sampled and provided to Oregon State University and the NMFS Northwest Fisheries Science Center (NWFSC) and SWFSC genetics laboratories for genotyping.

West Coast Salmon Genetic Stock Identification Infrastructure

The strategic plan for the WSC-GSI Collaboration was updated. The Data Sharing and Use Code of Conduct Agreement was accepted into use and is being used as a model for other organizations. Quarterly reports are being written and distributed to a wide audience of stakeholders.

Publications, Reports, and Scientific Findings

Several publications and reports using WCS-GSI Data are in progress. A graduate student in the Marine Resource Management program at OSU is analyzing coast-wide distribution patterns derived from GSI sampling. Patterns will be compared with similar analyses based on CWT data. One objective is to explore opportunities for finer spatio-temporal resolution using GSI in contrast to CWTs. Some of the data from this collaboration was used in part for Robert Ireland's Master's Thesis, "The distribution and aggregation of Chinook salmon stocks on the Oregon Shelf as indicated by the commercial catch and genetics." There is also a manuscript in preparation for publication in a peer-reviewed journal.

Habitat Model

Using WCS-GSI data, stock preference for different ocean habitat is being examined. By examining factors including salmon characteristics as well as environmental factors, the model is exploring factors that have the strongest correlation and highest predictability to determine salmon stock presence or absence. Additional steps will include comparing this information with Community Ecosystem Models.

Annual Meetings

Two biannual meetings were held with members of the WCS-GSI Collaboration. The spring meeting in Lacey, Washington was held April 27-28, 2011 with nineteen attendees. Twenty-six members were present at the fall meeting, held in Santa Cruz, California on October 24-25, 2011. Individual states also held state specific meetings.

Outreach and Education

The WCS-GSI Collaboration has worked on outreach to increase awareness and understanding of this research. Presentations have been made at conferences, trade meetings, and to other fisheries management groups. Additionally, Project CROOS worked with Educational Solutions to create an informational video, released in 2011, on the research conducted in Oregon. This hour-long video can be seen here: [http://educational solutions.org/documentary-intro-croos.html](http://educationalsolutions.org/documentary-intro-croos.html)

Funding Status

Limited funds were available to the WCS-GSI Collaboration in 2011. Long-term funds for ocean research need to be a part of federal and state efforts to aid the fishery and improve management and science. The tri-state partnership between California, Oregon, and Washington will support a coast-wide integrated approach for ocean salmon science and management, and has potential to provide economic benefits to the fishing industry.

Results and Discussion

Data analysis and presentation

Presentation of data is important because it influences the way the data are interpreted. We are introducing a basic method for displaying stock distributions using CPUE (fish caught per boat day) for stock units because CPUE allows for standardization of data across varying fishing effort. Effort and CPUE axes are logarithmic to facilitate display of a wide range of data values.

The data set collected in 2011 provides an opportunity to explore new ways of looking at Chinook salmon distribution and abundance in the ocean. In our initial explorations we have primarily continued to work at the current management scale of months and management areas, although we are exploring finer scale distributions. For example, for stocks of particular importance and with many salmon encounters, such as Central Valley Fall and the Klamath River stocks, we have examined the data in two-week and monthly time periods.

This is the second year we have been able to integrate data across California and Oregon, although our sampling coverage was not as complete in 2011 (Figure 3). In 2010 there were only three month/area cells from May through September with no samples collected (the Oregon and California Klamath Zones in May, and the Oregon Klamath Zone in July). In 2011 there were 12 missing cells (5 in the Klamath Zone and Northern California in May and June, August in Santa Barbara, and 6 areas in September). These gaps make it difficult to trace stock movements over time and highlight the value of comprehensive sampling.

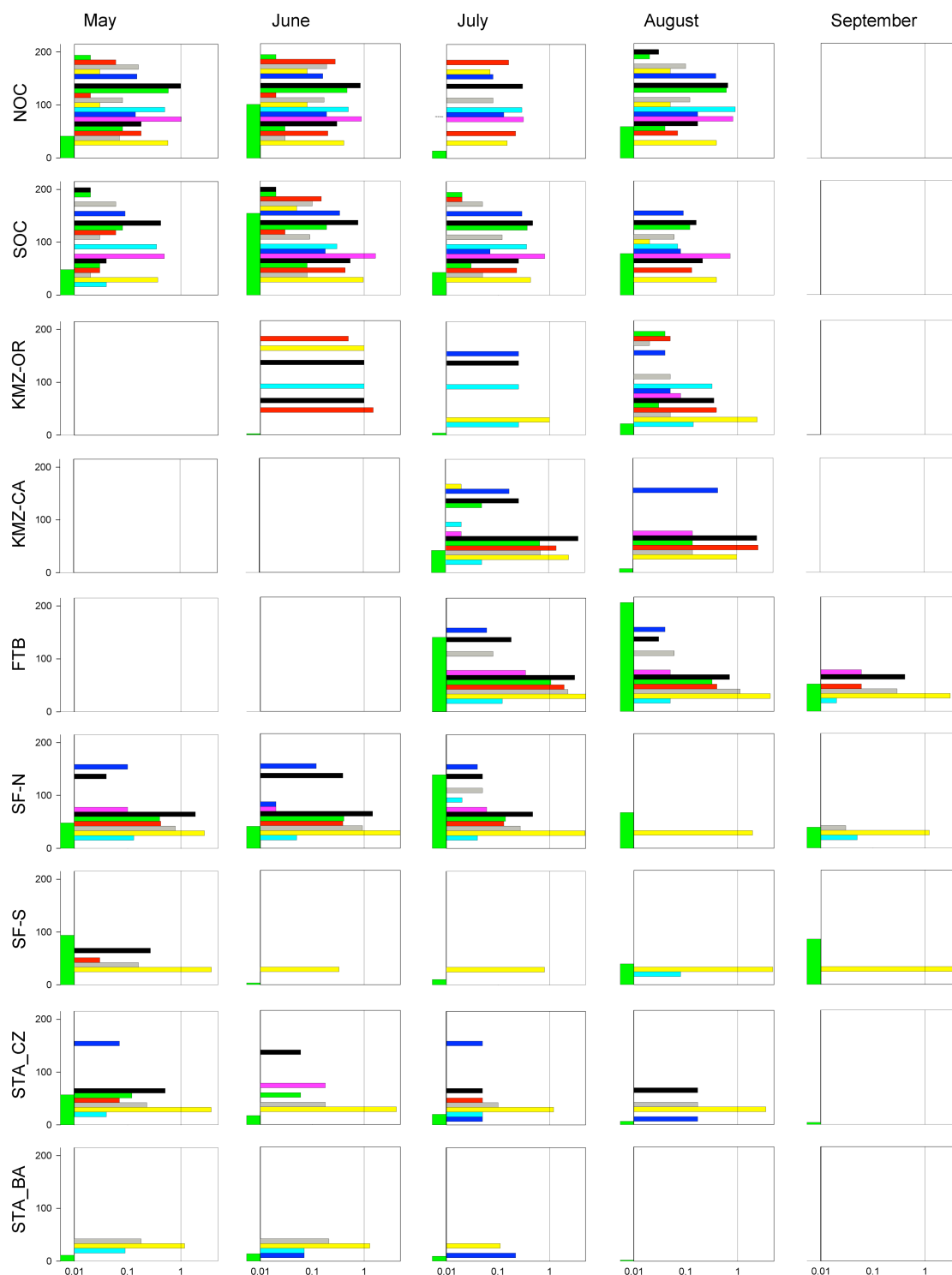


Figure 3. Matrix of effort and CPUE by Month (horizontal) and Area (vertical) from commercial Chinook sampling in 2011. Legend as in Figure 2. NOC, Northern Oregon Coast; SOC, Southern Oregon Coast; KMZ-OR, Klamath Management Zone – Oregon; KMZ-CA, Klamath Management Zone – California; FTB, Fort Bragg; SF-N, San Francisco North of Pt. Reyes; SF-S, San Francisco South of Pt. Reyes; STA-CZ, Santa Cruz; STA-BA, Santa Barbara.

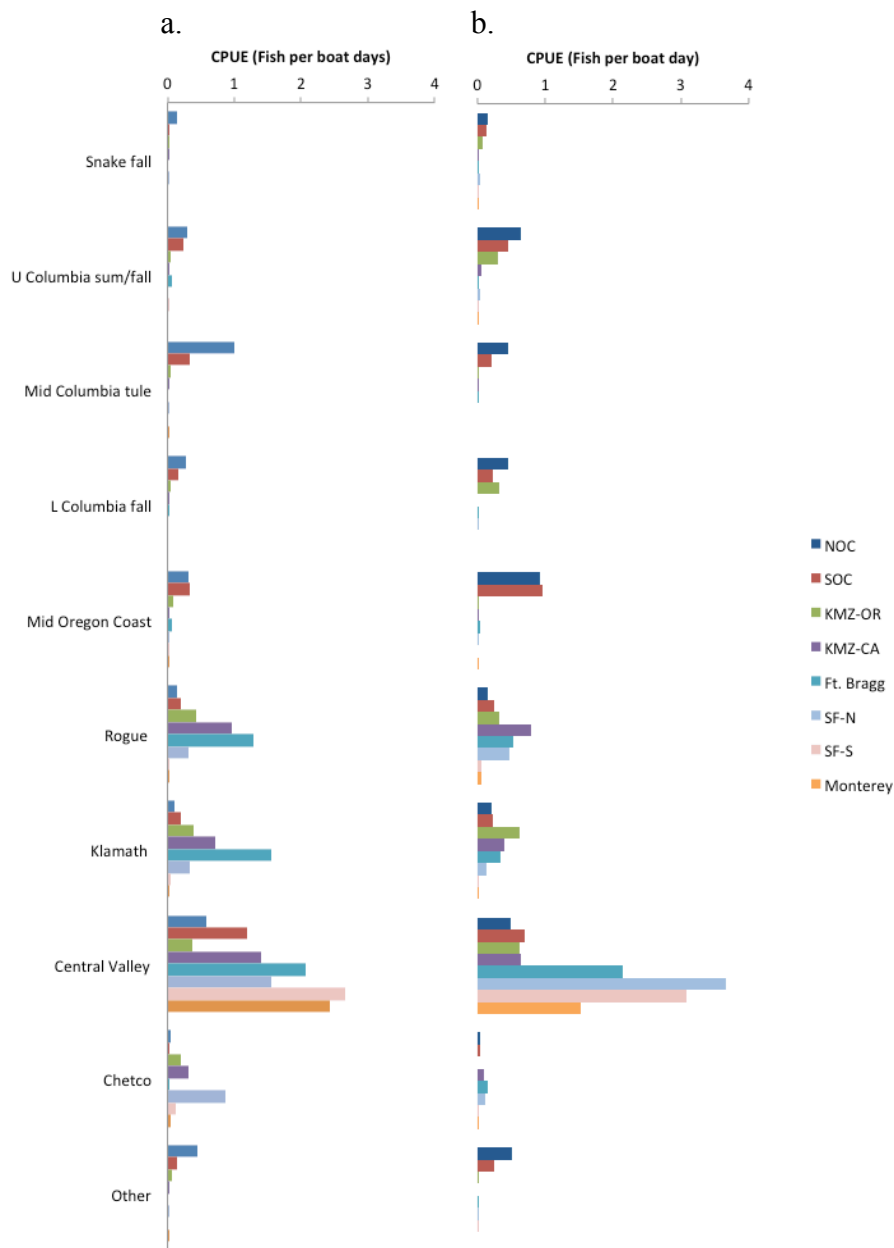


Figure 4. CPUE (Fish per boat day) of select stocks by management area in 2010 (a.), and 2011 (b.). Areas are color-coded and labeled as in Figure 3. Monterey is from Pigeon Point to the CA/Mexico border.

Figure 4 illustrates stock specific fish catch per boat day across the Oregon and California coasts in 2010 and 2011. In 2010, Mid Columbia tule Chinook were the dominant component of harvest in the NOC and Central Valley all Chinook were the dominant component of harvest for all other regions. In 2011, Mid Oregon coast stocks were the dominant component of harvest in the NOC and SOC. In the KMZ-OR the dominant component of harvest was Central Valley and Klamath stocks. In 2011, KMZ-CA the dominant component of harvest was Rogue and Central Valley stocks and Central Valley was the dominant component of harvest for all other regions in California. Expanding sampling coverage to include the Washington coast and more years of data may reveal interesting stock specific patterns across the Pacific coast enabling a more comprehensive understanding of stock specific distributions.

The following section is provided to illustrate our ability to compare fishing patterns and stock-specific catch rates across years and management areas. For simplicity we present an example from Oregon fisheries. The most valuable results will come when we can compare coast-wide patterns including Washington, Oregon, and California.

In Oregon we now have four years of data (2006, 2007, 2010, 2011). Although there is some variation in sampling coverage, these data can be used to contrast and compare fishing (sampling) patterns and changes in stock-specific contribution rates over the four years. Figure 5 presents monthly CPUE for four major stock groups in the four years of data collection in Oregon. Note that the vertical axis (catch rate) is scaled differently for each stock. Each stock showed one year of higher catch rates; Central Valley Fall in 2006 (Figure 6.a.), Klamath and Rogue in 2007 (Figure 6.c and 6.d.), and Mid-Columbia Tules in 2010 (Figure 6.b.). Stocks show different patterns over time. This analysis groups all age classes. In an earlier analysis we showed a change in age composition of Central Valley Chinook late in the year as mature Age 4 fish entered the rivers. Stock distribution patterns will become clearer as we extend these analyses to include California and Washington fisheries and to include more years of data.

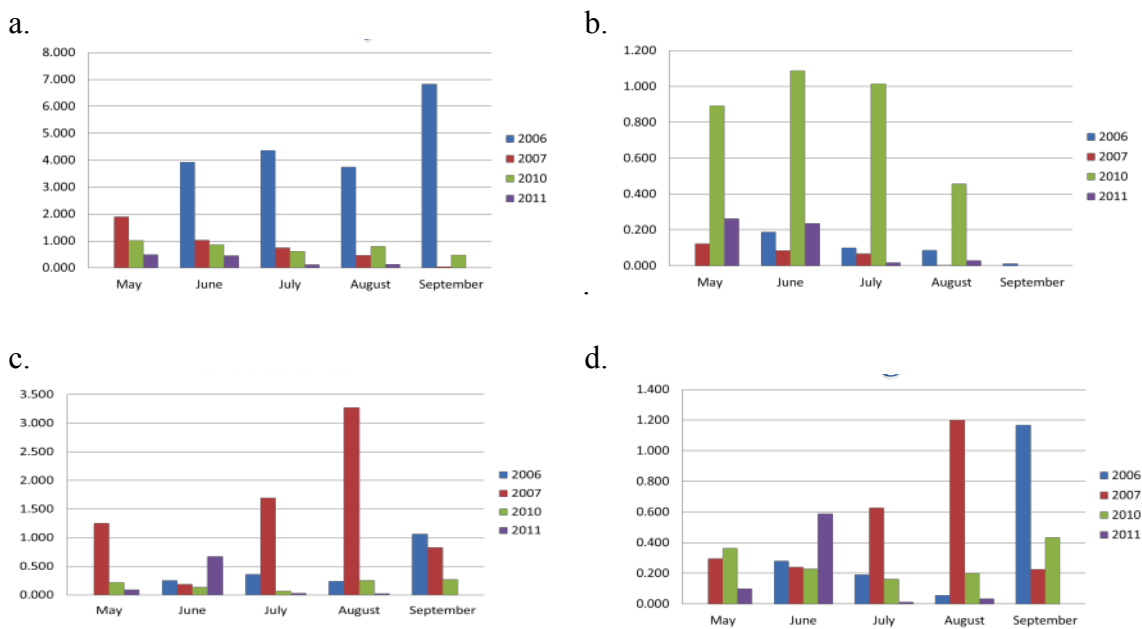


Figure 5. Catch Per Unit Effort (fish per boat day) of Select Stocks by Month in 2006, 2007, 2010, and 2011. a) Central Valley Fall, b) Mid Columbia River Tule, c) Klamath River, d) Rogue River Chinook.

Closer examination of these data will reveal more patterns of interest, although strict interpretation should be limited until we better understand the significance of GSI data, including the comparison to CWTs. Consistent fisheries, or an understanding of how to compare retention and non-retention fisheries, would also enhance the usefulness of this analytical technique. Additionally, data “holes” of missing data cause loss of information and difficulty of interpretation. Using GSI, stock-specific contribution rates and catch rates can be determined quickly, on a monthly or even weekly basis. We plan to develop our understanding of these patterns of stock composition in relation to stock abundance and ocean conditions.

Application to fisheries management

Direct application of GSI data to fisheries management remains difficult because assessment models are built around data derived from CWTs. Direct integration of GSI data into cohort reconstructions and harvest models is hampered when GSI reporting groups do not coincide with management units defined in fishery management plans, and when age information is not available in tandem with GSI data. Some of these difficulties may be resolved through other data sources (e.g., age estimation from scales, CWT historical data) and advances in genetics (e.g., parentage-based intergenerational tagging, increased stock resolution). However, management applications extend beyond direct incorporation of GSI data into cohort reconstructions and harvest models. For example, GSI data may refine our understanding of stock distributions in the ocean. New stock distribution information may aid in identifying biologically relevant management boundaries, which could result in better control over spatio-temporal allocation of fishing mortality. In addition, GSI gives us the ability to recognize short term (interannual) changes in distribution which may translate into more precise management, potentially improving weak stock conservation while allowing additional fishing opportunities.

GSI data also have the potential to aid in the evaluation of how well CWT indicator stocks approximate the distribution of untagged stocks. For instance, the Endangered Species Act consultation standard for threatened California Coastal Chinook is to limit Klamath River Fall Chinook (KRFC) age-4 ocean harvest rate to a maximum of 16% of total harvest. GSI data can allow for an evaluation of whether California Coastal Chinook, for which there is no CWT information, share a similar ocean distribution to tagged KRFC. Such an application could validate or provide a means to refine the use of certain indicator stocks for use in conservation and fishery management.

Depth of catch is a dimension of fish distribution that has not previously been available for analysis. Fishermen estimate the depth in the water column at which fish were caught, not the bathymetry or the terminal depth of gear. We analyzed stock-specific depth of catch data for Oregon in 2010 and 2011. Data were aggregated over the entire fishing season. Data are presented as box plots (Fig. 6).

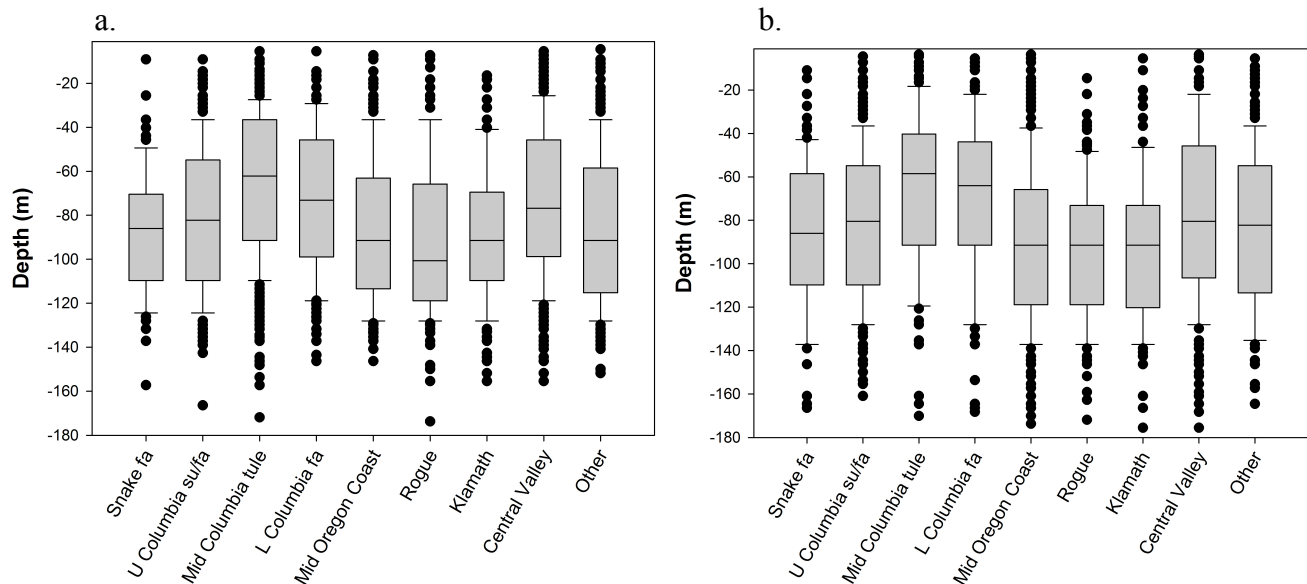


Figure 6. Box plots of depth of catch for eight major stocks and all other stocks (Other) for 2010 (a.), and 2011 (b.). Each box includes the 25th to 75th percentile, with the median indicated as a horizontal line within the box. Whiskers indicate 10th to 90th percentiles, and dots are points outside that range.

Throughout the fishery stocks are caught at the full range of depths from near the surface to about 180 meters. Some stocks showed specific depth preferences that were consistent in the two years. Columbia River tules, Lower Columbia River fall, and Central Valley fall Chinook had the shallowest median catch depth of around 60 meters. Mid-Oregon Coast, Rogue, and Klamath Chinook all shared a deeper distribution with a median catch depth of about 90 m. The remaining stocks were intermediate. The pattern was most clear-cut in 2011, but 2010 depth preferences were similar.

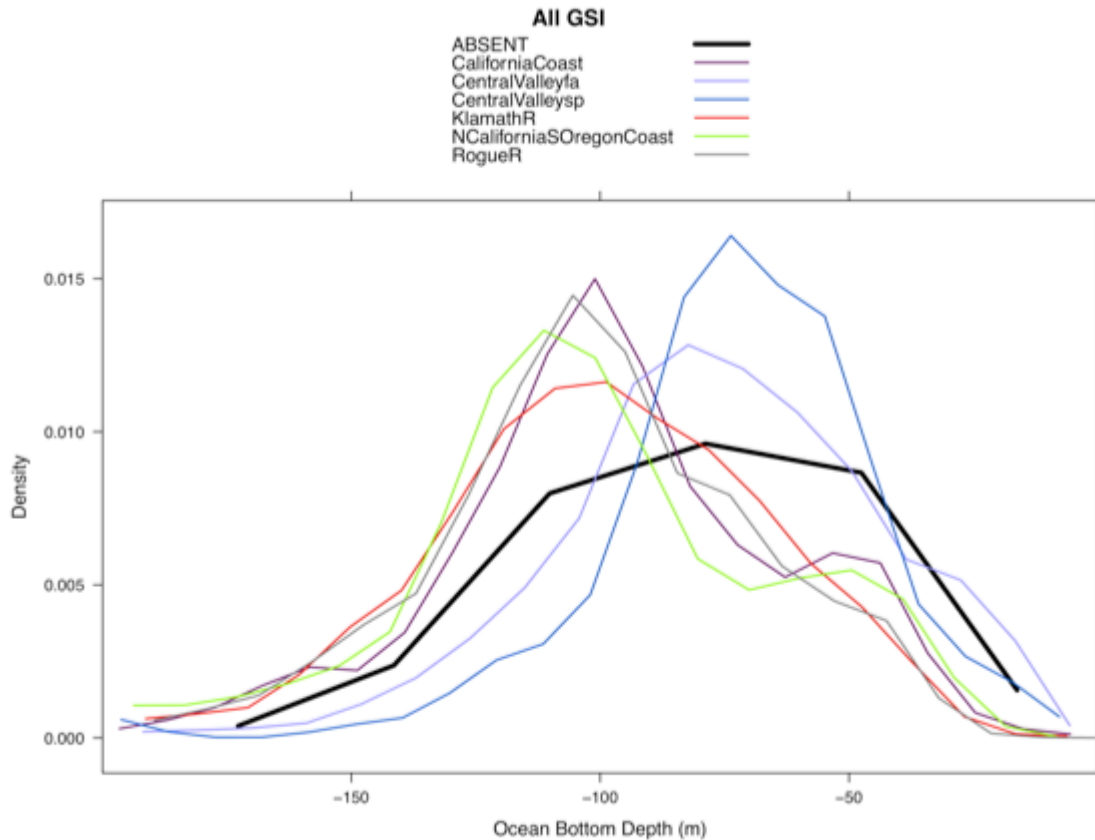


Figure 7. Bottom depth distribution of effort (heavy black line), Central Valley spring and fall Chinook (blue lines), and other Chinook stocks, 2010. Central Valley Chinook were generally caught at shallower depths than other stocks.

We explored the relationship between Chinook salmon catch locations and a variety of physical factors and environmental variables. Catch distribution in relation to bottom depth (as distinct from catch depth used in the previous example) differed depending on stock, indicating stock-specific habitat preferences (Figure 8). Central Valley spring-run and fall-run Chinook were found in significantly shallower habitats. Mapping catch locations by stock confirms this pattern (Figure 10). There may be an opportunity to control relative harvest rates on Central Valley stocks by changing the location of the fishing fleet.

The consistency of these preferences suggests that stocks are occupying specific habitats within the water column. As we understand these preferences better we may be able to define management actions. For example, we may be able to reduce tule impacts by fishing at greater depths. This could be

[illegible]

Figure 8. Catch locations, colored by stock, of Chinook salmon in the San Francisco management area, 2010. Central Valley spring and fall Chinook (blue) are distributed in shallower depths than other stocks.

Conclusion

The WCS-GSI collaboration has created the opportunity for fishermen, scientists, and fishery managers to work together toward common goals. Through Fish Trax™, we are creating web-based data access and mapping tools so fishermen, managers, and researchers involved in the project can see near-real time spatial distributions. By providing fishermen clear access to their own personal data, and allowing all fishermen and the public to see maps with data aggregated in a way that protects each individual boat's information, we are increasing the utility and value of the data. Fishermen and the public are able to examine trends and correlations. These data portals have seen substantial improvements in 2011.

Already we have been able to validate and extend the stock distribution patterns long known from CWTs. Differential distribution of Klamath stocks north of Pt. Reyes within the San Francisco management area, as revealed by GSI analysis, has a near-term potential for management application. We have been able to assess stock compositions in the Klamath Zone, where fishery restrictions and closures have prevented the collection of CWTs for over a decade.

Additionally, this data has the potential for improvements in the detail level of fishery management. Rather than using the scale of management zones, we are able to examine individual point data for locations of different stocks. By determining trends of weak stocks in finer scale than currently used, we are providing the data for potentially smaller scale management closures which would allow for greater fishing opportunities of healthy stocks while protecting weaker stocks. We do not know, at this point, how the finer-scale data will be useful. Patterns with potential management application, such

as the stock-specific depth preferences, are beginning to emerge, and will be an active area of continuing research.

The technologies that we have developed have been useful for other fisheries in marketing pilot projects, such as Gulf of Mexico Reef Fish Shareholders' Alliance and Oregon Albacore Tuna. These projects provided information about quality, safety, and sustainability of seafood to consumers. We continue to see domestic and international interest in our mapping technologies, data sharing agreements, and genetic baseline data. The methodologies we have developed and are continuing to improve have large scale applicability in the management and marketing of diverse fisheries. For example, contour plots can be used to help visualize many aspects of the data such as the difference between distribution maps for two stocks. Identifying areas of stock overlap and separation could lead to finer-scale strategies for stock targeting. Plots based on age or maturity could help reveal migration patterns. Overlays with charts of ocean environmental data could help discern ecological relationships or identify important marine habitat.

The WCS-GSI Collaboration has shown substantial benefits in understanding stock-specific distribution, as well as creating the framework for such an interdisciplinary working partnership. This collaboration has provided economic support to commercial fishermen and dependent communities along the entire Pacific Coast. The WCS-GSI Collaboration will continue to improve understanding of ocean salmon ecology, through comparison of different stocks, oceanographic conditions, and fishing effort. The project will continue to integrate multiple disciplines to develop and improve fisheries management strategies.

Future Actions

- We expect to increase the number of fish sampled in 2012 over the previous years, due to forecasts of high stock abundance.
- Due to limited funds, we will have to prioritize times and areas of greatest sample value to conduct sampling activities.
- We will completely integrate the Pacific Fish Trax website into the Fish Trax™ site. We will also expand the Fish Trax™ site to include pages for Project CROOS and the WCS-GSI Collaboration.
- We will continue to examine how to best integrate the data into fisheries management.
- We are continuing to explore additional applications of our methodology and technologies, including data loggers, mapping ability and information distribution.
- We are exploring new ways to present the data, including in time series, to better illustrate trends and improve understanding of the ocean ecology of salmon.
- We will look for funding to incorporate a pilot marketing program for Chinook salmon in 2012.
- We will develop and test an electronic at-sea data-entry system.
- Data from 2011 and previous years will be analyzed by members of the WCS-GSI Collaboration to explore opportunities for science and management applications and to produce publications.
- We will continue and increase outreach to fishing communities and fisheries managers to increase understanding of research, including potential partner organizations.
- We will communicate with legislators with the goal of securing funds to support ongoing research, including visits to Washington, DC.

Contact Information:**West Coast Salmon Genetic Stock Identification:**

www.pacificfishtrax.org and www.fishtrax.org

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2013-14 Harvest Specifications and Management Measures Advance Informational Briefing

**PFMC
April 2012**

Briefing Outline

- Discussion of preferred ACLs and range analyzed in the DEIS
- Discussion of the range of management measures, including allocations, analyzed in the DEIS
- Briefing highlights several important issues, yet does not cover everything
- References available under Agenda Item I.3

Actions at This Meeting

- Adopt the revised lingcod ABC in the north (technical correction from the March 2012 meeting action)
- Adopt preferred ACLs for all stocks and complexes from the range analyzed in the DEIS
 - In addition to the No Action ACLs, the Council requested a range be analyzed for canary, POP, and widow rockfish
- Adopt preliminary preferred management measures, including allocations, from the range analyzed in the DEIS
 - Introducing new alternatives outside the previously adopted range at this Council meeting has not been noticed and is not part of the adopted narrow process

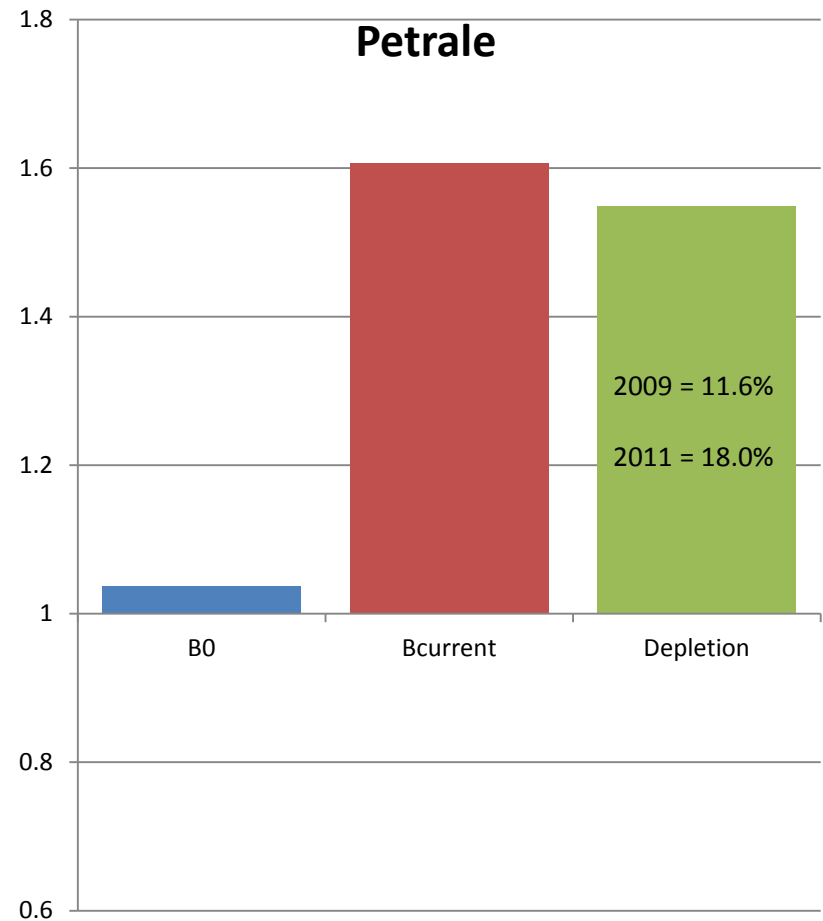
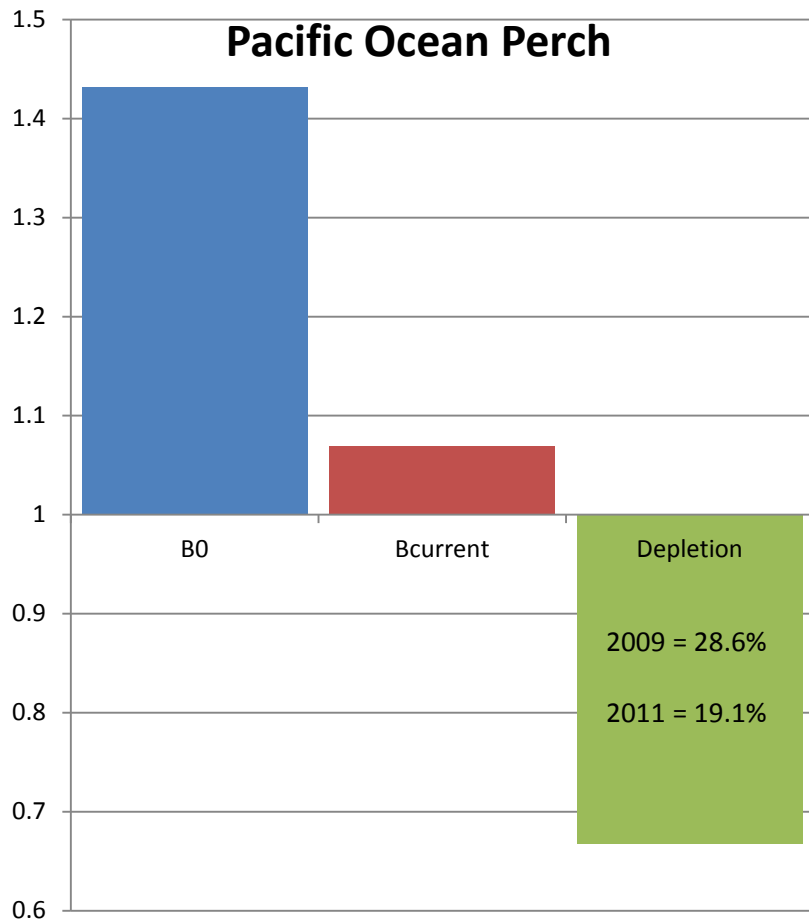
Preferred Alternative Harvest Specifications and Range of ACLs for Analysis

- Preferred ACLs need to be decided for all stocks and complexes
- The Council asked for more analysis of the range of ACLs for canary, POP, longnose skate, and widow rockfish
- Introducing new ACL alternatives at this Council meeting outside the previously adopted range has not been noticed and is not part of the adopted narrow process

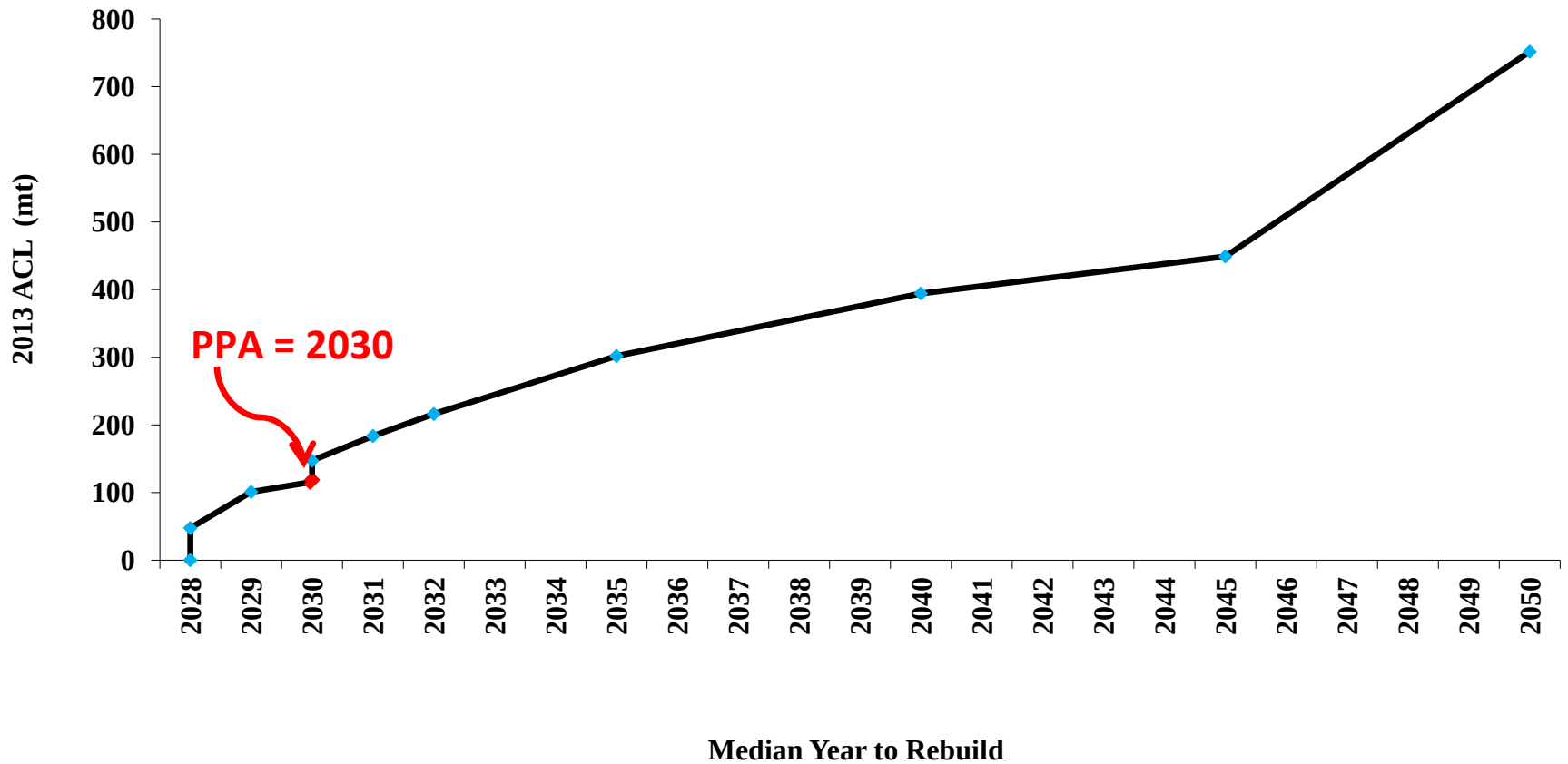
Changes in our understanding of stock status of overfished species

- 5 of 7 rebuilding plans maintain status quo harvest control rules and rebuilding parameters (rebuilding is ahead of schedule)
- Canary and POP predicted to not rebuild by current T_{TARGET} with $\geq 50\%$ probability (even with zero harvest starting in 2013)
- Current biomass estimates from 2011 assessment not signif. different from the 2009 assessments, but B_0 different

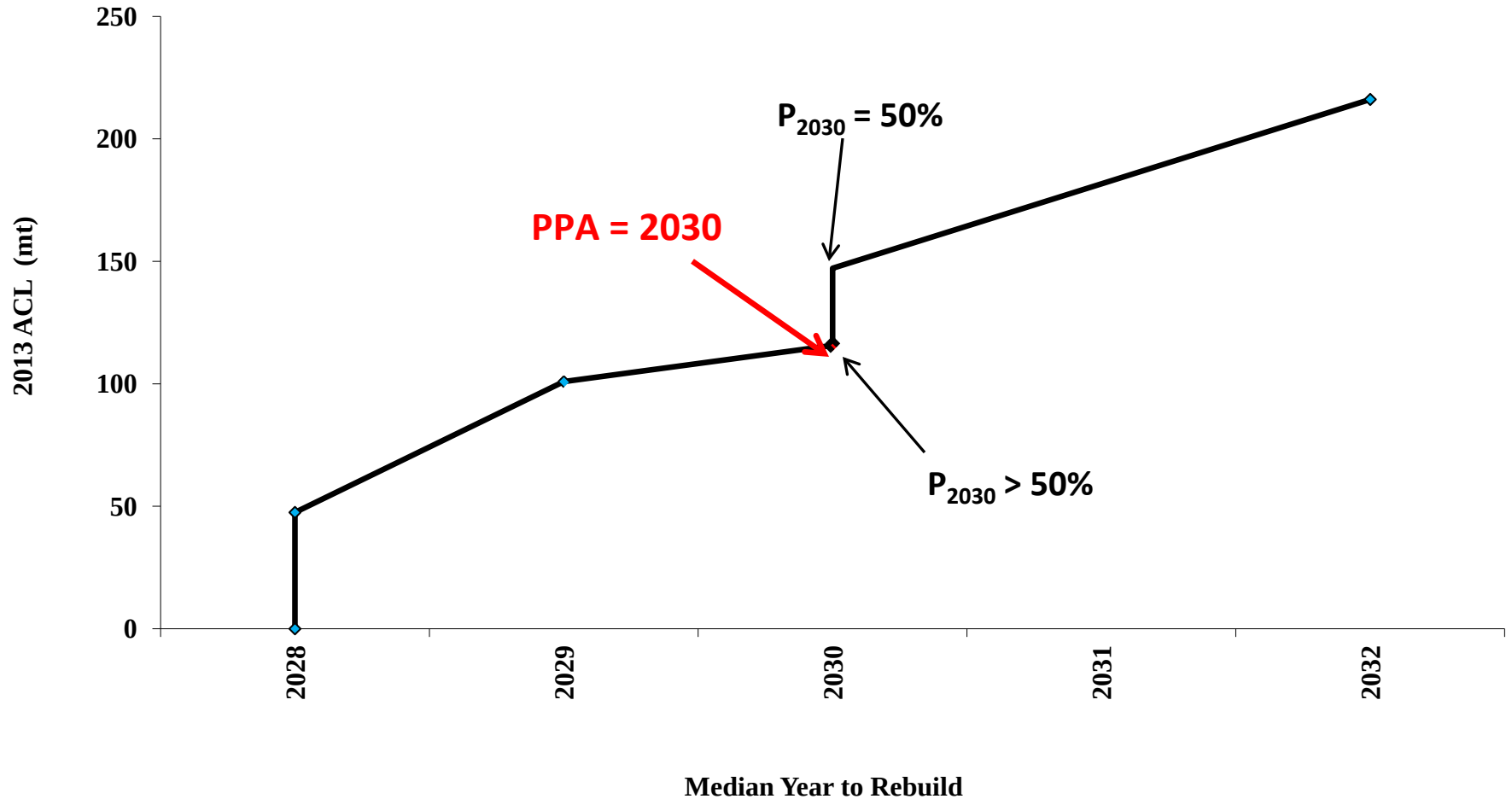
Example of Changes to Status Quo 2011 Relative to 2009



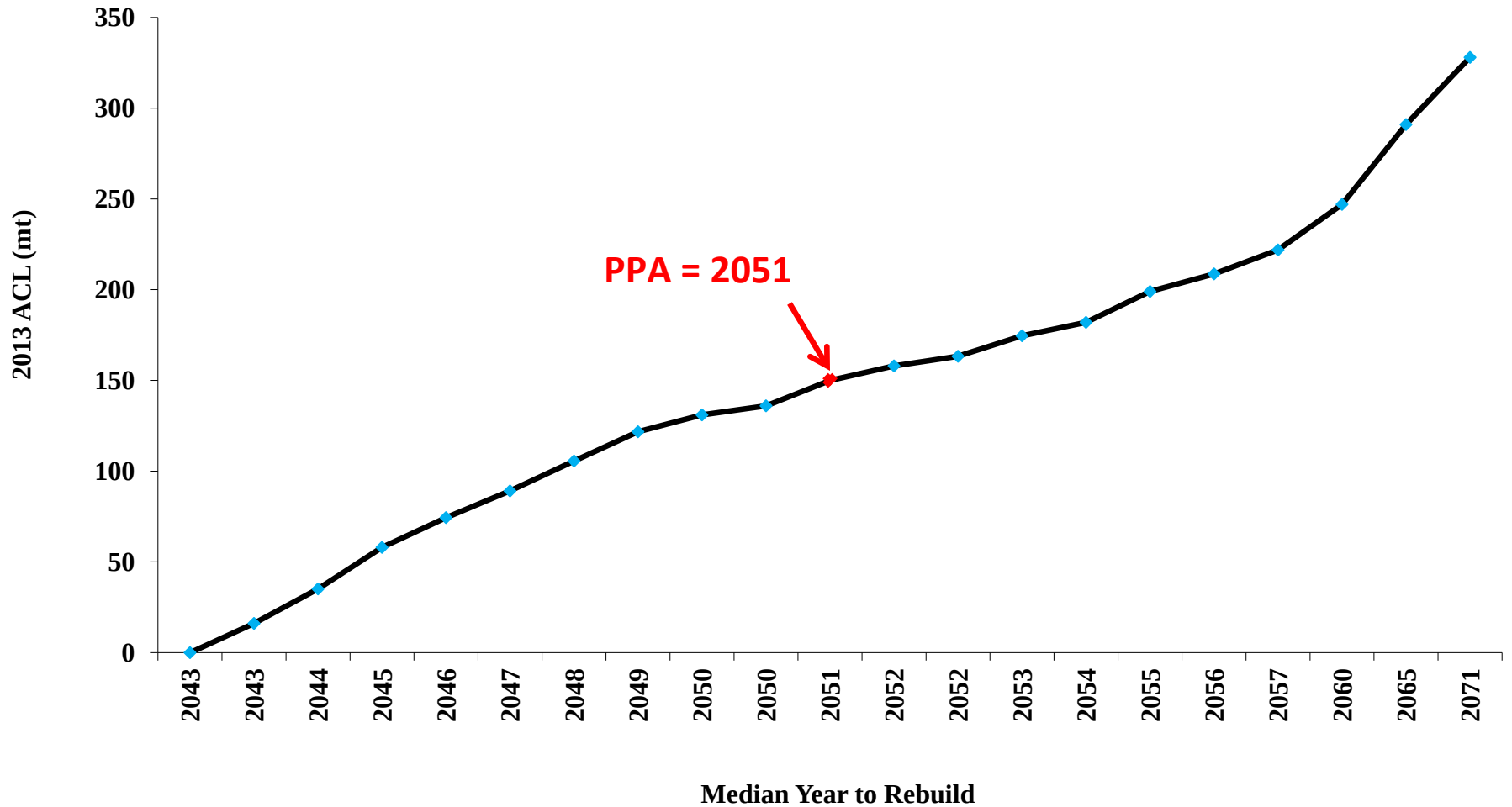
Canary Rebuilding



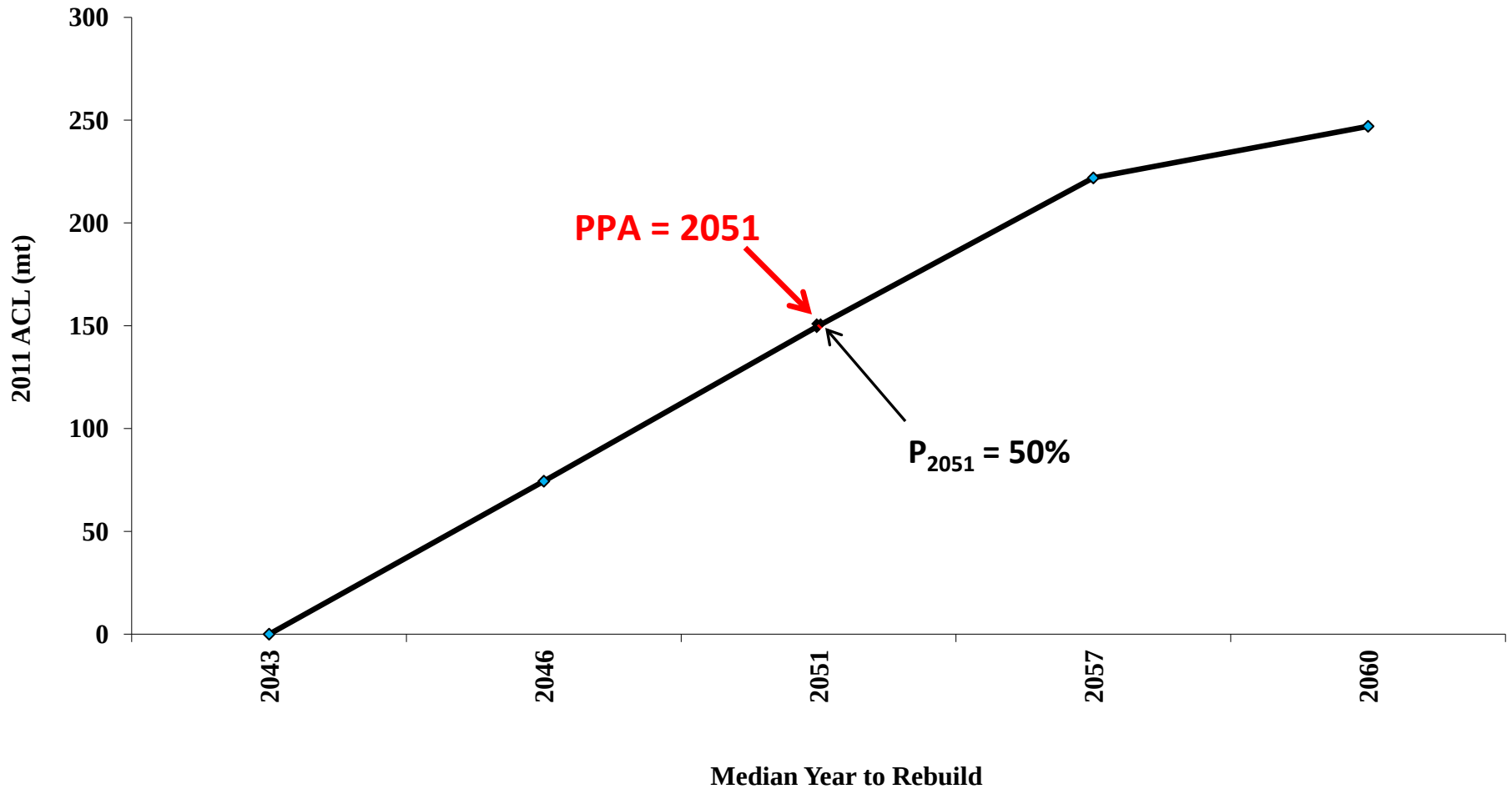
Canary Rebuilding Analyzed ACL Alternatives



POP Rebuilding

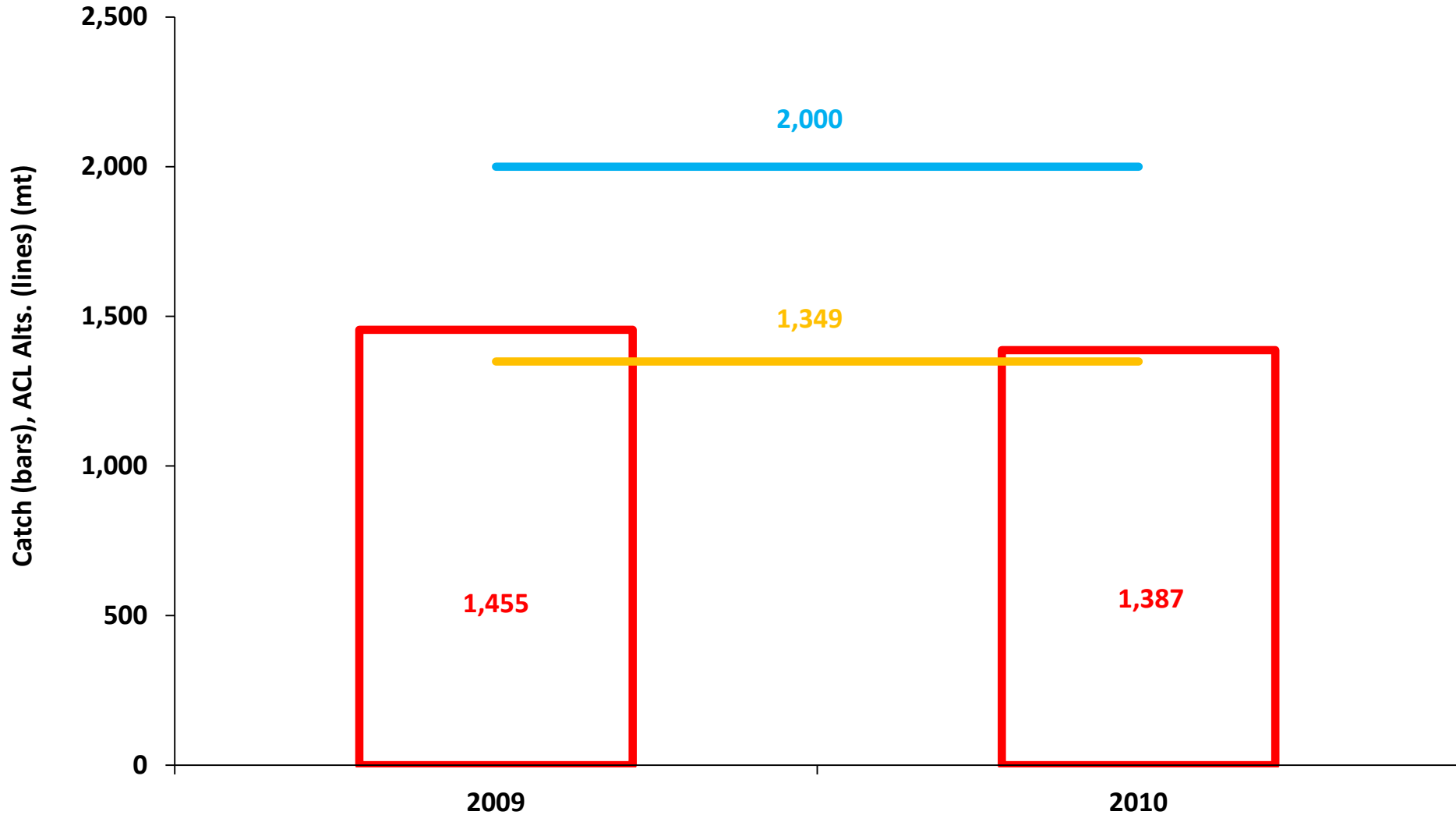


POP Rebuilding Analyzed ACL Alternatives

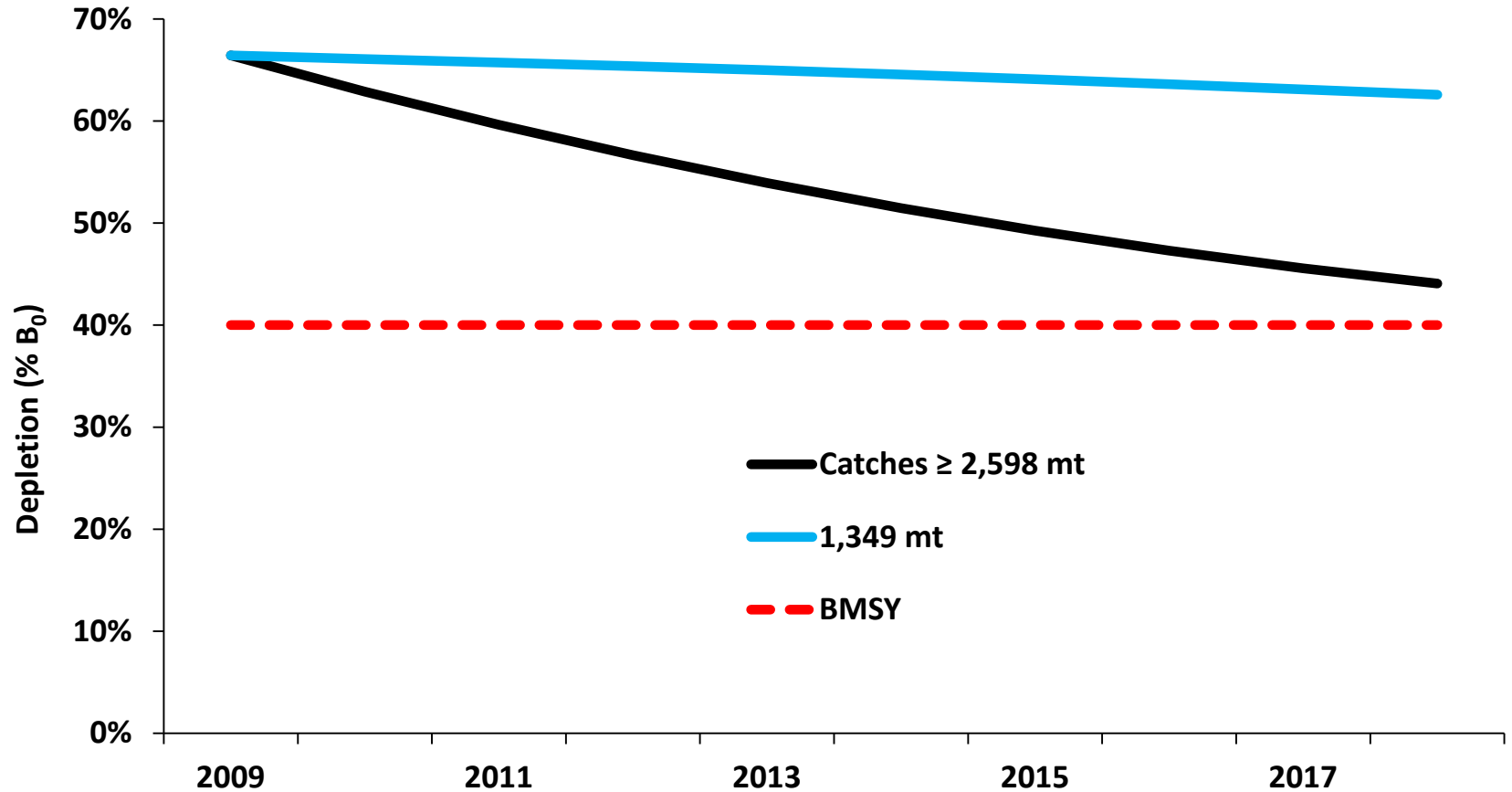


Longnose Skate

Recent Mortalities & ACL Alts.

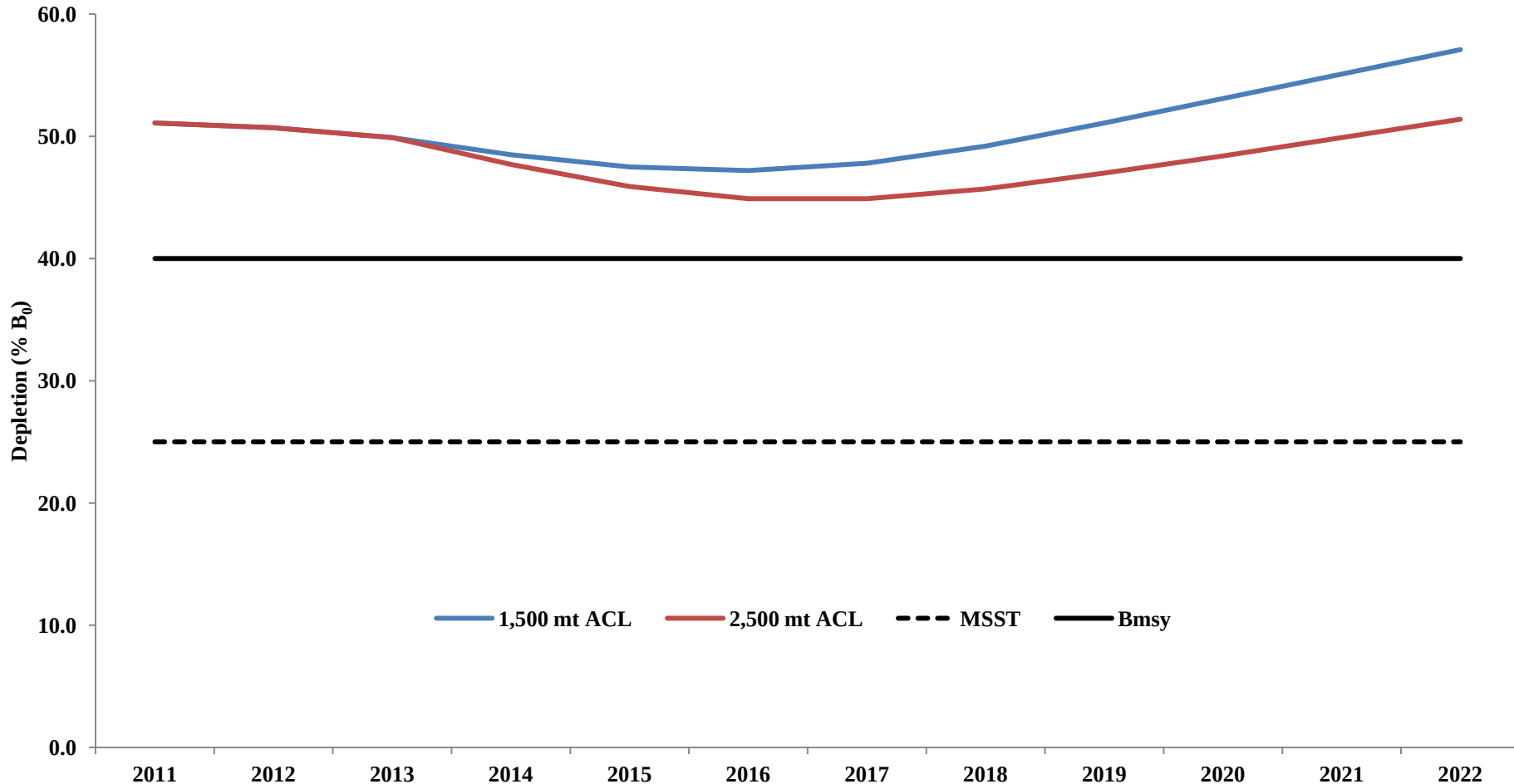


Longnose Skate ACL Impact Projections



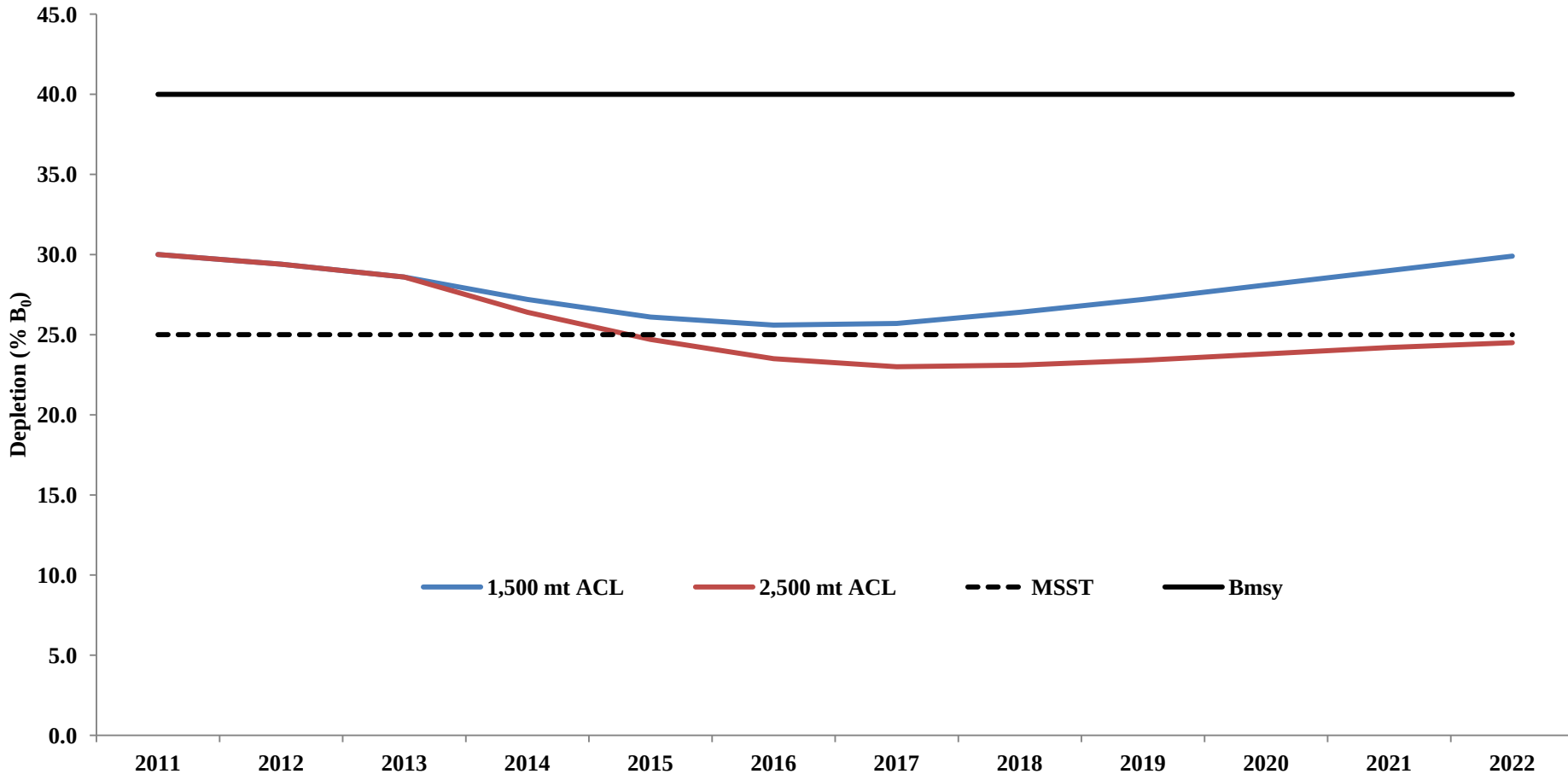
Widow ACL Projections

Base Case Model ($h = 0.76$)



Widow ACL Projections

Low State of Nature Model ($h = 0.41$)



Management Measures

Management Measures

- Changes to the waypoints that define RCA boundaries to better approximate depth
- ✓ Sorting requirements north of 40°10 N. lat for aurora, shortraker, and roughey rockfishes
- Clarifications to the FMP and regulations regarding catch accounting between limited entry and open access
- ✓ Widow rockfish within trawl allocation (between shorebased and at-sea)

Management Measures – con't

- Shorebased IFQ Fishery
 - Accumulation limits: lingcod as a result of the new management units
 - ✓ Enhanced accountability measures for the surplus carry-over provision
 - Remove or reduce the lingcod length limit in the IFQ fishery (all legal gears)
- California Recreational
 - Shelf rockfish retention in the Cowcod Conservation Area (from 0-20 fm) when groundfish is open
 - Remove the 10 inch bocaccio size limit
 - Increase the bocaccio bag limit from 2 to 3
 - Increase the greenling bag limit from 2 to 10

Other Notable Modifications

- Sablefish daily trip limit reductions as a result of the lower ACL
- Regulatory adjustment for sablefish north of 40°10' that governs movement from the limited entry fixed gear primary to daily trip limit fishery
- Sorting requirements and limited entry and open access fixed gear trip limit reductions for blackgill rockfish south of 40°10'
- Trip limits and/or RCA adjustments to reduce spiny dogfish and longnose skate mortality, if necessary

Shorebased IFQ – Surplus Carry-Over

- Background
 - NMFS Report in September 2011 outlined concerns and the Council guidance was to explore solutions both for 2012 and beyond
 - Short-term (2012), medium term (13-14), and long-term solutions (beyond)

Shorebased IFQ – Surplus Carry-Over

Option 1: Enhanced Accountability Measures (AMs)

- 1. Inseason Action:** Provides for a Council role to make changes to the eligible surplus carry-over before the QP are issued, should a conservation concern arise
- 2. Regulations Re-Organization**
- 3. Automatic Action:** Closure of the non-whiting shorebased fishery, in addition to the authority to close the whiting fishery (see regulations at 660.60 (d)).

Shorebased IFQ – Surplus Carry-Over

Benefits

- Provides a review process to ensure best available data are used in decision-making, allows for stakeholder input, and for the Council to evaluate the risk
- Increased clarity in regulations
- The authority to close the non-whiting IFQ fishery provides an additional AM to respond to conservation concerns

Limitations

- No guarantee that surplus pounds in one year would be issued in the following year
- Lack of certainty increases the likelihood of fishing into deficit at the end of the year
- This option does not seem to implement the program as envisioned by the Council, therefore long-term solutions needed

Sorting Requirement North 40°10' N. Lat.

- Historical high catch rates of aurora, rougheye, and shortraker compelled consideration
- It appears mortalities were significantly reduced in 2011 due to IFQ management
- Occurrence of aurora south of 40°10' N. latitude merits consideration of a coastwide sorting requirement

2011 Catches of Vulnerable Slope Rockfish

Sector/Gear	N of 40°10' N. lat.			S of 40°10' N. lat.		
	Aurora	Rougheye	Shortraker	Aurora	Rougheye	Shortraker
IFQ fixed gear	0.0	10.7	0.7	0.1	0.0	0.0
IFQ trawl gear	5.9	1.6	1.0	1.3	0.0	0.0
LE fixed gear	0.0	28.3	1.0	0.9	0.0	0.0
OA	0.0	0.0	0.0	0.0	0.0	0.0
Tribal	0.0	16.0	1.0	0.0	0.0	0.0
Total	5.9	56.6	3.7	2.3	0.0	0.0
2013-14 OFL contribution	15.4	71.1	18.7	26.1	0.4	0.1
2013-14 ABC contribution	12.8	59.3	15.6	21.7	0.3	0.1

Current Widow Allocations

- FMP trawl alloc. = 91% of Fishery HG
- FMP within-trawl alloc.:
 - 500 mt or 10% of trawl alloc., whichever is greater, to whiting sectors (apportioned according to whiting alloc. %s)
 - Shoreside whiting allocation (42%) is added to the shoreside non-whiting allocation to determine the shorebased IFQ allocation
 - at-sea in 2012 = 147.9 mt
 - at-sea in 2013-14 under PPA ACL = 290 mt

Widow Allocation Considerations

- Shorebased IFQ sector (whiting and non-whiting) benefits from maximum widow allocation since a healthy widow stock is targeted and necessary for whiting and yellowtail targeting
- At-sea sectors need enough widow to attain whiting allocations (a low widow allocation can limit access to whiting)

Trawl Sector Widow Allocation Options

vs. Max. 2005-11 Widow Catch

ACL Alt.	Fishery HG	Trawl Alloc.	Widow Alloc. Option	SB IFQ Alloc.	At-sea Trawl Alloc.	MS Alloc.	CP Alloc.
Max. 2005-11 widow catch				124		73	73
600	513.4	467.2	Option 1	177.2	290.0	120.0	170.0
			Option 2	319.3	147.9	61.2	86.7
			Option 3	267.2	200.0	82.8	117.2
			Option 4	217.2	250.0	103.4	146.6
			Option 5	167.2	300.0	124.1	175.9
1,500	1,413.4	1,286.2	Option 1	996.2	290.0	120.0	170.0
			Option 2	1,138.3	147.9	61.2	86.7
			Option 3	1,086.2	200.0	82.8	117.2
			Option 4	1,036.2	250.0	103.4	146.6
			Option 5	986.2	300.0	124.1	175.9
2,500	2,413.4	2,196.2	Option 1	1,906.2	290.0	120.0	170.0
			Option 2	2,048.3	147.9	61.2	86.7
			Option 3	1,996.2	200.0	82.8	117.2
			Option 4	1,946.2	250.0	103.4	146.6
			Option 5	1,896.2	300.0	124.1	175.9

Widow Allocation - Revenue

- Assuming the average 2001 widow-yellowtail encounter (landing) rate and 2011 ex-vessel prices, a widow and yellowtail rockfish directed fishery may have an exvessel value
 - Between \$1.2 million and \$2.2 million under the 1,500 mt widow ACL alternative
 - Between \$2.7 million and \$4.2 million under the 2,500 mt widow ACL alternative
- Ex-vessel range depends on the assumed bycatch rate and intersector allocation

Integrated Alternatives

- Overfished species (OFS) ACLs are analyzed with the preferred non-overfished species ACLs
 - For 2013-2014 canary and POP vary
- Allocations for overfished species (two-year & long-term)
- Management measures necessary to stay within the ACLs or to achieve other management objectives (i.e., routine measures)
- Landings and mortality model projections, given OFS constraints
- Impact analysis of proposed new measures

2013 Integrated Alternatives

	No Action	1 - PPA	2	3	4	5	6	7
Bocaccio	274	320						
Canary	107	116	101	116	48	216	101	147
Cowcod	3	3						
DRK	296	317						
POP	183	150	150	74	247	74	222	222
Petrale	1,160	2,592						
YE	17	18						

Results of the Integrated Alternatives

- Analysis focused on the tradeoffs to fishery sectors from the variation in canary and POP ACLs
- Analysis does not inform the ACL decision for non-overfished species
- The imprecision of the impact projection models for each sector needs to be considered when deciding an ACL

Results of the Analysis of Integrated Alternatives

- POP ACL decision only affects northern trawl sectors
- All sectors are affected by the canary ACL decision
- All variation in non-trawl impacts due to variation in the canary ACL
- Canary becomes more constraining to nearshore and recreational fisheries than yelloweye when the canary ACL is ~50 mt (Alt. 4)

Ex-vessel Revenue by Sector

Change from No Action

Sector	Revenue Rank	Alternative 1 PPA	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Canary / POP ACLs		116 / 150	101 / 150	116 / 74	48 / 247	216 / 74	101 / 222	147 / 222
Whiting	2							
Nonwhiting Trawl	1							
LE Fixed Gear	3							
Nearshore OA	6							
Non-nearshore OA	5							
Tribal (incl. whiting)	7							

- Alternatives 1, 2, 6, and 7 are estimated to produce about \$85 million in ex-vessel revenue in 2013, a **9-10% decline** from No Action
 - This decline is primarily due to the reduction in the sablefish ACL; historically sablefish has accounted for about 50% of coastwide groundfish revenue
- Alternatives 3, 4, and 5 are estimated to produce about \$79 million in ex-vessel revenue in 2013, a **15-16% decline** from No Action
- **Nonwhiting Trawl** declines from No Action by **\$5-6 million** under Alternatives 3, 4, and 5.
- **LE Fixed Gear** and **Non Nearshore OA** decline from No Action by **\$5 million** under all alternatives.
- **Nearshore OA increases** from No Action by **\$0.5-0.7 million** under all alternatives except Alternative 4, where it declines by \$0.7-1.5 million.
- All the alternatives show an increase in shoreside revenue from the 2005-10 average annual ex-vessel revenue of \$66 million.

Commercial & Recreational Personal Income Impacts

Change from No Action

Community Groups	Income Rank	Alternative 1 PPA	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Canary / POP ACLs		116 / 150	101 / 150	116 / 74	48 / 247	216 / 74	101 / 222	147 / 222
Puget Sound	10							
Washington Coast	3							
Astoria-Tillamook	2							
Newport	4							
Coos Bay-Brookings	6							
Crescent City-Eureka	7							
Fort Bragg - Bodega Bay	9							
San Francisco Area	8							
Santa Cruz - Monterey - Morro Bay	5							
Santa Barbara - Los Angeles - San Diego	1							

- Alternatives 1, 2, 6, and 7 are projected to generate \$155-156 million in personal income in 2013, a 5-6% decline from No Action.
- Alternative 3, 4, and 5 are projected to generate \$148-149 million in personal income in 2013, a 9-10% decline from No Action.
- Under Alternative 1** (Preliminary Preferred) income is projected to decline from No Action by about \$2.5 million in Washington, \$5 million in Oregon, and \$1 million in California.
- Under Alternative 4** the income declines are \$3 million for Washington, \$10 million for Oregon, and \$3 million for California.

Nearshore OA Options

Community Group	Nearshore OA Baseline		Integrated Action Alternatives						
	\$,000	Pct.	1	2	3	4	5	6	7
Astoria-Tillamook	125	1%							
Newport	23	<1%							
Coos Bay-Brookings	854	9%							
Crescent City-Eureka	479	8%							
Fort Bragg - Bodega Bay	248	7%							
San Francisco Area	136	9%							
Santa Cruz - Monterey - Morro Bay	1,116	30%							
Santa Barbara - Los Angeles - San Diego	226	10%							

- For Alternatives 1-3 and 6-7 projected ex-vessel revenue in Oregon under Option B is **\$194,000** less than under Option A. There is no difference in California.
- For Alternative 4 projected ex-vessel revenue in California under Option B is **\$833,000** less than under Option A. There is no difference in Oregon.

Summary of Impacts by Ranking

Ranking of impacts: 1 = least adverse / most beneficial (only nearshore option A shown)

Impact Metric	No Action	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Rec Option 4B
Canary / POP ACLs		116 / 150	101 / 150	116 / 74	48 / 247	216 / 74	101 / 222	147 / 222	
Socioeconomic Impacts									
Recreational Income	3	1	2		4		2		5
Commercial Income	1	3		4	5	4	2		
Stock Rebuilding (Target Year)									
Canary	*	3	2	3	1	4	2	3	
POP	*	2	2	1	4	1	3	3	
Overall Ranking		1	1	2	4	3	1	2	

- The overall ranking re-ranks the sum of the independent rankings of each metric. This approach assumes that all metrics are ***equally weighted***.
- Alternatives 6 and 7 have the least adverse / most beneficial socioeconomic impacts, followed by Alternatives 1 and 2.
- Alternatives 1, 2, 6, and 7 combine intermediate canary and POP target years while alternatives 3-5 contrast shorter and longer rebuilding times.
- No Action is not ranked for stock rebuilding, because the canary and POP target years are not feasible.

Next Steps At This Meeting

- Under Agenda Item I.3, tentative adoption of
 - Final preferred harvest specifications
 - Preliminary preferred allocations
 - Preliminary preferred season structures (e.g., bag limits, trip limits, etc.)
 - Some management measures decided under I.3 (e.g., bag limits, trip limits, etc.); others may need analysis assignment to GMT and GAP for decisions under I.8 (carry-over, widow allocations, etc.)

Next Steps At This Meeting

- Agenda Item I.8:
 - Tentative adoptions under I.3 are finalized
 - Any assigned analysis to advisory bodies is received and any remaining harvest specifications, allocations, and management measures are adopted
 - Final preferred harvest specifications
 - Preliminary preferred management measures, including allocations

Questions?

Other Fish Complex

Stock Complex and Component Stocks	OFL a/		ABC a/		ACL	
	2013	2014	2013	2014	2013	2014
Other Fish	6,832	6,802	4,717	4,697	4,717	4,697
<i>Big skate</i>	458.0	458.0	317.9	317.9		
<i>Cabazon (WA)</i>	b/	b/	b/	b/		
<i>California skate</i>	86.0	86.0	59.7	59.7		
<i>Finescale codling</i>	b/	b/	b/	b/		
<i>Kelp greenling (CA)</i>	118.9	118.9	82.5	82.5		
<i>Kelp greenling (OR & WA)</i>	b/	b/	b/	b/		
<i>Leopard shark</i>	167.1	167.1	116.0	116.0		
<i>Pacific grenadier</i>	1,519.0	1,519.0	1,054.2	1,054.2		
<i>Ratfish</i>	1,441.0	1,441.0	1,000.1	1,000.1		
<i>Soupfin shark</i>	61.6	61.6	42.8	42.8		
<i>Spiny dogfish</i>	2,980	2,950	2,044	2,024		

a/ Values for these specifications are the sum of known contributions of component stocks.

b/ No OFL or ABC contribution for these stocks given the lack of an approved method for estimating the OFL.

Slide 1

**2013-14 Harvest Specifications and
Management Measures
Advance Informational Briefing**

**PFMC
April 2012**

Briefing Outline

- Discussion of preferred ACLs and range analyzed in the DEIS
- Discussion of the range of management measures, including allocations, analyzed in the DEIS
- Briefing highlights several important issues, yet does not cover everything
- References available under Agenda Item I.3

We will present detailed information on only three management measures, if you'd like a more detailed presentation on another management measure, we can provide that under Agenda Item I.3.

Note: Due to the volume, the excerpts of the DEIS reference materials are provided electronic only

Actions at This Meeting

- Adopt the revised lingcod ABC in the north (technical correction from the March 2012 meeting action)
- Adopt preferred ACLs for all stocks and complexes from the range analyzed in the DEIS
 - In addition to the No Action ACLs, the Council requested a range be analyzed for canary, POP, and widow rockfish
- Adopt preliminary preferred management measures, including allocations, from the range analyzed in the DEIS
 - Introducing new alternatives outside the previously adopted range at this Council meeting has not been noticed and is not part of the adopted narrow process

1) March lingcod north ABC was 3,036 mt (2013) and 2,878 mt (2014). The corrected lingcod north ABC is 3,187 mt (2013) and 3,023 mt (2014).

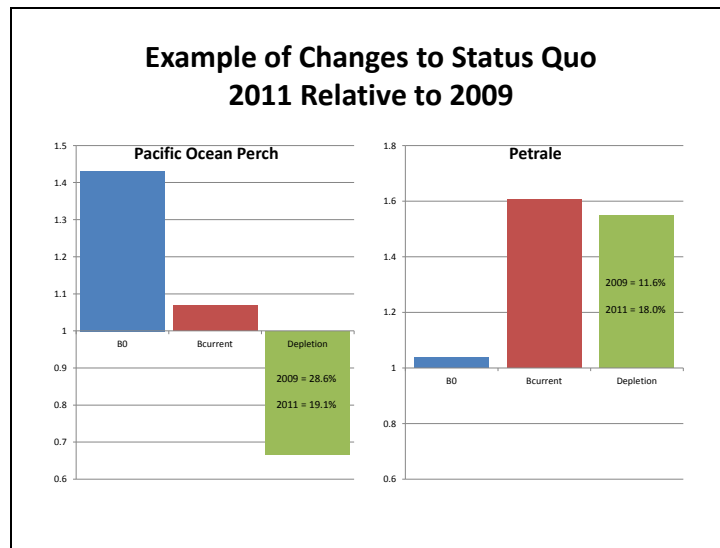
**Preferred Alternative Harvest
Specifications and Range of ACLs
for Analysis**

- Preferred ACLs need to be decided for all stocks and complexes
- The Council asked for more analysis of the range of ACLs for canary, POP, longnose skate, and widow rockfish
- Introducing new ACL alternatives at this Council meeting outside the previously adopted range has not been noticed and is not part of the adopted narrow process

Changes in our understanding of stock status of overfished species

- 5 of 7 rebuilding plans maintain status quo harvest control rules and rebuilding parameters (rebuilding is ahead of schedule)
- Canary and POP predicted to not rebuild by current T_{TARGET} with $\geq 50\%$ probability (even with zero harvest starting in 2013)
- Current biomass estimates from 2011 assessment not signif. different from the 2009 assessments, but B_0 different

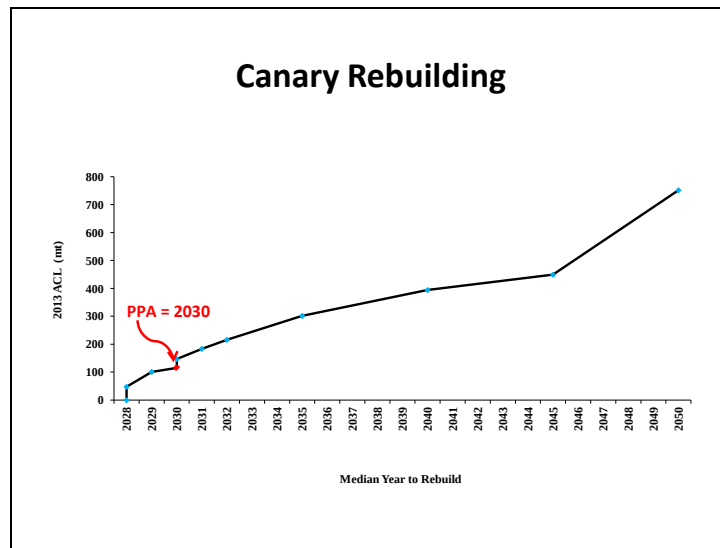
Slide 6



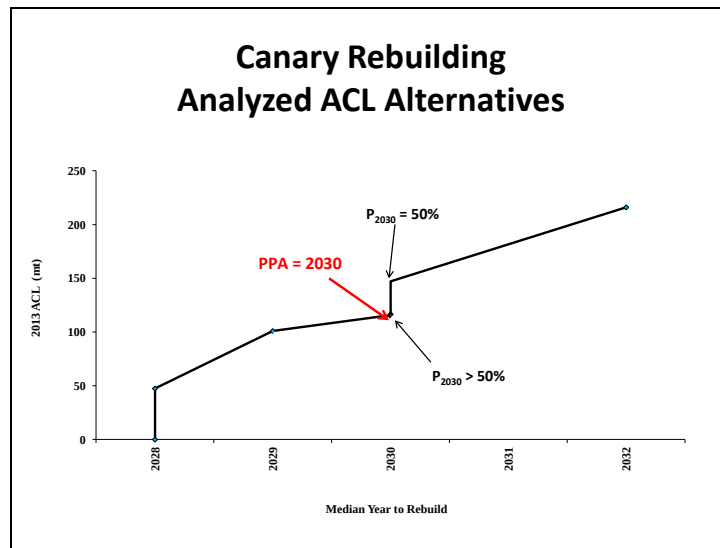
depletion = $BCURRENT/B0$

The POP example is very similar for canary.

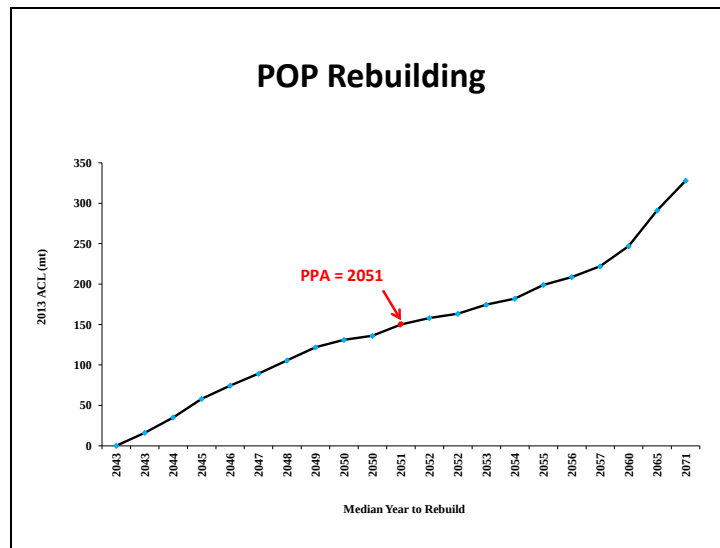
Slide 7



Shortest time to rebuild = 2028; Current Ttarget = 2027; PPA Ttarget = 2030

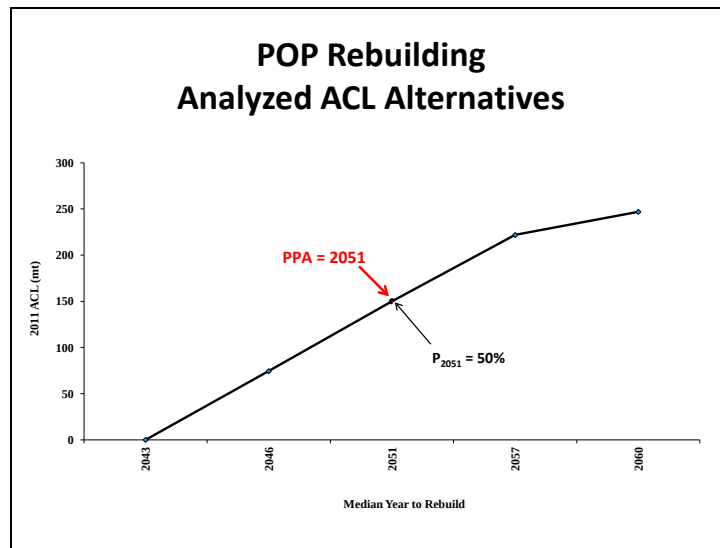


Slide 9

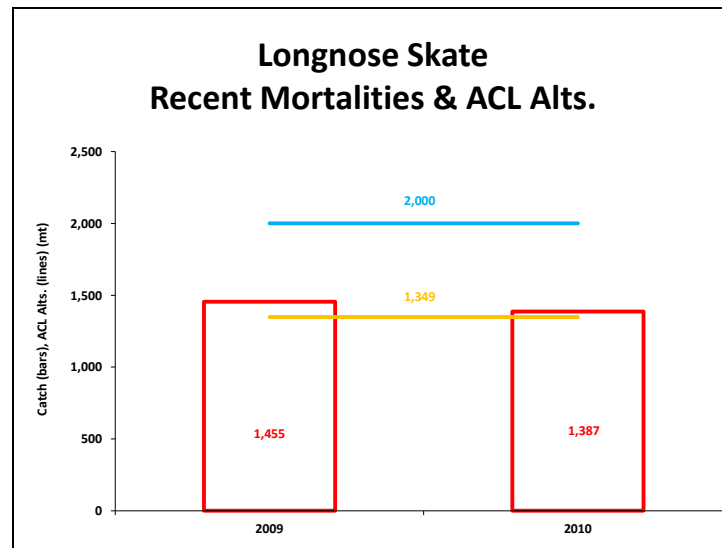


Shortest time to rebuild = 2043; Current Ttarget = 2020; PPA Ttarget = 2051.

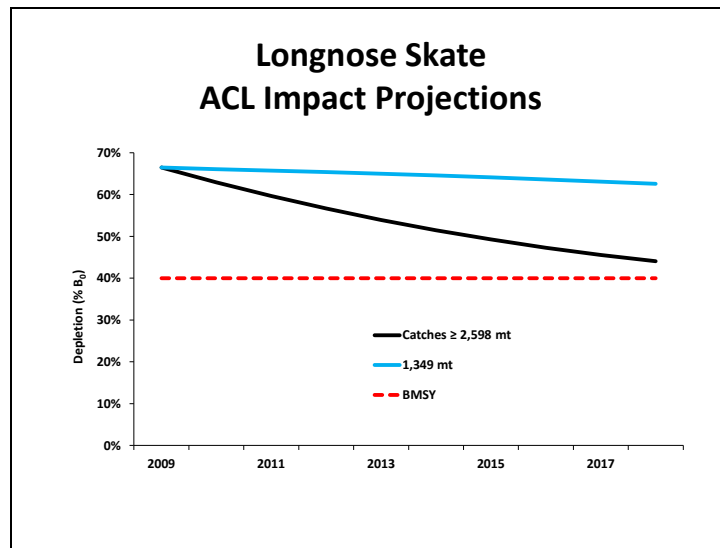
Slide 10

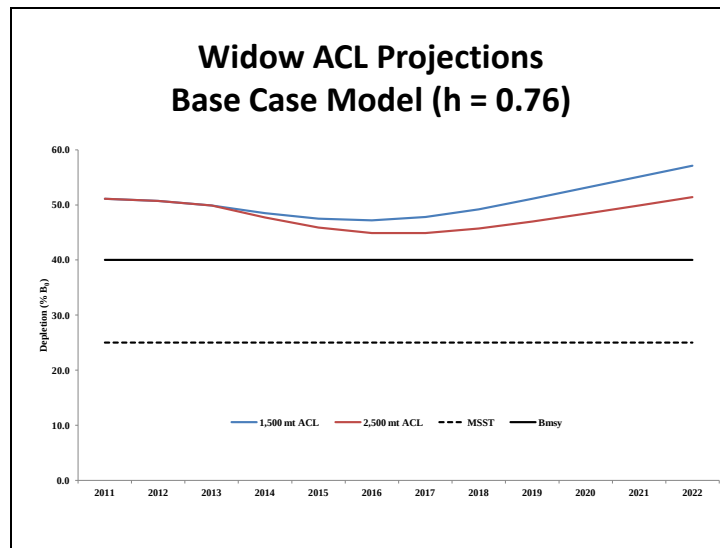


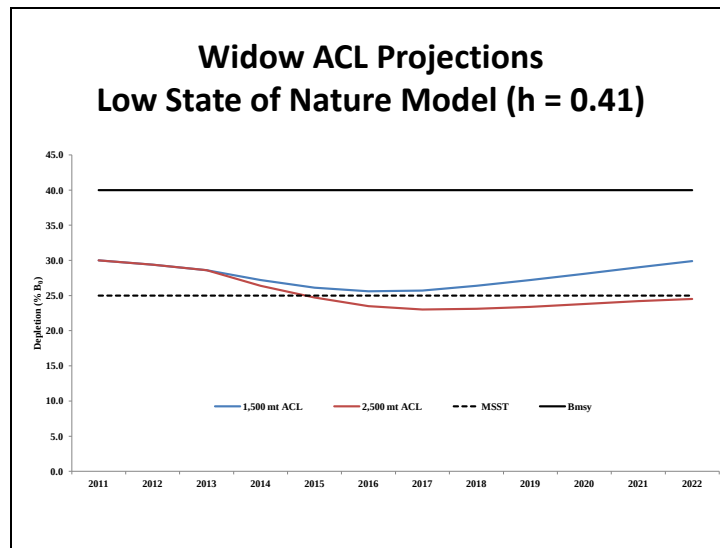
key info for int alts



- Policy is a sustainable level of harvest that will not constrain fisheries.
- Discard mortality assumption was 100%; however, SSC says to use the discard mortality rates in the assessment (50% trawl discard mort.).
- Therefore did not exceed 2009 and 2010 Oys: 2009 = 1,120 mt, 2010 = 1,182 mt







Management Measures

The next three slides outline the range of management measures that were requested for more detailed analysis by the Council at the September and November 2011 meetings. Generally, these management measures have not previously been analyzed and implemented in regulation. I have provided a bulleted list of the measures and I will go over the checked items greater detail. I can answer questions about the remaining management measures, if desired. Additionally, if you'd like a more detailed presentation on another management measure, I can provide that under Agenda Item I.3.

An executive summary of the analysis can be found in Attachment 4. Full details are in Appendix D, which is Supplemental Attachment 7 provided electronically only.

Management Measures

- Changes to the waypoints that define RCA boundaries to better approximate depth
- ✓ Sorting requirements north of 40°10 N. lat for aurora, shortraker, and roughey rockfishes
- Clarifications to the FMP and regulations regarding catch accounting between limited entry and open access
- ✓ Widow rockfish within trawl allocation (between shorebased and at-sea)

1) Changes to the waypoints that define RCAs are proposed to better approximate depth. Corrections off Washington and Oregon (200 and 150 fm); Oregon (200 fm); California (150 fm near Usal and Noyo Canyon)

2) Sorting requirements for aurora, shortraker, and roughey rockfish north of 40°10 were requested by the Council to improve the accuracy and timeliness of landings information for these species.

3) Revisions to the FMP and regulations regarding catch accounting in the LE and OA sectors are proposed. This action essentially reinstates a Council-recommended provision, which inadvertently deleted under Amendment 21.

4) Widow rockfish was declared rebuilt during this assessment cycle. Therefore, the FMP rebuilt allocation of widow rockfish, which was adopted under Amendment 21, will be implemented in 2013-14. In November, the Council requested that we analyze a range of new allocations within the trawl sector under the range of widow rockfish ACLs (600, 1500, 2500 mt). Within trawl allocations are contemplated for the shorebased (whiting and non-whiting target strategies) and at-sea sectors (CP and MS).

Management Measures – con't

- **Shorebased IFQ Fishery**
 - Accumulation limits: lingcod as a result of the new management units
 - ✓ Enhanced accountability measures for the surplus carry-over provision
 - Remove or reduce the lingcod length limit in the IFQ fishery (all legal gears)
- **California Recreational**
 - Shelf rockfish retention in the Cowcod Conservation Area (from 0-20 fm) when groundfish is open
 - Remove the 10 inch bocaccio size limit
 - Increase the bocaccio bag limit from 2 to 3
 - Increase the greenling bag limit from 2 to 10

- Accumulation limits are implemented in the shorebased IFQ fishery to prevent to excessive control of QS and QP in a vessel account. Performance of the accumulation limits was analyzed for all species. In particular, the change from coastwide lingcod QP to north and south of 40'10 may compel the Council to revise the lingcod accumulation limits. More information on this matter will be provided in a Supplemental report.
- In September 2011, NMFS asked for further analysis on the surplus carry-over provision to ensure it was consistent with the MSA conservation requirements. The Council requested that analysis be completed in the 13-14 process and an option is presented that provides enhanced accountability measures.
- In September 2011, the Council requested an analysis to remove or reduce the minimum lingcod length limit in the shorebased IFQ fishery which has been completed.
- CDFG proposed the following management measures, which were analyzed in the DEIS. The projected mortality of implementing these measures is provided in the executive summary in Attachment 4.

Other Notable Modifications

- Sablefish daily trip limit reductions as a result of the lower ACL
- Regulatory adjustment for sablefish north of 40°10' that governs movement from the limited entry fixed gear primary to daily trip limit fishery
- Sorting requirements and limited entry and open access fixed gear trip limit reductions for blackgill rockfish south of 40°10'
- Trip limits and/or RCA adjustments to reduce spiny dogfish and longnose skate mortality, if necessary

Other notable modifications to routine management measures include:

- Reductions to the sablefish DTL limits are necessary as a result of the proposed lower 2013-14 sablefish ACL.
- In 2011, the GMT identified an issue with the current regulations that govern movement from the primary fishery to the DTL fishery. In the past, there was a daily trip limit around 300 pounds per day, however when the daily limit was removed, the threshold became the weekly limit, which is substantially larger. This proposed action would implement a poundage threshold in the regulations (300 lbs) that is not linked to either a daily, weekly or bi-monthly limit.
- Blackgill rockfish was assessed for the 2013-14 cycle. The Council recommended that blackgill continue to be managed in the slope rockfish complex, but implement a sorting requirement to improve the accuracy and timeliness of landings information. Additionally, LE and OA trip limit reductions are proposed to reduce blackgill rockfish mortality.
- Trip limits and/or RCA adjustments were analyzed to reduce mortality of dogfish and longnose skate, if necessary. **Spiny dogfish set-asides or allocations for the at-sea sectors were also discussed**

Shorebased IFQ – Surplus Carry-Over

- Background
 - NMFS Report in September 2011 outlined concerns and the Council guidance was to explore solutions both for 2012 and beyond
 - Short-term (2012), medium term (13-14), and long-term solutions (beyond)

- Background
- Three timelines were identified for addressing the carry-over. The short-term timeline is to address the issuance of surplus carry-over in 2012. This matter will be discussed later in the week under Inseason. Due to the limited scope for 13-14, the options for a medium term solution were limited. Therefore, it was recognized that long term solutions still need to be explored.

Shorebased IFQ – Surplus Carry-Over

Option 1: Enhanced Accountability Measures (AMs)

- 1. Inseason Action:** Provides for a Council role to make changes to the eligible surplus carry-over before the QP are issued, should a conservation concern arise
- 2. Regulations Re-Organization**
- 3. Automatic Action:** Closure of the non-whiting shorebased fishery, in addition to the authority to close the whiting fishery (see regulations at 660.60 (d)).

1) E.g., In March or April, the Council would review the eligible surplus carry-over amounts from the previous year, projected impacts for the current year, and available AMs to determine whether the issuing the eligible surplus carry-over QPs results in a conservation concern. If a conservation concern arises, the eligible surplus carry-over would be reduced or eliminated.

The ability to modify the surplus carry-over percentages through routine inseason action is different from the No Action option where adjustments are made by NMFS under MSA authority or by the Council during the biennial cycle.

2) Reorganizing the regulations to provide greater clarity in the currently available AMs to address a conservation concern.

3) Regulations provide NMFS with the automatic authority to close the whiting fishery when a whiting or bycatch allocation is attained or projected to be attained. Under the enhanced AMs, NMFS would also have the ability to close the non-whiting IFQ sector

Shorebased IFQ – Surplus Carry-Over

Benefits

- Provides a review process to ensure best available data are used in decision-making, allows for stakeholder input, and for the Council to evaluate the risk
- Increased clarity in regulations
- The authority to close the non-whiting IFQ fishery provides an additional AM to respond to conservation concerns

Limitations

- No guarantee that surplus pounds in one year would be issued in the following year
- Lack of certainty increases the likelihood of fishing into deficit at the end of the year
- This option does not seem to implement the program as envisioned by the Council, therefore long-term solutions needed

1) E.g., one long term solution would be to use the average mortality against the ACL. This would apply for all sectors..., therefore was outside the scope of the 13-14 process

**Sorting Requirement
North 40°10' N. Lat.**

- Historical high catch rates of aurora, rougheye, and shortraker compelled consideration
- It appears mortalities were significantly reduced in 2011 due to IFQ management
- Occurrence of aurora south of 40°10' N. latitude merits consideration of a coastwide sorting requirement

Current preferred alternative is to mandate a sorting requirement for these species only north of 40°10' N. latitude.

2011 Catches of Vulnerable Slope Rockfish

Sector/Gear	N of 40°10' N. lat.			S of 40°10' N. lat.		
	Aurora	Rougheye	Shortraker	Aurora	Rougheye	Shortraker
IFQ fixed gear	0.0	10.7	0.7	0.1	0.0	0.0
IFQ trawl gear	5.9	1.6	1.0	1.3	0.0	0.0
LE fixed gear	0.0	28.3	1.0	0.9	0.0	0.0
OA	0.0	0.0	0.0	0.0	0.0	0.0
Tribal	0.0	16.0	1.0	0.0	0.0	0.0
Total	5.9	56.6	3.7	2.3	0.0	0.0
2013-14 OFL contribution	15.4	71.1	18.7	26.1	0.4	0.1
2013-14 ABC contribution	12.8	59.3	15.6	21.7	0.3	0.1

Current Widow Allocations

- FMP trawl alloc. = 91% of Fishery HG
- FMP within-trawl alloc.:
 - 500 mt or 10% of trawl alloc., whichever is greater, to whiting sectors (apportioned according to whiting alloc. %s)
 - Shoreside whiting allocation (42%) is added to the shoreside non-whiting allocation to determine the shorebased IFQ allocation
 - at-sea in 2012 = 147.9 mt
 - at-sea in 2013-14 under PPA ACL = 290 mt

Turn into flow chart

Widow Allocation Considerations

- Shorebased IFQ sector (whiting and non-whiting) benefits from maximum widow allocation since a healthy widow stock is targeted and necessary for whiting and yellowtail targeting
- At-sea sectors need enough widow to attain whiting allocations (a low widow allocation can limit access to whiting)

**Trawl Sector Widow Allocation Options
vs. Max. 2005-11 Widow Catch**

ACL Alt.	Fishery HG	Trawl Alloc.	Widow Alloc. Option	SB IFQ Alloc.	At-sea Trawl Alloc.	MS Alloc.	CP Alloc.
Max. 2005-11 widow catch				124		73	73
600	513.4	467.2	Option 1	177.2	290.0	120.0	170.0
			Option 2	319.3	147.9	61.2	86.7
			Option 3	267.2	200.0	82.8	117.2
			Option 4	217.2	250.0	103.4	146.6
			Option 5	167.2	300.0	124.1	175.9
1,500	1,413.4	1,286.2	Option 1	996.2	290.0	120.0	170.0
			Option 2	1,138.3	147.9	61.2	86.7
			Option 3	1,086.2	200.0	82.8	117.2
			Option 4	1,036.2	250.0	103.4	146.6
			Option 5	986.2	300.0	124.1	175.9
2,500	2,413.4	2,196.2	Option 1	1,906.2	290.0	120.0	170.0
			Option 2	2,048.3	147.9	61.2	86.7
			Option 3	1,996.2	200.0	82.8	117.2
			Option 4	1,946.2	250.0	103.4	146.6
			Option 5	1,896.2	300.0	124.1	175.9

Option 1 = No Action (FMP alloc. when widow is rebuilt)

Option 2 could be constraining to at-sea sectors, especially MS sector.

Widow Allocation - Revenue

- Assuming the average 2001 widow-yellowtail encounter (landing) rate and 2011 ex-vessel prices, a widow and yellowtail rockfish directed fishery may have an exvessel value
 - Between \$1.2 million and \$2.2 million under the 1,500 mt widow ACL alternative
 - Between \$2.7 million and \$4.2 million under the 2,500 mt widow ACL alternative
- Ex-vessel range depends on the assumed bycatch rate and intersector allocation

Integrated Alternatives

- Overfished species (OFS) ACLs are analyzed with the preferred non-overfished species ACLs
 - For 2013-2014 canary and POP vary
- Allocations for overfished species (two-year & long-term)
- Management measures necessary to stay within the ACLs or to achieve other management objectives (i.e., routine measures)
- Landings and mortality model projections, given OFS constraints
- Impact analysis of proposed new measures

2013 Integrated Alternatives

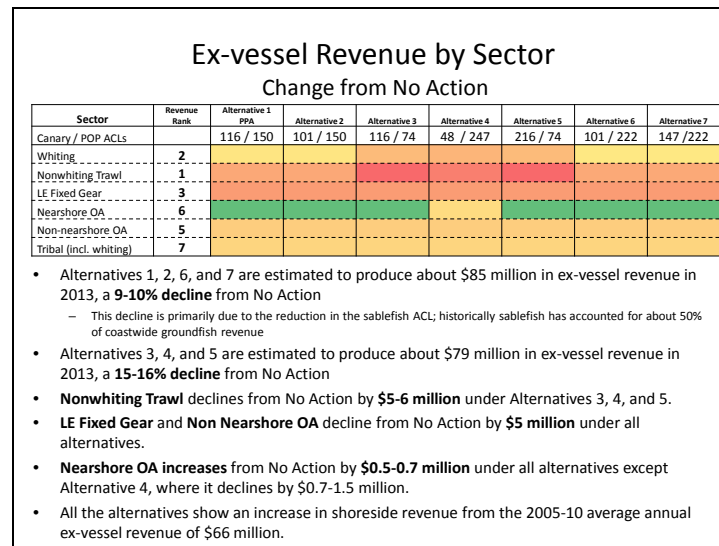
	No Action	1 - PPA	2	3	4	5	6	7
Bocaccio	274	320						
Canary	107	116	101	116	48	216	101	147
Cowcod	3	3						
DRK	296	317						
POP	183	150	150	74	247	74	222	222
Petrale	1,160	2,592						
YE	17	18						

Results of the Integrated Alternatives

- Analysis focused on the tradeoffs to fishery sectors from the variation in canary and POP ACLs
 - Analysis does not inform the ACL decision for non-overfished species
 - The imprecision of the impact projection models for each sector needs to be considered when deciding an ACL
-
- Analysis assumes the preferred ACLs for the other overfished species as well as the preferred sector allocations.
 - Analysis only informs overfished species ACLs, particularly those for canary and POP in this cycle.
 - Model imprecision is especially high for the new IFQ model since it is informed by only one partial year (2011) of data and does not factor in potential trading of QS or QP (when a permit runs out of quota, the model assumes that vessel is done fishing for the year.
 - Model imprecision, uncertain recruitment, and catch monitoring uncertainty are reasons to have a buffer between the ACL and the projected mortality impacts.

Results of the Analysis of Integrated Alternatives

- POP ACL decision only affects northern trawl sectors
 - All sectors are affected by the canary ACL decision
 - All variation in non-trawl impacts due to variation in the canary ACL
 - Canary becomes more constraining to nearshore and recreational fisheries than yelloweye when the canary ACL is ~50 mt (Alt. 4)
-
- Impacts are projected landings of all species and projected total mortalities of overfished species.
 - Constraining means impeding fishing opportunities for healthy target stocks.
 - Not in the analysis, but logically true: whiting sectors are especially impacted when both canary and POP ACLs are low (fleets have limited ability to successfully target whiting).



Only results for nearshore option A is shown in the figure. The “revenue rank” column shows the relative contribution of each sector to total revenue (e.g., nonwhiting trawl contributes the most) under No Action. For the action alternatives the cells are shaded according to the change in revenue from No Action. Green shaded cells indicate ex-vessel revenue greater than No Action. The yellow/orange/red cells indicate revenue less than No Action, with the color intensity correlating with the size of the decline.

Commercial & Recreational Personal Income Impacts Change from No Action

Community Groups	Income Rank	Alternative 1 PPA	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Canary / POP ACLs	10	116 / 150	101 / 150	116 / 74	48 / 247	216 / 74	101 / 222	147 / 222
Puget Sound	3							
Washington Coast	3							
Astoria-Tillamook	2							
Newport	4							
Coos Bay-Brookings	6							
Crescent City-Eureka	7							
Fort Bragg - Bodega Bay	9							
San Francisco Area	8							
Santa Cruz - Monterey - Morro Bay	5							
Santa Barbara - Los Angeles - San Diego	1							

- Alternatives 1, 2, 6, and 7 are projected to generate \$155-156 million in personal income in 2013, a 5-6% decline from No Action.
- Alternative 3, 4, and 5 are projected to generate \$148-149 million in personal income in 2013, a 9-10% decline from No Action.
- **Under Alternative 1** (Preliminary Preferred) income is projected to decline from No Action by about \$2.5 million in Washington, \$5 million in Oregon, and \$1 million in California.
- **Under Alternative 4** the income declines are \$3 million for Washington, \$10 million for Oregon, and \$3 million for California.

Only results for nearshore option A is shown in the figure. The “income rank” column shows the relative contribution of each community group to total coastwide income under No Action (e.g., Santa Barbara-Los Angeles-San Diego contributes the most). For the action alternatives the cells are shaded according to the change in income from No Action. Green shaded cells indicate income greater than No Action. The yellow/orange/red cells indicate income less than No Action, with the color intensity correlating with the size of the decline.

Nearshore OA Options

Community Group	Nearshore OA Baseline		Integrated Action Alternatives						
	\$,000	Pct.	1	2	3	4	5	6	7
Astoria-Tillamook	125	1%							
Newport	23	<1%							
Coos Bay-Brookings	854	9%							
Crescent City-Eureka	479	8%							
Fort Bragg - Bodega Bay	248	7%							
San Francisco Area	136	9%							
Santa Cruz - Monterey - Morro Bay	1,116	30%							
Santa Barbara - Los Angeles - San Diego	226	10%							

- For Alternatives 1-3 and 6-7 projected ex-vessel revenue in Oregon under Option B is **\$194,000** less than under Option A. There is no difference in California.
- For Alternative 4 projected ex-vessel revenue in California under Option B is **\$833,000** less than under Option A. There is no difference in Oregon.

Ex-vessel revenue under A option subtracted from revenue under B option. Green shaded cells indicate no difference between A and B and yellow/red cells indicate B option estimated revenue less than A.

Summary of Impacts by Ranking

Ranking of impacts: 1 = least adverse / most beneficial (only nearshore option A shown)

Impact Metric	No Action	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Rec Option #8
Canary / POP ACLs		116 / 150	101 / 150	116 / 74	48 / 247	216 / 74	101 / 222	147 / 222	
Socioeconomic Impacts									
Recreational Income	3	1	2		4		2		5
Commercial Income	1	3		4	5	4	2		
Stock Rebuilding (Target Year)									
Canary	+	3	2	3	1	4	2	3	
POP	+	2	2	1	4	1	3	3	
Overall Ranking		1	1	2	4	3	1	2	

- The overall ranking re-ranks the sum of the independent rankings of each metric. This approach assumes that all metrics are **equally weighted**.
- Alternatives 6 and 7 have the least adverse / most beneficial socioeconomic impacts, followed by Alternatives 1 and 2.
- Alternatives 1, 2, 6, and 7 combine intermediate canary and POP target years while alternatives 3-5 contrast shorter and longer rebuilding times.
- No Action is not ranked for stock rebuilding, because the canary and POP target years are not feasible.

Next Steps At This Meeting

- Under Agenda Item I.3, tentative adoption of
 - Final preferred harvest specifications
 - Preliminary preferred allocations
 - Preliminary preferred season structures (e.g., bag limits, trip limits, etc.)
 - Some management measures decided under I.3 (e.g., bag limits, trip limits, etc.); others may need analysis assignment to GMT and GAP for decisions under I.8 (carry-over, widow allocations, etc.)

Next Steps At This Meeting

- Agenda Item I.8:
 - Tentative adoptions under I.3 are finalized
 - Any assigned analysis to advisory bodies is received and any remaining harvest specifications, allocations, and management measures are adopted
 - Final preferred harvest specifications
 - Preliminary preferred management measures, including allocations

Questions?

Other Fish Complex						
Stock Complex and Component Stocks	OFL a/		ABC a/		ACL	
	2013	2014	2013	2014	2013	2014
Other Fish	6,832	6,802	4,717	4,697	4,717	4,697
<i>Big skate</i>	458.0	458.0	317.9	317.9		
<i>Cabezon (WA)</i>	b/	b/	b/	b/		
<i>California skate</i>	86.0	86.0	59.7	59.7		
<i>Finescale codling</i>	b/	b/	b/	b/		
<i>Kelp greenling (CA)</i>	118.9	118.9	82.5	82.5		
<i>Kelp greenling (OR & WA)</i>	b/	b/	b/	b/		
<i>Leopard shark</i>	167.1	167.1	116.0	116.0		
<i>Pacific grenadier</i>	1,519.0	1,519.0	1,054.2	1,054.2		
<i>Ratfish</i>	1,441.0	1,441.0	1,000.1	1,000.1		
<i>Southern shark</i>	61.6	61.6	42.8	42.8		
<i>Spiny dogfish</i>	2,980	2,950	2,044	2,024		

a/ Values for these specifications are the sum of known contributions of component stocks.
b/ No OFL or ABC contribution for these stocks given the lack of an approved method for estimating the OFL.

Revised OFLs as per Agenda Item F.2.a, Attachment 2. Need SSC endorsement.