Salmon: Research could change how wetlands are restored

Continued from Page 1A

The crew, less than two weeks into a study that runs through July, got their trawl net tangled up, but still returned to port with a modest catch: a single hatchery yearling Chinook, and a wild steelhead trout.

"In three days of sampling here, we're trying to get 50 fish of each yearling Chinook and steelhead," Weitkamp said. "The idea is that some of the fish we're catching are not stocks we're interested in, and so we need to get enough so we have a big enough sample size of the stocks we are interested in — the Snake River and mid- upper-Columbia Chinook … and the Columbia steelhead as well."

The juvenile salmon and steelhead caught in Weitkamp's nets could be some of the same counted by a separate NOAA survival study upriver as the fish swim through an antenna array affixed to an open-ended trawl net.

Photos by Joshua Bessex/The Daily Astorian

Crews prepare a trawling net on the Columbia River near Cathlamet, Wash.

Lance Renoux, a wildlife biologist from Ocean Associates, takes a blood sample from one of the juvenile fish.

Laurie Weitkamp, a biologist with NOAA, measures the length of a juvenile Chinook.

'The goal is to try to draw some inferences of how these wetlands are benefiting the salmon.'

Kurt Fresh

the principal investigator in the migration study and head of the estuarine and ocean ecology program in the National Marine Fisheries Science Center, part of NOAA

Gut and freeze

Docked back in Cathlamet, the crew started untangling the net, while Weitkamp and Lance Renoux, a wildlife biologist from Ocean Associates, processed the catch.

Renoux snatched the fish from the bucket and submerged them in a liquid anesthetic before measuring and taking blood samples. As he removed his needle and placed the sample in a small plastic test tube, Renoux passed each fish on to Weitkamp, who quickly sliced open the guts and removed the Red Hots-sized livers, crushing and flash-freezing them between metal blocks supercooled in dry ice. Meanwhile, Renoux hooked up a small, portable centrifuge to spin the blood samples.

"We have to bleed immediately, and we have to take the livers within 10 minutes," Weitkamp said of the quick progression from flopping yearling in a bucket of water to a dissected corpse on ice.

Signs of growth

Back at the Point Adams Research Station, researchers remove more parts of the salmon, including the stomach, intestines, ear bones, gills and a fin clip, before sending the specimens to various National Marine Fisheries Science Center labs from Newport to Seattle.

With juvenile yearling salmon spending only a week in the estuary on their way out to sea, Weitkamp said researchers need quick indicators of growth related to time spent in the estuary, such as the animals' diets and nutrients gleaned from nearby food sources.

Fresh said NOAA has another researcher looking at what sort of organic matter flows from wetlands into the channel, with the overarching goal of finding linkages between migrating yearlings and wetlands.

Are wetlands working?

Weitkamp's crew finished their first round of sampling Friday. In a few weeks, they'll begin a new two-week field process, trawling for salmon and steelhead along the Columbia near Rooster Rock in the Columbia River Gorge, Longview, Cathlamet and just downriver from the Astoria Bridge. They'll keep sampling into the summer, when the yearlings all reach the ocean and the focus shifts to subyearling fall Chinook from the Snake River that can spend weeks to months in the estuary.

NOAA's and the Pacific Northwest National Laboratory's studies are joined at the hip and paid for by the Corps. While NOAA focuses on the indirect benefits of wetlands to salmon and steelhead swimming by, Fresh said, the Department of Energy's laboratory sends researchers into wetlands nearby to see how the migrants interact with the restored areas while in them.

After two years of fieldwork, researchers will synthesize the collected data and turn it into a final report to the Corps.

"The goal is to try to draw some inferences of how these wetlands are benefiting the salmon," Fresh said, adding the results, if definitive enough, could lead to changes in how and where wetlands are restored.

Ghost fishing: 'Crabs get trapped in the pots and starve to death'

Continued from Page 1A

Recommended solutions include degradable panels on traps that will quickly break down and allow trapped marine life to escape, and fast-degrading screws on whelk pots that serve the same purpose. Numerous international agreements also prohibit the deliberate dumping of fishing equipment at sea.

Some debris is deliberately thrown overboard; in England, small vessels can run up landfill charges of 500 British pounds ($702) per year, giving them an incentive to ditch broken gear.

"Crabs get trapped in the pots and starve to death," said John Wnek, supervisor of New Jersey's Marine Academy of Technology and Environmental Science, whose students are involved in a project to collect abandoned fishing gear from New Jersey's Barnegat Bay. "They're still fishing long after they're not supposed to be. This happens everywhere there's commercial fishing."

Tons of nets

A 2009 United Nations report estimated there are 640,000 tons of abandoned fishing nets on the ocean floor worldwide. A 2005 survey found fishing boats in Greenland lose an average of 15 nets per day, stretching nearly 2,500 feet.

A 2001 study suggested that ghost fishing kills 4 million to 10 million blue crabs each year in Louisiana alone.

A 2002 study found 260,000 traps being lost each year in the Gulf of Arabia, leading the United Arab Emirates to mandate degradable panels in the traps, a step other jurisdictions have also adopted. The following year, a study in South Korea off the coast of Incheon found 97,000 tons of discarded fishing gear, and about 1,000 tons of lost gear are recovered each year from the Sea of Japan.

The U.S. National Marine Fisheries Service estimates 12 miles of net are lost each day of the fishing season in the North Pacific, and in Queensland, Australia, about 6,000 crab pots are lost each year.

Solving the problem

While the scope of the problem is vast, so is the range of projects to address it. One such effort, called "Fishing For Energy," has collected over 3 million pounds of discarded fishing gear nationwide. It has already plucked more than 400 crab traps from Barnegat Bay and has its sights on 600 more. It also is active in Massachusetts, Oregon, Rhode Island, New Hampshire and Florida.

Traps that are still usable are returned to local fishermen; unusable ones are either recycled or burned in one of 40 trash-to-energy incinerators run by the energy company Covanta.

The work involves volunteers taking boats onto the bay and using sonar to detect crab pots on the bay's floor. They mark the spot with buoys and slowly sail over them, trying to snag the debris with a grappling hook dragged from a heavy rope. It is funded in part by a $109,000 grant from the National Oceanic and Atmospheric Administration.

Cleanups are also underway in other countries. A September effort in Orkney, England, retrieved 60 crab pots and 25 whelk pots, along with rope and netting that a local artist used to create doormats.

THE DAILY ASTORIAN

TV LISTINGS

Evening listings
TUESDAY

TUESDAY EVENING — A - Charter Astoria/ Seaside - L - Charter Long Beach — **APRIL 26**

A		L	6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30
2	KATU	2	KATU News at 6		Jeopardy!	Wheel of Fortune	Fresh Off-Boat (N)	Real O'Neals (N)	Agents of SHIELD "The Singularity" (N)		Beyond the Tank (N)		KATU News at 11	(:35) Jimmy Kimmel
-	KOMO	4	KOMO 4 News		Wheel of Fortune	Jeopardy!	Fresh Off-Boat (N)	Real O'Neals (N)	Agents of SHIELD "The Singularity" (N)		Beyond the Tank (N)		KOMO 4 News	(:35) Jimmy Kimmel
-	KING	5	NBC Nightly News	KING 5 News	KING 5 News	Evening	The Voice "Live Top 11 Eliminations" (N)		Chicago Med "Inheritance" (N)		Chi.Fire "The Last One for Mom" (N)		KING 5 News	(:35) Tonight Show
6	KOIN	-	KOIN 6 News at 6	CBS Evening News	Extra	Ent. Tonight	NCIS "Déjà Vu"		NCIS: New Orleans "Undocumented"		Limitless "Finale: Part Two" (SF) 2/2 (N)		KOIN 6 News @ 11	(:35) S. Colbert
-	KIRO	7	KIRO 7 News	CBS Evening News	The Insider	Ent. Tonight	NCIS "Déjà Vu"		NCIS: New Orleans "Undocumented"		Limitless "Finale: Part Two" (SF) 2/2 (N)		KIRO News	(:35) S. Colbert
8	KGW	-	KGW News at 6:00 p.m.		Live at Seven	Inside Edition	The Voice "Live Top 11 Eliminations" (N)		Chicago Med "Inheritance" (N)		Chi.Fire "The Last One for Mom" (N)		KGW News at 11	(:35) Tonight Show
9	KRCW	3	Seinfeld Pt. 2 of 2	Seinfeld Pt. 2 of 2	Modern Family	Modern Family	The Flash "Back to Normal" (N)		Containment "I to Die, You to Live" (N)		KGW News at 10	(:35) Two and Half	(:05) Two and Half	(:35) King of Hill
10	KOPB	10	Ask-Old House	Business (N)	PBS NewsHour		American Masters "Johnny Carson: King of Late Night"				The National Parks: America's Best Idea "The Last Refuge (1890-1915)"			
12	KPTV	12	6 O'Clock News		Family Feud	Family Feud	New Girl (N)	Grandfathered (N)	New Girl (N)	The Grinder (N)	10 O'Clock News		11 O'Clock News	Loves Ray
13	KPDX	-	Mike & Molly	Mike & Molly	Big Bang Theory	Big Bang Theory	FOX 12's 8 O'Clock News on PDX-TV		FOX 12's 9 O'Clock News on PDX-TV		The Walking Dead "Live Bait"		The Walking Dead "Dead Weight"	
-	KCPQ	13	Name Game	Modern Family	Big Bang Theory	Big Bang Theory	New Girl (N)	Grandfathered (N)	New Girl (N)	The Grinder (N)	Q13 News at 10		Q13 News	Modern Family
20	TBS	20	Seinfeld	Seinfeld	Seinfeld	Seinfeld	Big Bang Theory	Big Bang Theory	Big Bang Theory	Greatest Makers	Separation "Trai and Kristen" (N)		Conan (N)	
-	KZJO	22	Two and Half Men	Two and Half Men	The Simpsons	The Simpsons	Modern Family	Modern Family	Q13 News at 9		Big Bang Theory	Big Bang Theory	Friends	Friends
29	ESPN	29	(5:30) SportsCenter	Hey Rookie	E:60 (N)		SportsCenter		SportsCenter		SportsCenter		SportsCenter	
30	ESPN2	30	E:60		Hey Rookie	Hey Rookie	Hey Rookie	SportsCenter Special "NFL Nation Mock Draft"			NBA Tonight	Jalen & Jacoby (N)	NFL Live	
31	NICK	31	Henry Danger	Henry Danger	The Thundermans	The Thundermans	NickyRickyDicky	Paradise Run	Full House	Full House	Full House	Full House	Friends	Friends
32	DISN	32	(:20) ★★★ Brave ('12) Voices of Billy Connolly, Emma Thompson, Kelly Macdonald.				K.C. Undercover	Stuck in Middle	Liv and Maddie	Friends Whenever	Bunk'd	Stuck in Middle	K.C. Undercover	Liv and Maddie
34	FAM	34	★★★ Harry Potter and the Chamber of Secrets (2002, Family) Rupert Grint, Emma Watson, Daniel Radcliffe.								Stitchers "The Dying Shame" (N)		The 700 Club	
35	FMC	35	(5:00) The Counselor Cameron Diaz.		(:20) The Counselor (2013, Drama) Penélope Cruz, Michael Fassbender, Cameron Diaz.					(:40) FXM Presents	The Call (2013, Thriller) Halle Berry.			(:50) FXM Presents
36	LIFE	36	Dance Moms: Dance and Chat		Dance Moms		Dance Moms: Dance and Chat		Dance Moms (N)		(:05) Pitch Slapped		(:05) Dance Moms	
38	ROOT	38	(5:30) Customs	MarinersPre-game	MLB Baseball Houston Astros at Seattle Mariners Site: Safeco Field -- Seattle, Wash. (L)						Post-game	MLB Baseball Houston Astros at Seattle Mariners		
39	FS1	39	MLB Pre-game	MLB Baseball St. Louis Cardinals at Arizona Diamondbacks Site: Chase Field -- Phoenix, Ariz. (L)						MLB Whiparound (L)		Fox Sports Live	TMZ Sports (N)	Fox Sports Live
43	SPIKE	43	Ink Master "New School, Old Artist"		Ink Master "Under Pressure"		Ink Master "Knuckle Sandwich"		Ink Master "Breath Fire"		Ink Master "Sink or Soar" (N)		Ink Master (N)	Ink Master
44	COM	44	Futurama	Futurama	Futurama	Futurama	Tosh.0	Tosh.0	Tosh.0	Tosh.0	Daniel Tosh: People Pleaser		The Daily Show (N)	Nightly Show (N)
45	HIST	45	(5:00) To Be Announced		To Be Announced		Counting Cars (N)	Counting Cars (N)	Top Gear (N)		(:05) Top Gear (N)		(:05) Counting Cars	Counting Cars
46	A&E	46	The First 48		Storage Wars	Storage Wars	Storage Wars	Storage Wars	Storage Wars "Barry's Best Finds" (N)		Storage Wars (N)	Storage Wars	(:05) Storage Wars	(:35) Storage Wars
47	TLC	47	(:05) Long Lost Family		(:05) Family "Alone in a Crowded Room"		(:05) Jill Jessa "Girls Hit the Road" (N)		Jill and Jessa: Counting On (N)		Kate Eight "10 Year Anniversary" (N)		(:05) Jill and Jessa: Counting On	
48	DISC	48	Deadliest Catch "First Timers"		Deadliest Catch "No Good Deed..."		Deadliest Catch "Swedish Twins" (N)		Deadliest Catch "Million-Dollar Bet" (N)		The Last Alaskans "Survival Mode" (N)		Deadliest Catch "Million-Dollar Bet"	
49	NGEO	49	Life Below Zero "Pride and Power"		The Boonies "Into the Abyss"		Boonies "Blood and Sweat and Deer"		Life Below Zero "Pride and Power"		Life Below Zero "Falling Apart"		Life Below Zero "Pride and Power"	
50	TNT	50	(5:00) NBA Basketball Playoffs (L)			NBA Basketball Playoffs (L)					Inside the NBA		NBA Basketball Playoffs	
51	AMC	51	(4:30) ★★★ The Rock ('96, Act) Nicolas Cage, Sean Connery.			★★★ Con Air (1997, Action) John Cusack, John Malkovich, Nicolas Cage.					The Night Manager (N)		(:20) The Night Manager	
52	USA	52	(5:00) NHL Hockey Stanley Cup Playoffs (L)				Law & Order: S.V.U. "Paranoia"		Law & Order: S.V.U. "Parasites"		Law & Order: S.V.U. "Folly"		Chrisley Knows	Chrisley Knows
53	FOOD	53	Chopped Junior "Birthday Cake Crush"		Chopped Junior "Cereal Miracles"		Chopped Junior "Dough Business" (N)		Chopped Junior "Cuteness Overload"		Chopped (N)		Chopped "Cooking With Bass"	
54	HGTV	54	Fixer Upper		Fixer Upper		Fixer "Three Generations, One Fixer"		Fixer Upper		House Hunters (N)	House Hunters (N)	Good Bones (N)	
56	FX	56	★★ My Boss's Daughter ('03, Comedy) Tara Reid, Jeffrey Tambor, Ashton Kutcher.				★★ Bad Teacher (2011, Comedy) Jason Segel, Justin Timberlake, Cameron Diaz.				★★ Bad Teacher (2011, Comedy) Jason Segel, Justin Timberlake, Cameron Diaz.			
57	CNN	57	America's Choice "Super Tuesday 4" (L)		America's Choice "Super Tuesday 4" (L)		America's Choice "Super Tuesday 4" (L)		America's Choice "Super Tuesday 4" (L)		America's Choice "Super Tuesday 4" (L)		Early Start	
58	FNC	58	The Kelly File with Megyn Kelly		Hannity		The O'Reilly Factor		The Kelly File with Megyn Kelly		Hannity		On the Record	
61	CNBC	61	Shark Tank		Billion Dollar Buyer (N)		Shark Tank		Shark Tank		Billion "If Y'all Got the Edge, I Want It"		Paid Program	Paid Program
63	BRAV	63	Beverly Hills "Goodbye Dubai"		Beverly Hills "Who Do You Believe?"		Beverly Hills "Reunion Part 1" Pt. 1 of 3		Beverly Hills "Reunion Part 2" 2/3 (N)		Real Wives Dallas "Making Frenemies"		WatchWhat (N)	Beverly Hills 2/3
64	TCM	64	Movie	(:45) ★★ Because They're Young ('60) Tuesday Weld, Doug McClure, Dick Clark.				★★★ Lord Love a Duck ('66, Com) Tuesday Weld, Martin West, Roddy McDowell.				★★★ I'll Take Sweden ('65, Com) Tuesday Weld, Bob Hope.		
65	SYFY	65	★★ The Core (2003, Sci-Fi) Aaron Eckhart, Bruce Greenwood, Hilary Swank.						★★★ Deep Impact (1998, Action) Morgan Freeman, Robert Duvall, Elijah Wood.					The Core ('03)
162	RFD	162	(5:30) Cattlemen	American Harvest	Downunder Horseman.		Chris Cox	Rural Eve. News	Ag PhD	Cattlemen to Cattlemen		American Harvest	Product Showcase	

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