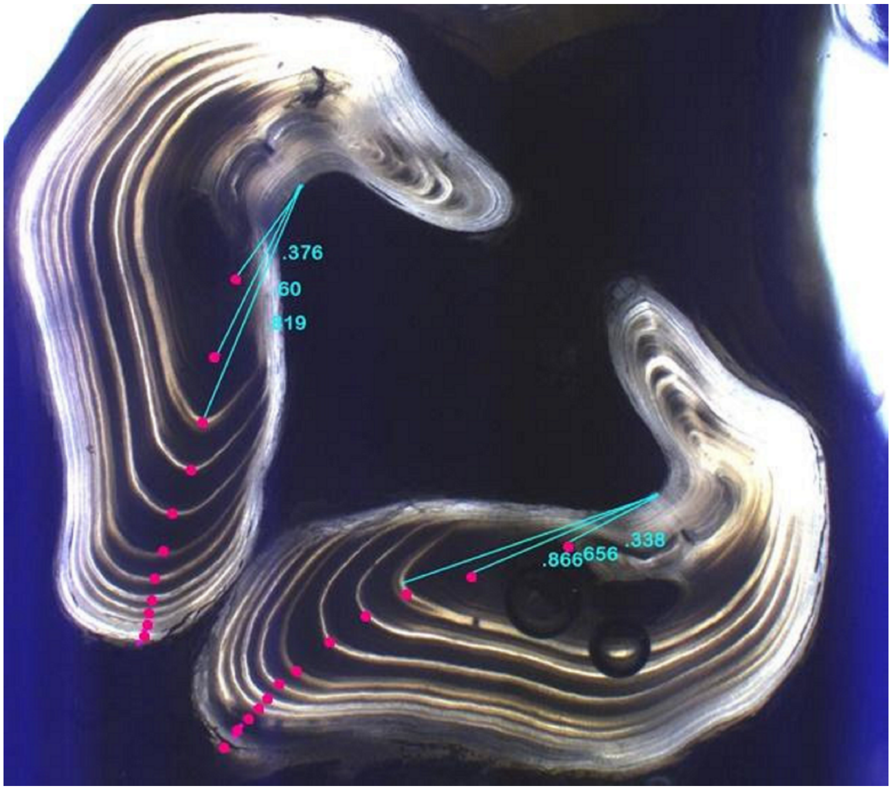

Figure S1. Lingcod fin-ray section with radii measurements on the first three annuli (in mm). Ages were determined by counting the number of annuli, the translucent zones that form once a year during winter growth. Winter growth increments can be seen in white. Radii measurements for the first three annuli can be difficult to distinguish due to the presence of checks, or translucent rings, during summer growth zones. Mean annular radii measurements were established by Beamish and Chilton (1977), later validated by McFarlane and King (2001), and are used as a guideline with which to better identify the first three annuli for ageing accuracy.

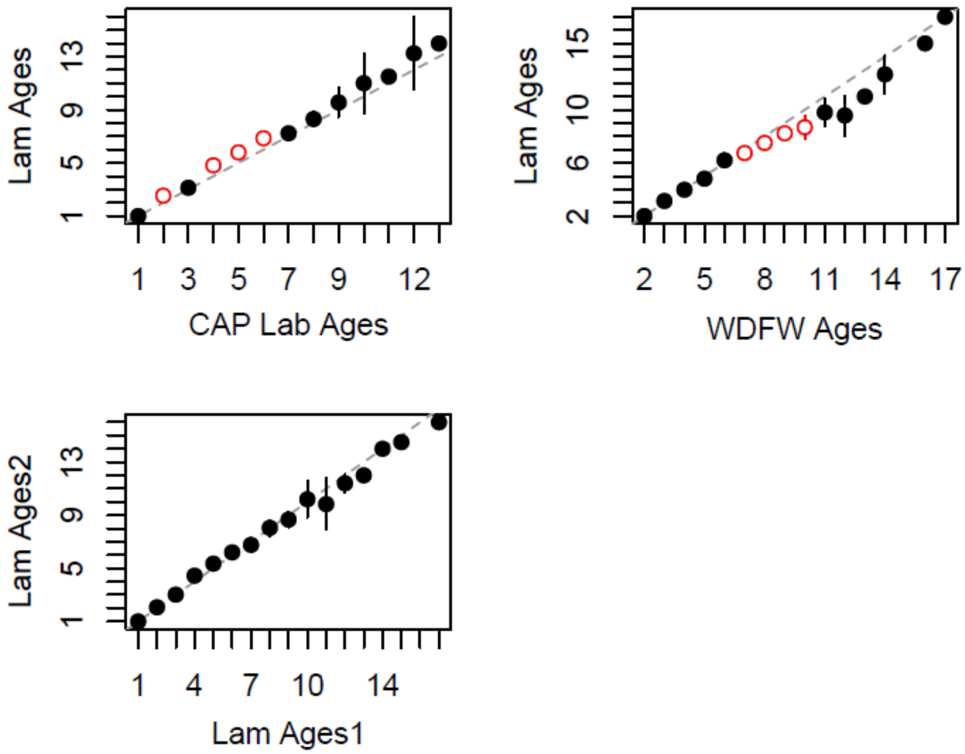

Figure S2. Age-agreement plots between A.) Lam and CAP Lab, B.) Lam and WDFW age reads and C.) Lam to Lam age reads. The dashed 1:1 agreement line is shown for comparative purposes. Significantly different ages between age readers are shown in red (α=0.05). A subsample of 196 and 386 slides were exchanged with the CAP lab and the WDFW ageing lab, respectively, to be cross read for accuracy and precision. A subsample of 219 individuals were blind-read to compare within reader bias.

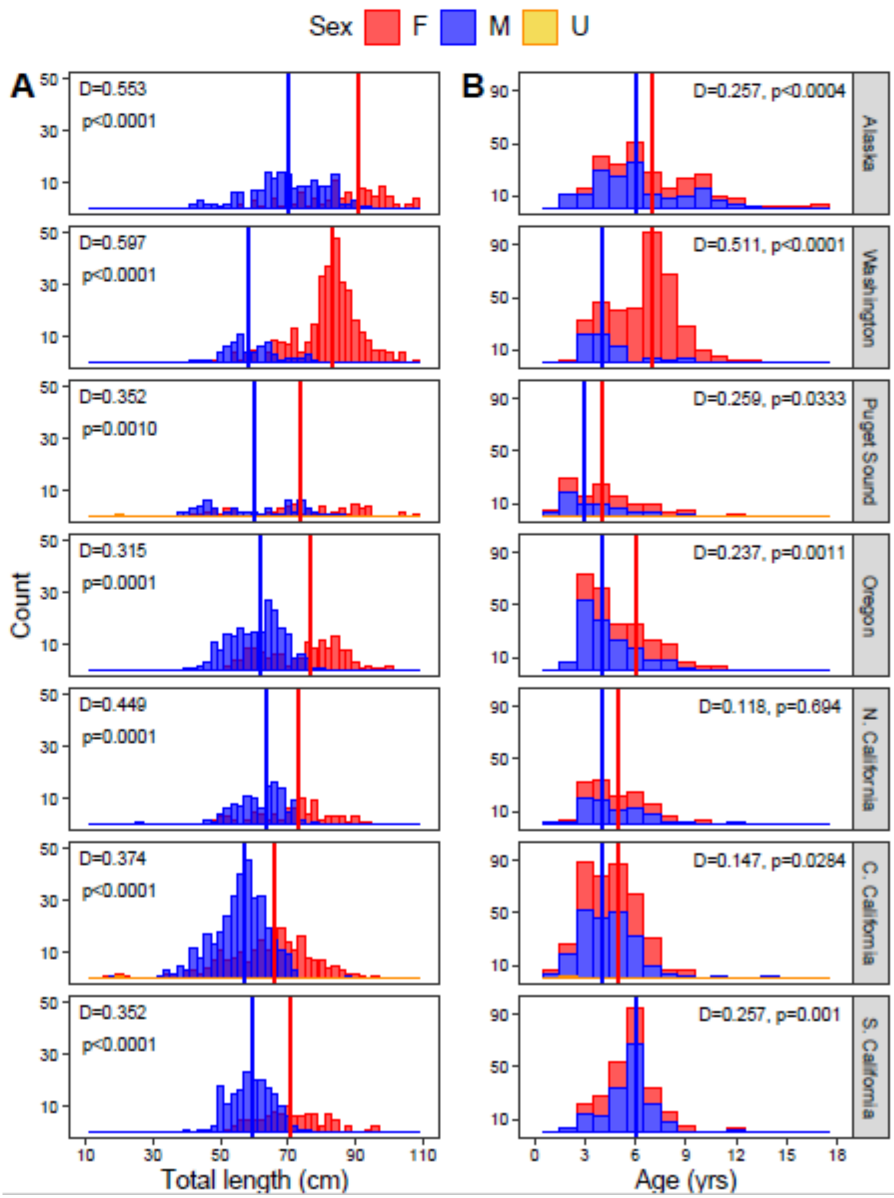

Figure S3. A) Size- and B) age-frequency of lingcod by sex in order of decreasing latitude. The red and blue vertical lines indicate median size and age for female and male lingocd, respectively. Regions were compared using the Kolomogorov-Smirnov test (α=0.05). Female median sizes were consistently smaller than male median sizes across all regions. Female median ages were generally younger than male median ages, with the exception of lingcod from northern California.

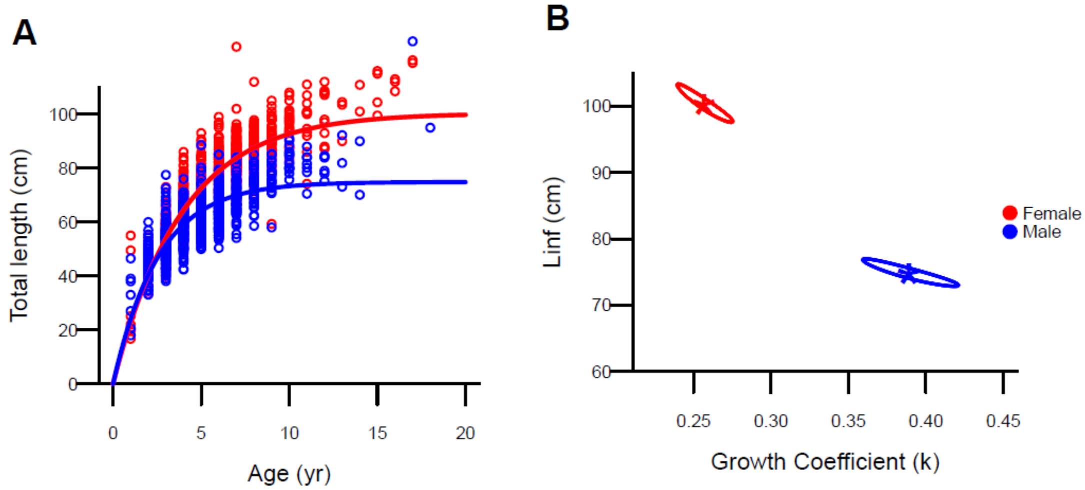

Figure S4. A) Female and male lingcod von Bertalanffy growth curves (regions pooled), and B) 95% confidence intervals for L_{inf} and k. Overlapping intervals indicate no difference in growth.

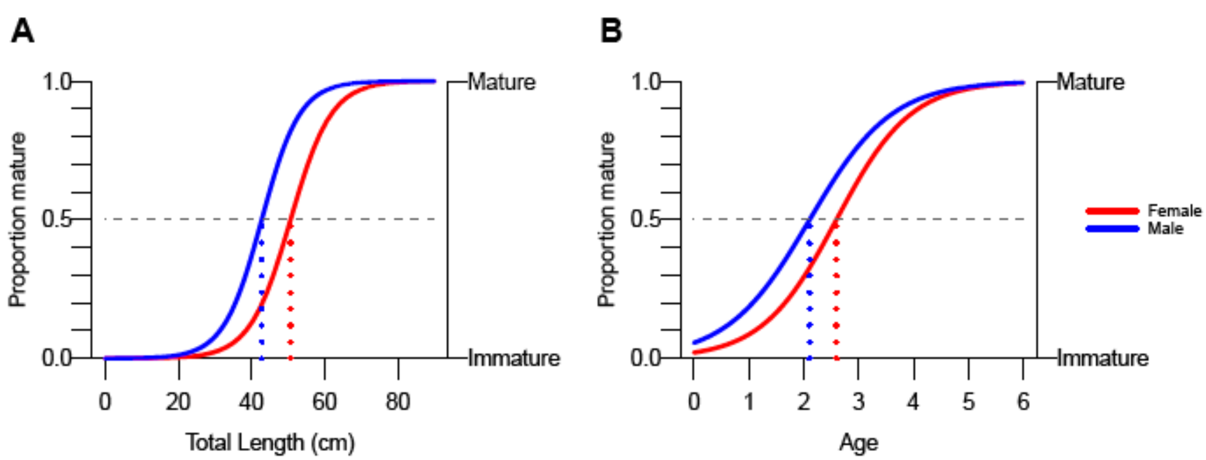

Figure S5. Logistic regression estimating A) total length at 50% maturity and B) age at 50% maturity for female and male lingcod (regions pooled). The horizontal dashed line represents the time when 50% of the population is mature; the vertical dashed lines indicate the size and age at 50% maturity, respectively.

Table S1. Lingcod maturity stages as defined by the Washington Department of Fish and Wildlife (WDFW) (Silberberg et al. 2001).

	Stages	**Description**
Female	Immature	Ovaries are small (1.5-2.0 cm). Color ranges from translucent pink to red. Multiple-veined in appearance. No distinguishable eggs present.
	Maturing	Eggs are visible and opaque. Ovaries are swelling with an orange colored egg mass. The ovary wall may or may not be thickened.
	Mature	Ovaries are swollen with large, pale, sticky egg mass. The ovaries will appear thickened.
	Spent	Thick-walled ovaries are empty and flaccid. They may appear bloodshot. There may be residual eggs inside the ovary.
	Transitional	Ovaries are thick-walled and firming in early stage, progressing to thinner-walled, multi-veined condition similar to advanced immature ovaries. Eggs are not distinguishable.
Male	Immature	Testes are small, round to thin ribbon in shape. Color may range from translucent to white.
	Transitional	Moderate sized testes, firm and compact. The color ranges from brown to mottled white. Flowing sperm is not present.
	Ripe	Testes moderate to large, softening and white. Flowing sperm should be detectable by pressure or visible in cut cross-section.

Table S2. Average coefficient of variation (ACV), average percent error (APE), and percent agreement between three agers: L. Lam, the NWFSC Cooperative Ageing Project (CAP) lab, and the Washington Department of Fish and Wildlife (WDFW) ageing lab.

	ACV	APE	% agreement	+/- 1 yr	+/- 2 yr
L. Lam: CAP lab	8.2	5.9	55%	87%	97%
L. Lam: WDFW	6.6	4.7	52%	89%	98%
L. Lam: L. Lam	6.0	4.2	61%	90%	98%

Table S3. Two-tailed *t*-test summary table comparing Fulton's K and hepatosomatic index (HSI) condition factor between male and female lingcod per region. To account for the significant positive relationship between Fulton's K and lingcod length (β=0.002, r2=0.04, F1,2117=96.5, p<0.0001), residuals were extracted and saved from the linear regression to be used in the subsequent t-test. Significant p-values are shown in bold.

	Fulton's K					**HSI**				
Region		Female	Male	t-value	pval		Female	Male	t-value	pval
Alaska	N	57	147	1.175	0.241	N	58	146	-0.794	0.429
	mean	1.007	1.000			mean	1.232	1.008		
	SD	0.176	0.144			SD	0.594	0.465		
Washington	N	318	68	0.908	0.367	N	315	68	-8.189	**<0.0001**
	mean	0.952	0.921			mean	1.593	0.708		
	SD	0.103	0.160			SD	0.665	0.599		
Puget Sound	N	61	59	0.880	0.381	N	61	59	0.527	0.599
	mean	1.006	0.101			mean	1.052	0.940		
	SD	0.994	0.141			SD	0.309	0.376		
Oregon	N	146	211	5.171	**<0.0001**	N	146	211	-1.379	0.169
	mean	0.932	0.970			mean	1.544	1.323		
	SD	0.116	0.138			SD	0.607	0.595		
N. California	N	81	118	2.726	**0.007**	N	81	118	5.134	**<.0001**
	mean	0.953	0.973			mean	1.374	1.869		
	SD	0.102	0.114			SD	0.737	0.957		
C. California	N	125	209	2.313	**0.022**	N	123	205	3.056	**0.003**
	mean	0.896	0.907			mean	1.322	1.382		
	SD	0.140	0.128			SD	0.495	0.440		
S. California	N	64	88	4.139	**<0.0001**	N	64	89	2.881	**0.005**
	mean	1.003	1.069			mean	2.330	2.493		
	SD	0.131	0.150			SD	0.664	0.620		

Table S4: Comparison of lingcod life-history estimates from past studies and stock assessments to estimates derived using the current dataset. For each previous study, the publication year, study location, and method of collection are shown; life-history values for growth and/or maturity were estimated for male and female lingcod separately except in the Haltuch et al. (2018) stock assessment. We derived the same life-history parameter using the current dataset, subset accordingly by combining regions that most closely reflect past study locations. We used the von Bertalanffy growth model and logistic regression methods described in the current study to estimate growth and timing of maturity, respectively.

Past studies									Current study				
	Year	Location	Method of collection	Sex	L_{inf}	k	Size at 50% maturity (cm)	Age at 50% maturity (yrs)	Region used	L_{inf}	k	Size at 50% maturity (cm)	Age at 50% maturity (yrs)
Miller and Geibel	1973	Central California	Hook-and-line	F	-	-	58.2	4.7	Central California	-	-	45.4	2.6
		(Monterey to Morro Bay)		M	-	-	42.3	2.2		-	-	40.8	2.4
Cass et al.	1990	Vancouver Island	Research trawl	F	-	-	61-75	3-5	NA				
				M	-	-	50	2					
Richards et al.	1990	Vancouver Island, BC	Commercial trawl	F	-	-	64.1	3.9	NA				
				M	-	-	58.1	3.5					
Jagielo	1994	Washington	Commercial trawl and commercial hook-and-line	F	131.1	0.11	-	4.6	Washington	96.73	0.29	-	2.8
				M	93.2	0.17	-	3.4		68.78	0.5	-	2.8
Silberberg et al.	2001	Northern and Central California	Commercial trawl and commercial hook-and-line	F	-	-	55.7	3.8	N. California, C. California	-	-	46.8	2.5
		(Crescent City to Morro Bay)		M	-	-	46.1	3.2		-	-	41.6	2.3
Jagielo and Wallace	2005	Washington, Oregon	WCGBTS*, recreational fishery	F	130.2	0.1	68	-	Washington, Oregon	97.8	0.28	56.9	-
				M	91.9	0.15	-	-		71.9	0.47	-	-
		California	WCGBTS	F	112.8	0.15	60	-	N. California, C. California, S. California	89.8	0.29	46.4	-
				M	81.7	0.22	-	-		67.9	0.43	-	-
Haltuch et al	2017	Washington, Oregon	WCGBTS, recreational fishery	F	108.6	0.173	56.7	-	Washington, Oregon	97.8	0.28	56.9	-
				M	79.3	0.268	-	-		71.9	0.47	-	-
		California	WCGBTS, H&L Survey**	F	100.9	0.191	52.3	-	N. California, C. California, S. California	89.8	0.29	46.4	-
				M	86.3	0.214	-	-		67.9	0.43	--	-

*West Coast Groundfish Bottom Trawl Survey (WCGBTS)
**Southern California Bight Shelf Rockfish Hook-and-Line Survey (H&L)

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