

Supplemental Material A. (Additional material examined of *Careproctus ambustus* and *C. melanurus*)

Careproctus ambustus: Japan: NSMT-P 48987, 149 mm, Pacific coast of Honshu, Iwate Prefecture, off Miyako, 39.4132°N, 142.316°E, 643 m depth, 27 October 1995. **Russia:** ZIN uncat., Northern Kuril Islands, *Tora Maru* 58, 1993, V. V. Fedorov and A. V. Balushkin; ZIN uncat., haul 123–124, 58.8333°N, 178.1667°W, R/V *Adler*, 21 September 1963. **Eastern Bering Sea:** UW 154647, 170 mm, 56.5081°N, 172.4174°W, 933 m depth, F/V *Morning Star*, cruise 2000-01, haul 47, 1 July 2000, G. R. Hoff; UW 116438, 2, 100–130 mm, 58.2544°N, 175.5059°W, 646 m depth, F/V *Morning Star*, cruise 2002-02, haul 52, 21 June 2002, L. L. Britt; UW 113849, 122 mm, 56.1115°N, 169.2329°W, 1061 m depth, F/V *Morning Star*, cruise 2000-01, haul 33, 27 June 2000, G. R. Hoff; UW 154642, 225 m, 55.9697°N, 169.7129°W, 748 m depth, F/V *Morning Star*, cruise 2000-01, haul 38, 28 June 2000, G. R. Hoff; UW 154859, 250 mm, 54.3059°N, 166.7247°W, 845 m depth, F/V *Morning Star*, cruise 2000-01, haul 3, 20 June 2000, G. R. Hoff; UW 155325, 155 mm, 55.5808°N, 168.8425°W, 1013 m depth, F/V *Morning Star*, cruise 2000-01, haul 17, 24 June 2000, G. R. Hoff; UW 155330, 145 mm, 58.5290°N, 176.2295°W, 884 m depth, F/V *Morning Star*, cruise 2000-01, haul 77, 10 July 2000, J. W. Orr; UW 116436, 117 mm, 58.5247°N, 176.1373°W, 670 m depth, F/V *Morning Star*, cruise 2002-02, haul 54, 22 June 2002; UW 154578, 2, 341–361 mm, 55.4266°N, 168.3283°W, 518 m depth, F/V *Morning Star*, cruise 2000-01, haul 13, 23 June 2000, G. R. Hoff; UW 155319, 370 mm, 56.1594°N, 169.4043°W, 636 m depth, F/V *Morning Star*, cruise 2000-01, haul 28, 26 June 2000, G. R. Hoff; CAS 45539, 129.8 mm, 58.2456°N, 175.4731°W, 681–818 m depth, TI-79-68,

23 June 1979; UW 154579, 420 mm, 54.9286°N, 167.6823°W, 620 m depth, F/V *Morning Star*, cruise 2000-01, haul 12, 22 June 2000, G. R. Hoff; UW 180148, 98 mm, 55.95°N, 168.9383°W, 729 m depth, R/V *Oscar Dyson*, cruise 1DY09, 1 March 2009. **Aleutian Islands:** RBCM 16125, 365 mm, 52.4642°N, 169.61°W, 402 m depth, F/V *Ocean Harvester*, cruise 1980-02, haul 36, 7 August 1980; UW 114933, 148 mm, 53.3684°N, 165.9811°W, 472 m depth, F/V *Gladiator*, cruise 2005-01, haul 12, 27 May 2005, V. C. Smith; HUMZ 88604, $n = 1$, south of Kagalaska I., 51.57°N, 176.23°W, 535 m depth, *Maru 62*, 3 August 1980; CAS 47501, 280.7 mm, 52.8173°N, 172.11433°E, 446 m depth, *Hatsue Maru No. 62*, cruise 1980-01, haul 115, 22 August 1980; CAS 47518, 143 mm, 52.8138°N, 172.229°E, 580 m depth, *Hatsue Maru No. 62*, cruise 1980-01, haul 116, 22 August 1980; CAS 47667, 322.9 mm, 51.9962°N, 175.11°E, 521 m depth, *Hatsue Maru 62*, cruise 1980-01, haul 94, 15 August 1980; UW 112057, 335 mm, 52.8372°N, 172.3485°E, 314 m depth, F/V *Sea Storm*, cruise 2004-01, haul 238, 2 August 2004, P. Von Szalay; UW 116382, 360 mm, 51.7178°N, 177.3024°E, 458 m depth, F/V *Sea Storm*, cruise 2006-01, haul 187, 23 July 2006, D. Carrison-Stone; UW 117242, 317.5 mm, 51.6715°N, 177.9568°E, 385 m depth, F/V *Sea Storm*, cruise 2006-01, haul 220, 31 July 2006, D. Carrison-Stone. **Gulf of Alaska:** UW 119247, 205 mm, 56.8999°N, 151.3909°W, 908 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 155, 26 June 2009; UW 119463, 185 mm, 54.5928°N, 133.1290°W, 391 m depth, F/V *Pacific Explorer*, cruise 2009-01, haul 294, 28 July 2009, R. N. Clark; UW 114706, 225 mm, 54.5373°N, 132.7738°W, 375 m depth, F/V *Sea Storm*, cruise 2005-01, haul 316, 1 August 2005; UW 119253, 235 mm, 55.9337°N, 153.8606°W, 322 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 160, 27 June 2009, R. N. Clark; UW 119705, 230 mm, 54.0963°N, 161.5617°W, 453 m depth, F/V *Sea Storm*, cruise 2009-01, haul 45, 3 June 2009, P. Von Szalay; UW 119310, 2, 220–230 mm, 59.5926°N, 142.6267°W, 510 m depth, F/V

Vesteraalen, cruise 2009-01, haul 252, 17 July 2009, N. Roberson; UW 49516, 215 mm, 58.9771°N, 147.8031°W, 745 m depth, F/V *Morning Star*, cruise 1999-01, haul 187, 3 July 1999; UW 45153, 230 mm, 60.1504°N, 145.2832°W, 58 m depth, F/V *Vesteraalen*, cruise 1999-01, haul 230, 4 July 1999, W. C. Flerx; UW 119242, 245 mm, 55.1545°N, 156.6840°W, 539 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 100, 13 June 2009, L. L. Britt; UW 45161, 340 mm, 58.2505°N, 148.5422°W, 510 m depth, F/V *Dominator*, cruise 1999-01, haul 223, 3 July 1999; UW 113833, 2, 350–360 mm, 59.5358°N, 143.445°W, 555 m depth, F/V *Dominator*, cruise 1999-01, haul 256, 11 July 1999, R. N. Clark; UW 200009 (out of 117628), 210 mm, 58.7853°N, 140.9784°W, 632 m depth, F/V *Northwest Explorer*, cruise 2005-01, haul 260, 22 July 2005, J. W. Orr; UW 119254, 2, 290–340 mm, 58.2363°N, 148.5763°W, 516 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 218, 8 July 2009, J. Stark; UW 119260, 270 mm, 59.0021°N, 147.8259°W, 526 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 234, 11 July 2009; UW 119674, 90 mm, 58.8801°N, 148.0635°W, 611 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 236, 11 July 2009, J. Stark; UW 153168, 230 mm, 58.7722°N, 148.0736°W, 728 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 217, 21 July 2007; UW 155335, 2, 120–130 mm, 57.7478°N, 149.5917°W, 498 m depth, F/V *Gladiator*, cruise 2007-01, haul 226, 14 July 2007, N. E. Roberson; UW 157795, 3, 165–195 mm, 58.8974°N, 147.9341°W, 865 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 163, 2 August 2015; HUMZ 67238, $n = 1$, 55.18°N, 156.23°W, 560 m depth, *Tanshu Maru*, 14 June 1977; HUMZ 67858, $n = 1$, 54.22°N, 161.05°W, 530 m depth, *Tanshu Maru*, 12 June 1977; HUMZ 102012, $n = 1$, 57.35°N, 150.53°W, 372 m depth, *Daikichi Maru No. 37*, 13 August 1984; HUMZ 102014, $n = 1$, 57°N, 151.3°W, 735 m depth, *Daikichi Maru No. 37*, 13 August 1984; HUMZ 102015, $n = 1$, 54.15°N, 161.45°W, 500 m depth, *Daikichi Maru No. 37*, 28 July 1984; HUMZ 102019-102020, $n = 2$, Gulf of Alaska.,

57.53°N, 149.85°W, 720 m depth, *Daikichi Maru No. 37*, 14 August 1984; HUMZ 102183, $n = 1$, 58.52°N, 153.4°W, 585 m depth, *Daikichi Maru No. 37*, 7 September 1984; NMC 67-107 (ex UBC 62-738), 272 mm, M/V *Arthur H.*, 55.65°N, 155.1833°W; UW 25145, 305 mm, 56.4833°N, 152.3667°W, 345 m depth, M/V *Akebono Maru No. 16*, haul 137, 2 August 1982, S. Klein; UW 45082, 143 mm, 55.1465°N, 156.4382°W, 569 m depth, F/V *Dominator*, cruise 1999-01, haul 87, 5 June 1999, H. MacConnell; UW 45181, 145 mm, 58.8982°N, 147.9278°W, 903 m depth, F/V *Morning Star*, cruise 1999-01, haul 186, 3 July 1999; UW 45797, 6, 110–262 mm, 54.9755°N, 156.9069°W, 788 m depth, F/V *Morning Star*, cruise 1999-01, haul 61, 3 June 1999, J. W. Orr; UW 45934, 255 mm, 55.1854°N, 156.3619°W, 414 m depth, F/V *Vesteraalen*, cruise 2001-01, haul 105, 13 June 2001, J. Stark; UW 113834, 6, 125–165 mm, 55.6205°N, 154.7932°W, 882 m depth, F/V *Morning Star*, cruise 1999-01, haul 103, 10 June 1999, J. W. Orr; UW 113838, 175 mm, 58.9937°N, 147.8624°W, 579 m depth, F/V *Dominator*, cruise 1999-01, haul 229, 4 July 1999; UW 114960, 240 mm, 54.3725°N, 159.4819°W, 513 m depth, F/V *Gladiator*, cruise 2005-01, haul 58, 4 June 2005; UW 118528, 290 mm, 55.1465°N, 156.4382°W, 569 m depth, F/V *Dominator*, cruise 1999-01, haul 87, 5 June 1999, R. N. Clark; UW 119240, 2, 150–160 mm, 54.2102°N, 161.1178°W, 720 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 57, 2 June 2009, L. L. Britt; UW 119244, 225 mm, 55.9232°N, 153.5975°W, 476 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 164, 28 June 2009; UW 119470, 310 mm, 59.2683°N, 146.4411°W, 403 m depth, F/V *Pacific Explorer*, cruise 2009-01, haul 227, 14 July 2009, R. N. Clark; UW 119562, 200 mm, 59.5491°N, 144.2639°W, 719 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 248, 16 July 2009, N. E. Roberson; UW 119584, 110 mm, 55.1421°N, 156.2445°W, 748 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 103, 14 June 2009, L. L. Britt; UW 119672, 105 mm, 55.8841°N, 154.1246°W, 559 m depth, F/V *Vesteraalen*, cruise 2009-01, haul 113, 16 June 2009,

L. L. Britt; UW 119735, 360 mm, 54.6894°N, 158.2461°W, 402 m depth, F/V *Sea Storm*, cruise 2003-01, haul 88, 18 June 2003; UW 152156, 2, 90–106 mm, 55.5755°N, 168.7861°W, 894 m depth, F/V *Vesteraalen*, cruise 2012-01, haul 104, 5 July 2012; UW 153164, 170 mm, 59.5462°N, 144.3050°W, 746 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 230, 24 July 2007; UW 153165, 2, 141–183 mm, 54.9552°N, 156.9164°W, 783 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 83, 20 June 2007; UW 153166, 2, 180–190 mm, 58.9957°N, 147.6965°W, 846 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 221, 22 July 2007; UW 153167, 4, 125–180 mm, 55.7624°N, 154.6023°W, 903 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 121, 27 June 2007; UW 155320, 6, 98–132 mm, 57.8592°N, 149.2567°W, 722 m depth, F/V *Northwest Explorer*, cruise 2005-01, haul 163, 29 June 2005; UW 155337, 3, 110–190 mm, 54.8235°N, 157.5266°W, 546 m depth, F/V *Gladiator*, cruise 2007-01, haul 100, 19 June 2007, P. Von Szalay; UW 155338, 148 mm, 54.2131°N, 161.1338°W, 715 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 44, 10 June 2007, J. W. Orr; UW 155339, 2, 150–170 mm, 58.9957°N, 147.6965°W, 846 m depth, F/V *Vesteraalen*, cruise 2007-01, haul 221, 22 July 2007; UW 155346, 135 mm, 54.2091°N, 161.0914°W, 716 m depth, F/V *Northwest Explorer*, cruise 2005-01, haul 33, 1 June 2005, R. N. Clark; UW 155494, 135 mm, 55.1854°N, 156.3619°W, 414 m depth, F/V *Vesteraalen*, cruise 2001-01, haul 105, 13 June 2001; UW 156549, 130 mm, 58.9995°N, 147.7264°W, 727 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 166, 2 August 2015; UW 156560, 150 mm, 55.6962°N, 154.7892°W, 893 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 109, 19 July 2015, M. Zimmerman; UW 156571, 320 mm, 59.6015°N, 142.7885°W, 554 m depth, F/V *Alaska Provider*, cruise 2015-01, haul 272, 26 July 2015, W. Nittler; UW 156573, 4, 108–165 mm, 55.5475°N, 155.1877°W, 761 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 107, 19 July 2015; UW 156579, 190 mm, 56.3695°N, 155.8818°W, 180 m depth, F/V *Alaska*

Provider, cruise 2015-01, haul 143, 26 June 2015, W. Nittler; UW 156705, 2, 100–107 mm, 55.1490°N, 156.3327°W, 635 m depth, F/V *Sea Storm*, cruise 2015-01, haul 71, 13 June 2015; UW 157758, 210 mm, 55.6250°N, 154.7944°W, 879 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 108, 19 July 2015, M. Zimmermann; UW 157768, 230 mm, 59.4972°N, 143.3743°W, 660 m depth, F/V *Ocean Explorer*, cruise 2017-01, haul 228, 26 July 2017; UW 157796, 320 mm, 58.8974°N, 147.9341°W, 865 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 163, 2 August 2015, M. Zimmerman; UW 158217, 115 mm, 55.7826°N, 135.2945°W, 662 m depth, F/V *Cape Flattery*, cruise 2015-01, haul 183, 10 August 2015, M. Zimmerman; UW 47974, 2, 340–380 mm, 59.0507°N, 147.7014°W, 385 m depth, F/V *Morning Star*, cruise 2001-01, haul 237, 15 July 2001, K. P. Maslenikov; UW 117584, 355 mm, 55.2215°N, 156.6861°W, 286 m depth, F/V *Dominator*, cruise 1999-01, haul 86, 5 June 1999. **British Columbia:** RBCM 16119, 320 mm, Queen Charlotte Islands, Moresby I., Englefield Bay, 53°N, 132°W, 540 m depth, 1 October 1991; RBCM 16419 (out of RBCM 16095), 235 mm, west of Nootka I., 49.7011°N, 127.6132°W, 601 m depth, 10 April 2003. **North Pacific:** RBCM 16129, 280 mm, unknown, 24 November 1976; RBCM 16134, 265 mm, unknown, 4 October 1976; HUMZ 34416, $n = 1$; HUMZ 181058, $n = 1$; HUMZ 182825, $n = 1$.

Careproctus melanurus: **Lectotype:** USNM 44285, “179+ mm,” (Burke, 1930) in very poor condition, xray only, off southern California, 39.5417°N, 117.4°W, 620 m depth, *Albatross* station 2925, 19 January 1889. **Paralectotypes:** CAS-SU 36, 2, 166–182 mm, Santa Barbara Channel, 32.5417°N, 117.4°W, 619 m depth, *Albatross* station 2892, 5 January 1889; USNM 126712, 133 mm, xray only, 34.25°N, 120.6°W, 519 m depth, *Albatross* station 2892, USBF 604, 5 January 1889. **Gulf of Alaska:** UW 114709, 156 mm, 54.5081°N, 132.8168°W, 376 m depth,

F/V *Sea Storm*, cruise 2005-01, haul 313, 1 August 2005; UW 43263, 4, 172–230 mm, 54.6136°N, 132.9019°W, 365 m depth, F/V *Dominator*, cruise 1996-01, haul 277, 30 July 1996, J. W. Orr; UW 117628, 230 mm, 58.7853°N, 140.9784°W, 632 m depth, F/V *Northwest Explorer*, cruise 2005-01, haul 260, 22 July 2005, J. W. Orr. **British Columbia:** RBCM 16101*, 2, 155–166 mm, Queen Charlotte Sound, TC2006-024, 51.1861°N, 130.1354°W, 848 m depth, 15 October 2006; RBCM 16110*, 167 mm, SW Vancouver I., offshore to SW of Flores I., 48.9574°N, 126.792°W, 651 m depth, R/V *Frosti*, Tanner Crab survey, tow 11, 16 October 2005; RBCM 16112*, 222 mm, SW Vancouver I., 48.7945°N, 126.6306°W, 833 m depth, R/V *Frosti*, tow 15, 17 October 2006; RBCM 16113*, 171 mm, SW Vancouver I., 49°N, 126.8°W, 651 m depth, R/V *Frosti*, tow 11, 16 October 2005; CAS 15389, 232 mm, off Vancouver Island, 48.7567°N, 126.5567°W, 455 m depth, R/V *G. B. Reed*, cruise 197203, sta. 18; RBCM 16090, 4, 148–200 mm, west off Vancouver I., 49.9111°N, 127.9714°W, 761 m depth, 30 August 2003; RBCM 16091, 3, 108–137 mm, off Nootka I., 49.5494°N, 127.3482°W, 920 m depth, 29 August 2004; RBCM 160926, 189 mm, west off Vancouver I., 49.7028°N, 127.6082°W, 567 m depth, 29 August 2004; RBCM 16093, 165 mm, west off Vancouver I., 49.8436°N, 127.9123°W, 754 m depth, 1 September 2004; RBCM 16095, 250 mm, west of Nootka I., 49.7011°N, 127.6132°W, 601 m depth, 10 April 2003; RBCM 16096, 3, 122–152 mm, Vancouver I., Brook Peninsula, 49.943°N, 127.974°W, 772 m depth, 14 April 2003; RBCM 16097, 4, 112–145 mm, off Vancouver I., west of Nootka Sound, 2003 Tow 30, 49.5316°N, 127.6413°W, 958 m depth, 16 April 2003; RBCM 16098, 3, 131–223 mm, Vancouver I., off Nootka I., 49.6602°N, 127.598°W, 584 m depth, 16 April 2003; RBCM 16099, 241 mm, offshore to SW of Hesquiat Peninsula, 49.1737°N, 127.0709°W, 569 m depth, 2003 Tow 6, TC2003-006, 5 April 2003; RBCM 16100, 112 mm, west off Hesquiat Peninsula, 49.347°N, 127.2838°W, 894 m depth, 6 April 2003;

RBCM 16102, 2, 100–105 mm, offshore of Hesquiat Peninsula, 49.1662°N, 127.1089°W, 743 m depth, 5 April 2003; RBCM 16104, 3, 122–230 mm, off the west coast of Vancouver I., 49.5675°N, 127.4967°W, 1068 m depth, 9 April 2003; RBCM 16105, 196 mm, offshore of Vancouver I., south of Nootka I., west off Tofino, 49.0014°N, 126.9221°W, 719 m depth, 5 April 2003; RBCM 16106, 222 mm, Barkley Canyon, 48.2°N, 126.1°W, 554 m depth, 27 January 1994; RBCM 16107, 4, 141–255 mm, west of Vancouver I., 49.5112°N, 127.4124°W, 1100 m depth, 23 August 2004; RBCM 16108, 137 mm, offshore of Vancouver I., west of Nootka I., 2003 Tanner Crab tow 27, 49.6775°N, 127.7383°W, 15 April 2003; RBCM 16109, 198 mm, 39.8583°N, 124.1433°W, 402 m depth, R/V *David Starr Jordan*, cruise 197705, haul 79, 17 August 1977; RBCM 16114, 210 mm, Vancouver I., west of Nootka Sound, 49.5667°N, 127.4267°W, 931 m depth, 11 March 1999; RBCM 16120, 4, 145–240 mm, off Nootka I., 49.5798°N, 127.637°W, 660 m depth, 10 April 2003; RBCM 16122, 265 mm, west of Queen Charlotte Islands, 53.8667°N, 133.575°W, 896 m depth, AMR 230103-4, 4 May 2003; RBCM 16123, 3, 255–295 mm, unknown; RBCM 16127, 245 mm, Vancouver I., west of Nootka Sound, 49.5667°N, 127.4267°W, 931 m depth, 10 March 1999; RBCM 16131, 2, 205–235 mm, off Vancouver I., 48.9683°N, 126.69°W, 435 m depth, 11 March 1994; RBCM 16132, 228 mm, Vancouver I., 48.7333°N, 126.4967°W, 550 m depth, 25 February 1988; RBCM 16133, 310 mm, west of Queen Charlotte Islands, 53.2833°N, 133.0417°W, 315 m depth, AMR 200136, 11 May 2000; RBCM 16136, 3, 270–325 mm, BW78-2, haul 9, 9 September 1978; RBCM 16137, 170 mm, Vancouver I., 48.89°N, 126.695°W, 14 November 1997; UW 10794, 2, 265–287 mm, south of Esteban, 49°N, 126.5°W, 154 m depth, F/V *Kristine*, 7 December 1951; UW 14768, 250 mm, SSW of Esteban Pt., 48.8°N, 126.9°W, 1481 m depth, M/V *Regina*, 29 March 1954, P. Buholm; UW 14771, 285 mm, SW of Lennard I., 48.8°N, 126.1°W, 102 m depth, August 1952; RBCM

16128, 232 mm, 1988; RBCM 010-00494-001, 4, 168–205 mm, west of Vancouver Island, 2004
Tow 11, TC2004-011, 49.896°N, 127.8696°W, 862 m depth, 30 August 2004; RBCM 010-488-
004, 3, 140–158 mm, Ricker TC 2004-001, 49.4509°N, 127.2885°W, 752 m depth, 27 August
2004; RBCM 010-00491-002, 2, 115–195 mm, west of Nootka Island, TC2004-005, 49.5710°N,
127.6004°W, 667 m depth, 28 August 2004; RBCM 010-00344-004, 124 mm, SW of Barkley
Sound, 48.5073°N, 125.3384°W, 18 April 2003. **Washington:** UW 45779, 2, 190-195 mm,
47.7603°N, 125.3098°W, 860 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 12, 20
October 1996; UW 45578, 200 mm, 47.8972°N, 125.5983°W, 471 m depth, R/V *Miller
Freeman*, cruise 1996-15, haul 6, 19 October 1996, D. Kamikawa; UW 48646, 2, 150–195 mm,
47.5961°N, 125.4394°W, 942 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 187, 24
November 1997, W. C. Flerx; UW 48659, 3, 185-205 mm, 47.2335°N, 125.0074°W, 450 m
depth, R/V *Miller Freeman*, cruise 1997-11, haul 179, 22 November 1997; UW 112508, 4, 175-
185 mm, 48.0821°N, 125.8908°W, 886 m depth, R/V *Miller Freeman*, cruise 2001-12, haul 3, 13
October 2001, D. Kamikawa; UW 8470, 237.5 mm, SSW of Cape Flattery, 48°N, 125.3°W, 284
m depth, 29 November 1952, C. Abrahamsen; UW 10792, 1, 278 mm, Cape Flattery, off Makah
Bay, 48.3°N, 125°W, 183 m depth, 17 November 1951; UW 14770, 258 mm, Clallam County, W
of Umatilla on coast, 48°N, 125°W, 161 m depth, 11 October 1953; UW 25144, 266 mm, SW of
Cape Flattery, 48°N, 125.4°W, 220 m depth, 31 October 1978, D. Liljestrand; UW 45675, 269
mm, off Cape Flattery, 48.4°N, 124.9°W, 1 October 2001, K. Hughes; UW 118514, 95 mm,
47.24054°N, 125.00937°W, 475 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 178, 22
November 1997; UW 154677, 221 mm, 46.4722°N, 124.7062°W, 700 m depth, NWFSC LS,
2014, 7, 25 May 2014. **Oregon:** UW 150588*, 143 mm, 44.9318°N, 125.9984°W, 904 m depth,
R/V *Miller Freeman*, cruise 1996-15, haul 114, 1 November 1996; UW 150589*, 150 mm TL,

44.9318°N, 125.9984°W, 904 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 114, 1 November 1996; UW 115145*, 229 mm, 47.77°N, 125.42°W, 803 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 13, 20 October 1996; UW 153307*, 2, 158–195 mm, 45.0098°N, 124.7299°W, 536 m depth, F/V *Last Straw*, cruise 2013, haul 42, 7 June 2013; SIO 95-2*, 190 mm, 32.7367°N, 117.4033°W, 410 m depth, R/V *R. G. Sproul*, 4 March 1995, R. Rosenblatt; UW 48418, 144 mm, 43.3527°N, 124.7775°W, 564 m depth, R/V *Miller Freeman*, cruise 1999-13, haul 156, 7 November 1999, R. C. Harrison; UW 48660, 140 mm, 42.6119°N, 124.7920°W, 679 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 110, 12 November 1997, W. C. Flerx; UW 45785, 4, 125–170 mm, 44.2827°N, 125.0342°W, 795 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 157, 9 November 1996, J. W. Orr; UW 48648, 3, 125–155 mm, 44.5389°N, 124.9481°W, 652 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 138, 16 November 1996, J. W. Orr; UW 48658, 170 mm, 43.5414°N, 124.7831°W, 583 m depth, R/V *Miller Freeman* cruise 1997-11, haul 126, 14 November 1997; UW 48417, 224 mm, 44.0764°N, 124.9504°W, 350 m depth, R/V *Miller Freeman*, cruise 1999-13, haul 135, 5 November 1999, G. R. Hoff; UW 42346, 6, 200–270 mm, 45.9667°N, 124.8333°W, 69 m depth, 12 June 1966, R. B. Grinols; HUMZ 94279, $n = 1$, 43.45°N, 124.8°W, 530 m depth, 10 June 1974; RBCM 16116, 3, 225–245 mm, 43.105°N, 124.8483°W, 283 m depth, R/V *Commando*, cruise 1977-01, haul 177, 23 August 1977; RBCM 16138, 237 mm, 43.1°N, 124.8833°W, 375 m depth, 23 August 1977; RBCM 979-11355-001, 245 mm, west of Nehalem Bank, off Seaside, F/V *Tordenkjord*, 45.8833°N, 124.7333°W, 1 September 1977; UW 17199, 120 mm, 45.9356°N, 124.8506°W, BCF AEC sta. 15A, 27 May 1962; UW 17448, 3, 185–215 mm, 45.95°N, 124.8667°W, 732 m depth, BCF AEC sta. 15A, 6 December 1964; UW 19355, 220 mm, 45.9667°N, 124.7833°W, 549 m depth, BCF 13-13, 11 June 1966; UW 25175, 3, 205–230 mm, 45.9667°N, 124.783°W, 562 m depth, R/V

John N. Cobb, BCF, AEC, 12 June 1966, R. B. Grinols; UW 45781, 6, 70–165 mm, 43.5138°N, 124.9133°W, 741 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 191, 14 November 1996; UW 45782, 22, 115–180 mm, 44.3505°N, 125.0329°W, 773 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 148, 8 November 1996, J. W. Orr; UW 47264, 3, 148–205 mm, 44.3993°N, 124.8355°W, 447 m depth, R/V *Frosti*, cruise 2001-01, haul 68, 17 July 2001, L. L. Britt; UW 48661, 4, 143–185 mm, 43.5230°N, 124.9133°W, 736 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 124, 14 November 1997; UW 155642, 2, 55–70 mm, 43.5219°N, 124.7844°W, 596 m depth, R/V *Miller Freeman*, cruise 2001-12, haul 79, 21 October 2001, G. R. Hoff; UW 155649, 95 mm, 44.3159°N, 124.9438°W, 598 m depth, R/V *Miller Freeman*, cruise 1996-15, haul 156, 9 November 1996, J. W. Orr; UW 156830, 197.3 mm, 43.5831°N, 124.6564°W, 376 m depth, F/V *Excalibur*, cruise 2015, haul 71, 9 June 2015; UW 156837, 164.5 mm, 43.0986°N, 124.8869°W, 377 m depth, NWFSC, F/V *Ms. Julie*, cruise 2012, haul 76, 12 June 2012.

California: UW 45293, 2, 83–126 mm, 37.5092°N, 122.5647°W, 925 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 40, 30 October 1997, D. Kamikawa; UW 47482, 175 mm, 36.1165°N, 121.7036°W, 426 m depth, F/V *Vesteraalen*, cruise 1998-02, haul 27, 12 June 1998, J. W. Orr; UW 154696, 165 mm, 40.6850°N, 124.6745°W, 837 m depth, R/V *Miller Freeman*, cruise 1995-12, haul 66, 10 November 1995; UW 48647, 2, 156–162 mm, 41.7488°N, 124.5965°W, 584 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 98, 9 November 1997, W. C. Flerx; UW 113811, 2, 120–165 mm, 40.2029°N, 124.5221°W, 455 m depth, F/V *Vesteraalen*, cruise 1998-02, haul 94, 24 June 1998, J. W. Orr; UW 47479, 4, 125–173 mm, 34.5678°N, 120.8798°W, 386 m depth, F/V *Vesteraalen*, cruise 1998-02, haul 1, 8 June 1998, J. W. Orr; UW 48428, 3, 185–195 mm, 38.5472°N, 123.6924°W, 442 m depth, F/V *Vesteraalen*, cruise 1998-02, haul 72, 21 June 1998, J. W. Orr; UW 155640, 100 mm, 34.8926°N, 121.5025°W, 681 m

depth, R/V *Miller Freeman*, cruise 1997-11, haul 16, 26 October 1997, J. W. Orr; UW 152455, 4, 125–180, 165 mm, 36.7623°N, 122.2097°W, 676 m depth, R/V *Miller Freeman*, cruise 2000-12, haul 205, 7 November 2000, G. R. Hoff; UW 154698, 7, 135–210 mm, 40.8262°N, 124.7018°W, 960 m depth, R/V *Miller Freeman*, cruise 1995-12, haul 71, 11 November 1995, J. W. Orr; HUMZ 105596, $n = 1$, Santa Lucia, 34.95°N, 121.42°W, 470 m depth; CAS 21191, 2, 81–96.8 mm, Santa Barbara Channel Islands, 34.1833°N, 120.25°W, 50 m depth, *Albatross* station 2840, 9 May 1888; RBCM 16135, 260 mm, 39.9583°N, 124.1667°W, 384 m depth, R/V *David Star Jordan*, cruise 77-5, haul 61, 12 August 1977; UW 47481, 3, 177–207 mm, 41.7548°N, 124.5322°W, 447 m depth, F/V *Dominator*, cruise 1998-01, haul 101, 29 June 1998, W. C. Flerx; UW 48647, 2, 156–162 mm, 41.7488°N, 124.5965°W, 591 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 98, 9 November 1997, W. C. Flerx; UW 152413, 6, 160–200 mm, 38.5454°N, 123.7170°W, 620 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 53, 1 November 1997, J. W. Orr; UW 152450, 3, 82–88 mm, 34.5559°N, 121.0248°W, 797 m depth, R/V *Miller Freeman*, cruise 1997-11, haul 10, 25 October 1997.