# **Professor Charles Gray**

# OVERVIEW

- Professional scientist with 30<sup>+</sup> years research experience in aquatic resource ecology, assessment and management
- Research focus on applied natural resource conservation and sustainable management
- High-level strategic multidisciplinary research planning and development, prioritisation and management, project funding and budgeting, implementation, coordination, completion and reporting, research capacity and team building
- Strong history of scientific rigor and endeavour, experimental and research survey design, project methodologies and analytical techniques
- Extensive provision of research and management advice to governments (ministers and agency staff), industry representatives, stakeholder and advisory groups, and the general public
- Representative on national research, management and advisory committees
- Strong client-focused industry liaison, research support and extension
- Recruited, assembled, led and mentored collaborative multidisciplinary research teams
- Developed and implemented collaborative research projects across seven universities
- Supervised fourteen postgraduate research projects across five universities
- Initiated and managed staff development, training, performance and mentoring programs
- Experienced in risk assessments, implementation and monitoring of OHS and EEO
- Advanced working knowledge of government legislation, conservation and harvesting policies
- International conference and workshop presenter and coordinator
- Published 125<sup>+</sup> scientific international journal papers

# **CAREER EMPLOYMENT HISTORY**

RoLE Director WildFish Research	<b>Period</b> July 2013 - Current	ORGANISATION Private Business
Professorial Visiting Fellow	March 2011 - Current	Univ. NSW
Research Leader Wild Fisheries Unit NSW DPI	July 2004 - July 2013	NSW Government
Deputy Director Cronulla Fisheries Research Centre	Feb. 2005 – Feb. 2013	NSW Government
Professorial Research Fellow	July 2008 – July 2013	Univ. Wollongong
Principal Research Scientist	Jan. 2001 - June 2004	NSW Government
Senior Research Scientist	Mar. 1998 – Dec. 2000	NSW Government
Research Scientist	Aug. 1994 – Feb. 1998	NSW Government

# **EDUCATION QUALIFICATIONS**

Doctor of Philosophy, University of Sydney (1996) Master of Science, University of Sydney (1985) Diploma in Frontline Management, NSW TAFE (2005)

# **EMPLOYMENT OVERVIEW**

# **CURRENT: WILDFISH RESEARCH CONSULTANCY**

*WildFish Research* is a dynamic scientific-based enterprise that provides high quality, rigorous and costeffective research and advisory consultancies for public and private entities. *WildFish Research* specializes in undertaking fundamental and applied research (including impact assessments) for the sustainable management and conservation of the world's natural resources.

# **RECENT PROJECTS**

- Assessment of discarding of endangered, threatened and protected species in world marine fisheries (FAO, Rome)
- First implementation of an independent observer program for the Charter Boat Industry of NSW: data for industry-driven resource sustainability (FRDC Project 2014/036)
- Conservation and fisheries sustainability studies in the World Heritage Listed Paranaguá estuarine complex (Federal University of Paraná, Brazil)
- Optimising the collection of relative abundance data for the pipi population in New South Wales (FRDC Project 2012/018)
- Integrating fishery-independent and -dependent data for improved sustainability of fisheries resources and other aspects of biodiversity (FRDC Project 2008/004)

# **IMMEDIATE PAST APPOINTMENTS:**

# Research Leader, Wild Fisheries Unit, NSW Primary Industries (July 2004 – July 2013)

Lead, develop, prioritise, manage and coordinate the research activities (projects, finances, staffing, resources, partnerships) of the NSW Government's Wild Fisheries Research Unit. The Wild Fisheries Research Unit was responsible for providing the scientific advice, research and development to support the sustainable and profitable management of the wild fisheries resources of NSW. The unit had five key research areas: fishing gear technology, fishing and resource surveys, resource enhancement, harvested species biology and ecology, stock assessment. There were up to 45 staff employed in the unit working on more than 50 research projects with an operating budget exceeding \$2.5 million per annum.

# Deputy Director, Cronulla Fisheries Research Centre of Excellence (February 2005 – February 2013)

Develop collaborative partnerships and projects with national and international research providers and industry groups; attract external funding for fisheries and aquatic conservation related research from external funding agencies. Oversee infrastructure support, maintenance and security of the 2.25 ha Cronulla Fisheries Research Centre (16 buildings that housed approximately 160 staff from research, management, compliance and corporate services of NSW Department of Primary Industries). The research facilities included three wet and dry laboratories, a digital imaging laboratory, aquaria system, workshop, wharf, and six vessels.

# Visiting Professorial Fellow, University of New South Wales (March 2011 - current) Professorial Research Fellow, University of Wollongong (July 2008 – June 2013)

Develop and source funding for collaborative research projects; develop and progress industry partnerships; initiate and manage postgraduate student projects and supervise postgraduate students; contribute to the scientific endeavour, outputs and public good of universities.

#### **SCIENTIFIC OUTPUTS**

ORCID ID: 0000-0001-9939-9995

#### **International Journal Publications:**

- 126. Brodie S, Hobday AJ, Smith JA, Spillman CM, Hartog JR, Everett JD, Taylor MD, Gray CA, Suthers IM (2017) Seasonal forecasting of dolphinfish distribution in eastern Australia to aid recreational fishers and managers. *Deep-Sea Research Part II: Topical Studies in Oceanography*. (doi: 10.1016/j.dsr2.2017.03.004)
- 125. Gray GME, Gray CA (2017) Beach-user attitudes to shark-bite mitigation strategies on coastal beaches; Sydney, Australia. *Human Dimensions of Wildlife* 22. (doi: 10.1080/10871209.2017.1295491)
- 124. Gray CA, Kennelly SJ (2017) Evaluation of observer- and industry-based catch data in a recreational charter fishery. *Fisheries Management and Ecology* 24, 126-138. (doi: 10.1111/fme.12210)
- 123. Pichler HA, Gray CA, Broadhurst MK, Spach HL, Nagelkerken I (2017). Seasonal and environmental influences on recruitment patterns and habitat usage among resident and transient fishes in a World Heritage Site subtropical estuary. *Journal of Fish Biology* 90, 396-416. (doi:10.1111/jfb.13191)
- 122. Possatto FE, Broadhurst MK, Gray CA, Spach HL, Lamour M (2017) Spatio-temporal variation among demersal ichthyofauna in a subtropical estuary bordering World Heritage Listed and marine protected areas: implications for resource management. *Marine and Freshwater Research*. (doi:10.1071/MF15345)
- Brodie S, Taylor MD, Smith JA, Suthers IM, Gray CA, Payne NL (2016) Improving consumption rate estimates by incorporating wild activity into bioenergetics models. *Ecology and Evolution* 6, 2262-2274. (doi:10.1002/ece3.2027)
- 120. Payne NL, Smith JA, van der Meulen DE, Taylor MD, Watanabe YY, Takahashi A, Marzullo TA, Gray CA, Cadiou G, Suthers IM (2016) Temperature-dependence of fish performance in the wild: links with species biogeography and physiological thermal tolerance. *Functional Ecology* 30, 903-912. (doi:10.1111/1365-2435.12618)
- 119. Smoothey AF, Gray CA, Kennelly SJ, Masens OJ, Peddemors VM, Robinson WA (2016) Patterns of occurrence of sharks in Sydney Harbour, a large urbanised estuary. *PLoS One* 11, e0146911. (doi:10.1371/journal.pone.0146911).
- 118. Gray CA (2016) Evaluation of fishery-dependent sampling strategies for monitoring a small-scale beach clam fishery. *Fisheries Research* 177, 24-30. (doi:10.1016/j.fishres.2016.01.007).
- 117. Gray CA (2016) Effects of fishing and fishing closures on beach clams: experimental evaluation across commercially fished and non-fished beaches before and during harvesting. *PLoS One* 11, e0146122. (doi:10.1371/journal.pone.0146122)
- 116. Gray CA (2016) Assessment of spatial fishing closures on beach clams. *Global Ecology and Conservation* 5, 108-117. (doi:10.1016/gecco.2015.12.002)
- 115. Gray CA (2016) Tide, time and space: scales of variation and influences on structuring and sampling beach clams. *Journal of Experimental Marine Biology and Ecology* 474, 1-10. (doi:10.1016/j.jembe.2015.09.013)

- 114. Brodie S, Hobday AJ, Smith JA, Everett JD, Taylor MD, Gray CA, Suthers IM (2015) Modelling the oceanic habitats of two pelagic species using recreational fisheries data. *Fisheries Oceanography* 24, 463-477. (doi:10.1111/fog.12122)
- 113. Pichler HA, Spach HL, Gray CA, Broadhurst MK, Schwarz R Jnr, de Oliveira Neto JF (2015) Environmental influences on resident and transient fishes across shallow estuarine beaches and tidal flats in a Brazilian World Heritage area. *Estuarine, Coastal and Shelf Science* 164, 482-492. (doi:10.1016/j.ecss.2015.07.041)
- 112. Payne NL, van der Meulen DE, Suthers IM, Gray CA, Walsh CT, Taylor MD (2015). Rain-driven changes in fish dynamics: a switch from spatial to temporal segregation. *Marine Ecology Progress Series* 528, 267-275. (doi:10.3354/meps11285)
- 111. Gray CA (2015) Spatial variation in demography of an estuarine teleost: implications for population and fishery assessments. *Aquatic Biology* 23, 209-223. (doi:10.3354/ab00623)
- 110. Stocks J, Gray CA, Taylor MD (2015) Out in the wash: spatial ecology of a temperate marine shallow rocky-reef species derived using acoustic telemetry. *Marine and Freshwater Research* 66, 559-571. (dx.doi.org/10.1071/MF14182)
- 109. Gannon R, Payne NL, Suthers IM, Gray CA, van der Meulen DE, Taylor MD (2015) Fine-scale movements, site fidelity and habitat use of an estuarine dependent sparid. *Environmental Biology of Fishes* 98, 1599-1608. (doi.10.1007/s10641-015-0385-5)
- 108. Gray CA, Barnes LM (2015) Spawning, maturity, growth and movement of *Platycephalus fuscus* (Cuvier, 1829) (Platycephalidae): fishery management considerations. *Journal of Applied Ichthyology* 31, 442-450. (doi:10.1111/jai.12703)
- 107. Stocks J, Gray CA, Taylor MD (2015) Intra-population trends in the maturation and reproduction of a temperate marine herbivore *Girella elevata* across latitudinal clines. *Journal of Fish Biology* 86, 463-483. (doi: 10.1111/jfb.12563)
- 106. Payne NL, van der Meulen DE, Suthers IM, Gray CA, Taylor MD (2015) Foraging intensity of wild mulloway Argyrosomus japonicus decreases with increasing anthropogenic disturbance. Marine Biology 162, 539-546. (doi: 10.1007/s00227-014-2603-7)
- 105. Ochwada-Doyle FA, McLeod J, Barrett G, Clarke G, Gray CA (2014) Spatial patterns of recreational exploitation in eastern Australian ROFAs; implications for zonal management. *Fisheries Management and Ecology* 21, 383-397. (doi: 10.1111/fme.12087)
- 104. Gray CA, Barnes LM, Ochwada-Doyle FA, van der Meulen DE, Kendall BW, Robbins WD (2014) Age, growth and demographic characteristics of *Sillago flindersi* exploited in a multi-species trawl fishery. *Fisheries Science* 80, 915-924. (doi: 10.1007/s12562-014-0793-z)
- 103. Gannon R, Taylor MD, Suthers IM, Gray CA, van der Meulen DE, Smith JA, Payne NL (2014) Thermal limitation of performance and biogeography in a free-ranging ectotherm: insights from accelerometry. *The Journal of Experimental Biology* 217, 3033-3037. (doi:10.1242/jeb.104455)
- 102. Ochwada-Doyle FA, Stocks J, Barnes L, Gray CA (2014) Reproduction, growth and mortality of the exploited, *Sillago ciliata* Cuvier, 1829. *Journal of Applied Ichthyology* 30, 870-880. (doi:10.1111/jai.12478)

- 101. Morriengello JR, Walsh CT, Gray CA, Stocks JR, Crook DA (2014) Environmental change drives longterm recruitment and growth variation in an estuarine fish. *Global Change Biology* 20, 1844-1860. (doi:10.1111/gcb.12545)
- 100. Gray CA, Barnes LM, van der Meulen DE, Kendall BW, Ochwada-Doyle FA, Robbins WD (2014) Depth interactions and reproductive ecology of sympatric Sillaginidae: *Sillago robusta* and *S. flindersi. Aquatic Biology* 21, 127-142. (doi:10.3354/ab00578)
- 99. Taylor MD, van der Meulen DE, Ives MC, Walsh CT, Reinfelds IV, Gray CA (2014) Shock, stress or signal? Implications of freshwater pulses for a top-level estuarine predator. *PLoS One* 9, e95680. (doi:10.1371/journal.pone.0095680)
- 98. Stocks J, Gray CA, Taylor MD (2014) Synchrony and variation across latitudinal gradients: the role of climate and oceanographic processes in the growth of a herbivorous fish. *Journal of Sea Research* 90, 23-32. (doi:10.1016/j.seares.2014.03.002)
- 97. Gray CA, Johnson DD, Reynolds D, Rotherham D (2014) Development of rapid sampling procedures for an exploited bivalve in the swash zone on exposed ocean beaches. *Fisheries Research* 154, 205-212. (doi:10.1016/j.fishres.2014.02.027)
- 96. van der Meulen DE, Walsh CT, Taylor MD, Gray CA (2014) Habitat requirements and spawning strategy of an estuarine-dependent fish, *Percalates colonorum*. *Marine and Freshwater Research* 65, 218-227. (doi:10.1071/MF13060)
- 95. Stocks J, Gray CA, Taylor, MD (2014) Testing the effects of near-shore environmental variables on acoustic detections: implications on telemetry array design and data interpretation. *Marine Technology Society Journal* 48, 28-35. DOI: 10.4031/MTSJ.48.1.8
- 94. Roberts DG, Gray CA, Ayre DJ (2014) Microsatellite primers for Australian recreationally and commercially important estuarine fishes. *Journal of Fish Biology* 84:273-81. (doi:10.1111/jfb.12283)
- 93. Taylor MD, McPhan L, Gannon R, van der Meulen DE, Gray CA, Suthers IM, Payne NL (2013) Interactive drivers of activity in a free-ranging estuarine predator. *PLoS One* 8, e80962. (doi:10.1371/journal.pone.0080962)
- 92. Young CL, Rotherham D, Johnson DD, Gray CA (2013) Small-scale variation in reproduction and abundance of greentail prawn, *Metapenaeus bennettae* Racek and Dall, 1965. *Journal of Crustacean Biology* 33, 651-659. (doi:10.1163/1937240X-00002172)
- 91. Robbins WD, Peddemors VM, Broadhurst MK, Gray CA (2013) Hooked on fishing? Recreational angling interactions with the *Critically Endangered* grey nurse shark, *Carcharias taurus* in eastern Australia. *Endangered Species Research* 21, 161-170. (doi:10.3354/esr00520)
- 90. van der Meulen DE, West RJ, Gray CA (2013) An assessment of otoliths, dorsal spines and scales to age the long-finned gurnard, *Lepidotrigla argus*, Ogilby, 1910 (Family: Triglidae). *Journal of Applied Ichthyology* 29, 815-824. (doi:10.1111/jai.12181)
- Reinfelds IV, Walsh CT, van der Meulen DE, Growns IO, Gray CA (2013) Magnitude, frequency and duration of instream flows to stimulate and facilitate catadromous fish migrations: Australian Bass (*Macquaria novemaculeata* Perciformes, Percichthyidae). *River Research and Applications* 29, 512-527. (doi:10.1002/rra.1611)

- 88. Rotherham D, Johnson DD, Macbeth WG, Gray CA (2013) Escape gaps as a management strategy for reducing bycatch in net-covered traps for giant mud crab *Scylla serrata*. *North American Journal of Fisheries Management* 33, 307-317. (doi:10.1080/02755947.2012.760502)
- 87. Walsh CT, Reinfelds IV, Ives MC, Gray CA, West RJ, van der Meulen DE (2013) Environmental influences on the spatial ecology and spawning behaviour of an estuarine-resident fish, *Macquaria colonorum*. *Estuarine, Coastal and Shelf Science* 118, 60-71. (doi:10.1016/j.ecss.2012.12.009)
- 86. Payne NL, van der Meulen DE, Gannon R, Semmens JM, Suthers IM, Gray CA, Taylor MD (2013) Rain reverses diel activity rhythms in an estuarine teleost. *Proceedings of the Royal Society B*, 280, 1750 20122363, 1471-2954. (doi:10.1098/rspb.2012.2363)
- 85. Barnes LM, van der Meulen DE Orchard BA, Gray CA (2013) Novel use of an ultrasonic cleaning device for fish reproductive studies. *Journal of Sea Research* 76, 222-226. (doi:10.1016/j.seares.2012.08.008)
- 84. Walsh CT, Reinfelds IV, West RJ, Gray CA, van der Meulen DE (2012) Distribution and movement of catadromous fish: design and implementation of a freshwater-estuarine acoustic telemetry array. American Fisheries Society Symposium 76, 251-264.
- 83. Macbeth WG, Millar RB, Johnson DD, Gray CA, Keech RS, Collins D (2012) Assessment of the relative performance of a square-mesh codend design across multiple vessels in a demersal trawl fishery. *Fisheries Research* 134-136, 29-41. (doi:10.1016/j.fishres.2012.07.012)
- 82. Ochwada-Doyle FA, Roberts DG, Gray CA, Barnes L, Haddy J, Fearman J (2012) Characterizing the biological traits and life history of *Acanthopagrus* (Sparidae) hybrid complexes: implications for conservation and management. *Journal of Fish Biology* 81, 1540-1558. (doi:10.1111/j.1095-8642.2012.03401.x)
- Gray CA, Haddy JA, Fearman J Barnes LM, Macbeth WG, Kendall BW (2012) Reproduction, growth and connectivity among populations of *Girella tricuspidata* (Pisces: Girellidae). *Aquatic Biology* 16, 53-68. (doi:10.3354/ab00428)
- 80. Ochwada-Doyle F, Gray CA, Loneragan NR, Suthers IM, Taylor MD (2012) Competition between wild and captive-bred *Penaeus plebejus* and implications for stock enhancement. *Marine Ecology Progress Series* 450, 115-129. (doi:10.3354/meps09600)
- 79. Rotherham D, Johnson DD, Kesby CL, Gray CA (2012) Sampling estuarine fish and invertebrates with a beam trawl provides a different picture of populations and assemblages than multi-mesh gillnets. *Fisheries Research* 123-124, 49-55. (doi:10.1016/j.fishres.2011.11.019)
- 78. Walsh CT, Reinfelds IV, Gray CA, West RJ, van der Meulen DE, Craig JR (2012) Seasonal residency and movement patterns of two co-occurring catadromous percichthyids within a south-eastern Australian river. *Ecology of Freshwater Fish*, 21, 145-159. (doi:10.1111/j.1600-0633.2011.00534.x)
- 77. Gray CA, Rotherham D, Johnson DD (2011) Consistency of temporal and habitat-related differences among assemblages of fish in coastal lagoons. *Estuarine, Coastal and Shelf Science* 95, 401-414. (doi:10.1016/j.ecss.2011.10.010)
- 76. Barnes LM, Gray CA, Williamson JE (2011) Divergence of the growth characteristics and longevity of coexisting Platycephalidae (Pisces). *Marine and Freshwater Research* 62, 1308-1317. (doi:10.1071/MF11045)

- 75. Rotherham D, Chapman MG, Underwood AJ, Gray CA, Johnson DD (2011) Untangling spatial and temporal variation in abundances of estuarine fish sampled with multi-mesh gillnets. *Marine Ecology Progress Series* 435, 183-195. (doi:10.3354/meps09204)
- 74. Ochwada-Doyle F, Gray CA, Loneragan NR, Taylor MD, Suthers IM (2011) Spatial and temporal variability in the condition of postlarval and juvenile *Penaeus plebejus* sampled from a population subjected to pilot releases. *Aquaculture Environment Interactions* 2, 15-25. (doi:10.3354/aei00026)
- Rotherham D, Macbeth WG, Kennelly SJ, Gray CA (2011) Reducing uncertainty in the assessment and management of fisheries resources following an environmental impact. *ICES Journal of Marine Science* 68, 1726-1733. (doi:10.1093/icesjms/frs079)
- 72. Walsh CT, Gray CA, West RJ, Williams LFG (2011) Reproductive biology and spawning strategy of the catadromous percichthyid, *Macquaria colonorum* (Gunther, 1863). *Environmental Biology of Fishes* 91, 471-486. (doi:10.1007/s10641-011-9807-1)
- 71. Stocks J, Stewart J, Gray CA, West, RJ (2011) Using otolith increment widths to infer spatial, temporal and gender variation in the growth of sand whiting *Sillago ciliata*. *Fisheries Management and Ecology* 18, 121-131. <u>http://dx.doi.org/</u>
- 70. Barnes LM, Leclerc M, Gray CA, Williamson JE (2011) Dietary niche differentiation of five sympatric species of Platycephalidae. *Environmental Biology of Fishes* 90, 429-441.
- 69. Roberts DG, Gray CA, West RJ, Ayre DJ (2011) Temporal stability of a hybrid swarm between the migratory marine and estuarine fishes *Acanthopagrus australis* and *A. butcheri*. *Marine Ecology Progress Series* 421, 199-204.
- 68. Roberts DG, Gray CA, West RJ, Ayre DJ (2010) Gamete compatibility between marine and estuarine Acanthopagrus spp. (Sparidae) and their hybrids. Journal of Fish Biology 77, 425-431. (doi:10.11`11/j.1095-8649.2010.02649)
- 67. Ochwada-Doyle F, Gray CA, Loneragan NR, Taylor MD (2010) Using experimental ecology to understand stock enhancement: comparisons of habitat-related predation on wild and hatchery-reared *Penaeus plebejus* Hess. *Journal of Experimental Marine Biology and Ecology* 390, 65-71.
- 66. Walsh CT, Gray CA, West RJ, van Der Meulen DE, Williams LFG (2010) Growth, episodic recruitment and age truncation in populations of a catadromous percichthyid, *Macquaria colonorum*. *Marine and Freshwater Research* 61, 397-407.
- 65. Gray CA, Ives MC, Macbeth WG, Kendall BW (2010) Variation in growth, mortality, length and age compositions of harvested populations of the herbivorous fish, *Girella tricuspidata*. *Journal of Fish Biology* 76, 880-899.
- 64. Johnson DD, Gray CA, Macbeth WG (2010) Reproductive biology of *Portunus pelagicus* in a south-east Australian estuary. *Journal of Crustacean Biology* 30, 200-205.
- 63. Roberts DG, Gray CA, West RJ, Ayre DJ (2010) Marine genetic swamping: hybrids replace an obligately estuarine fish. *Molecular Ecology*, 19, 508-520.
- 62. Kendall BW, Gray CA, Bucher DD (2009) Age validation and variation in growth, mortality and population structure of *Liza argentea* and *Myxus elongatus* (Mugilidae) in two temperate Australian estuaries. *Journal of Fish Biology* 75, 2788-2804.

- 61. Kendall BW, Gray CA (2009) Reproduction, age and growth of *Sillago maculata* in south-eastern Australia. *Journal of Applied Ichthyology* 25, 529-536.
- 60. Ochwada F, Loneragan NR, Gray CA, Suthers IM, Taylor MD (2009) Complexity affects habitat preference and predation mortality in postlarval *Penaeus plebejus*: implications for stock enhancement. *Marine Ecology Progress Series* 380, 161-171.
- 59. Roberts DG, Gray CA, West RJ, Ayre DJ (2009) Evolutionary impacts of hybridization and interspecific gene flow on an obligate estuarine fish. *Journal of Evolutionary Biology*, 22, 27-35.
- 58. Gray CA, Rotherham D, Chapman MG, Underwood AJ, Johnson DD (2009) Spatial scales of variation among assemblages of fish in coastal lakes sampled with multi-mesh gillnets: implications for designing research surveys. *Fisheries Research* 96, 58-63.
- 57. Silberschneider V, Gray CA, Stewart J (2009) Age, growth, maturity and the overfishing of the iconic sciaenid, *Argyrosomus japonicus*, in south-eastern Australia. *Fisheries Research* 95, 220-229.
- 56. Hughes JM, Stewart J, Kendall BW, Gray CA (2008) Growth and reproductive biology of tarwhine *Rhabdosargus sarba* (Sparidae) in eastern Australia. *Marine and Freshwater Research* 59, 1111-1123.
- 55. Johnson DD, Rotherham D, Gray CA (2008) Sampling estuarine fish and invertebrates using demersal otter trawls: effects of net height, tow duration and diel period. *Fisheries Research* 93, 315-323.
- 54. Kendall BW, Gray CA (2008) Reproductive biology of two co-occurring mugilids, *Liza argentea* and *Myxus elongatus*, in south-eastern Australia. *Journal of Fish Biology* 73, 963-979.
- 53. Rotherham D, Broadhurst MK, Gray CA, Johnson DD (2008) Developing a beam trawl for sampling estuarine fish and crustaceans: assessment of a codend cover and effects of different sizes of mesh in the body and codend. *ICES Journal of Marine Science* 65, 687-696.
- 52. Broadhurst MK, Kennelly SJ, Gray CA (2008) Working laterally towards perfect selectivity in fishing gears. *American Fisheries Society Symposium* 49, 1303-1309.
- 51. Gray CA (2008) A scientific assessment program to test the reconciliation of an estuarine commercial fishery with conservation. *American Fisheries Society Symposium* 49, 1593- 1596.
- 50. Ochwada F, Scandol J, Gray CA (2008) Predicting the age of fish using linear models of biometric data: a case study of two estuarine species from NSW Australia. *Fisheries Research* 90, 187-197.
- 49. Rotherham D, Gray CA, Johnson DD, Lokys P (2008) Effects of diel period and tow duration on estuarine fauna sampled with a beam trawl over bare sediment: consequences for designing more reliable and efficient surveys. *Estuarine, Coastal and Shelf Science* 78, 179-189.
- 48. Macbeth W, Gray CA (2008) Differences in catch composition among types of commercial penaeidseining operations in an Australian estuary. *Asian Fisheries Science* 21, 339-353.
- 47. Silberschneider V, Gray CA (2008) A synopsis of biological, fisheries and aquaculture-related information on *Argyrosomus japonicus* (Pisces: Sciaenidae), with particular reference to Australia. *Journal of Applied Ichthyology* 24, 7-17.

- 46. Rotherham D, Underwood AJ, Chapman MG, Gray CA (2007) A strategy for developing scientific sampling tools for fishery-independent surveys of estuarine fish in New South Wales, Australia. *ICES Journal of Marine Science* 64, 1512-1516.
- 45. Butcher PA, Broadhurst MK, Reynolds D, Reid DD, Gray CA (2007) Release method and anatomical hook location: effects on short-term mortality of angler-caught *Acanthopagrus australis* and *Argyrosomus japonicus*. *Diseases of Aquatic Organisms* 74, 17-26,
- 44. Broadhurst MK, Dijkstra K, Reid DD, Gray CA (2006) Utility of morphological data for key fish species in southeastern Australian beach-seine and otter-trawl fisheries: predicting mesh size and configuration. *New Zealand Journal of Marine and Freshwater Research* 40, 259-272.
- 43. Gray CA, Young DJ, Broadhurst MK (2006) A comparison of catches and bycatches from 3 non-trawl penaeid fishing gears used in an Australian estuary. *Asian Fisheries Science* 19, 117-130.
- 42. Rotherham D, Gray CA, Broadhurst MK, Johnson DD, Barnes LM, Jones MV (2006) Sampling estuarine fish using multi-mesh gill nets: effects of panel length and soak and setting times. *Journal of Experimental Marine Biology and Ecology* 331, 226-239.
- 41. Gray CA, Broadhurst MK, Johnson DD, Young DJ (2005) Influences of hanging ratio, fishing height, twine diameter and material of bottom-set gillnets on catches of dusky flathead *Platycephalus fuscus* and non-target species in New South Wales, Australia. *Fisheries Science* 71, 1216-1227.
- 40. Gray CA, Jones MV, Rotherham D, Broadhurst MK, Johnson DD, Barnes LM (2005) Utility and efficiency of multi-mesh gill nets and trammel nets for sampling assemblages and populations of estuarine fish. *Marine and Freshwater Research* 56, 1077-1088.
- Broadhurst MK, Young DJ, Gray CA, Wooden MEL (2005) Improving selection in southeastern Australian whiting (*Sillago* spp.) trawls: effects of modifying the body, codend and extension. *Scientia Marina* 69, 301-311.
- 38. Gray CA, Johnson DD, Broadhurst MK, Young DJ (2005) Seasonal, spatial and gear-related influences on relationships between retained and discarded catches in a multi-species gillnet fishery. *Fisheries Research* 75, 56-72.
- 37. Broadhurst MK, Gray CA, Reid DD, Wooden MEL, Young DJ, Haddy JA, Damiano C (2005) Mortality of key fish species released by recreational anglers in an Australian estuary. *Journal of Experimental Marine Biology and Ecology* 321, 171-179.
- 36. Gray CA, Kennelly SJ (2004) A simple change in fishing practice reduces bycatch in an estuarine penaeid prawn seine fishery. *Ecological Management and Restoration* 5, 207-210.
- 35. Gray CA (2004) An overview of commercial fishing in Lake Illawarra: trends in reported catch and effort, bycatch and discarding. *Wetlands (Australia)* 21, 152-162.
- 34. Stewart J, Walsh C, Reynolds D, Kendall B, Gray CA (2004) Determining an optimal mesh size for use in the lampara net fishery for eastern sea garfish, *Hyporhamphus australis*. *Fisheries Management and Ecology* 11, 403-410.
- 33. Broadhurst MK, Millar RB, Kennelly SJ, Macbeth WG, Young DJ, Gray CA (2004) Selectivity of conventional diamond- and novel square-mesh codends in an Australian estuarine penaeid-trawl fishery. *Fisheries Research* 67, 183-194.

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