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Marine and Freshwater Research

Supplementary Material

A comparison of catch efficiency and bycatch reduction of tuna pole-and-line fisheries using Japan tuna hook (JT-hook) and circle-shaped hook (C-hook)

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Table S1. Model selection criteria for the dockside data.

Species	Variables	GCV	Deviance explained	AICc	Remark
Sea turtle	*lightpower*[A]	0.2	22.4%	160.5	All terms were statistically significant
	month + lightpower	0.3	13.7%	166.6	Month variable was not significant
	month + lightpower+fishingday	0.4	20.1%	172.7	Fishingday and month variable were not significant
	month + lightpower+fishingday+vesselpower	0.3	22.0%	175.7	Fishingday, month, and vesselpower variables were not significant
	month+lightpower+fishingday+ vesselpower+vessellength	0.5	21.0%	184.8	Fishingday, month, vesselpower and vessellength variables were not significant
Yellowfin tuna	*month + lightpower*[A]	98.4	43.2%	838.8	All terms were statistically significant
	month + lightpower+fishingday	103.6	37.6%	841.7	Fishingday variable was not significant
	month + lightpower+fishingday+vesselpower	102.3	37.6%	843.5	Fishingday and vesselpower variables were not significant
	month + lightpower+fishingday+ vesselpower+vessellength	103.6	42.2%	846.0	Fishingday, vesselpower and vessellength variables were not significant
Bigeye tuna	hooktype[A]	4.3	36.6%	444.7	Only linear term was retained in the model
	month + lightpower+fishingday+ vesselpower+vessellength	4.6	27%	483.6	All terms were not statistically significant
Yellowfin and bigeye tuna combined	*month + lightpower*[A]	110.1	44.2%	847.7	All terms were statistically significant
	month + lightpower+fishingday	111.8	36.0%	849.7	Fishingday variable was not significant
	month + lightpower+ fishingday+vesselpower	113.8	39.5%	852.6	Fishingday and vesselpower variables were not significant
	month + lightpower+fishingday+ vesselpower+vessellength	116.8	37.0%	853.6	Fishingday, vesselpower and vessellength variables were not significant

[A]The selected model with the lowest GCV, highest deviance explained, and lowest AICc and all model parameters being statistically significant.

Table S2. Model selection criteria for the on-board research data.

Species	Variables	GCV	Deviance explained	AICc	Remark
Yellowfine tuna	*moonlight*[A]	0.9	13.4%	490.8	Moonlight variable was statistically significant
	moonlight+month	1.0	12.6%	492.2	Month variable was not significant
Bigeye tuna		0.1	10.1%	100.1	Only linear term was retained in the model
	moonlight+month	1.0	8.1%	108.0	Both month and moonlight variables were not significant
Long snouted lancetfish	*moonlight*[A]	1.5	12.8%	578.6	Moonlight variable was statistically significant
	moonlight+month	1.9	11.8%	588.6	Month variable was not significant
Wahoo		1.5	8.0%	578.2	Only linear term was retained in the model
	moonlight+month	1.8	6.8%	579.6	Both month and moonlight variables were not significant
Thresher shark	*moonlight*[A]	0.4	10.4%	335.9	Moonlight variable was statistically significant
	moonlight+month	1	9.2%	344.8	Month variable was not significant
Swordfish		0.4	4.0%	324.9	Only linear term was retained in the model
	moonlight+month	0.7	3.7%	334.0	Both month and moonlight variables were not significant

[A]The selected model with the lowest GCV, highest deviance explained, and lowest AICc and all model parameters being statistically significant.

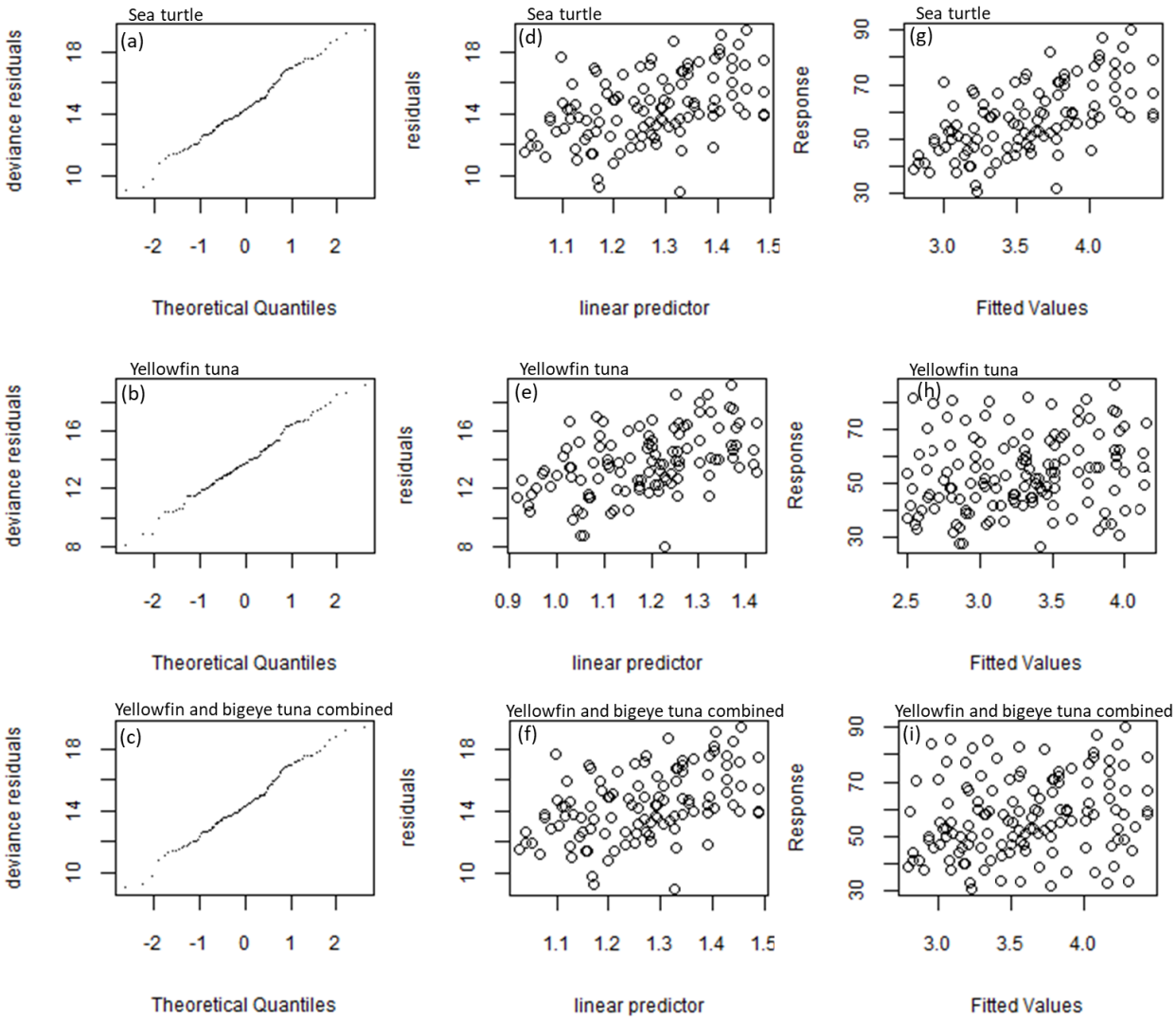

Fig. S1. QQ plots of residuals (a, b, c), deviance residuals *v.* linear plots (d, e, f), and deviance residuals *v.* fitted values (g, h, i) for GAMMs developed for sea turtles (top panels), yellowfin tuna (middle panels), and yellowfin and bigeye tuna combined (bottom panels) for the dockside data

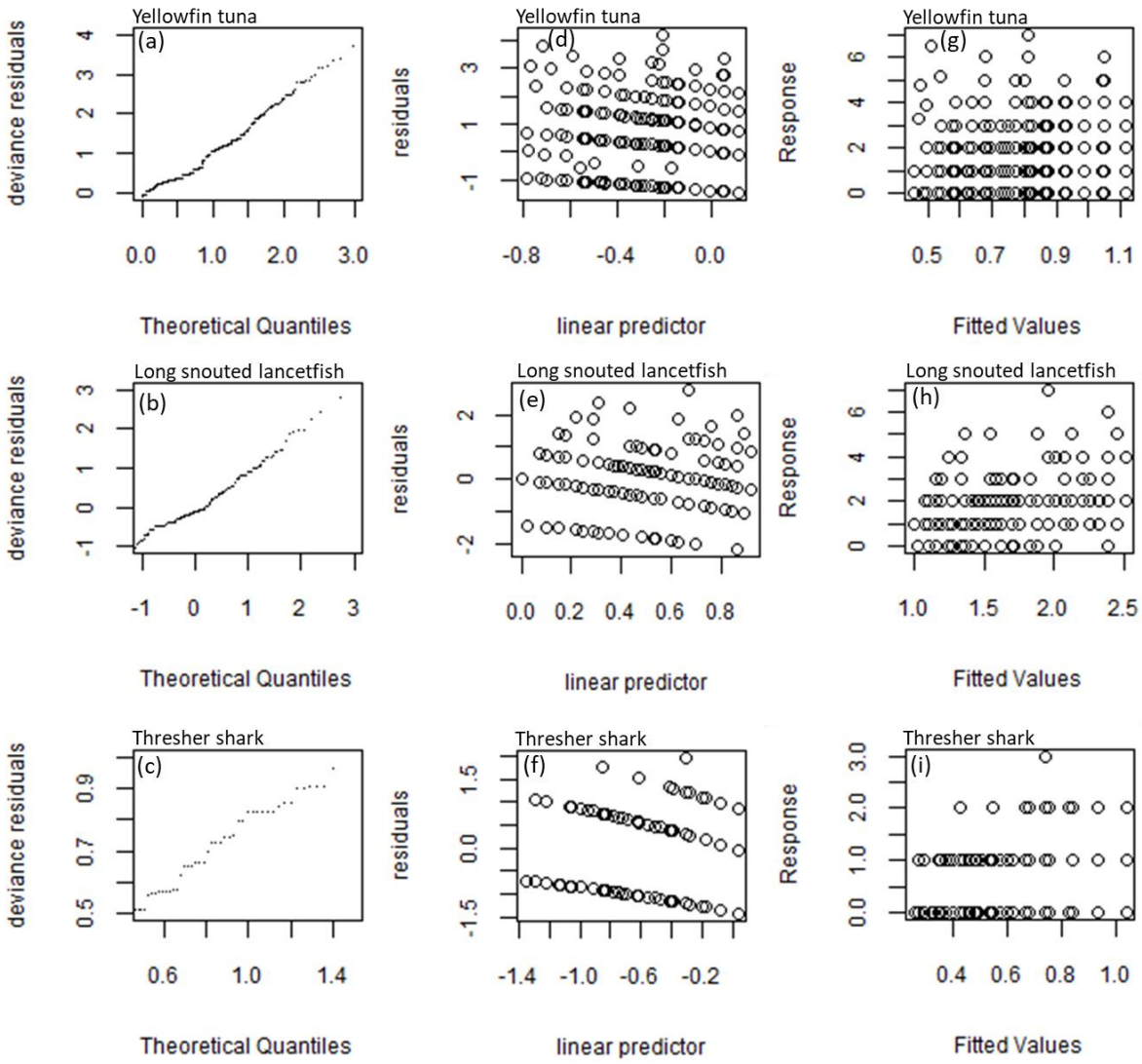

Fig. S2. QQ plots of residuals (a, b, c), deviance residuals *v.* linear plots (d, e, f), and deviance residuals *v.* fitted values (g, h, i) for GAMs developed for yellowfin tuna (top panels), long snouted lancetfish (middle panels), and thresher shark (bottom panels) for the on-board research data.