





<b>Gamma (catch + 1)</b>						<b>Gamma (catch + 1)</b>				<b>Gamma (catch + 1)</b>				
Year Vessel Métier Target Quarter	-14522.3	-14420.3	-14099.0			Year Vessel Gear Target *	106091.6	106169.6	106495.5	Year Area Depth Moon Soak time	-2524.0	-2402.0	-1987.8	
Year Vessel Métier Target Quarter <i>Year × Quarter</i>	-14545.5	-14441.5	-14113.9	23.2	< 0.001					Year Area Depth Moon Soak time <i>Year × Moon</i>	-2697.5	-2573.5	-2152.5	173.5 < 0.001
Year Vessel Métier Target Quarter <i>Year × Quarter</i>	-16179.5	-16073.5	-15739.6	1634.1	< 0.001					Year Area Depth Moon Soak time <i>Year × Moon</i>	-3241.1	-3115.1	-2687.3	543.7 < 0.001
<i>Year × Vessel</i>										<i>Year × Area</i>				
Year Vessel Métier Target Quarter <i>Year × Quarter</i>	-16257.7	-16149.7	-15809.5	78.2	< 0.001					Year Area Depth Moon Soak time <i>Year × Moon</i>	-3391.418	-3263.4	-2828.8	150.3 < 0.001
<i>Year × Vessel Year × Métier</i>										<i>Year × Area Year × Soak time*</i>				
	BRF						BRF				BRF			
<b>Gamma (catch + c)</b>						<b>Gamma (catch + c)</b>				<b>Gamma (catch + c)</b>				
Year Vessel *	-14584.1	-14504.1	-14251.3			Year Vessel Gear Depth Target *	137653.6	137727.6	138033.2	Year Area Depth	11659.8	11763.8	12131.1	
										Year Area Depth <i>Year × Area *</i>	11240.0	11346.0	11720.3	419.8 < 0.001
<b>Gamma (catch + 1)</b>						<b>Gamma (catch + 1)</b>				<b>Gamma (catch + 1)</b>				
Year Vessel Target	3116.6	3202.6	3474.3			Year Vessel Gear Depth Target *	136512.9	136586.9	136892.5	Year Area Depth	25172.8	25276.8	25644.0	
Year Vessel Target <i>Year × Vessel *</i>	1261.7	1349.6	1627.7	1854.9	< 0.001					Year Area Depth <i>Year × Area *</i>	24488.1	24594.1	24968.5	684.6 < 0.001
	RIB						RIB				RIB			
<b>Gamma (catch + c)</b>						<b>Gamma (catch + c)</b>				<b>Gamma (catch + c)</b>				
Year Quarter Vessel Métier	-37927.6	-37825.6	-37504.3			Year Vessel Gear Target *	30222.3	30300.3	30626.2	Year Area Depth*	-4673.5	-4569.5	-4202.3	
Year Quarter Vessel Métier <i>Year × Vessel *</i>	-40564.0	-40460.0	-40132.4	2636.4	< 0.001									
<b>Gamma (catch + 1)</b>						<b>Gamma (catch + 1)</b>				<b>Gamma (catch + 1)</b>				
Year Vessel Target	-9242.9	-9156.9	-8885.2			Year Vessel Gear Depth Target *	72962.3	73044.3	73382.9	Year Area Depth	18432.9	18536.9	18904.1	
Year Vessel Target <i>Year × Vessel *</i>	-10402.9	-10314.9	-10036.9	1160.0	< 0.001					Year Area Depth <i>Year × Area *</i>	17847.5	17953.5	18327.8	585.4 < 0.001

The factors in normal typeface are treated as fixed effects and those in italics are random interactions.

c: 10% of the mean catch rate; \* the best fitted model.

## B. Lognormal

	LPUE (kg landing <sup>-1</sup> vessel <sup>-1</sup> )					CPUE (kg days at sea <sup>-1</sup> vessel <sup>-1</sup> )					RPN (ind. 10 <sup>-3</sup> hooks)			
	RJC					RJC					RJC			
	- 2 REM log likelihoo d					- 2 REM log likeliho od					- 2 REM log likelihoo d			
	AIC	BIC	LRT			AIC	BIC	LRT			AIC	BIC	LRT	
Lognormal (catch + c)					Lognormal (catch + c)					Lognormal (catch + c)				



Year Vessel Métier *	8743.5	8839.5	9141.9			Year Vessel Gear Target	94046.0	94124.0	94449.9			Year Area Depth*	24258.7	24362.7	24729.9		
Year Vessel Métier <i>Year × Vessel</i>	8860.4	8958.4	9267.1	116.9	< 0.001	Year Vessel Gear Target <i>Year × Vessel *</i>	93428.4	93508.4	93842.7	617.6	< 0.001	Year Area Depth <i>Year × Area</i>	24398.6	24504.6	24878.9	139.9	< 0.001
Year Vessel Métier <i>Year × Vessel Year × Métier</i>	8782.0	8882.0	9197.0	78.4	< 0.001												
Lognormal (catch + 1)						Lognormal (catch + 1)						Lognormal (catch + 1)					
Year Vessel Métier Target	-15851.1	-15753.1	-15444.4			Year Vessel Gear Target	68303.1	68381.1	68707.0			Year Area Depth Moon Soak time*	-5256.7	-5134.7	-4720.5		
Year Vessel Métier Target <i>Year × Vessel *</i>	-16582.0	-16482.0	-16167.0	730.9	< 0.001	Year Vessel Gear Target <i>Year × Vessel *</i>	67789.9	67869.9	68204.1	513.3	< 0.001	Year Area Depth Moon Soak time <i>Year × Moon</i>	-4825.7	-4701.7	-4280.7	431.0	< 0.001
Year Vessel Métier Target <i>Year × Vessel Year × Métier</i>	-16582.0	-16480.0	-16158.7	0.0	1.000							Year Area Depth Moon Soak time <i>Year × Moon Year × Area</i>	-4908.3	-4782.3	-4354.4	82.5	< 0.001
												Year Area Depth Moon Soak time <i>Year × Moon Year × Area Year × Soak time</i>	-4928.257	-4800.3	-4365.7	20.0	< 0.001
	BRF						BRF						BRF				
Lognormal (catch + c)						Lognormal (catch + c)						Lognormal (catch + c)					
Year Vessel Métier Target *	8311.6	8413.6	8734.9			Year Vessel Gear Depth Target *	73491.3	73573.3	73911.9			Year Area Depth *	26754.7	26858.7	27225.9		
Year Vessel Métier Target <i>Year × Vessel</i>	8418.7	8522.7	8850.3	107.1	< 0.001							Year Area Depth <i>Year × Area</i>	26777.2	26883.2	27257.5	22.5	< 0.001
Year Vessel Métier Target <i>Year × Vessel Year × Métier</i>	8326.0	8432.0	8765.9	92.7	< 0.001												
Lognormal (catch + 1)						Lognormal (catch + 1)						Lognormal (catch + 1)					
Year Vessel Métier Target	-548.6	-446.6	-125.3			Year Vessel Gear Depth Target *	74230.0	74312.0	74650.6			Year Area Depth Moon*	14141.6	14251.6	14635.8		
Year Vessel Métier Target <i>Year × Vessel</i>	-500.0	-396.0	-68.4	48.6	< 0.001							Year Area Depth Moon <i>Year × Moon</i>	14365.6	14477.6	14868.8	224.0	< 0.001
Year Vessel Métier Target <i>Year × Vessel Year × Métier *</i>	-572.9	-466.9	-133.0	72.9	< 0.001							Year Area Depth Moon <i>Year × Moon Year × Area</i>	14158.3	14272.3	14670.4	207.4	< 0.001
	RIB						RIB						RIB				
Lognormal (catch + c)						Lognormal (catch + c)						Lognormal (catch + c)					
Year Vessel Métier Target	8588.3	8690.3	9011.6			Year Vessel Gear Depth Target	61072.9	61154.9	61493.5			Year Depth Area	24886.6	24990.6	25357.8		
Year Vessel Métier Target <i>Year × Vessel</i>	8494.5	8598.5	8926.1	93.9	< 0.001	Year Vessel Gear Depth Target <i>Year × Vessel *</i>	59647.5	59731.5	60078.4	1425.4	< 0.001	Year Depth Area <i>Year × Area *</i>	24870.9	24976.9	25351.1	15.8	< 0.001



Year Vessel Métier  
 Target Year × Vessel 8084.7 8190.7 8524.6 409.7 < 0.001  
 Year × Métier \*

Lognormal (catch + 1)						Lognormal (catch + 1)					Lognormal (catch + 1)						
Year Vessel Target	-10878.4	-10792.4	-10520.6			Year Vessel Gear Depth Target	41676.2	41758.2	42096.8		Year Depth Area*	11839.2	11943.2	12310.4			
Year Vessel Target <i>Year × Vessel *</i>	-10913.4	-10825.4	-10547.4	35.1	< 0.001	Year Vessel Gear Depth Target <i>Year × Vessel *</i>	40215.9	40299.9	40646.8	1460.3	< 0.001	Year Depth Area <i>Year × Area</i>	11920.0	12026.0	12400.3	80.8	< 0.001

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c: 10% of the mean catch rate; \* the best fitted model.

### C. Tweedie

		LPUE (kg landing <sup>-1</sup> vessel <sup>-1</sup> )							CPUE (kg days at sea <sup>-1</sup> vessel <sup>-1</sup> )							RPN (ind. 10 <sup>-3</sup> hooks)				
		RJC							RJC				RJC							
		- 2 REM log likelihood	AIC	BIC	LRT				- 2 REM log likelihood	AIC	BIC	LRT				- 2 REM log likelihood	AIC	BIC	LRT	
Year Vessel Métier	Quarter	6023.1	6125.1	6456.9			Year Vessel Gear Target	61635.0	61713.0	62039.1			Year Area Depth	8797.0	8901.0	9268.2				
Year Vessel Métier	Quarter Year × Quarter	-8856.6	-8752.6	-8425.0	NA	NA	Year Vessel Gear Target Year × Vessel	51144.4	51224.0	51559.0	NA	NA	Year Area Depth Year × Area*	4093.6	4199.6	4573.9	NA	NA		
Year Vessel Métier	Quarter Year × Quarter Year × Vessel	-9035.9	-8929.9	-8596.0	179.3	< 0.001	Year Vessel Gear Target Year × Vessel Year × Gear *	51084.6	51166.6	51509.3	59.8	< 0.001								
Year Vessel Métier	Quarter Year × Quarter Year × Vessel Year × Métier *	-9565.4	-9457.4	-9117.2	529.6	< 0.001														
		BRF							BRF							BRF				
Year Vessel Métier		-5477.1	-5381.1	-5068.7			Year Vessel Gear Depth Target *	102446.3	102528.3	102871.1			Year Area Depth *	21976.8	22080.8	22448.1				
Year Vessel Métier	Year × Métier *	-5811.5	-5713.5	-5404.8	NA	NA														
		RIB							RIB							RIB				
Year Vessel Métier		8086.6	8182.6	8495.0			Year Vessel Gear Depth Target *	40676.5	40758.5	41101.3			Year Area Depth Year Area Depth Year × Area *	14731.5	14835.5	15202.7				
Year Vessel Métier	Year × Vessel *	-2891.1	-2793.1	-2484.4	NA	NA								12009.8	12115.8	12490.1	NA	NA		

The factors in normal typeface are treated as fixed effects and those in italics are random interactions.

\* the best fitted model.

### D. Hurdle–gamma

	LPUE (landing <sup>-1</sup> vessel <sup>-1</sup> )					CPUE (kg days at sea <sup>-1</sup> vessel <sup>-1</sup> )					RPN (ind. 10 <sup>-3</sup> hooks)						
	RJC					RJC					RJC						
	– 2 REM log likelihoo d	AIC	BIC	LRT		– 2 REM log likelihood	AIC	BIC	LRT		– 2 REM log likelihood	AIC	BIC	LRT			
Binomial (proportion of positive catches)						Binomial (proportion of positive catches)						Binomial (proportion of positive catches)					
Year Métier Vessel	2119.6	2213.6	2509.7			Year Vessel Gear Target	18369.1	18445.1	18762.7			Year Area	4656.7	4712.7	4910.5		
Year Métier Vessel <i>Year × Vessel *</i>	2111.4	2207.4	2509.8	8.23	0.004	Year Vessel Gear Target <i>Year × Gear *</i>	18194.2	18272.2	18598.1	174.9	< 0.001	Year Area <i>Year × Area*</i>	4646.1	4704.1	4908.9	10.6	0.001
Gamma (positive catches)						Gamma (positive catches)						Gamma (positive catches)					
Year Vessel Métier Quarter	-14015.1	-13915.1	-13652.2			Year Gear Target Quarter Vessel	31474.0	31556.0	31817.6			Year Area Depth Month Moon Soak time	336.8	442.76	670.3		
Year Vessel Métier Quarter <i>Year × Quarter</i>	-14020.4	-13918.4	-13650.3	5.3	0.021	Year Gear Target Quarter Vessel <i>Year × Quarter</i>	31436.4	31520.4	31788.3	37.6	< 0.001	Year Area Depth Month Moon Soak time <i>Year × Month</i>	338.7	446.66	678.5	1.90	0.168
Year Vessel Métier Quarter <i>Year × Quarter Year × Vessel</i>	-14078.6	-13974.6	-13701.3	58.3	< 0.001	Year Gear Target Quarter Vessel <i>Year × Quarter Year × Vessel *</i>	31288.4	31374.4	31648.7	148.0	< 0.001	Year Area Depth Month Moon Soak time <i>Year × Month Year × Moon</i>	336.1	446.14	682.3	2.51	0.113
Year Vessel Métier Quarter <i>Year × Quarter Year × Vessel Year × Métier *</i>	-14326.8	-14220.8	-13942.2	248.2	< 0.001							Year Area Depth Month Moon Soak time <i>Year × Month Year × Moon Year × Area*</i>	314.978	426.98	667.4	21.16	< 0.001
												Year Area Depth Month Moon Soak time <i>Year × Month Year × Moon Year × Area Year × Soak time</i>	314.2987	428.30	673.0	0.68	0.410
	BRF						BRF						BRF				
Binomial (proportion of positive catches)						Binomial (proportion of positive catches)						Binomial (proportion of positive catches)					
Year Métier Vessel	2654.9	2748.9	3045.0			Year Gear Target *	23316.2	23384.2	23668.3			Year Depth Soak time*	6569.9	6665.9	6991.0		
Year Métier Vessel <i>Year × Vessel</i>	2653.6	2749.6	3052.0	1.32	0.251	Year Gear Target <i>Year × Target</i>	23316.2	23386.2	23678.7	0.0	0.993	Year Depth Soak time <i>Year × Soak time</i>	6569.9	6667.9	6999.8	0.0	0.997
Year Métier Vessel <i>Year × Vessel Year × Métier *</i>	2565.4	2663.4	2972.1	88.2	< 0.001												
Gamma (positive catches)						Gamma (positive catches)						Gamma (positive catches)					
Year Quarter Vessel *	-10880.8	-10794.8	-10561.4			Year Vessel Gear Target	75262.2	75340.2	75617.7			Year Area Depth	12383.8	12481.8	12784.3		

						Year Vessel Gear Target Year $\times$ Gear *	74699.2	74779.2	75063.9	562.9	< 0.001	Year Area Depth Year $\times$ Area *	12256.9	12356.9	12665.6	126.9	< 0.001
	RIB						RIB						RIB				
Binomial (proportion of positive catches)						Binomial (proportion of positive catches)						Binomial (proportion of positive catches)					
Year Métier Vessel	1060.1	1154.1	1450.2			Year Vessel Gear Depth Target *	6583.2	6663.2	6993.6			Year Depth Area	4296.9	4398.9	4759.0		
Year Métier Vessel Year $\times$ Vessel	1057.5	1153.5	1455.9	2.54	0.111							Year Depth Area Year $\times$ Area *	4117.7	4221.7	4588.9	179.2	< 0.001
Year Métier Vessel Year $\times$ Vessel Year $\times$ Métier *	1002.7	1100.7	1409.4	54.9	< 0.001												
Gamma (positive catches)						Gamma (positive catches)						Gamma (positive catches)					
Year Vessel Métier	-5129.4	-5055.4	-4896.3			Year Depth Target Quarter Vessel	15028.8	15104.8	15313.1			Year Area Depth Month Moon	6555.0	6663.0	6954.1		
												Year Area Depth Month Moon Year $\times$ Month	6549.5	6659.5	6956.0	5.5	0.019
Year Vessel Métier Year $\times$ Vessel	-5134.5	-5058.5	-4895.0	5.0	0.024	Year Depth Target Vessel Year $\times$ Quarter	15029.6	15107.6	15321.4	0.8	0.380	Year Area Depth Month Moon Year $\times$ Month Year $\times$ Moon	6507.9	6619.9	6921.8	41.6	< 0.001
Year Vessel Métier Year $\times$ Vessel Year $\times$ Métier *	-5156.5	-5078.5	-4910.8	22.0	< 0.001	Year Depth Target Vessel Year $\times$ Quarter Year $\times$ Vessel *	14999.0	15079.0	15298.3	30.6	< 0.001	Year Area Depth Month Moon Year $\times$ Month Year $\times$ Moon Year $\times$ Area *	6447.1	6561.1	6868.5	60.8	< 0.001

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\* the best fitted model.