

SUPPLEMENTARY ELECTRONIC MATERIAL

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CONSERVATION STATUS OF THE MEDITERRANEAN SHAG *GULOSUS ARISTOTELIS DESMARESTII* IN THE ADRIATIC SEA DURING THE NON-BREEDING PERIOD: BASELINE POPULATION, TRENDS, THREATS AND KNOWLEDGE GAPS

ESTADO DE CONSERVACIÓN DEL CORMORÁN MOÑUDO MEDITERRÁNEO *GULOSUS ARISTOTELIS DESMARESTII* EN EL MAR ADRIÁTICO DURANTE EL PERÍODO NO REPRODUCTIVO: POBLACIÓN DE REFERENCIA, TENDENCIAS, AMENAZAS Y LAGUNAS DE CONOCIMIENTO

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TABLE S1

Roost counts of Mediterranean shag (*Gulosus aristotelis desmarestii*) in Slovenia for July 2020 and 2021.

[Recuento de dormitorios del cormorán moñudo mediterráneo (*Gulosus aristotelis desmarestii*) en Eslovenia para julio de 2020 y 2021.]

	2020				2021		
	Adults & subadults	Juvenile	Unaged	Total	Adults & subadults	Juvenile	Unaged
Debeli rtič-Punta sottile (Slovenia only)	12	67	97	176	186	16	0
Sečovlje	199	267	87	553	300	140	0
Strunjan	191	37	21	249	227	35	0
Total	402	371	205	978	713	191	0

TABLE S2

Roost counts of Mediterranean shag (*Gulosus aristotelis desmarestii*) in Italy for July 2020 and 2021. "NAs" represent sites not census in that specific year. Region surveyed were: Friuli-Venezia Giulia, Veneto, Emilia Romagna, Marche.

[Recuento de dormitorios del cormorán moñudo mediterráneo (Gulosus aristotelis desmarestii) en Italia para julio de 2020 y 2021. "NAs" representan sitios que no fueron censados en ese año específico. Las regiones encuestadas fueron: Friuli-Venezia Giulia, Veneto, Emilia Romagna, Marche.]

	2020				2021			
	Adults & subadults	Juvenile	Unaged	Total	Adults & subadults	Juvenile	Unaged	Total
Punta Sottile-Debeli rtič (Italy only)	58	15	134	207	121	5	0	126
Punta Olmi (Trieste)	23	3	0	26	26	3	0	29
Dighe foranee (Trieste)	117	65	0	182	124	114	0	238
Miramare (Trieste)	0	0	0	0	0	0	0	0
Costiera Triestina (Trieste)	0	0	383	383	0	0	315	315
Duino (Trieste)	319	44	0	363	0	0	433	433
Foce Isonzo Isola della Cona (Gorizia)	143	60	0	203	102	28	0	130
Bocca di Primero (Gorizia)	13	9	0	22	4	2	0	6
Mula di Muggia (Gorizia)	11	3	0	14	2	8	0	10
Porto di Grado (Gorizia)	21	10	0	31	3	23	0	26
Laguna Marano (Udine)	0	6	0	6	0	2	0	2
Laguna canale Marano (Udine)	28	87	0	115	7	69	0	76
Mare bocca di porto Lignano (Udine)	0	0	0	0	1	0	0	1
Foce Tagliamento (Udine)	1	0	0	1	0	7	0	7
Litorale Caorle (Venezia)	4	4	0	8	0	0	3	3
Laguna di Venezia (Venezia)	935	382	0	1317	1015	434	0	1449
Sacca di Scardovari (Rovigo)	44	29	0	73	0	0	69	69
Sacca e Scanno di Goro (Ferrara)	17	1	0	18	0	0	2	2
Riserva statale Foce fiume Reno (Ferrara)	2	2	0	4	NA	NA	NA	NA
Lido Estensi – Comacchio (Ferrara)	0	1	0	1	6	NA	18	24

Ravenna	0	1	0	1	NA	NA	NA	0
Isola del Lido di Venezia - Malamocco	NA	NA	NA	NA	0	0	29	29
Foce Po di Maistra (Rovigo)	NA	NA	NA	NA	0	0	116	116
Porto Potenza (Macerata)	NA	NA	NA	NA	0	0	0	0
Civitanova (Macerata)	NA	NA	NA	NA	0	0	0	0
Marotta-Mondolfo (Pesaro)	NA	NA	NA	NA	3	2	5	10
Senigallia (Ancona)	NA	NA	NA	NA	2	0	2	4
Total	1736	722	517	2975	1416	697	992	3105

TABLE S3

Roost counts of Mediterranean shag (*Gulosus aristotelis desmarestii*) for Croatia for July 2020 and 2021. “NAs” represent sites not census in that specific year. Kvarner archipelago was not censused in 2021 where 219 birds were counted in 2020.

[Recuento de dormitorios del cormorán moñudo mediterráneo (*Gulosus aristotelis desmarestii*) para Croacia en julio de 2020 y 2021. "NAs" representan sitios que no fueron censados en ese año específico. El archipiélago de Kvarner no fue censado en 2021, donde se contabilizaron 219 aves en 2020.]

	2020				2021			
	Adults & subadults	Juvenile	Unaged	Total	Adults & subadults	Juvenile	Unaged	Total
Kanegra	0	0	276	276	100	76	98	274
Istra-west coast	39	14	0	53	0	0	11	11
NP Brijuni	101	107	163	371	196	218	58	472
Istra - Kamenjak	10	8	0	18	NA	NA	NA	NA
Kvarner (is. Krk, Cres, Plavnik)	14	9	196	219	NA	NA	NA	NA
is. Silba	0	0	0	0	NA	NA	NA	NA
is. Ugljan	33	9	0	42	34	15	0	49
NP Telašćica	0	0	18	18	0	1	6	7
Šibenik county-coast	0	0	0	0	1	0	0	1
is. Šolta	7	1	0	8	NA	NA	NA	NA
NP Mljet	27	6	2	35	0	0	46	46
Malostonski zaljev	0	0	0	0	0	0	2	2
Total	231	154	655	1040	331	310	221	862

TABLE S4

Raw data of Mediterranean shag (*Gulosus aristotelis desmarestii*) from which the thirteen-year trends (2010-2022) were derived. Non-integer counts represent averages of multiple counts when a given site was surveyed by different surveyors in the same period.

[Datos sin procesar del cormorán moñudo mediterráneo (Gulosus aristotelis desmarestii) a partir de los cuales se obtuvieron las tendencias de trece años (2010-2022). Los recuentos no enteros representan promedios de múltiples conteos cuando un sitio dado fue encuestado por diferentes encuestadores en el mismo período.]

Site	Country	Year	Count	Site	Country	Year	Count
Dighe foranee	Italy	2010	0	Mussel farm Punta-Sottile Lazzareto	Italy	2010	761
Dighe foranee	Italy	2011	0	Mussel farm Punta-Sottile Lazzareto	Italy	2011	761
Dighe foranee	Italy	2012	NA	Mussel farm Punta-Sottile Lazzareto	Italy	2012	628.5
Dighe foranee	Italy	2013	NA	Mussel farm Punta-Sottile Lazzareto	Italy	2013	548
Dighe foranee	Italy	2014	NA	Mussel farm Punta-Sottile Lazzareto	Italy	2014	585
Dighe foranee	Italy	2015	NA	Mussel farm Punta-Sottile Lazzareto	Italy	2015	600
Dighe foranee	Italy	2016	NA	Mussel farm Punta-Sottile Lazzareto	Italy	2016	498
Dighe foranee	Italy	2017	143.5	Mussel farm Punta-Sottile Lazzareto	Italy	2017	427.5
Dighe foranee	Italy	2018	174	Mussel farm Punta-Sottile Lazzareto	Italy	2018	390.5
Dighe foranee	Italy	2019	128.5	Mussel farm Punta-Sottile Lazzareto	Italy	2019	336
Dighe foranee	Italy	2020	177	Mussel farm Punta-Sottile Lazzareto	Italy	2020	366.5
Dighe foranee	Italy	2021	229	Mussel farm Punta-Sottile Lazzareto	Italy	2021	312
Dighe foranee	Italy	2022	183	Mussel farm Punta-Sottile Lazzareto	Italy	2022	263
Dighe foranee	Italy	2010	652	Mussel farms Timavo	Italy	2010	786
Dighe foranee	Italy	2011	473	Mussel farms Timavo	Italy	2011	1091.5
Dighe foranee	Italy	2012	645	Mussel farms Timavo	Italy	2012	895
Dighe foranee	Italy	2013	398.5	Mussel farms Timavo	Italy	2013	733.5
Dighe foranee	Italy	2014	487	Mussel farms Timavo	Italy	2014	1120
Dighe foranee	Italy	2015	570	Mussel farms Timavo	Italy	2015	912
Dighe foranee	Italy	2016	529.5	Mussel farms Timavo	Italy	2016	799.5
Dighe foranee	Italy	2017	503	Mussel farms Timavo	Italy	2017	563
Dighe foranee	Italy	2018	412	Mussel farms Timavo	Italy	2018	457
Dighe foranee	Italy	2019	445.5	Mussel farms Timavo	Italy	2019	535
Dighe foranee	Italy	2020	396.5	Mussel farms Timavo	Italy	2020	392

Dighe foranee	Italy	2021	298.5	Mussel farms Timavo	Italy	2021	453.5
Dighe foranee	Italy	2022	245.5	Mussel farms Timavo	Italy	2022	367
Kanegra	Slovenia	2010	0	Punta Sdobba	Italy	2010	NA
Kanegra	Slovenia	2011	0	Punta Sdobba	Italy	2011	571
Kanegra	Slovenia	2012	0	Punta Sdobba	Italy	2012	1073.5
Kanegra	Slovenia	2013	0	Punta Sdobba	Italy	2013	287.5
Kanegra	Slovenia	2014	NA	Punta Sdobba	Italy	2014	234
Kanegra	Slovenia	2015	NA	Punta Sdobba	Italy	2015	219.5
Kanegra	Slovenia	2016	NA	Punta Sdobba	Italy	2016	123
Kanegra	Slovenia	2017	NA	Punta Sdobba	Italy	2017	256
Kanegra	Slovenia	2018	NA	Punta Sdobba	Italy	2018	136
Kanegra	Slovenia	2019	NA	Punta Sdobba	Italy	2019	165.5
Kanegra	Slovenia	2020	261	Punta Sdobba	Italy	2020	161
Kanegra	Slovenia	2021	329.5	Punta Sdobba	Italy	2021	166.5
Kanegra	Slovenia	2022	350	Punta Sdobba	Italy	2022	164.5
Miramare MPA	Italy	2010	17	Secoveljske soline	Slovenia	2010	NA
Miramare MPA	Italy	2011	15	Secoveljske soline	Slovenia	2011	NA
Miramare MPA	Italy	2012	40	Secoveljske soline	Slovenia	2012	750.5
Miramare MPA	Italy	2013	17.5	Secoveljske soline	Slovenia	2013	633.5
Miramare MPA	Italy	2014	12	Secoveljske soline	Slovenia	2014	NA
Miramare MPA	Italy	2015	22.5	Secoveljske soline	Slovenia	2015	NA
Miramare MPA	Italy	2016	7.5	Secoveljske soline	Slovenia	2016	NA
Miramare MPA	Italy	2017	26	Secoveljske soline	Slovenia	2017	NA
Miramare MPA	Italy	2018	1.5	Secoveljske soline	Slovenia	2018	NA
Miramare MPA	Italy	2019	2.5	Secoveljske soline	Slovenia	2019	NA
Miramare MPA	Italy	2020	0	Secoveljske soline	Slovenia	2020	515.5
Miramare MPA	Italy	2021	4.5	Secoveljske soline	Slovenia	2021	326.5
Miramare MPA	Italy	2022	10	Secoveljske soline	Slovenia	2022	323
Punta Olmi musselfarm	Italy	2010	172	Strunjan	Slovenia	2010	NA
Punta Olmi musselfarm	Italy	2011	119.5	Strunjan	Slovenia	2011	NA
Punta Olmi musselfarm	Italy	2012	107.5	Strunjan	Slovenia	2012	380
Punta Olmi musselfarm	Italy	2013	31.5	Strunjan	Slovenia	2013	262
Punta Olmi musselfarm	Italy	2014	64	Strunjan	Slovenia	2014	NA
Punta Olmi musselfarm	Italy	2015	66	Strunjan	Slovenia	2015	NA
Punta Olmi musselfarm	Italy	2016	37.5	Strunjan	Slovenia	2016	NA
Punta Olmi musselfarm	Italy	2017	28	Strunjan	Slovenia	2017	NA
Punta Olmi musselfarm	Italy	2018	15.5	Strunjan	Slovenia	2018	NA
Punta Olmi musselfarm	Italy	2019	26	Strunjan	Slovenia	2019	NA
Punta Olmi musselfarm	Italy	2020	27	Strunjan	Slovenia	2020	274.5

Punta Olmi musselfarm	Italy	2021	30.5	Strunjan	Slovenia	2021	310
Punta Olmi musselfarm	Italy	2022	27.5	Strunjan	Slovenia	2022	315

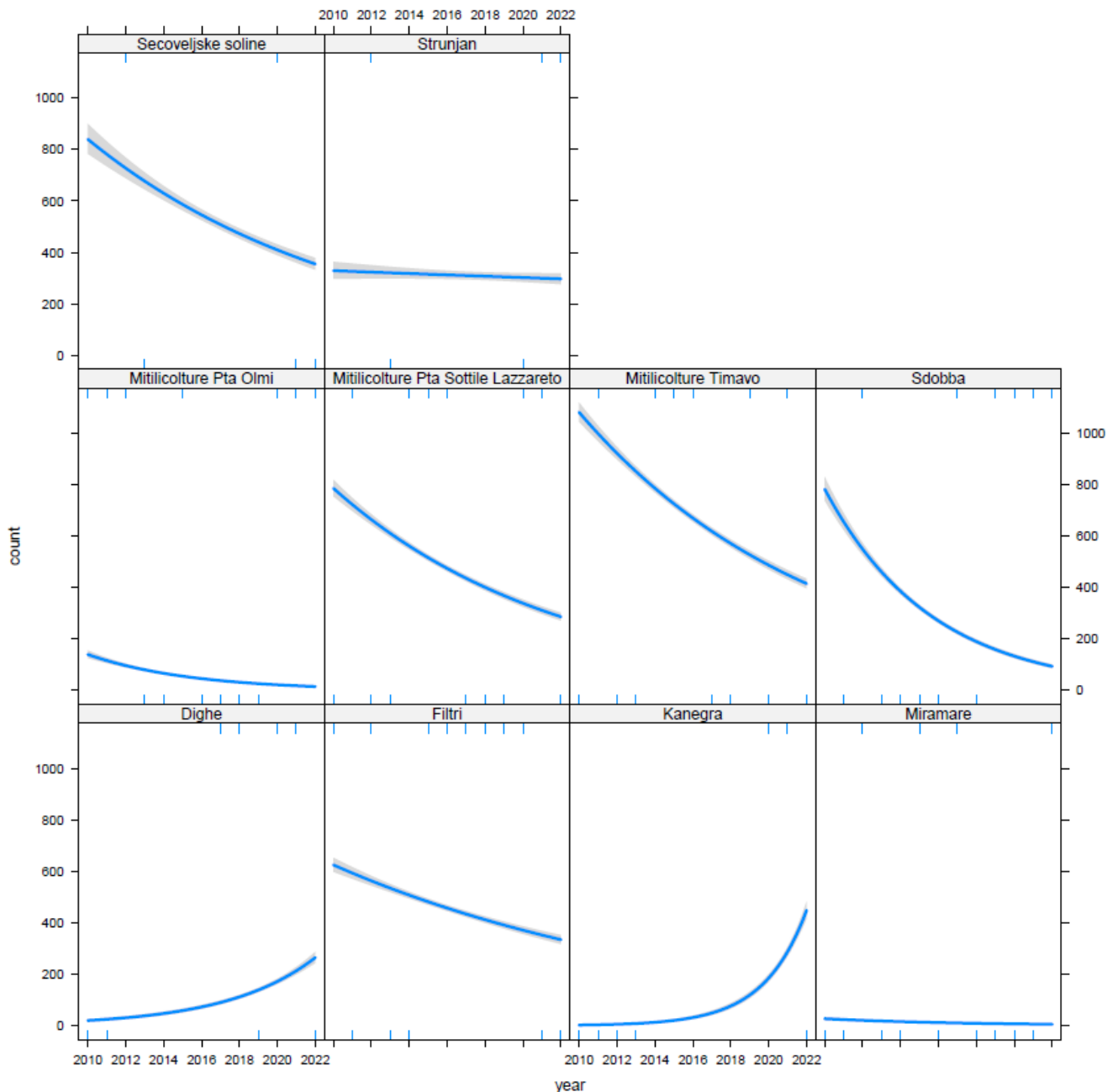


FIG. S1._Thirteen-year trends (2010-2022) of Mediterranean shag (*Gulosus aristotelis desmarestii*) abundances at roost locations in the Gulf of Trieste (Italy and Slovenia) indicating a negative trend in all roosts, except for the 'dighe' (breakwaters artificial structures located in front of Trieste, Italy), which have experienced an increase in usage over the survey period.

[Tendencias de trece años (2010-2022) de la abundancia del cormorán moñudo mediterráneo (Gulosus aristotelis desmarestii) en los lugares de descanso en el golfo de Trieste (Italia y Eslovenia), indicando una tendencia negativa en todos los lugares de descanso, excepto en las "dighe" (estructuras artificiales de rompeolas ubicadas frente a Trieste, Italia), las cuales han experimentado un aumento en su uso durante el período de estudio.]