Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area

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Monitoring of cetaceans' bycatch and testing pingers as mitigation measure in Bulgarian turbot fishery in the Black Sea

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GREEN BALKANS greenbalkans.org

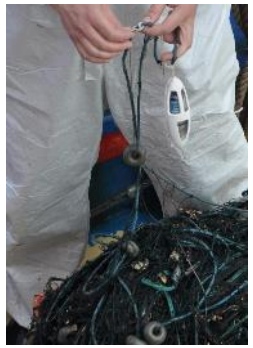
PARTNER ACCOBAMS

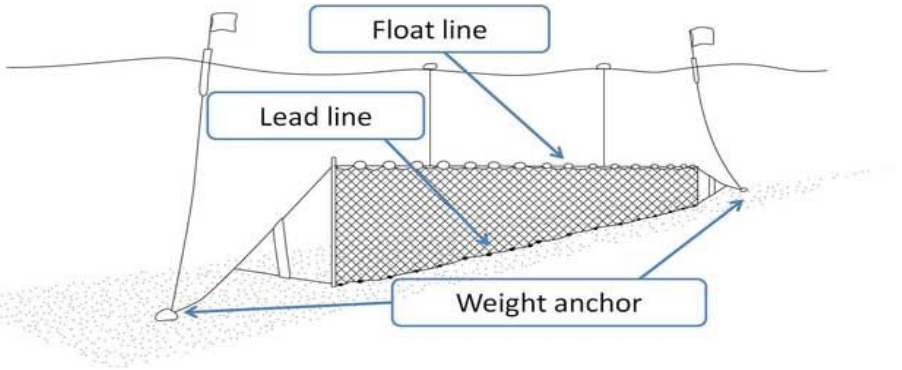
Turbot fishery in Bulgaria

Executive Agency of Fisheries and Aquaculture (EAFA):
Number of permits in Bulgaria for 2019 – 116
Number of permits in Bulgaria for 2020 – 124

Involved vessels:
5 in 2019
4 in 2020 (6 have not fished due to COVID-19)

Used types of pingers:
Future Oceans – 10 kHz, 132 dB NETGUARD
Future Oceans – 70kHz, 145 dB NETGUARD
Porpoise Alerting Devices (PAL) – 10 kHz, 132 dB by F^3: Maritime Technology





Material and methods

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2019

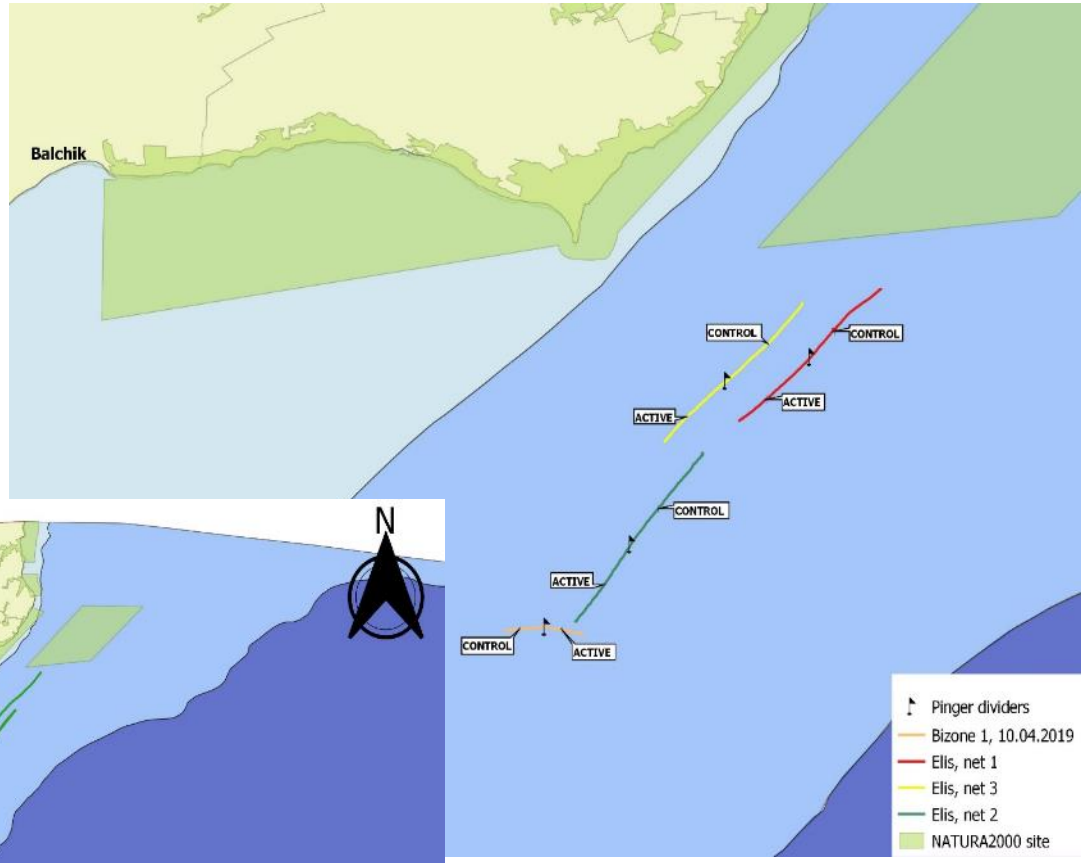
Shelf waters of Bulgarian Black Sea waters

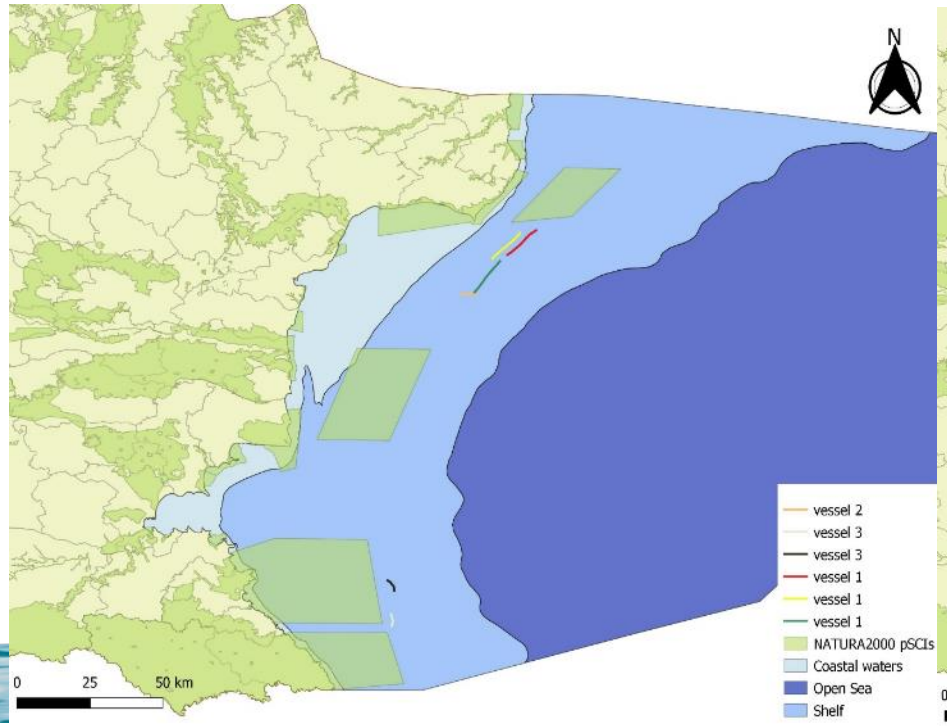
Independent observers

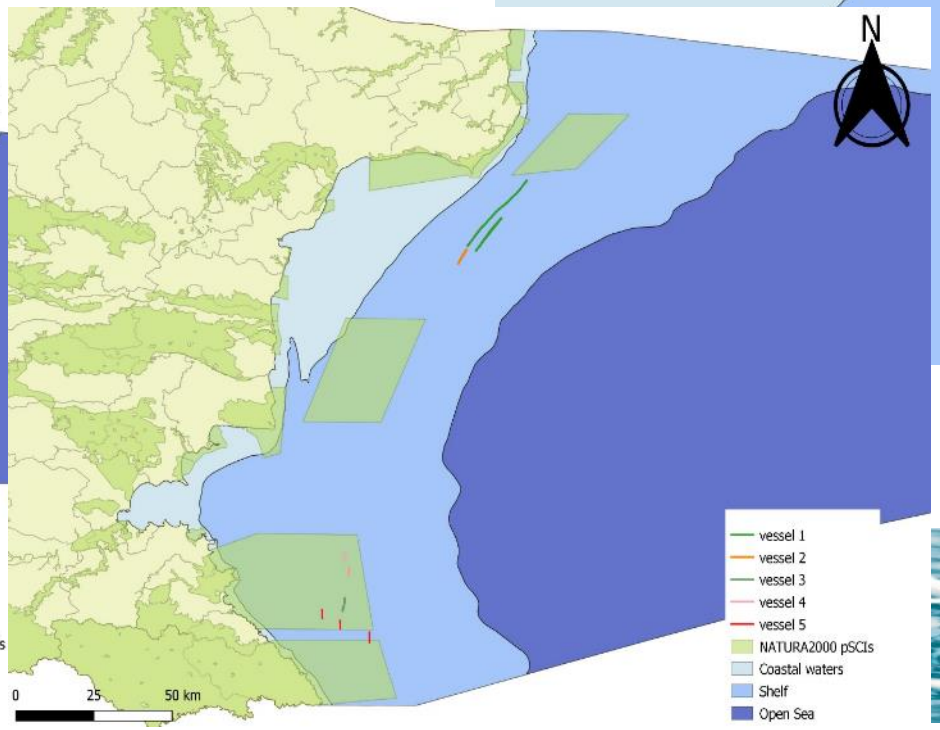
Mixed strings of active and control sections

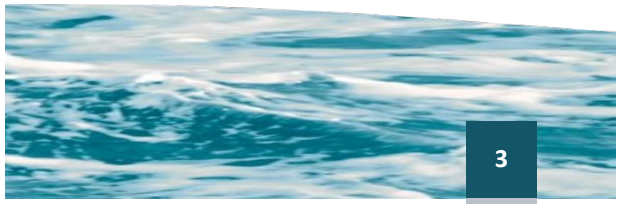
Spring – 50,28 km; Summer – 46,6 km

$$\text{Bycatch} = \frac{\text{individuals}}{\text{day.km}^2}$$









Main results 2019

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Sample size: 4,**3 %** of licensed fishing vessels for turbot fishery in 2019
Soaking time: 18-26 days in **spring**; 10-91 days in **summer/autumn at depth:** 68-88 m
Total: 105 bycaught cetaceans – 1 *Tursiops truncatus* and 104 *Phocoena phocoena*
Seasonal distribution: significant increase in bycatch in summer!!! *Phocoena phocoena* bycatch rate in summer - **2,2 ind/km** - exceeds highest reported rate for Black Sea – **1,51 ind/km** (*Birkun Jr. et al 2009*)

	spring				summer/autumn			
Fishing vessel	Effort active (day km²)	Bycatch -ind.	Effort control (day km²)	Bycatch -ind.	Effort active (day km²)	Bycatch -ind.	Effort control (day km²)	Bycatch -ind.
Vessel 1	1,2264	2	1,2978	1	0,5334	39	0,7203	53
Vessel 2	0,0702	0	0,1404	1	0,0624	0	0,1248	2
Vessel 3*	0,2726	2	0,2192	0	0,312	5		
Vessel 4					0,114	0		
Vessel 5**					1,554	0		
Total	1,5692	4	1,6574	2	2,5758	44	0,8451	55

Main results 2019

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Sex ratio between bycaught cetaceans was as follows:

T. t. ponticus – 0 male and 1 female;

P. p. relicta – 50 males; 33 females and 21 - unknown (dropped during haul)

In the summer, at least 2 of the bycaught females were lactating.

Length of bycaught porpoises varied between 102 and 152 cm

Main results 2019

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Use of pingers:

Future Oceans 10 kHz, 132 dB

- in spring on vessels 1 (120 pingers spaced at 70 and 140 m), vessel 2 (15 pingers spaced at 100 m) and vessel 3 (15 pingers at random spacing)
- in summer on vessel 1 (120 pingers spaced at 70 m), vessel 2 (15 pingers spaced at 100 m) and vessel 3 (13 pingers at random spacing)

active			control		
date	vessel	bycatch (ind./day.km^2)	date	vessel	bycatch (ind./day.km^2)
10.4.2019	Vessel 2	0	10.4.2019	Vessel 2	7,1225
10.4.2019	Vessel 1	2,4802	10.4.2019	Vessel 1	2,2547
12.4.2019	Vessel 1	2,4802	12.4.2019	Vessel 1	0
12.4.2019	Vessel 3	8,1599	12.4.2019	Vessel 3	0
1.7.2019	Vessel 1	55,5556	8.4.2019	Vessel 1	0
2.7.2019	Vessel 1	86,5801	1.7.2019	vessel 1	35,8423
6.7.2019	Vessel 2	0	2.7.2019	vessel 1	103,8961
6.7.2019	Vessel 3	16,8691	6.7.2019	vessel 2	16,0256
4.11.2019	Vessel 5	0			

Main results 2019

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Use of pingers:

Future Oceans 70 kHz, 145 dB

- in spring on vessel 1 (20 pingers spaced at 280 m) and vessel 3 (25 pingers at random spacing)
- in summer on vessel 1 (40 pingers spaced at 140 m) and vessel 4 (10 pingers spaced at 200 m)

active			control		
Vessel	date	bycatch (ind./day.km^2)	Vessel	date	bycatch (ind./day.km^2)
Vessel 1	11.4.2019	0	Vessel 1	11.4.2019	0
Vessel 3	13.4.2019	6,666667	Vessel 3	13.4.2019	0
Vessel 1	6.7.2019	74,40476	Vessel 1	6.7.2019	78,125
Vessel 5	21.10.2019	0	Vessel 1	27.6.2019	56,6893
Vessel 4	8.7.2019	0			

No significant difference in bycatch rates between active and control nets!

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2020

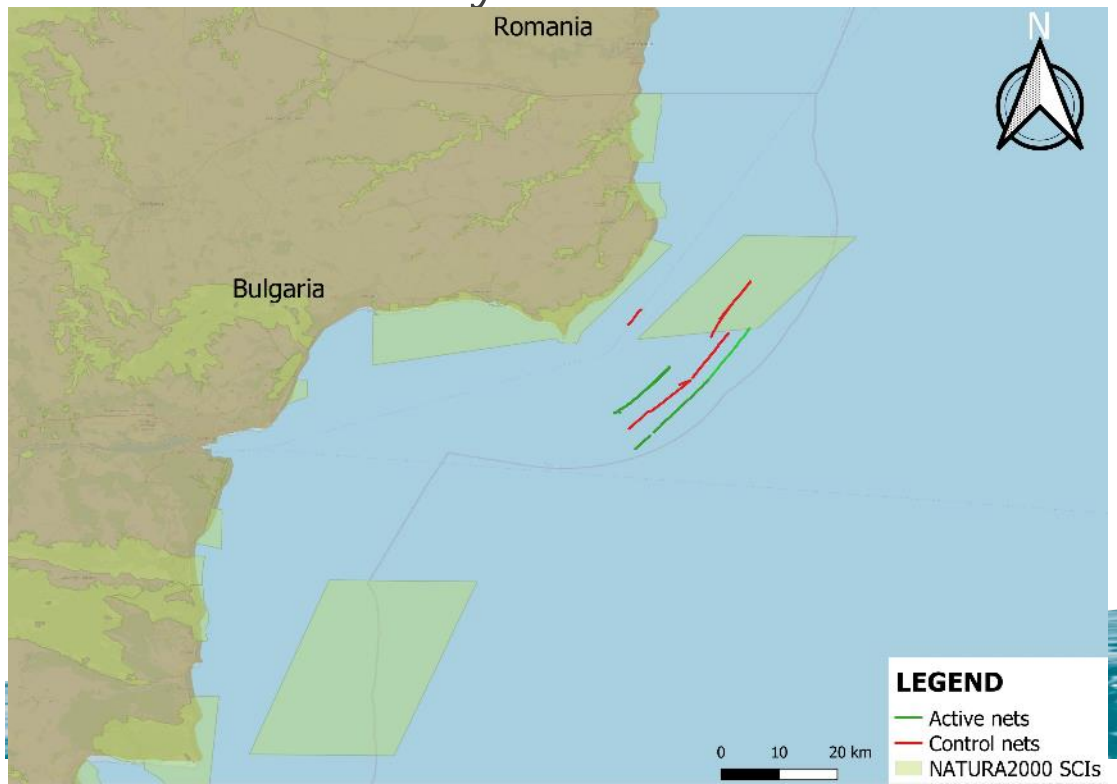
Shelf waters of Bulgarian Black Sea waters

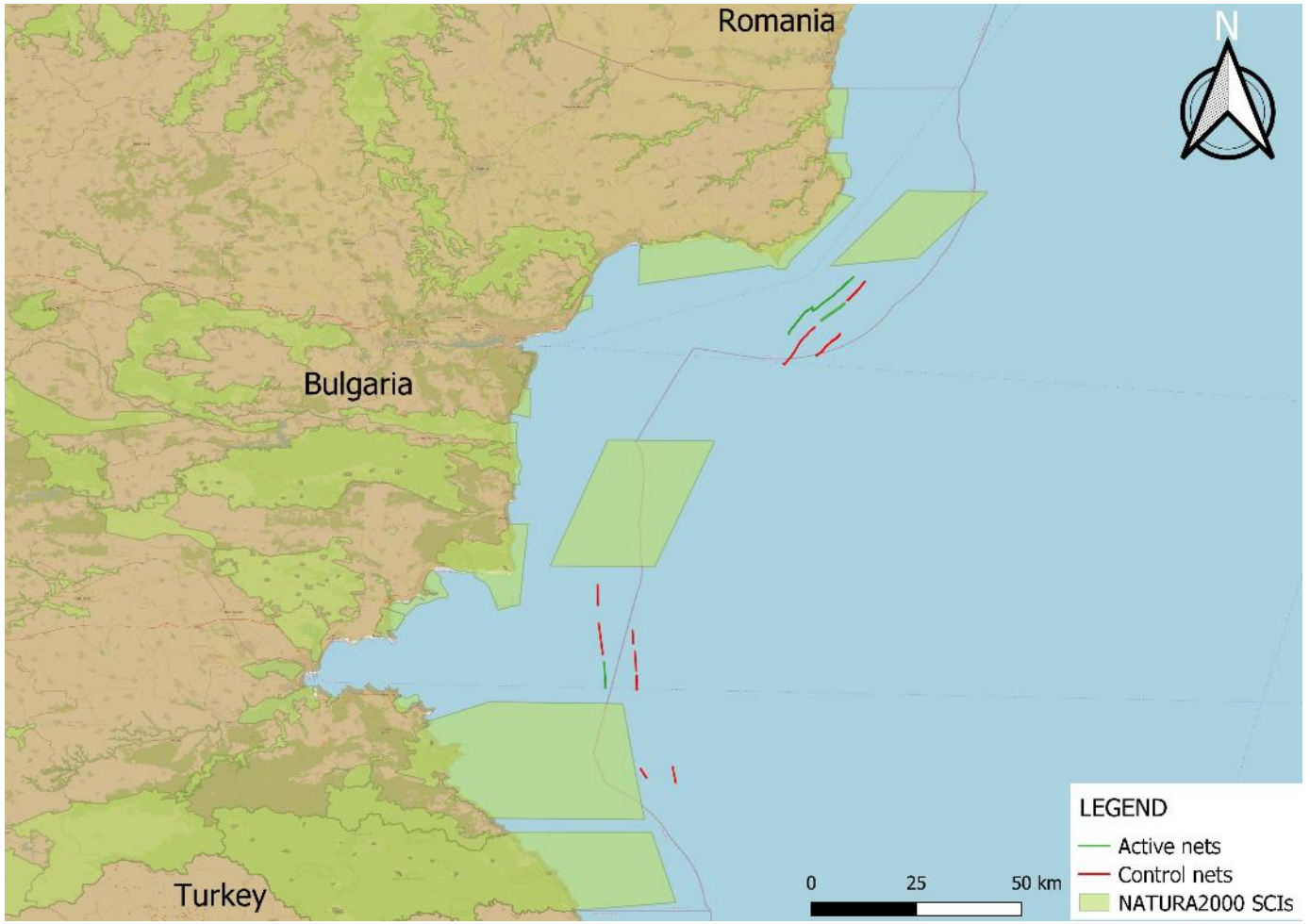
Independent observers

Strings of active and control sections

Spring – 82,76 km; Summer – 71,8 km

$$\text{Bycatch} = \frac{\text{individuals}}{\text{day.km}^2}$$





Main results 2020

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Sample size: **3,2 %** of licensed fishing vessels for turbot fishery in 2020
Soaking time: 14-31 days in **spring**; 7-14 days in **summer/autumn at depth:** 45-83 m
Total: 47 bycaught cetaceans – 1 *Tursiops truncates; 3 Delphinus delphis* and 43 *Phocoena phocoena*
Seasonal distribution: higher bycatch in summer!!!

	spring				summer/autumn			
Fishing vessel	Effort active (day km^2)	Bycatch -ind.	Effort control (day km^2)	Bycatch -ind.	Effort active (day km^2)	Bycatch -ind.	Effort control (day km^2)	Bycatch -ind.
Vessel 1	1,1105	2	1,1794	4	1,1256	11	1,1283	27
Vessel 2	0,1638	0	0,4477	1	0,093	0	0,0543	0
Vessel 3	0,8628	0	0,255	1				
Vessel 4			0,3579	1				
Total	1,5293	2	2,8477	7	1,2186	11	1,1825	27

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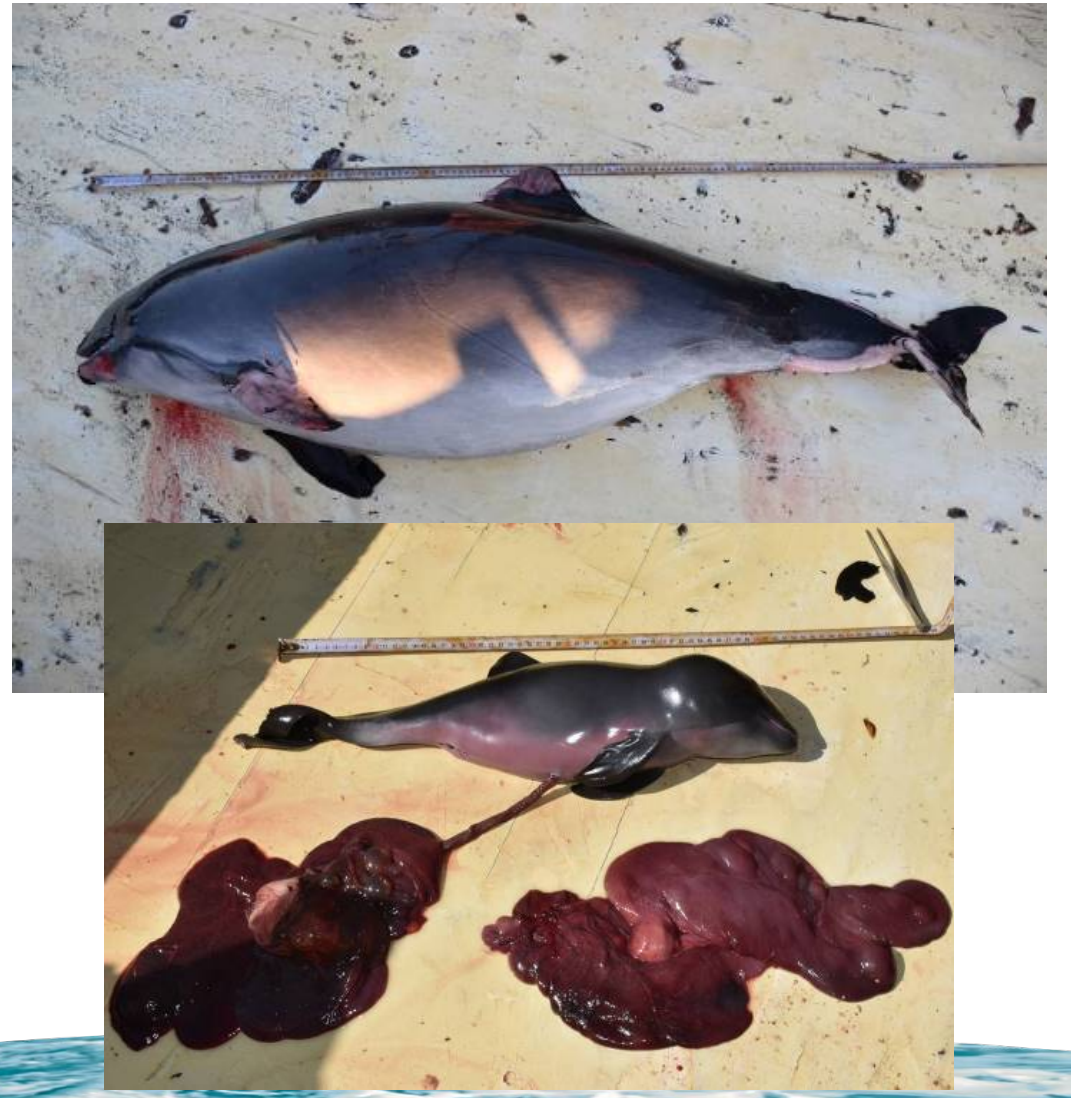
Sex ratio between bycaught cetaceans was as follows:

T. t. ponticus – 1 unknown;
D. d. ponticus – 1 female and 2 unknown
P. p. relicta – 6 males; 25 females and 12 - unknown (dropped during haul)

In spring 1 of the bycaught females was pregnant and other was lactating. In summer 4 females were lactating.

Length of bycaught porpoises varied between 41 and 150 cm; common dolphin was 159 cm and bottlenose dolphin was approx. 180 cm.



Results of pingers' trials:

Future Oceans 10 kHz, 132 dB

- in spring on vessels 1 (80 pingers spaced at 140 m), vessel 2 (45 pingers spaced at 100 m)
- in summer on vessel 2 (31 pingers spaced at 100 m)

active			control		
date	vessel	bycatch (ind./day.km^2)	date	vessel	bycatch (ind./day.km^2)
12.4.2020	Vessel 1	2,6396	13.4.2020	Vessel 1	2,4197
12.4.2020	Vessel 2	2,4802	12.4.2020	Vessel 2	3,4341
28.6.2020	Vessel 2	0	14.10.2020	Vessel 2	0

Future Oceans 70 kHz, 145 dB

- only in spring on vessel 3 (29 pingers spaced at 200 m)

active			control		
date	vessel	bycatch (ind./day.km^2)	date	vessel	bycatch (ind./day.km^2)
13.4.2020	Vessel 3	0	13.4.2020	Vessel 3	7,8431

Results of pingers' trials:

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Porpoise Alerting Devices (PAL) – 10 kHz, 132 dB by F^3: Maritime Technology

- in spring on vessels 1 (40 pingers spaced at 140 m)
- in summer on vessel 1 (80 pingers spaced at 140 m)

active			control		
Vessel	date	bycatch (ind./day.km^2)	Vessel	date	bycatch (ind./day.km^2)
Vessel 1	10.4.2020	0	Vessel 1	10.4.2020	5,6689
Vessel 1	28.6.2020	14,88095	Vessel 1	4.7.2020	32,17503
Vessel 1	2.8.2019	3,13283	Vessel 1	23.7.2020	31,7864
Vessel 1	16.7.2020	9,92064	Vessel 1	29.7.2020	7,9248

No significant difference in bycatch rates between active and control nets when FO pingers are used!

61% reduction of bycatch with PALs but more trials needed to confirm that rate!

ACKNOWLEDGMENTS

Bycatch monitoring was conducted within **Support MSFD implementation in the Black Sea through establishing a regional monitoring system of cetaceans (D1) and noise monitoring (D11) for achieving GES CeNoBS** project co-funded by European Commission www.cenobs.eu

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Pinger trials in 2019 were made in **Black Sea Harbour porpoise (*Phocoena phocoena relicta*) bycatch mitigation in the Bulgarian waters of the Black Sea** project funded by New England Aquarium, Boston, USA

Protecting the blue planet

Pinger trials in 2020 were made in **Monitoring and mitigation of cetacean bycatch in Bulgarian waters** project funded by ACCOBAMS Supplementary Conservation Fund, MoU 14/2019

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THANKS FOR YOUR ATTENTION!

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