

Croatia. Progress report on cetacean research, January 2008 to December 2008, with statistical data for the calendar year 2008

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This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
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Faculty of Veterinary Medicine University of Zagreb	FVM	hrvoje.gomercic@vef.hr

1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Adriatic Sea	2.1.1; 2.1.2; 2.2; 3.1.1; 4.2; 4.3; 7.3.2; 7.3.3; 8
Striped dolphin	<i>Stenella coeruleoalba</i>	Adriatic Sea	2.1.2; 4.2; 4.3; 7.3.2; 8
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Adriatic Sea	4.3; 8

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Target species	Date	Area ¹	No. of sightings	Contact person/institute and references
Common bottlenose dolphin	1/1/2008-31/12/2008	Northern Adriatic Sea (Kvarner and Kvarnerić areas)	74	Nikolina Rako /BWI
Common bottlenose dolphin	28/04/2008-01/09/2008	Central Adriatic Sea (Vis and Lastovo island areas)	49	Draško Holcer /BWI
Common bottlenose dolphin	July-September 2008	Northern Adriatic Sea– cooperation w. Morigenos, Slovenia (Gulf of Trieste and Western coast of Istria)	25 (10 in Croatian waters)	Draško Holcer /BWI
Common bottlenose dolphin	8.6.2008	Iž island	1	Hrvoje Gomerčić/FVM
Common bottlenose	10.6.2008	Molat island	1	Hrvoje Gomerčić/FVM

¹ Refers to the Croatian part of the Adriatic Sea

dolphin				
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BW: The BW is currently running two research projects on bottlenose dolphins in Croatian waters and cooperative project in Croatian and Slovenian waters headed by Morigenos NGO from Slovenia:

1. The *Adriatic Dolphin Project - Lošinj*, a long-term study on ecology and conservation of a resident bottlenose dolphin (*Tursiops truncatus*) group of about 120 individuals inhabiting the Cres-Lošinj archipelago in the northern Adriatic Sea. Surveys are carried out all year round from a 5.8 m long RIB equipped with an outboard 90 HP engine. Data on natural markings have been continuously collected since 1990, through photo-identification.
2. The *Adriatic Dolphin Project- Vis*, research on distribution, ecology and population size of bottlenose dolphins in the Central Adriatic Sea. The project collects data on natural markings through photo-identification since 2007. Surveys are carried out from a 5.8 m long RIB equipped with an outboard 90 HP engine.
3. Boat-based surveys, land-based surveys and standard photo-identification procedures were carried out in Slovenia and western coast of Istria (Croatia). A total of 25 sightings were recorded and 41 well-marked dolphins photo-identified.

FVM: The FVM is running the project “Save the last Adriatic dolphins” since 2000 in cooperation with the Society for Dolphin Conservation (Gesellschaft zur Rettung der Delphine, GRD) Germany. The project goal is the development and implementation of research methods for preservation of the bottlenose dolphin in the Adriatic Sea.

2.1.2 Opportunistic, platforms of opportunity

Primary species	Area	Date	Time	No. of animals	Behaviour	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Striped dolphin, Common bottlenose dolphin	Selce	09.03.2008		2		photographs/photo-identification	Dario Štefančić	land		Nikolina Rako/BWI
Striped dolphin, Common bottlenose dolphin	Vrbnik (Krk)	01.05.2008		2		photographs/photo-identification	Manuela Balent	boat		Nikolina Rako/BWI
Striped dolphin, Common bottlenose dolphin	Palagruža island	05.05.2008		Cca 20 + 1 common dolphin		Photographs/Photo-identification	Tomas Kverka	boat		Nikolina Rako/BWI
Common bottlenose dolphin	Zadar channel, island of Ošljak (Preko/Ugljan)	06/05/2008	11.55	2	slow swimming	sighting	project member	motor boat	GRD	U. Kirsch/GRD
Common bottlenose dolphin	Zadar channel, off the town of Ugljan (on the island of Ugljan)	12/05/2008	13.17 – 15.55	7 incl. 2 juveniles	playful, bow-riding, leaps clear of water	sighting	project member	motor boat	GRD	U. Kirsch/GRD
Common bottlenose dolphin	Zadar channel, between Ošljak and North Kukljica (Ugljan)	13/05/2008	12.45 – 13.45	7 incl. 1-2 juveniles	playful, bow-riding, leaps clear of water	sighting	project member	motor boat	GRD	U. Kirsch/GRD

Common bottlenose dolphin	Zadar channel, off Zelena Punta, Kukljica (Ugljan)	14/05/2008	12.40-14.20	6	bow-riding, active	sighting	project member	motor boat	GRD	U. Kirsch/GRD
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2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Common bottlenose dolphin	1/1/08-31/12/08	Northern Adriatic Sea (Kvarner and Kvarnerić areas)	Encounter Rates /km; Spatial analysis / km	Habitat use, encounter rate; relative density; survey effort (distance effort and time effort), behaviour, ambient noise	Nikolina Rako/BWI
Common bottlenose dolphin	28/04/08-01/09/08	Central Adriatic Sea (Vis and Lastovo island areas)	Encounter Rates /km; Spatial analysis / km	Encounter rate; relative density; survey effort (distance effort and time effort)	Draško Holcer/BWI
Common bottlenose dolphin	July - September 2008	Northern Adriatic Sea – cooperation w. Morigenos, Slovenia (Gulf of Trieste and Western coast of Istria)	Encounter Rates /km; Spatial analysis / km	Encounter rate; relative density; survey effort (distance effort and time effort)	Draško Holcer /BWI

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Common bottlenose dolphin	Dorsal fin	Kvarner and Kvarnerić areas	220	Y	400	Nikolina Rako /BWI
Common bottlenose dolphin	Dorsal fin	Vis and Lastovo island areas	273	Y	273	Draško Holcer /BWI
Common bottlenose dolphin	Dorsal fin	Gulf of Trieste and Western coast of Istria	41	Y		Draško Holcer /BWI

3.1.2. Artificial marking data

No artificial marking was carried out.

3.1.3 Telemetry data

No telemetry studies were carried out.

3.2 Analyses/development of techniques

BWI:

Analysis of navigation data from Lošinj was undertaken for the period January- November 2008. The analysis has shown the **total distance** covered by the research vessel was 2882.8 nm, **distance covered 'in search'** was 2240.5 nm, whilst **distance 'in search' and in 'positive conditions'** (sea state <2 according to the Douglas scale) was 2203.4 nm. In terms of time: researchers spent 344.8 hrs all together out on the sea; 154.8 hrs in

search; 152.08 hrs 'in search' in 'positive effort'; and 66.7 hours 'with' dolphins. Analysis of navigation data for Vis area is not finished yet.

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1 Biopsy samples (summary only)

BWI:

15 biopsy samples of common bottlenose dolphins have been collected in the Central Adriatic (Vis island area) for further analysis (genetics, toxicology, stable isotopes, DNA bank)

4.2 Samples from directed catches (commercial, aboriginal and scientific permits) or bycatches

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Common bottlenose dolphin		skin, blubber, muscle, kidney, liver, spleen, lung, ovaries	1	Y		Hrvoje Gomerčić/FVM
Striped dolphin		skin, blubber, muscle, kidney, liver, spleen, lung, ovaries	1	1		Hrvoje Gomerčić/FVM

*e.g. liver, skin, blubber, ovaries, etc.

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Common bottlenose dolphin	Cres island (point Banja)	Skin and blubber	2 of each	Y		Draško Holcer/BWI
Common bottlenose dolphin	Floating between St. Damjan,- Trstenik island	skin, blubber, ribs, teeth, muscle, lungs, heart, liver and stomach	2 of each + stomach content	Y		Draško Holcer/BWI
Common bottlenose dolphin	Koromačno, Istra	skin, blubber, ribs, teeth, muscle, lungs, heart, liver and	2 of each + stomach content	Y		Draško Holcer/BWI
Common bottlenose dolphin	Maračol, Unije island	skin, blubber, muscle, ribs, lungs and heart	2 of each	Y		Draško Holcer/BWI
Common bottlenose dolphin		skin, blubber, muscle, kidney, liver, spleen, lung, ovaries	16	Y		Hrvoje Gomerčić/FVM
Striped dolphin		skin, blubber, muscle, kidney, liver, spleen, lung, ovaries	2	Y		Hrvoje Gomerčić/FVM

Cuvier's beaked whale		skin, blubber, muscle, kidney, liver, spleen, lung, ovaries	1	Y		Hrvoje Gomerčić/FVM
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*e.g. liver, skin, blubber etc.

4.4 Analyses/development of techniques

BWI: Acoustic monitoring allows to measure the extent of the anthropogenic pressure in the area of Lošinj-Cres archipelago by measuring the variation of man-made noise between tourist and non-tourist season and to verify its impact on bottlenose dolphin distribution in the archipelago.

Acoustic research was undertaken according to the previously defined methodology (Richardson & Green 1995). Sea Ambient Noise was recorded on the 10 acoustic stations once during every month in non-tourist season and three times in period between June and August. During recordings, information on wind direction and sea state, distances to various vessels in the area and general background information were noted. The intention is to relate this anthropogenic pressure (in terms of noise and vessel presence) with the dolphin distribution in the archipelago.

In addition, the behaviour study initiated in 2004 was continued in this year as well. The protocol for data collection was "group follow" while the sampling method was "focal group sampling" (Altmann, 1974; Mann, 1999). Behavioural state, as the predominant activity of the dolphins within a group, together with their formation were continuously observed and recorded every 3 minutes. Throughout this year, behaviour of bottlenose dolphins was sampled 39 times. The overall results showed that dolphins spent most of their time engaged in *Dive-travel* (32.3%) and *Dive* (18.8%) followed by *Travel* (12.5%), *Socialise* (12.2%), *Trawler follow* (11.6%) and *Social-travel* (9.5%) while other behaviour states were less present in their behaviour budget (*Travel slow* 1.76%, *Mill* 1% and *Surface feeding* 0.6%).

5. POLLUTION STUDIES

BWI: The analysis of content of heavy metals and PCBs in the tissues of the stranded dolphins collected over 15 years period have been carried out. Results still have to be analysed.

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

None.

6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 20XX or the season 20XX/XX

None.

6.3 Anthropogenic mortality of large whales for the calendar year 2008

6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

None.

6.3.2 Fishery bycatch of large whales

None.

7. STATISTICS FOR SMALL CETACEANS

7.1 Corrections to earlier years' statistics for small cetaceans

None.

7.2 Direct catches of small cetaceans for the calendar year 2008

None.

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2008

7.3.1 Observed or reported ship strikes of small cetaceans (including non fatal events)

None.

7.3.2 Fishery bycatch of small cetaceans

Species	Sex	No.	Date	Location	Fate	Targeted fish	Gear	How observed?	Source or contact
Striped dolphin	F	1	06/02/2008	42°71'19,4''N; 17°91'41,7''E	dead		GN	necropsy	FVM
Common bottlenose dolphin	F	1	19/04/2008	42°92'44,4''N; 17°17'75''E	dead		GN	necropsy	FVM
Common bottlenose dolphin		1	29/06/2008	42°73'33,3''N; 17°84'16,7''E	dead		GN	necropsy	FVM
Common bottlenose dolphin	M	1	26/11/2008	44°16'66,7''N; 14°83'33,3''E	dead		GN	necropsy	FVM
Comments: Entangled in gear, cut off and sank.									

7.3.3. Pouching

Species	Sex	No.	Date	Location	Fate	How observed?	Source or contact
Common bottlenose dolphin	F	1	17/05/2008	43°15'44,4''N; 17°21'27,8''E	dead ²	necropsy	FVM
Common bottlenose dolphin	M	1	28/10/2008	44°99'67,2''N; 13°72'75''E	dead ²	necropsy	FVM

8. STRANDINGS

Stranding data are collected by the FVM and BW and compiled by the State Institute for Nature Protection.

² hit with gun

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Common bottlenose dolphin	4	4	Nikolina Rako / BWI	Nikolina.rako@blue-world.org
Common bottlenose dolphin	19	19	Hrvoje Gomerčić, FVM	hrvoje.gomercic@vef.hr
Striped dolphin	2	2	Hrvoje Gomerčić, FVM	hrvoje.gomercic@vef.hr
Cuvier's beaked whale	1	1	Hrvoje Gomerčić, FVM	hrvoje.gomercic@vef.hr

9. OTHER STUDIES AND ANALYSES

None.

10. LITERATURE CITED

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Gomerčić, T., Đuras Gomerčić, M., Lucić, H., Galov, A., Škrtić, D., Ćurković, S., Vuković, S., Gomerčić, H. (2008). The prevalence of congenital umbilical hernia in bottlenose dolphins (*Tursiops truncatus*) in the

Adriatic. In: Book of abstract of the 8th conference of the European wildlife disease association. Rovinj. 2-5 October 2008. 24.

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Mackelworth, P. C., Holcer, D. and Fortuna, C. M. (2008). Multiple use marine protected areas as complex commons. 12th International conference on Study of Commons, Gloucester, UK, 15 -18 July 2008.

Nimak, M., Fortuna, C. M., Holcer, D. and Mackelworth, P. C. (2008). 'Déjà vu', can past fisheries policies and new conservation techniques inform the imminent conflict between fishermen and bottlenose dolphins in Croatia. 22nd conference of the European Cetacean Society in Egmond aan Zee, Netherlands, 10-12th March 2008.

Rako, N. (2008). Sea Ambient Noise as an indicator of the anthropogenic impact on the distribution of bottlenose dolphins (*Tursiops truncatus*) within the Lošinj Dolphin Reserve (Croatia). The impact of human activities at sea, on the coast and its hinterland on the northern Adriatic biodiversity" Conference, Piran, Slovenia, 7 -10. October 2008.

Appendix 1. FOA fishing descriptions and codes

FAO FISHING GEAR CATEGORIES:		FALLING GEAR	
SURROUNDING NETS		Cast nets	FCN
With purse lines	PS	Falling gear (not specified)	FG
One-boat operated purse seines	PS1	GILLNETS AND ENTANGLING GEAR	
Two-boat operated purse seines	PS2	Set gillnets (anchored)	GNS
Without purse lines (lampara)	LA	Driftnets	GND
SEINE NETS		Encircling gillnets	GNC
Beach seines	SB	Fixed gillnets (on stakes)	GNF
Boat seines	SV	Trammel nets	GTR
Danish seines	SDN	Combined gillnet-trammel nets	GTN
Scottish seines	SSC	Gillnets and entangling gillnets (not specified)	GEN
Pair seines	SPR	Gillnets (not specified)	GN
Seine nets (not specified)	SX	TRAPS	
TRAWLS		Stationary uncovered pounds nets	FPN
Bottom trawls	TBB	Pots	FPO
Beam trawl	OTB	Fyke nets	FYK
Otter trawls (side or stern)	PTB	Stow nets	FSN
Pair trawls	TBN	Barriers, fences, weirs, etc	FWR
Nephrops trawls	TBS	Aerial traps	FAR
Shrimp trawls (not specified)	TM	Traps (not specified)	FIX
Midwater trawls		HOOKS AND LINES	
Otter trawls (side or stern)	OTM	Handlines and pole-lines (hand operated)	LHP
Pair trawls	PTM	Handlines and pole-lines (mechanised)	LHM
Shrimp trawls	TMS	Set longlines	LLS
Midwater trawls (not specified)	TM	Drifting longlines	LLD
Otter twin trawls	OTT	Longlines (not specified)	LL
Otter trawls (not specified)	OT	Trolling lines	LTL
Pair trawls (not specified)	PT	Hooks and lines (not specified)	LX
Other trawls (not specified)	TX		

DREDGES		GRAPPLING AND WOUNDING	
Boat dredges	DRB	Harpoons	HAR
Hand dredges	DRH	HARVESTING MACHINES	
LIFT NETS		Pumps	HMP
Portable lift nets	LPN	Mechanised dredges	HMD
Boat-operated lift nets	LNB	Harvesting machines (not specified)	HMX
Shore operated stationary lift nets	LNS	MISCELLANEOUS GEAR	MIS
Lift nets (not specified)	LN	RECREATIONAL FISHING GEAR	RG
		GEAR NOT KNOWN OR NOT SPECIFIED	NK
		SHARK CONTROL NETS	NSC
		DERELICT FISHING GEAR	