

Croatia. Progress report on cetacean research, January 2007 to December 2007, with statistical data for the calendar year 2007

COMPILED BY ANA ŠTRBENAC

Compiler's affiliation and address: STATE INSTITUTE FOR NATURE PROTECTION, TRG MAŽURANIĆA 5, 10000 ZAGREB, CROATIA

This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
Blue World Institute of Marine Research and Conservation	BW	Drasko.Holcer@blue-world.org
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; 8
Risso's dolphin	<i>Grampus griseus</i>	Adriatic Sea	8
Short-beaked common dolphin	<i>Delphinus delphis</i>	Adriatic Sea	2.1.2
Striped dolphin	<i>Stenella coeruleoalba</i>	Adriatic Sea	2.1.2

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	1/1/07-31/12/07	Northern Adriatic Sea (Kvarner and Kvarnerić areas)	108	Nikolina Rako/BW
Common bottlenose dolphin	16/06/07-28/08/07	Central Adriatic Sea (Vis Island area)	19	Drasko Holcer/BW
Common bottlenose dolphin	30/05/07-3/6/07	Central Adriatic Sea (Pašman Island area)	1	T. Gomerčić/ FVM

BW: The BW is currently running two research projects on bottlenose dolphins in Croatian waters:

1. The *Adriatic Dolphin Project*, 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.

¹ Refers to the Croatian part of the Adriatic Sea

- The Vis Project, started in 2007, with the aim of assessing the presence and distribution of cetaceans in the southern Croatian waters (Central Adriatic Sea) and monitor through the photo-identification the local community of bottlenose dolphins.

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
Common bottlenose dolphin	West off Kamenjak	20/09/2007	afternoon	1	Slow swimming	Sighting	Dedicated observer	From land	GRD ²	Veronika Harris/GRD
Common bottlenose dolphin	--	30/08/2007	16.00	6	Bow riding, accompanying boat	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	South of Prvic Island	28/08/2007	14.00 – 14.10	2	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Edith Schaich/GRD
Common bottlenose dolphin	Bay near Žirje Island	16/08/2007	18.30	3	Leaping	Sighting	Dedicated observer	Boat	GRD	Claudia Schick/GRD
Common bottlenose dolphin	Off Unije Island	23/07/2007	11.00-11.10	6-8	Slow swimming	Sighting	Dedicated observer	Motor boat	GRD	D. u. S. Moritz/GRD
Common bottlenose dolphin	Mali Lošinj/Lošinj Island	23/07/2007	--	1	Slow swimming	Sighting	Dedicated observer	Motor boat	GRD	D. u. S. Moritz/GRD
Common bottlenose dolphin	South of Silba and Olib Islands	18/07/2007	12.00	8	Hunting, leaping	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	Pula/near Verudela	22/06/2007	20.30-21.30	6-8	Foraging	Sighting	Dedicated observer	From land	GRD	Patrick Schmid/GRD
Common bottlenose dolphin	Northeast of Silba Island	22/06/2007	15.00	3	--	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	west of V. Vodnjak (Pakleni Otoci)	09/06/2007	11.45-11.50	1	Fast swimming	Sighting	Dedicated observer	Sailing boat	GRD	Wolfgang Wild/GRD
Common bottlenose dolphin	Plic Cavlin	06/06/2007	13.25-13.28	2	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Wolfgang Wild/GRD
Common bottlenose dolphin	bei Rovinj	05/06/2007	10.35	5	--	Sighting	Dedicated observer	Boat	GRD	Susanne Horn/GRD
Common bottlenose dolphin	44°58'417'' N 13°39'656'' E	30/05/2007	9.15	4	--	Sighting	Dedicated observer	Boat	GRD	Susanne Horn/GRD
Common bottlenose dolphin	North of Silba island	10/05/2007	14.00	3	--	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	43°00'729'' N 16°11'659'' E	09/05/2007	14.00-14.15	3	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Jörg Stamm/GRD

² Gesellschaft zur Rettung der Delphine e.V./Society for Dolphin Conservation, Germany

Common bottlenose dolphin	42°57'680'' N 016°36'233' E	09/05/2007	13.15- 13.40	5	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Jörg Stamm/GRD
Common bottlenose dolphin	42°54'891'' N 017°13'210' E	09/05/2007	15.30- 15.45	3	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Jörg Stamm/GRD
Common bottlenose dolphin	Between islands of Silba and Olib	09/05/2007	13.40	2	Slow swimming	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	Near Trstenik	07/05/2007	14.40	3	--	Sighting	Dedicated observer	Sailing boat	GRD	Peter Schettler/GRD
Common bottlenose dolphin	Magarac island off Rovinj	13/04/2007	14.05- 14.20	2	Fast swimming/ foraging	Sighting	Dedicated observer	Motor boat	GRD	Jens-Uwe Mai/GRD
Common bottlenose dolphin	Limski channel (west)	29/03/2007	11.30	20	Hunting	Sighting	Dedicated observer	--	GRD	M. Krach/GRD
Short-beaked common dolphin	Between Baba Island and Vela Garška bay (Hvar island)	14/03/2007	9.45- 9.50	2	Fast swimming, leaping	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Prapatna towards Grebišće	12/03/2007	10.51- 11.15	8	Slow swimming	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Between Split and Brač Island	07/03/2007	15.00- 15.05	2	Leaping	Sighting	Dedicated observer	Ferry	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Ženčišće (Hvar island)	03/03/2007	9.40- 9.41	2	Leaping	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Directly off Bacvice beach	Early March 2007	8.00	group	--	Sighting	Dedicated observer	From land	GRD	Michael Schwinn/GRD
Common bottlenose dolphin	Off Vela Stiniva bay (Hvar island)	23/02/2007	10.20- 10.47	4	Mixed: Slow, fast swimming, leaping	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Grebišće (Hvar island)	29/01/2007	7.30- 7.45	2	Slow swimming, resting	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Striped dolphin or Short-beaked common dolphin	Prapatna bay	15/01/2007	11.38- 11.50	1	Fast swimming	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Striped dolphin or short-beaked common dolphin	Prapatna bay	11/01/2007	8.40- 8.45	1	Bow riding	Sighting	Dedicated observer	Motor boat	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Off Mali Stiniva bay	05/01/2007	12.10- 12.25	19	Mostly slow swimming, some leaping	Sighting	Dedicated observer	From land	GRD	Melanie Mog/GRD
Common bottlenose dolphin	Off Jelsa	01/01/2007	15.07- 15.20	6	Mixed: slow, fast swimming, leaping	Sighting	Dedicated observer	From land	GRD	Melanie Mog/GRD

2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Common bottlenose dolphin	11/01/07-31/12/07	Adriatic Sea, Kvarnerić	Encounter Rates /km; Spatial analysis / km	Habitat use, encounter rate; relative density; survey effort (distance effort and time effort), behaviour, ambient noise	N.Rako / BW
Common bottlenose dolphin	16/06/07-28/08/07	Adriatic Sea/ Vis Island	Encounter Rates /km; Spatial analysis / km	Encounter rate; relative density; survey effort (distance effort and time effort),	D.Holcer / BW

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	Lošinj Island	239	Y	364	N.Rako / BW
Common bottlenose dolphin	Dorsal fin	Vis Island	115	Y	115	D.Holcer / BW

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

BW: Geofunk analysis of navigation data was undertaken for the whole year of 2007. The analysis has shown the total distance covered by the research vessel was 2790.3 nm, distance covered 'in search' was 2037.5 nm, whilst distance 'in search' and in 'positive conditions' (sea state <2 according to the Douglas scale) was 1972.9 nm. In terms of time: researchers spent 359.8 hrs all together out on the sea; 154.5 hrs in search; 150.6 hrs 'in search' in 'positive effort'; and 73.8 hours 'with' dolphins.

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1 Biopsy samples (summary only)

No biopsy samples were taken.

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	Adriatic Sea	Skin, blubber, muscle, liver, kidney spleen, lung, gonads	3	Y	0	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	Adriatic Sea	Skin, blubber, muscle, liver, lungs, heart, teeth, stomach content	2	Y	0	N.Rako/BW
Common bottlenose dolphin	Adriatic Sea	Skin, blubber, muscle, liver, kidney spleen, lung, gonads	13	Y	0	FVM

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

4.4 Analyses/development of techniques

BW: 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 January, February, March, April, May, September and October 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 was sampled 46 times. The overall results showed that dolphins spent most of their time engaged in Dive (35.6%) and Dive-travel (32.8%) while other behaviour states were less present in their behaviour budget (Travel 4.8%; Surface feeding 3.7%; Socialise 5.0% and Social-Travel 4.2%; Trawler follow 10.6%; and Travel slow (resting) 3.3%).

5. POLLUTION STUDIES

BW: 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 2007

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 2007

None.

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2007

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 species	Gear	How observed?	Source or contact
Common bottlenose dolphin	M	1	24/07/2007	45°26'36,5''N; 13°30'34,3''E	dead		GN	necropsy, confirmed by fishermen	FVM
Common bottlenose dolphin	M	1	20/08/2007	45°30'N; 13°26'E	dead		GN	necropsy, confirmed by fishermen	FVM
Common bottlenose dolphin	F	1	30/09/2007	43°23'53,5''N; 16°52'52,6''E	dead		GN	necropsy, confirmed by fishermen	FVM

Comments: Entangled in gear, cut off and sank.

8. STRANDINGS

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

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Common bottlenose dolphins	18	16	Hrvoje Gomerčić, FVM	hrvoje.gomercic@vef.hr
Risso's dolphin	1	0	Hrvoje Gomerčić, FVM	hrvoje.gomercic@vef.hr
Common bottlenose dolphin	2	2	N.Rako / BW	Nikolina.Rako@blue-world.org

9. OTHER STUDIES AND ANALYSES

None.

10. LITERATURE CITED

None.

11. PUBLICATIONS

11.1 Published or 'In Press' papers only

Bearzi, G., Fortuna, C.M., Reeves, R.R. 2003. Ecology, behaviour and conservation of Common Bottlenose Dolphins *Tursiops truncatus* in the Mediterranean Sea. *Mammal Review*

Ćurković, S., D. Škrtić, S. Vuković, H. Lucić, M. Đuras Gomerčić, T. Gomerčić, H. Gomerčić. 2007. Uginuće ženke i mladunčeta dobrog dupina – *Tursiops truncatus* (Montagu 1821) pri porodu – prikaz slučaja. In: Zbornik sažetaka. Veterinarska znanost i struka. Zagreb 26. listopada 2007. (Cvrtila, Ž., Konjević, D., eds.). Veterinarski fakultet Sveučilišta u Zagrebu. Zagreb. 62. [In Croatian].

Đuras Gomerčić, M., D. Škrtić, T. Gomerčić, H. Gomerčić, H. Lucić, S. Ćurković, S. Vuković. 2007. Promjene na ramenim zglobovima dobrih dupina (*Tursiops truncatus*) iz Jadrana. U: Zbornik sažetaka. Veterinarska znanost i struka. Zagreb 26. listopada 2007. (Cvrtila, Ž., Konjević, D., urednici). Veterinarski fakultet Sveučilišta u Zagrebu. Zagreb. 12. [In Croatian].

Đuras Gomerčić, M., T. Gomerčić, H. Gomerčić, A. Galov, H. Lucić, S. Vuković. 2007. Cranial characters of the bottlenose dolphin (*Tursiops truncatus*) from the Adriatic Sea. Abstracts of the 17th Biennial Conference on the Biology of Marine Mammals (compact disc). Cape Town, South Africa, 29 November-3 December 2007. The Society for Marine Mammalogy.

Galov, A. 2007. Genetička raznolikost populacije dobrog dupina (*Tursiops truncatus*) s osvrtom na druge vrste kitova (Cetacea) Jadranskog mora. Disertacija. Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu. Zagreb. 105 pp. [In Croatian].

Gomerčić, T., M. Đuras Gomerčić, H. Gomerčić, H. Lucić, D. Škrtić, S. Ćurković, S. Vuković. 2007. Odsukavanje i premještanje ženke dobrog dupina (*Tursiops truncatus*) iz rijeke Krke u more. U: Zbornik sažetaka. Veterinarska znanost i struka. Zagreb 26. listopada 2007. (Cvrtila, Ž., Konjević, D., urednici). Veterinarski fakultet Sveučilišta u Zagrebu. Zagreb. 15-16. [In Croatian].

Holcer, D., G. Notarbartolo di Sciara, C. M. Fortuna, V. Onofri, B. Lazar and N. Tvrtković. 2007. Cuvier's beaked whale, *Ziphius cavirostris*, in the Adriatic Sea. Journal of the Marine Biological Association of the United Kingdom, 87:259-362.

Lucić, H., G. Domitran, S. Vuković, H. Gomerčić, M. Đuras Gomerčić, T. Gomerčić, D. Škrtić, S. Ćurković. 2007. Usporedne osobitosti histološke građe hipofiza dobrog dupina (*Tursiops truncatus*) i plavobijelog dupina (*Stenela coeruleoalba*) iz Jadranskog mora. In: Zbornik sažetaka. Veterinarska znanost i struka. Zagreb 26. listopada 2007. (Cvrtila, Ž., Konjević, D., eds.). Veterinarski fakultet Sveučilišta u Zagrebu. Zagreb. 65. [In Croatian].

Nimak, M., Croft, D., Wood, T.D., Wiemann, A., Rako, N., Mackelworth, P., Fortuna, C. 2007. Behavioural responses of bottlenose dolphins, *Tursiops truncatus* to boat traffic in the Kvarnerić, northeastern Adriatic Sea. 21st Annual Conference of the European Cetacean Society, San Sebastian, Spain, 23-25th April 2007. *European Research on Cetaceans* 21.

Notarbartolo di Sciara, G., Fortuna, C.M. 2007. A joint cetacean sighting database: a cooperative effort among CIESM, ACCOBAMS and the Pelagos Sanctuary. *Rapp. Comm. int. Mer Médit.*, 38, 2007.

Pauk, M. 2007. Određivanje slijeda kontrolne regije mitohondrijske DNA dobrog dupina *Tursiops truncatus* (Montagu 1821). Diplomski rad. Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu. Zagreb. 38 pp. [In Croatian].

Rako, N., Fortuna, C., Mackelworth, P., Picciulin, M., Wiemann, A., Holcer, D. 2007. Anthropogenic noise and its impact on bottlenose dolphin (*Tursiops truncatus*) distribution in the Lošinj dolphin reserve (Croatia). 21st Annual Conference of the European Cetacean Society, San Sebastian, Spain, 23-25th April 2007. *European Research on Cetaceans* 21.

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