

ITALY. PROGRESS REPORT ON CETACEAN RESEARCH, JANUARY 2003 TO MAY 2004, WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2003.

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This report summarises information obtained from: Centro Studi Cetacei (CSC); Centro Turistico Studentesco (CTS); Istituto Centrale per la Ricerca Applicata al Mare (ICRAM); Università di Padova – Marine Mammal Tissue Bank (UNIPD); Università di Pavia-CIBRA (UNIPV); Università di Siena (UNISI); Tethys Research Institute (TRI).

1. Species and stocks studied

| Common name | Scientific name | Area/stock(s) | Items referred to | Contact |
|-----------------------------|-----------------------------------|---------------------------------------|---|-------------|
| Pilot whale | <i>Globicephala melas</i> | Ligurian/Tyrrhenian Sea | 2.1.1, 2.2 | CIBRA-UNIPV |
| Striped dolphin | <i>Stenella coeruleoalba</i> | Ligurian/Tyrrhenian Sea | 2.1.1, 2.2 | CIBRA-UNIPV |
| Sperm whale | <i>Physeter macrocephalus</i> | Ligurian/Tyrrhenian Sea | 2.1.1, 2.2 | CIBRA-UNIPV |
| Cuvier's beaked whale | <i>Ziphius cavirostris</i> | Ligurian/Tyrrhenian Sea | 2.1.1, 2.2 | CIBRA-UNIPV |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | North eastern Sardinia. | 2.1, 2.2, 3.1.1, 3.2, 4.3, 7.1, 9, 11.1..2. | CTS |
| Fin whale | <i>Balaenoptera physalus</i> | Ligurian Sea, Sicily Channel | 2.1.1, 3.1.1., 3.1.3., 9. | ICRAM |
| Striped dolphin | <i>Stenella coeruleoalba</i> | Mediterranean sea | 4.1, 4.4, 5, 9 | ICRAM |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Mediterranean sea | 4.1, 4.4, 5, 9 | ICRAM |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Corsican, Tyrrhenian, Adriatic Seas | 2.1.1, 2.2, 3.1.1., 4.3, 9 | ICRAM |
| Striped dolphin | <i>Stenella coeruleoalba</i> | Tyrrhenian sea | 2.1.1, 4.3, 5, 7.1 | ICRAM |
| Common dolphin | <i>Delphinus delphis</i> | Tyrrhenian sea | 2.1.1 | ICRAM |
| Killer whale | <i>Orcinus orca</i> | Ross Sea (Antarctica) | 2.1.1, 3.1.1 | ICRAM |
| Minke whale | <i>Balaenoptera acutorostrata</i> | Ross Sea (Antarctica) | 2.1.1 | ICRAM |
| Arnoux's beaked whale | <i>Berardius arnuxii</i> | Ross Sea (Antarctica) | 2.1.1 | ICRAM |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | North-western Greece, Amvrakikos Gulf | 2.1.1; 2.2; 3.1.1; 9; 10; 11.1 | TRI |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Eastern Ionian Sea | 2.1.1; 2.2; 3.1.1; 4.1; 9; 10; 11.1; 11.2 | TRI |
| Short-beaked common dolphin | <i>Delphinus delphis</i> | Eastern Ionian Sea | 2.1.1; 2.2; 3.1.1; 4.1; 9; 10; 11.1; 11.2 | TRI |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Northern Adriatic Sea | 2.2; 3.1.1; 9; 10 | TRI |
| Fin whale | <i>Balaenoptera physalus</i> | Ligurian Sea | 2.1.1; 2.2; 3.1.1; 4.1; 9; 10; 11.2 | TRI |
| Striped dolphin | <i>Stenella coeruleoalba</i> | Ligurian Sea | 2.1.1; 2.2; 3.1.1; 4.1; | TRI |
| Risso's dolphin | <i>Grampus griseus</i> | Ligurian Sea | 2.1.1; 2.2; 3.1.1; 4.1; | TRI |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Ligurian Sea | 3.1.1; | TRI |
| Long-finned pilot whale | <i>Globicephala melas</i> | Ligurian Sea | 2.1.1; 3.1.1; 4.1; 11.2 | TRI |
| Cuvier's beaked whale | <i>Ziphius cavirostris</i> | Ligurian Sea | 2.1.1; 2.2; 3.1.1; 4.1; 9; 10; 11.2 | TRI |
| Sperm whale | <i>Physeter macrocephalus</i> | Ligurian Sea | 2.1.1; 2.2; 3.1.1; 4.1; 9; 10; 11.2 | TRI |

2. Sightings data

2.1 Field work

2.1.1 SYSTEMATIC

| Area/stock(s) | Period | Species (# of sightings) | Notes | Contact |
|----------------------|-----------------------------|---|---|----------------------|
| Ligurian Sea | Summer 2003 | n.a. | Acoustic and visual survey (20d), aerial surveys (15 of 4h each), wideband sonobuoy surveys (18d) | Pavan/CIBRA-UNIPV |
| North Tyrrhenian Sea | 2003 | Common bottlenose dolphin | Boat surveys, 1183 hours, 166 sightings | Fozzi/CTS |
| Ligurian Sea | 1999-2002 | Fin whale | Automatic acoustic survey, 655d recorded | Borsani/ICRAM |
| South Tyrrhenian Sea | July 2002-May 2003 | Striped dolphin (42), common bottlenose dolphin (5), common dolphin (1) | 3 transect line campaigns | Fortuna/ICRAM |
| Sicily Channel | February 2004 | Fin whale (18) | 14d boat survey | Canese/ICRAM |
| Ross Sea | December 2003-February 2004 | Minke whale, Arnoux's beaked whale, Killer whale | Total of 69 encounters | Lauriano/ICRAM -PNRA |

| | | | | |
|---------------------------------------|---------------------------------------|---|--|-----------------------------------|
| North-western Greece, Amvrakikos Gulf | July-August 2003; February-April 2004 | Common bottlenose dolphin (20)/year 2003; (12)/year 2004 | Boat surveys; 15 daily surveys/year 2003; 11 daily surveys/year 2004 | TRI/Bearzi, Politi |
| Eastern Ionian Sea, Kalamos | April/June-September 2003 | Short-beaked common dolphins (20), common bottlenose dolphins (32) | Boat surveys; 78 daily surveys | TRI/ Bearzi, Politi |
| Ligurian Sea | April-October 2003 | Fin whale (16), striped dolphin (78), Risso's dolphin (3), long-finned pilot whale (1), Cuvier's beaked whale (4), sperm whale (17) | Ship surveys; 82 daily surveys | TRI/ Airoidi/Panigada/ Zanardelli |

2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

| Area/stock(s) | Period | Species (# of sightings) | Notes |
|-----------------------|-------------------------------------|--|---|
| Northern Adriatic Sea | May-November 2003; January-May 2004 | Common bottlenose dolphins (23)/year 2003; (1)/year 2004 | <i>Ad libitum</i> boat surveys; 18 daily surveys/year 2003; 4 daily surveys/year 2004; TRI/Bearzi |

2.2 Analyses/development of techniques

| Area/stock(s) | Species | Methods | Data analysis | Results |
|---------------------------------------|--|---|---------------|--|
| North-western Greece, Amvrakikos Gulf | Common bottlenose dolphin | Boat surveys, photoidentification | In progress | <ul style="list-style-type: none"> Sighting frequency, distribution (survey effort between July 2003 - May 2004: 32 sightings over 647 km travelled on effort) Population dynamics, social organization Bearzi (TRI) |
| Eastern Ionian Sea | Common bottlenose dolphin | Boat surveys, photoidentification, behavioural sampling | In progress | <ul style="list-style-type: none"> Sighting frequency, distribution (survey effort in 2003: 32 sightings over 4,580 km travelled on effort) Population dynamics, social organization Behaviour, ecology, feeding habits Politi, Bearzi (TRI) |
| Eastern Ionian Sea | Short-beaked common dolphin | Boat surveys, photoidentification, behavioural sampling | In progress | <ul style="list-style-type: none"> Sighting frequency, distribution (survey effort in 2003: 20 sightings over 4,580 km travelled on effort) Population dynamics, social organization Behaviour, ecology, feeding habits Politi, Agazzi, Bruno, Bearzi (TRI) |
| Northern Adriatic Sea | Common bottlenose dolphin | Ship surveys | In progress | <ul style="list-style-type: none"> Sighting frequency, distribution (survey effort in January 2003 - May 2004: 24 sightings over 1,021 km travelled on effort) Bearzi (TRI) |
| Ligurian Sea | Fin whale, striped dolphin, Risso's dolphin, Cuvier's beaked whale, sperm whale, long-finned pilot whale | Ship surveys, photoidentification, behavioural sampling | In progress | <ul style="list-style-type: none"> Habitat use Fin whale abundance Azzellino, Bendinoni, Panigada, Patti (TRI) |

CIBRA-UNIPV

Instrumentation for real-time sound recording, analysis and display developed at CIBRA has been further improved with the implementation of real-time GIS plotting of acoustic contacts, sightings and navigation data continuously, 24h/day. The equipment has been tuned in order to facilitate the detection of biological sounds while surveying an area with towed arrays and sonobuoys to support the implementation of Acoustic Risk

Mitigation Policies as well as to carry out monitoring and censusing activities. For these purposes, wideband detection (up to 45 kHz) proved to be useful to maximize detection capabilities. Continuous 24h/day monitoring proved to provide a better picture of the animals present in an area than usual survey techniques. In cooperation with Saclant the equipment was used to test the implementation of mitigation policies during sonar trials and to support the Woods Hole Oceanographic Institution tagging project.

CIBRA participates to the NEMO research project of National Institute of Nuclear Physics (INFN) for the development of an underwater platform for detecting high energy neutrino. Within the project, a test platform was designed to perform continuous monitoring of the ocean noise in order to evaluate the feasibility of acoustic detection of neutrino. The test platform will be deployed in 2004 at a depth of 2500m; it will transmit acoustic data collected by 4 broadband phones to INFN laboratories through a 25 km long optical cable. Analysis of data will allow long term study of underwater noise and of biological sound sources, including fin whales and sperm whales passing in the area.

3. Marking data

3.1 Field work

3.1.1 NATURAL MARKING DATA

| Species | Feature | Area/stock | Calendar year/season/ no. photographed | Catalogued (Y/N) | Catalogue total | Contact person/institute |
|-----------------------------|--|-----------------------|---|---------------------|--------------------|-----------------------------|
| Common bottlenose dolphin | Dorsal fin | Tyrrhenian Sea | 2003/33 | Y | 59 | Fozzi/CTS |
| Common bottlenose dolphin | Dorsal fin | Corsican Sea | 25 | Y | 45 | Lauriano/ICRAM |
| Fin whale | Permanent marks | Sicily Channel | 6 | Y | 6 | Canese/ICRAM |
| Common bottlenose dolphin | Dorsal fin | Eastern Ionian Sea | year 2003/spring-summer/12 | Y | 60 | TRI |
| Short-beaked common dolphin | Dorsal fin; white patch | Eastern Ionian Sea | year 2003/spring-summer/3 | Y | 78 | TRI |
| Common bottlenose dolphin | Dorsal fin | Northern Adriatic Sea | year 2003 /none | Y | 19 | TRI |
| Common bottlenose dolphin | Dorsal fin | Ligurian Sea | year 2003/spring-summer/none | Y | 63 | TRI |
| Risso's dolphin | Dorsal fin; body scars | Ligurian Sea | year 2003/spring-summer/Not analysed yet | Y | 243 | TRI |
| Long-finned pilot whale | Dorsal fin | Ligurian Sea | year 2003/spring-summer/Not analysed yet | Y | 54 | TRI |
| Cuvier's beaked whale | Dorsal fin | Ligurian Sea | year 2003/spring-summer/Not analysed yet | Y | 31 | TRI |
| Sperm whale | Flukes, white body patches | Ligurian Sea | year 2003/spring-summer/Not analysed yet | Y | 38 | TRI |
| Fin whale | Dorsal fin, blaze and chevron, major scars | Ligurian Sea | year 2003/spring-summer/15 | Y | 403 | TRI |

3.1.2. ARTIFICIAL MARKING DATA

None.

3.1.3 TELEMETRY DATA

| Species | Tag type | No. successfully deployed | Maximum time transmitting | Contact person/institute |
|-----------|-----------|---------------------------|---------------------------|--------------------------|
| Fin whale | Satellite | 5 | n/a | Canese/ ICRAM |

3.2 Analyses/development of techniques

None.

4. Tissue/biological samples collected

4.1 Biopsy samples

| Species | Area/stock | Calendar year/ season no. collected | Archived (Y/N) | No. analysed | Total holdings | Contact person/institute |
|---------------------------|-------------------|---|-------------------|-----------------|----------------|---|
| Striped dolphin | Mediterranean Sea | 2003/10 | Y | 10 | n/a | UNISI/Fossi/Marsili/Natoli |
| Common bottlenose dolphin | Mediterranean Sea | 2003/2 | Y | 2 | n/a | UNISI/Fossi/Marsili/Natoli, ICRAM/Lauriano |
| Long-finned pilot whale | Ligurian Sea | Year 2003/spring-summer/2 | Y | in progress | 3 | TRI |
| Sperm Whale | Ligurian Sea | Year 2003/spring-summer/1 | Y | in progress | 3 | TRI / UNISI/Fossi/Marsili/ Daniel Engelhaupt, University of Durham |

4.2 Samples from directed catches or bycatches

None.

4.3 Samples from stranded animals

| Species | Area/stock | Calendar year/ season total | Archived (Y/N) | Tissue type(s)* | Contact person/institute |
|--------------------|-------------------------|--------------------------------|-------------------|---|--------------------------|
| Bottlenose dolphin | Northern Tyrrhenian Sea | 2003/1 | Y | Liver, heart, skin, blubber, muscle | Fozzi/CTS |
| Striped dolphin | Northern Tyrrhenian Sea | 2003/1 | Y | Liver, kidney, heart, skin, blubber, muscle | Fozzi/CTS |

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

4.4 Analyses/development of techniques

Biomarkers Laboratory/UNISI

In the free-ranging cetacean biopsies were evaluated the Benzo(a)pyrene monooxygenase (BPMO) activity and the residue levels: chlorinated hydrocarbons (HCB, DDTs and PCBs) and polycyclic aromatic hydrocarbons (PAHs).

MFO activity (BPMO) has been assayed in skin biopsy samples by Fossi *et al.* (1992). BPMO activity was detected in the whole tissue. BPMO activity was assessed using the incubation mixture proposed by Kurelek *et al.* (1977) incubating each sample (plus the blanks) in a shaking bath for 2 h at 37°C. The activity was expressed in arbitrary units of fluorescence (AUF/h/g tissue).

For analysis of HCB, DDTs and PCBs, the samples were freeze-dried and extracted with n-hexane in a Soxhlet apparatus followed by sulphuric acid clean-up and Florisil chromatography (Marsili & Focardi, 1996). The analytical method used was high resolution capillary gas chromatography with a ⁶³Ni electron capture detector and an SBP-5 bonded phase capillary column (30 m long, 0.2 mm i.d.). The carrier gas was N₂ or He with a head pressure of 15.5 psi (splitting ratio 50/1). The scavenger gas was argon/methane (95/5) at 40 ml/min. Oven temperature was 100°C for the first 10 min, after which it was increased to 280°C at 5°C/min. Injector and detector temperatures were 200°C and 280°C respectively. A mixture of specific isomers was used to calibrate the system, evaluate recovery and confirm the results, which were expressed in ng/g or µg/g dry weight (d.w.). Recoveries were calculated by adding known quantities of standard to homogeneous replicates of the same sample.

PAHs were analysed by HPLC/Fluorescence system. Extraction was according to Griest & Caton (1983) and Holoubek *et al.* (1990), with several modifications developed in our lab (Marsili *et al.*, 1997). The organic fraction, concentrated to 1 ml in acetonitrile, was analysed by HPLC with fluorescence detection. A reversed-phase column (Supelcosil LC-18, 25 cm x 4.6 mm i.d., 0.5 µm particle size) was used with an acetonitrile/water gradient. The initial concentration of the gradient was 60% acetonitrile, increasing over 20 min to 100% acetonitrile, and then remaining stable for 10 min. The flow rate was 1 ml/min. Quantification was carried out using an external standard consisting of 16 PAHs from Supelco (EPA 610 polycyclic aromatic hydrocarbon mixture).

Cell cultures

An epidermal/dermal layer including a portion of the underlying blubber tissue was used to prepare culture fibroblasts. It is hoped to obtain genetic, biochemical and toxicological information from cultures of fibroblast cells grown from skin biopsy specimens. This data will be valuable for long-term field study of free-ranging cetaceans. In particular the tissue culture system will allow the study of relationships between contamination and

biochemical responses. One of the planned applications of this developed *in vitro* system will be the assessment of interspecies differences in the mixed function oxidase activity (BPMO, EROD, PROD, Cyt.-1A1) activity induced by *in vitro* treatment of various contaminants (DDTs, PCBs, PAHs, etc.) added at different concentrations. The skin sample was stored in sterile medium MEM Eagle Earle's salts w/L-glutamine and Sodium Bicarbonate (Mascia Brunelli, Milan, Italy) + 10% gamma irradiated fetal calf serum (Mascia Brunelli) + 1% MEM Not Essential Aminoacids (NEAA) solution 100X (Mascia Brunelli) + 1% Penicillin/Streptomycin 100X (Mascia Brunelli) + 0.1% Amphotericin B 100X (Mascia Brunelli) at ambient temperature, and was processed within 24 h of collection. In the laboratory, each sample was washed with Earle's balanced salt solution (EBSS) (Mascia Brunelli) containing antibiotic (Penicillin/Streptomycin 100X (Mascia Brunelli) and antimycotic (Amphotericin B 100X (Mascia Brunelli)) solutions. All specimens were handled using sterile techniques. First, the collected tissue was cut into small pieces with curved surgical scissors, placed in 30 mm Petri dishes and incubated with Trypsin-EDTA solution 1X (Mascia Brunelli) for 15 min at 37°C. The biopsy fragments were washed again and then placed in Falcon 25 flasks, moistened with medium. After 24 h at 37°C in an incubator with 5% CO₂, the cultures were covered with 1 ml of medium. Half of the culture medium was replaced every 48 h with fresh medium. Successful cell cultures were obtained from: striped dolphin, bottlenose dolphin, common dolphin, risso's dolphin and fin whale. The first fibroblasts were observed after 7-21 days (Fig. 1). Cultures reached 90% confluence in 15-20 days, then were trypsinized, washed and placed in Falcon 50 and 125 flasks, after two and three trypsinizations respectively. The samples grew for over 4 months, however, there were signs of senescence and increased resistance to trypsin treatment. Contamination by microorganisms is one of the main causes of limited cell viability or slow cell growth. Rapid proliferation of bacteria, yeasts and fungal spores produces an unfavourable environment for the growth of the mammalian cells both by depletion of the available nutrients or for the changes in the pH. The contamination may be introduced into a culture from several routes but principally is a dormant infection in the sampled specimens. In fact, the most persistent infection was an environmental *Candida* spp. The antimycotic (Amphotericin B 100X) in the medium was inactive against the fungus. Various unsuccessful attempts were made to stop the infection. The antimycotic Canesten 1% (Bayer) was also tried but the infection proliferated. Against bacterial infection, the cells were washed with Penicillin/Streptomycin 100X, and surprisingly, the fibroblasts continued to grow and the confluent layer did not seem to be damaged. We tested also Gentamicina but we notice that this antibiotic damaged the confluent layer.

IMMUNOFLUORESCENCE TECHNIQUE

The fibroblast cell cultures represent a "in vitro" surrogate of the whole animal that will be used for many purposes, including genetic and toxicological studies. In particular, fibroblasts can be used to test the vulnerability of cetaceans to different environmental contaminants such as organochlorine compounds, heavy metals and polycyclic aromatic hydrocarbons. The immunofluorescence technique uses antibodies that conjugate at fluorescent tracings, able to bind cellular structures in highly specific way, allow the qualitative and quantitative evaluation of the target structures. Fibroblast cell cultures (third generation) of bottlenose dolphin (*Tursiops truncatus*), sampled in the marine park of Asinara (Sardinia, Italy), and of striped dolphin (*Stenella coeruleoalba*), sampled in the Whale Sanctuary (Ligurian Sea, Italy), were exposed for 48 h to mixture of Arochlor 1260, pp'DDT e pp'DDE solubylised in DMSO (0,05%) added at three different doses: 1µg/ml, 5µg/ml and 25µg/ml. After, a first reaction with the primary antibodies for cytochromes 1A1-1A2 and 2B4 and for human estrogen receptor (hER) were applied, then were treated with the respective secondary antibodies marked with a fluorochrome. The main results were the presence of the cytochromes 1A1-1A2 and 2B4 and of the estrogen receptor in the fibroblast cells revealed from the crossreaction of the antibody used and from the presence of fluorescence in the fibroblasts, and the a suspected increase of fluorescence in function of the treatment doses of contaminants.

5. Pollution studies

See 4.4 Section.

6. Statistics for large cetaceans

6.1 Direct catches (commercial, aboriginal and scientific permits)

none

6.2 Other non-natural mortality for the calendar year 2003

none

6.3 Earlier years' statistics

Earlier years' statistics are available for the period 1986-1995 (Bortolotto and Podestà, 1997) included in Borri et al., (1997) and for the period 1986-2001 (Podestà and Bortolotto, 2001; Bortolotto and Podestà, 2004). In the calendar year 2002, 146 specimens belonging to the order Cetacea were recovered along the coasts of Italy. CSC 2003 report in preparation (contact person: M. Podestà, Natural History Museum of Milan) (CSC, 1987-2002)

7. Statistics for small cetaceans

7.1 For the calendar year 2003

| Species | Area/stock | Directed catch | | Incidental mortality | | | Live-capture |
|-----------------|----------------|----------------|------------|----------------------|------------|---------|--------------|
| | | Reported | Est. total | Reported | Est. total | Source* | Reported |
| Striped dolphin | Tyrrhenian sea | 0 | 0 | 6 | | Gillnet | |

7.2 Earlier years' statistics

none

8. Strandings

CSC/A.Bortolotto, Italian Stranding Network; centrostudicetacei@libero.it

9. Other studies and analyses

| Area | Species | Methodology | Data analysis | Results |
|---------------------------------------|-----------------------------|-----------------------------------|--|---|
| Ligurian Sea | Fin whale | Automated acoustic survey | Vocal repertoire, distribution, ambient noise | <ul style="list-style-type: none"> Fin whale sounds present year-round with emphasis during autumn, winter, spring; typical vocal repertoire determined; shipping noise higher during summer. Borsani (ICRAM), Clark (Cornell/BRP) |
| Patagonia, Argentina | Commerson's dolphin | Boat surveys, acoustics | Vocal repertoire, behaviour, ambient noise | <ul style="list-style-type: none"> Determination of ambient noise, acoustic and behaviour of the species Borsani (ICRAM), Crespo (CONICET) |
| Patagonia, Argentina | Dusky dolphin | Boat surveys, acoustics | Vocal repertoire, behaviour, ambient noise | <ul style="list-style-type: none"> Determination of ambient noise, acoustic and behaviour of the species Borsani (ICRAM), Crespo (CONICET) |
| North-western Greece, Amvrakikos Gulf | Common bottlenose dolphin | Boat surveys, photoidentification | sighting frequency, habitat use, population dynamics and social organization | <ul style="list-style-type: none"> study started: 2001 relative sighting frequency one order of magnitude higher than in the adjacent Kalamos area abundant prey resources Bearzi (TRI) |
| Eastern Ionian Sea | Short-beaked common dolphin | Boat surveys, photoidentification | sighting frequency, habitat use, population dynamics and social organization | <ul style="list-style-type: none"> study started: 1993 relative sighting frequency decreased over the study period (from 2.1 groups/100km in 1997 to 0.4 groups/100km in 2003) after 1996 decrease in average group size (from 11.8 individuals in 1994-1996 to 7.0 individuals in 1997-2003) highly resident community with low rates of immigration decline over the past eight years in number of encountered individuals fission-fusion society Bruno, Politi, Bearzi (TRI) |

| | | | | |
|-----------------------|------------------------------------|--|---|---|
| Eastern Ionian Sea | Common bottlenose dolphin | Boat surveys, photoidentification | sighting frequency, habitat use, population dynamics and social organization | <ul style="list-style-type: none"> study started: 1993 mean sighting frequency 0.57 groups/100km in 1997-2003 mean group size 6.5 individuals no longitudinal changes in sighting frequency and group size high levels of site fidelity for a small portion of catalogued individuals, while the majority of individuals are transient dolphins are present at low but relatively stable densities throughout the study period Politi, Bearzi (TRI) |
| Eastern Ionian Sea | Short-beaked common dolphin | behavioural sampling (focal group) | diurnal behaviour | analysis in progress; Politi, Agazzi (TRI) |
| Eastern Ionian Sea | Common bottlenose dolphin | behavioural sampling (focal group) | diurnal behaviour | analysis in progress; Politi (TRI) |
| Eastern Ionian Sea | Short-beaked common dolphin | collection of fish scales lost by prey during surface-feeding events | diet | <ul style="list-style-type: none"> main prey during surface feeding include sardines and anchovies Agazzi (TRI) |
| Northern Adriatic Sea | Common bottlenose dolphin | Ship surveys | In progress | preliminary data: <ul style="list-style-type: none"> bottlenose dolphin only regular cetacean species in the area mean sighting frequency 0.67 groups/100km Bearzi (TRI) |
| Ligurian Sea | Cuvier's beaked whale, sperm whale | <i>Ad libitum</i> surveys | Habitat use | analyses in progress <ul style="list-style-type: none"> importance of the Genoa Canyon area for Cuvier's beaked whale ecology and stronger relationship with the mesopelagic zone. higher sperm whales occurrence along the continental slope than in the pelagic area Azzellino, Patti (TRI) |
| Ligurian Sea | Fin whale | Ship surveys, photoidentification | Encounter rate, habitat use, evidence of collision between fin whales and ships | analyses in progress Bendinoni, Panigada (TRI) |

CIBRA-UNIPV

The "Centro Interdisciplinare di Bioacustica e Ricerche Ambientali" (CIBRA) participates in the "Sound Oceanography and Living Marine Resources" (SOLMAR) research project set up by the NATO Saclant Undersea Research Center in cooperation with the Office of Naval Research. The activities of CIBRA focused mainly on:

- managing databases on scientific literature concerned with underwater bioacoustics, strandings, sightings
- developing sound analysis systems for field research on the acoustic emissions of cetaceans
- scientific support and participation in acoustic and visual surveys
- scientific support for the development and tuning of Acoustic Risk Mitigation Policies
- analysis of acoustic data collected by different sources

CIBRA carried out the project "Bioacoustic Characterization of the Mediterranean Sea" granted by Office of Naval Research (ONR USA - Grant N00014-02-1-0333). The project is aimed at:

- collecting information about the sounds emitted by marine mammals in the Mediterranean
- improving the Cetacean Sound Library at CIBRA
- developing classification methods to identify vocalizing species
- developing instrumentation and methodologies for field research
- education and training

CIBRA performed education and training activities in Universities, in government and private organizations involved in marine mammals research and environmental protection.

Seminars about Underwater Bioacoustics and Marine Mammals were made within biology, nature conservation and ecology courses in many Universities. Depending on the target of the courses, seminars were aimed at providing either a basic interdisciplinary approach to marine mammals' conservation and management or at providing the technical bases for setting up researches on marine mammals and their acoustic behaviour by giving information about instruments and methodologies needed for each specific task.

CIBRA is also committed to improve the public awareness about marine mammals, their ecological role, and the impact of human activities with a particular concern for acoustic pollution.

CSC

The "Centro Studi Cetacei" (CSC) is a no-profit organization cooperating on a voluntary base with many research organization concerned with the study and protection of the marine environment and of marine mammals in particular.

The activities of CSC focused mainly on:

- scientific support and participation in acoustic and visual surveys;
- scientific support for the development of databases on strandings and sightings;
- scientific support and participation to the Scientific Committee of ACCOBAMS;
- scientific support for postmortem diagnosis on stranded specimens as well as tissue sampling;
- cooperating with the Mediterranean Marine Mammal Tissue Bank (MMMTB);
- founding of a blood (serum) bank;
- free medical consulting in case of live strandings;
- search for historical data on strandings and sightings;
- analysis of data on strandings.

CSC cooperates with CIBRA and the Natural History Museum of Milan and SACLANTCEN-La Spezia for the development of databases/GIS of strandings and sightings.

CSC provides biological samples to museums and to research institutions to carry out a number of different studies:

- ecotoxicological studies (UNISI, Pisa University)
- stomach contents (Bari, Padova and Firenze University, Fondazione Cetacea, Milano and Roma Natural History Museum)
- pathology (Padova University)
- osteometric and osteodensitometry (Padova University and Milano Natural History Museum)
- brain anatomy (Padova University)
- microscopic anatomy (Padova University)

ICRAM

In 2003 ICRAM has concluded a project called "Cetaceans' conservation plan – PAN Cetacei". Two main items were included in the project: cetaceans small scale fishery interaction monitoring along Italian coast and a line transect survey in South Tyrrhenian Sea. The first one comprised both census along the Italian coast conducted with the three main national fishery research consortium and in deep research in three fishery. The latter was held in order to evaluate interaction modality as well as economic loss due to both damaged to fishing gears and catch reduction (Northridge and Lauriano, 2001). Interaction was studied for trammel nets in Sardinia and in northern Adriatic Sea deployed in order to catch striped red mullet (*Mullus surmuletus*) and common sole (*Solea vulgaris*). In order to evaluate possibly pingers mitigation effects, monitory survey were held in Sardinia.

Since July 2003 ICRAM is partner of the LIFE Nature project "Activities for the protection of cetaceans in the International Sanctuary (LIFE03 NAT/IT/000148)" of the Ligurian Sea. Particularly, ICRAM is in charge of the following actions: 1) preparation of guidelines for sustainable fishing; 2) creation of a central database of all organisations and individuals carrying out research and whale-watching activities within the Sanctuary; 3) definition and divulgation of a specific "Whale-watching code of conduct" in synergy with the local WW operators.

ICRAM is a partner of ACCOBAMS and provides support to its Scientific Committee.

ICRAM is leader of the project NEREIDI (2002-2004) conducted in cooperation with the University of Genoa and a research group of National Research Council (CNR Messina). The aim of the project is the understanding of the distribution and movements of the top predators, like fin whales, in relation to the trophic resources in the Mediterranean Sea, in order to give a scientific advice to the Environmental Ministry for the management of the International Cetaceans Sanctuary. The principal steps of NEREIDI are: a) To determine the fin whales seasonal presence within the Sanctuary, and the biology and distribution of the northern krill (*Meganyctiphanes norvegica*); c) To study fin whales movements inside and outside of the Sanctuary area using satellite tags; d) To

analyse the oceanographic features of the Ligurian Sea; e) To define the anthropogenic problems that are present in the Cetacean Sanctuary.

UNIPD-Marine Mammal Tissue Bank

The Marine Mammal Tissue Bank at The University of Padua is active since 2002. Prof. Bruno Cozzi is the scientist in charge. It contains at present approx. 1000 biological samples from 60 individual cetaceans belonging to the following species: *Stenella coeruleoalba*, *Tursiops truncatus*, *Grampus griseus*, *Delphinus delphis*, *Ziphius cavirostris*, *Steno bredanensis*, *Globicephala melas*, *Physeter macrocephalus*, *Kogia simus*. The Marine Mammal Tissue Bank at The University of Padoa collaborates with several Institutes, among which are CSC and ICRAM, and works under CITES permits. It may be consulted online at: (<http://www.sperivet.unipd.it/tissuebank>). Also, in 2003 a bilingual (It.-E.) CD-rom relative to its activities was published. The Tissue Bank is a partner of ACCOBAMS and provides support to its Scientific Committee.

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