

The Benefits and Challenges of ecological networks: the case of the Sardinian network for the conservation of marine turtles

Outline

Part A: The Network system for habitat and species conservation

Part B: Biology, threats and protection of sea turtles

Part C: The case study of the “Sardinian Network for the conservation of marine turtles and mammals”

- Institutional agreements
- Organization
- Benefits and Challenges

Part A: The Network System

A group or system of interconnected people working in a coordinated manner who exchange information and contacts for professional or social purposes

Main threats to the Marine Environment:

- * Many marine species are protected because they are at Extinction risk
- * Overfishing and habitat loss/degradation are two of the most important variables negatively affecting the marine environment
- * The Mediterranean sea is at high pollution risk (Lloret, 2010)

International Conventions and Directives

- **Washington, 1973** → Convention on International trade in Endangered species of wild fauna and flora
- **Barcelona, 1976** → Convention for protection of the Mediterranean sea from pollution
- **Bonn, 1979** → Convention on migratory species
- **Bern, 1979** → Convention for wildlife protection
- **Rio de Janeiro, 1992** → Convention on biological diversity (CBD)
- **Habitats, 1992** → Directive for habitats conservation
- **Marine Strategy Framework Directive, 2008** → Directive on the marine policy of EU seas

* **Biodiversity**

* **Habitats**

* **Species**

* **Populations**

* Mediterranean level (large spatial scale)

* Regional level (medium spatial scale)

* Local level (small spatial scale)

Agreements and conventions provide for a cooperation strategy between member states

Ecological Network

The concept of Ecological Networks (EN) developed from a synthesis of ideas from the theory of island biogeography (MacArthur and Wilson, 1967) and metapopulation theory (Levins, 1969) that were integrated within the landscape ecology discipline

Aim: to contribute to Marine Environmental Conservation at global level (Theau et al., 2015)

ENs are designated to maintain biodiversity and ecological processes by protecting habitats and their linkages

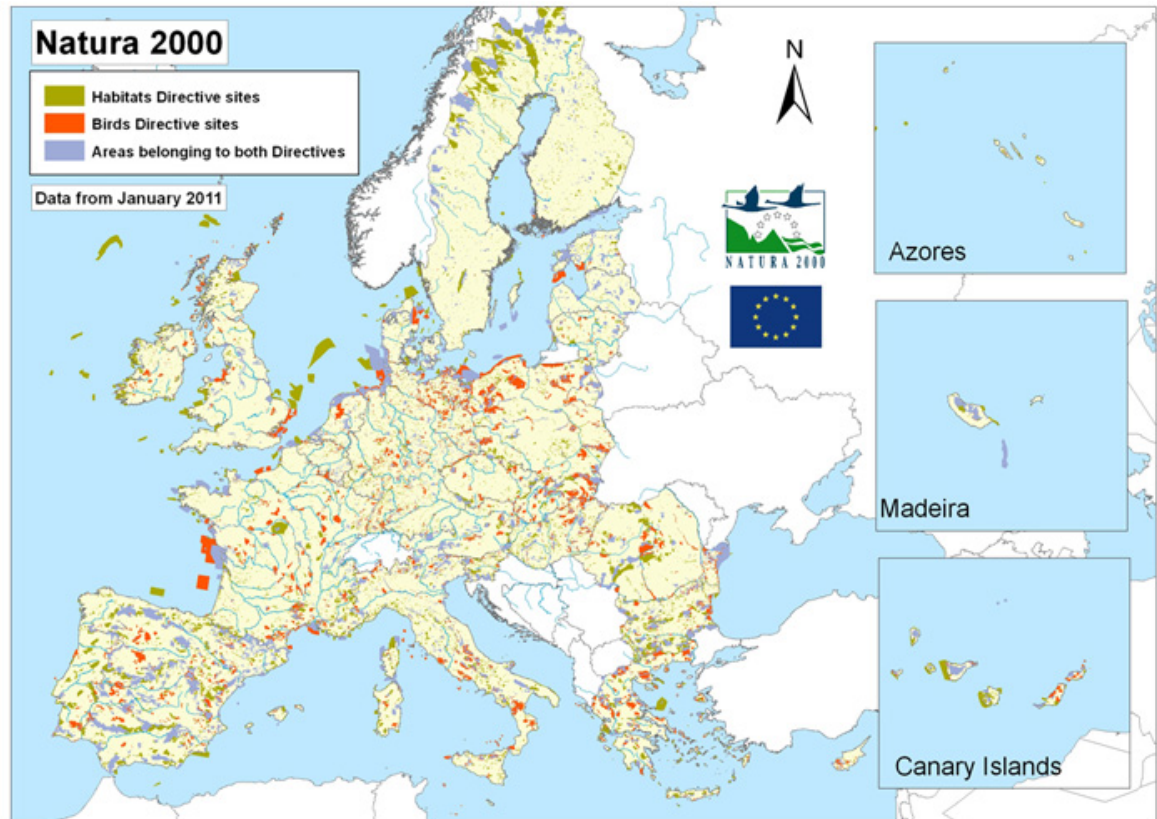
The approaches are based on single-species, multi-species, and landscape modelling categories

ENs are evaluated using ecological, economic, and social spatial thematic indicators (TI) relevant to sustainable landscape management (Theau et al., 2015)

European network of protected areas

* Natura 2000

- * “Habitats” directive
 - * SCIs – Sites of Community Importance
- * “Birds” directive
 - * SPAs – Special Protection Areas



SPAMI Network



**SPECIALLY PROTECTED AREAS OF MEDITERRANEAN IMPORTANCE (SPAMIs) ...
REGIONAL COOPERATION TOOLS FOR THE CONSERVATION OF THE MEDITERRANEAN HERITAGE...**



Date of inclusion
in the SPAMI List
2001

- Alboran Island*
- Cabo de Gata-Níjar Natural Park*
- Cap de Creus Natural Park*
- Columbretes Islands*
- Mar Menor and Oriental Mediterranean zone of the Region of Murcia coast*
- Modes Islands*
- Sea Bottom of the Levante of Almería*
- Port-Cros National Park*
- Parque Nacional de la Sierra de Guadarrama*
- Parque Nacional de la Sierra de Guadarrama*
- La Galite Archipelago*
- Zembra and Zembretta National Park*

Periodic Review:

SPAMI was subject to an ordinary periodic review. Ordinary periodic reviews take place every six years, counting from the date of the inclusion of the site in the SPAMI List.

Date of inclusion
in the SPAMI List
2003

- Archipelago of Cabrera National Park*
- Maro-Cerro Gordo Cliffs*

Date of inclusion
in the SPAMI List
2005

- Banc des Kabyles Marine Reserve*
- Habibas Islands*
- Portofino National Marine Protected Area*

Date of inclusion
in the SPAMI List
2008

- Tanfara-Porta Coda Cavallo Marine Protected Area*
- The Minerva Marine Protected Area*
- The Plemmirio Marine Protected Area*
- Toni Gasceto Marine Protected Area and Natural Reserve*

Date of inclusion
in the SPAMI List
2009

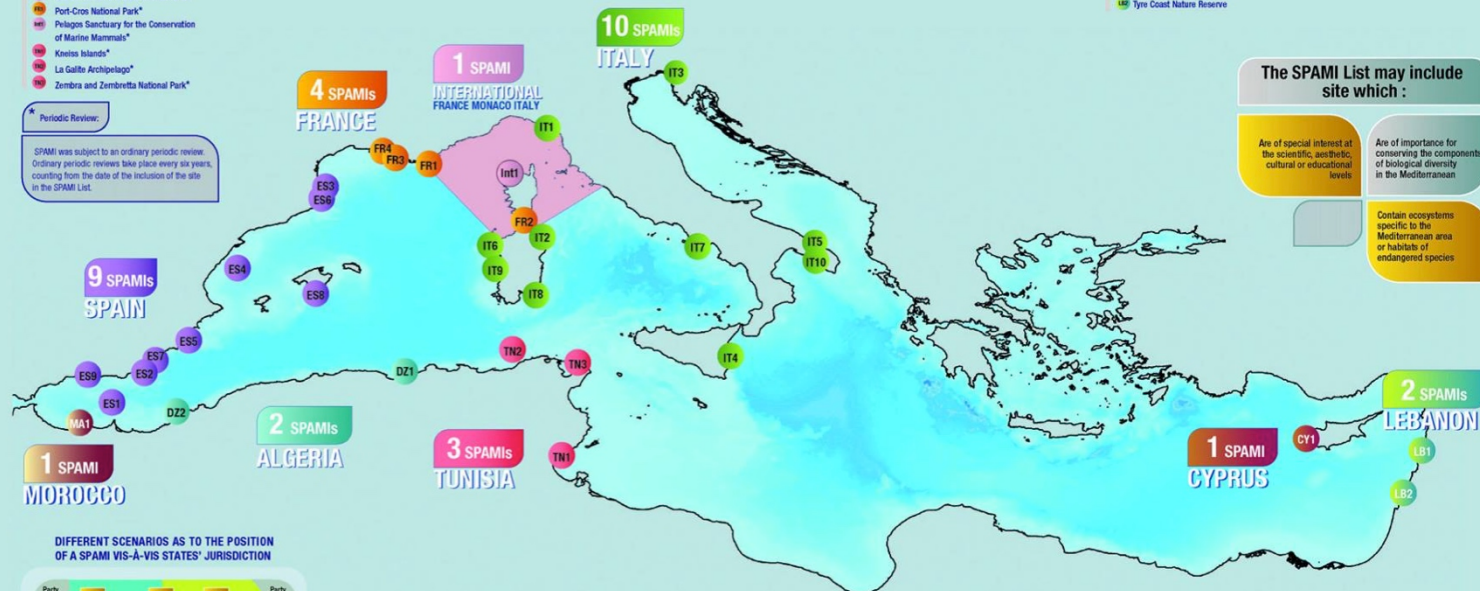
- Natural Reserve of Bouches de Bonifacio*
- Marine Protected Area Capo Caccia-Isola Piana*
- Marine Protected Area Punta Campanella*
- Al-Hocima National Park*

Date of inclusion
in the SPAMI List
2012

- The Blue Coast Marine Park
- The Embiez Archipelago - Six Fours
- Cabo Carbonara Marine Protected Area
- Península del Sini - Isla di Mal di Ventre Marine Protected Area
- Porto Cossaro Marine Protected Area
- Palm Islands Nature Reserve
- Tyne Coast Nature Reserve

Date of inclusion
in the SPAMI List
2013

- The Lura - Toveffa Turtle Reserve



DIFFERENT SCENARIOS AS TO THE POSITION
OF A SPAMI VIS-À-VIS STATES' JURISDICTION



SPAMIs could be established not only in the marine and coastal zones subject to the sovereignty or jurisdiction of the Parties (1, 2 & 3), but also in zones party (4 & 5) or wholly on the high sea (6).

The SPAMI List includes 33 sites :

Last update: 18th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols (COP 18 - Istanbul, Turkey, Dec. 2013)



Difficulties and Benefits of the Network system

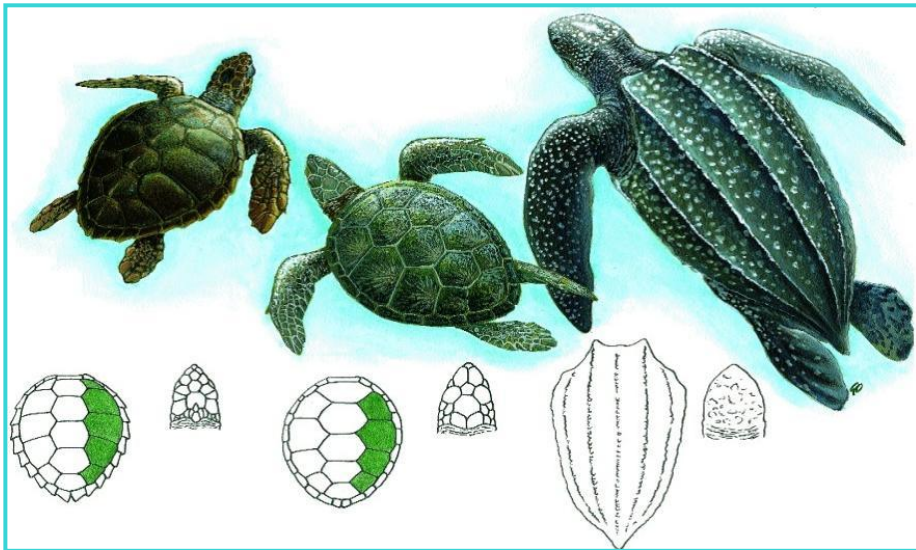
Protection and management methods vary depending on the species considered

Applying an holistic approach to the organization of ENs makes it possible to protect many species at the same time and in different geographic locations across jurisdictions

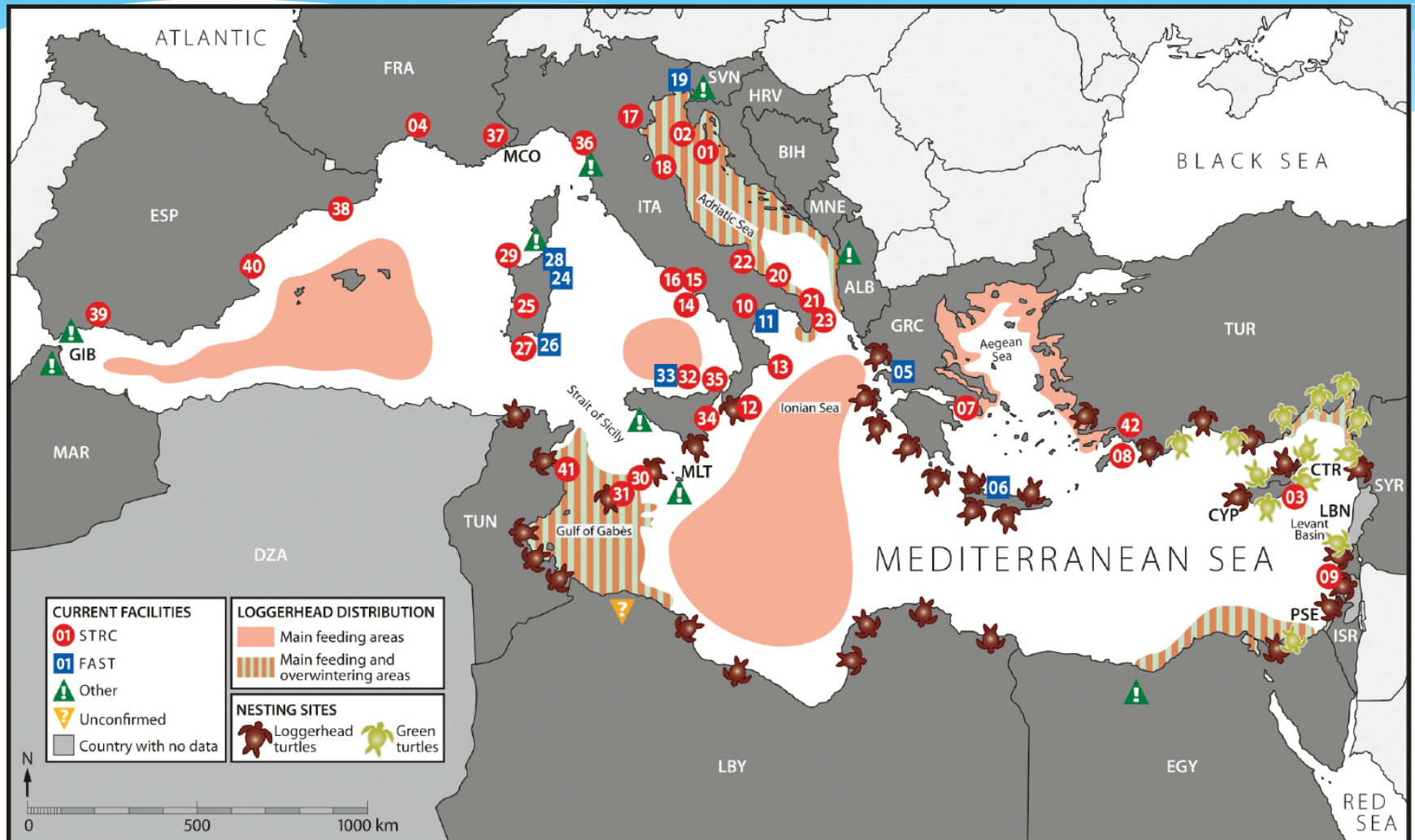
Sea turtle populations decline is difficult to stop if the cooperation and standardization of procedures differ and the legal and policy frameworks are not properly implemented

Part B: Sea turtles

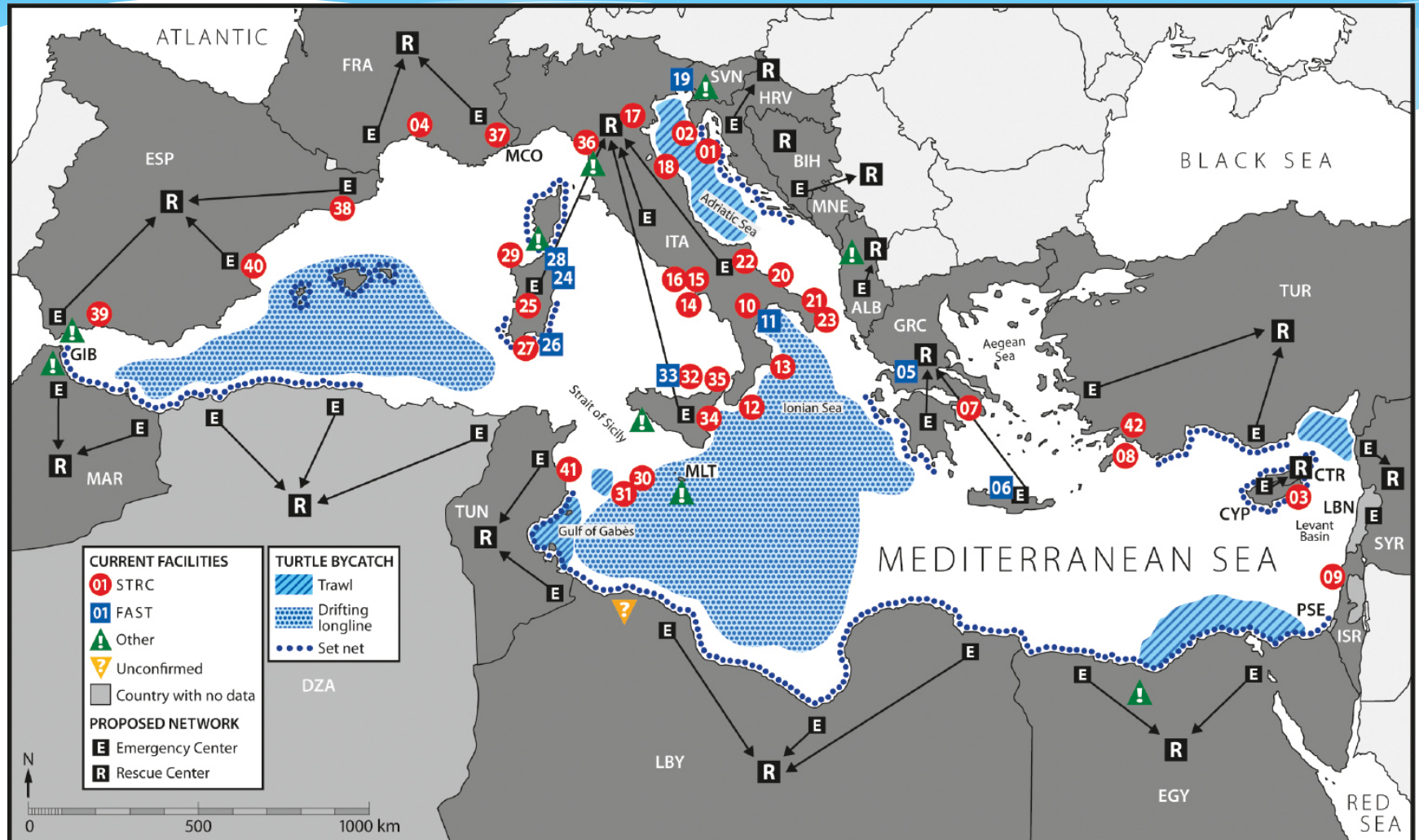
- * Migratory species
- * 3 species in the Mediterranean Sea
- * Frequent on both marine coastal zones and beaches → Threatened by human impacts (Lutcavage et al., 1977; IUCN, 2013)



Movements of Loggerhead and Green sea turtles in the Mediterranean



Fishery impact



International Conventions on Sea Turtles

Species	Inclusion in Directives, EU agreements, International Conventions							
	Be 2	Cms 1	Cms 2	Cit I	Ha II	Ha IV	Spa II	R.1967
<i>Caretta caretta</i>	*	*	*	*A	*	*	*	*
<i>Chelonia mydas</i>	*	*	*	*A	*	*	*	*
<i>Dermochelys coriacea</i>	*	*	*	*A		*	*	*

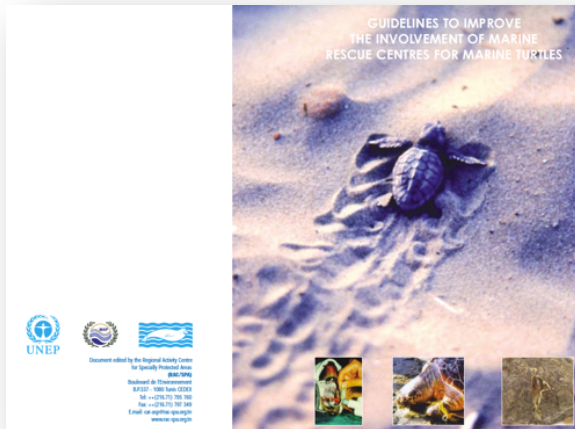
In 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP)

The main objectives of the MAP were to assist the Mediterranean countries to:

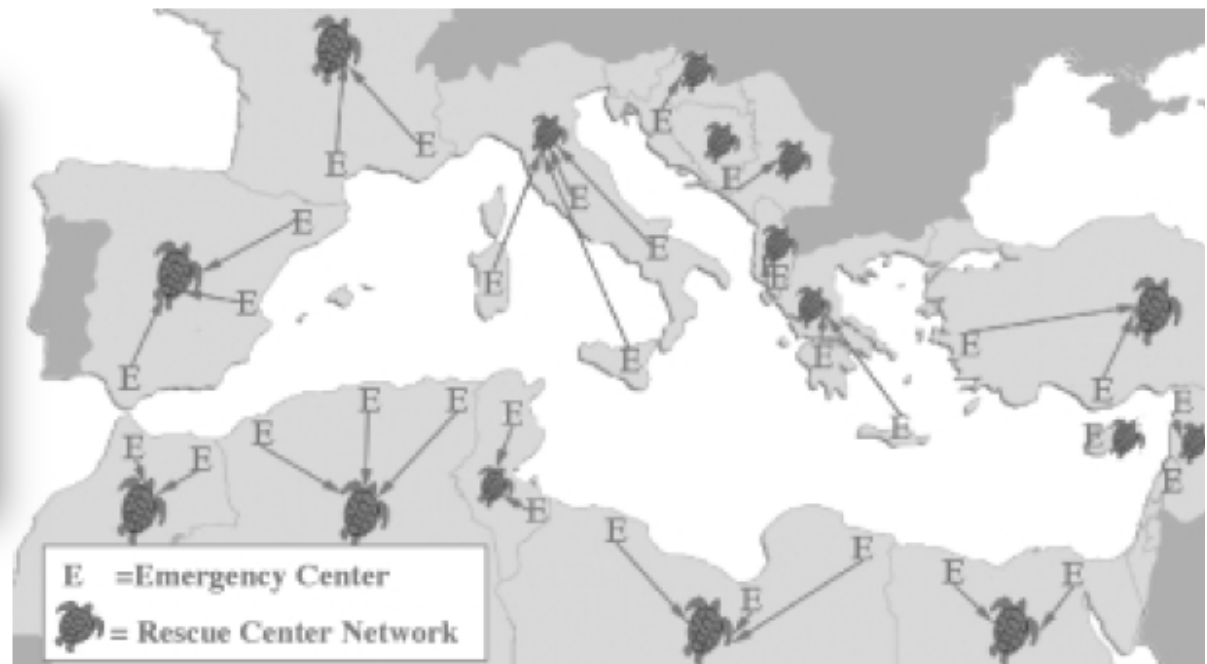
- assess and control marine pollution
- formulate their national environmental policies
- improve the ability of governments to identify better options for alternative patterns of development
- optimize the choices for allocation of resources

Network of Rescue and emergency centres of the Mediterranean area coordinated by RAC/SPA

UNEP (*United Nations Environmental Programme*) developed the Action Plan for the conservation of sea turtles in Mediterranean (UNEP/OCA, 1999)



UNEP-MAP, RAC/SPA, 2004)



Part C: Roles of the Sardinian Regional Network on the conservation of sea turtles



2004, constitution of the “Sardinian Regional Network”

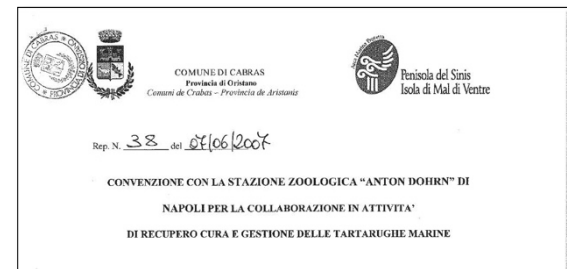


RETE REGIONALE
PER LA CONSERVAZIONE
DELLA FAUNA MARINA
SARDEGNA

The first institutional and operative
Network organization in Italy

Framework Agreement between Sardinian Regional Body (RAS) and:

- * MPAs
- * NPs
- * Vigilance bodies
- * Stazione Zoologica “Anton Dohrn”, Naples



Organisational aim: have specific roles and act according to a methodical, coordinated and synergistic organization

2010, Sinis MPA and IAMC-CNR: Official institution of the Sinis Rescue Centre (CReS)



Rescue and rehabilitation centre for
about 50 injured sea turtles per year

- Memorandum of Understanding:
 - Cabras Municipality and IAMC-CNR of Oristano (deliberazione del Consiglio Comunale N. 21 del 21.04.2010)
- Scientific collaboration agreement
 - Rep. N. 70 del 13.10.2010)



Areas of competence – nodes of the Network



Network Organization



Rescue Centres



Emergency Centres

Involvement of Institutional Bodies, Vigilance Bodies, Local recreational Associations



GIONHA Project 2009-2012

Protection of “Pelagos” Sanctuary and Sardinian coastline habitat

Partner:

- ARPAT (Tuscany)
- Liguria
- Prov. Livorno (Tuscany)
- Sardinia
- OEC (Corse)
- Principato di Monaco (France)

Benefits:

- Rescue procedures *standardization*
- Regional Guidelines processing and publishing
- Improvement of the Sardinian Network with economic resources to:
 - Rescue centre equipment
 - Activities
 - Collaborations start-up



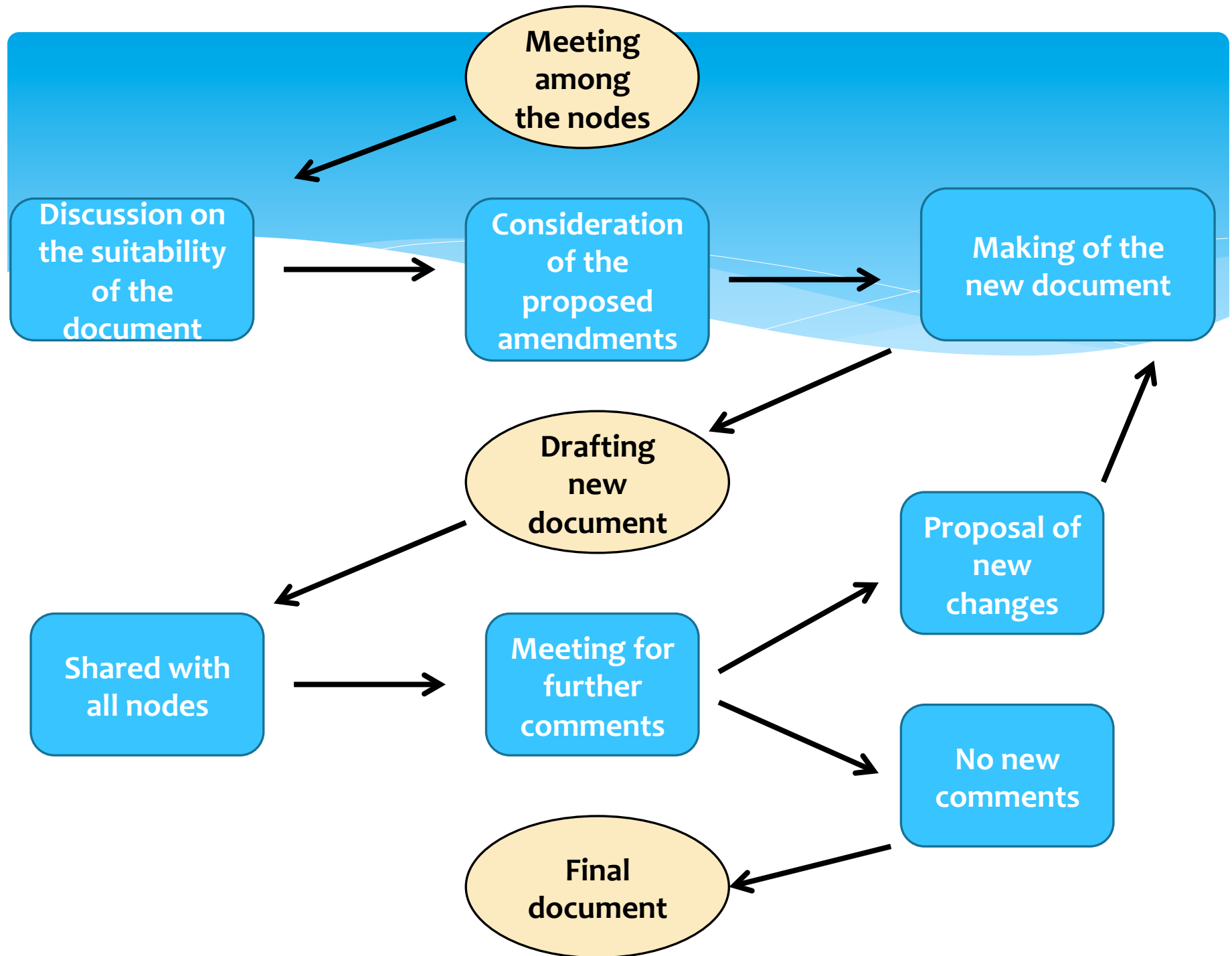
We need new projects to improve the conservation activities and Network implementation

Technical committee

* Involvement of experts for each topic discussed:

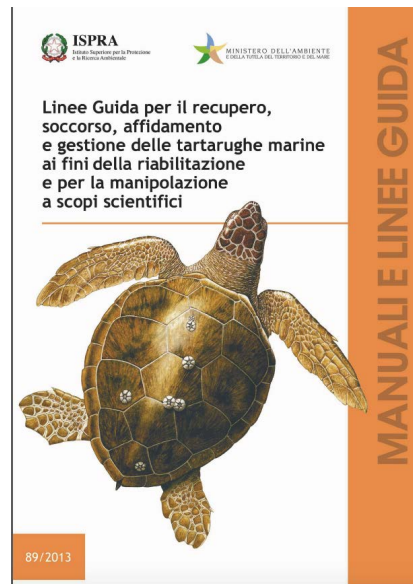
- * Researchers
- * Vets
- * Administrations
- * Technics
- * Volunteers
- * Associations
- * Citizens



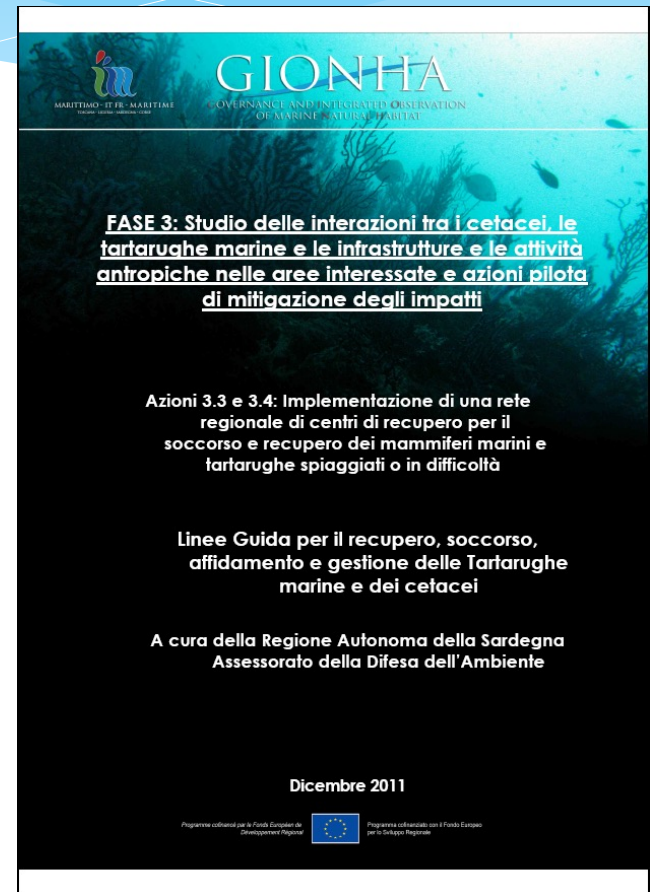


Regional guidelines

- Rescue and Emergency Centres classification
- First Aid Procedure
- Data collection
- Scientific monitoring
- Environmental education

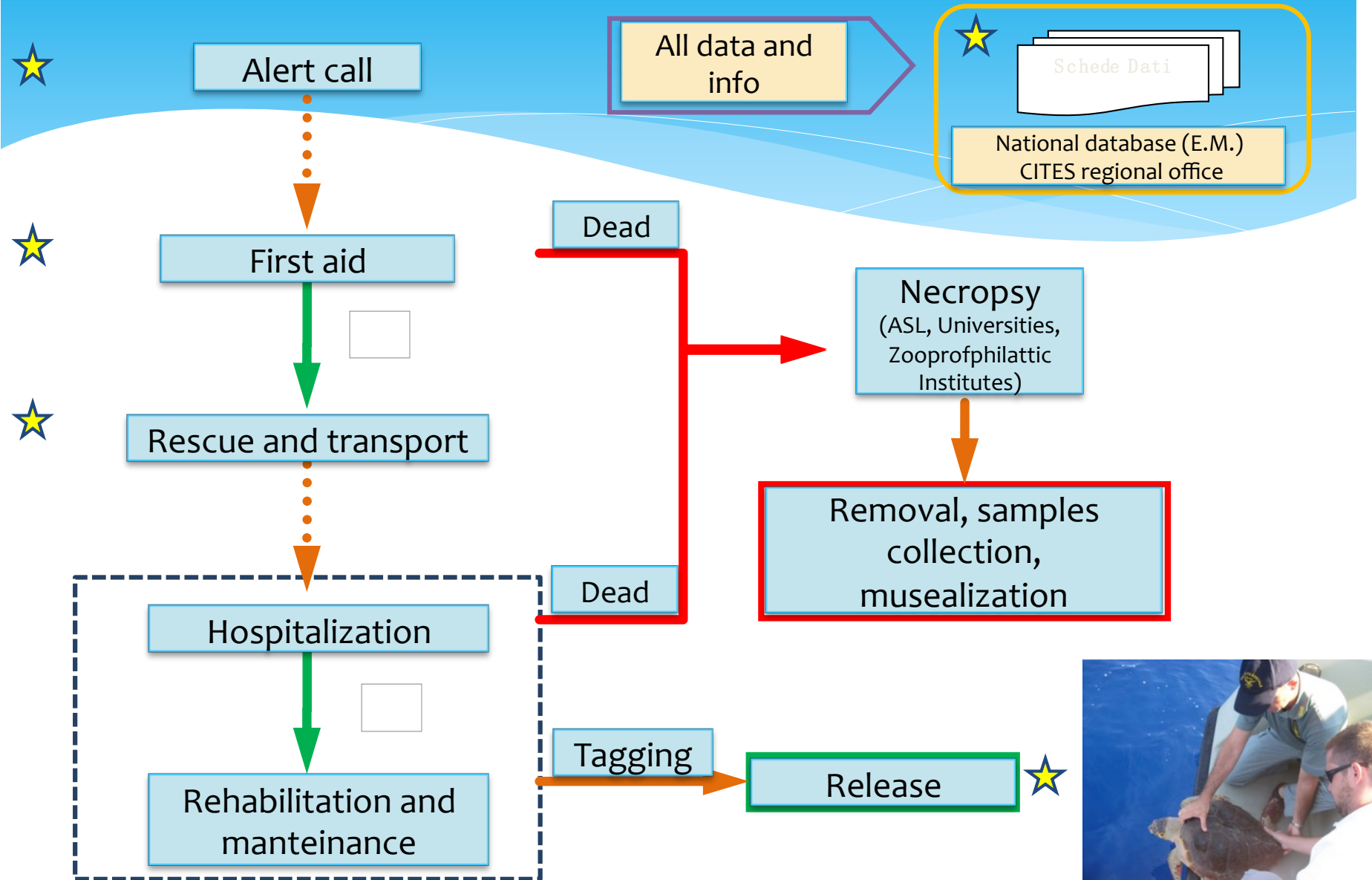


(MATTM, 2013)



(RAS, 2011)

Intervention procedure



Standardization at regional level



Immediately rescued and transported in standardized tanks



X Ray is the first medical examination in all cases

Monitoring Network of released turtles

- * It is possible only in a Network system
 - * Capture – release – recapture
(Not limited to the Mediterranean as sea turtles are a migratory species which moves also out of the basin)
- * Tags standard models
 - * Typology, material, univocal serial number

Archie Carr Sea Turtle Tag Inventory:

<http://accstr.ufl.edu/resources/tag-inventory/>



“Monitoring – Rescue” data sheet

- Standardized for the entire Network
- Small format for field use

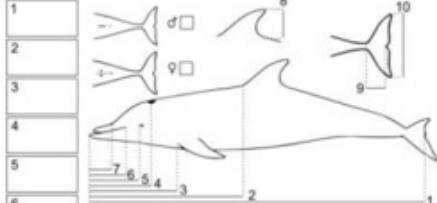


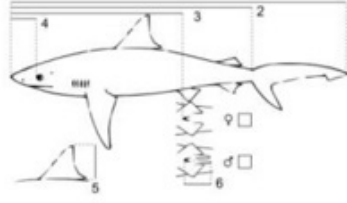
SCHEDA MONITORAGGIO RECUPERI
Centro di Recupero del Sinis

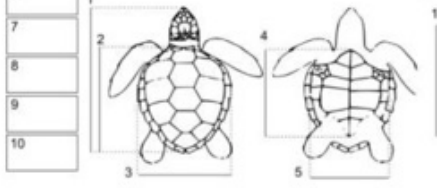


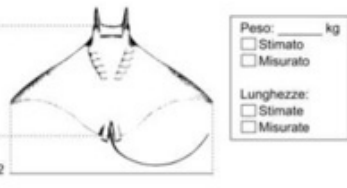

NODO _____ **N° SCHEDA** _____

SPECIE	DATA	COMUNE	PR
LOCALITA'			
LAT	LONG	MIGLIA DALLA COSTA	
CITES: Registro n°	CARICO:	SCARICO:	









CONDIZIONE ESEMPLARE

CODICE 0 1 2 3 4 5

0 - **Vivo**: 1 - **Aggravato debole**: Animale reperito vivo o deceduto al max da 2 hr.; 2 - **Caricasso fresco**: Deceduto entro le 24 hr., aspetto normale con minime danni da animali spazzini; odore normale; nessuna dissimulazione cutanea ed invecchiamento della cute; occhi e mucose appaiono; occhi pieni e lucidi; carcassa non grigia; lingue e penne non protrudenti; 3 - **Decomposizione moderata**: Carcassa integra, rigonfiamento evidente (lingue e penne protrudenti); cute non integra con aree di distacco; possibili danni da animali spazzini; lieve odore caratteristico; mucose appaiono secche; occhi infossati o mancanti; 4 - **Decomposizione avanzata**: La carcassa può essere integra, ma collassata; ampie aree di dissimulazione cutanea; gravi danni da animali opportunisti; odore forte; muscoli e bubble facilmente esportabili e staccabili dall'osso; liquefazione organi interni; 5 - **Resti scheletrici emulsionati**: Ripreso cute dissalata e secca sopra le ossa, secco.



SCHEDA
AVVISTAMENTO TARTARUGHE MARINE

ENTE APPARTENENZA:	
COMPILATORE SCHEDA (Nome/Cognome):	
CONTATTO (e-mail/telefono/fax):	

DATA AVVISTAMENTO:	LOCALITA':
IMBARCAZIONE:	
COPIERTURA CIELO (0-100%):	MARE :
VENTO:	DIREZIONE:

ORA CONTATTO:	COORDINATE INIZIO AVVISTAMENTO:
ORA TERMINE:	COORDINATE FINE AVVISTAMENTO:

SPECIE AVVISTATA:

TOT ESEMPLARI OSSERVATI:

COMPORTAMENTO:

GALLEGGIAMENTO IN SUPERFICIE (basking): l'esemplare effettua un "bagno di sole" in superficie in cui è visibile anche la parte superiore del carapace che fuoriesce dall'acqua.

SPOSTAMENTO: l'esemplare si sposta secondo una direzione abbastanza precisa.

ACCOPIAMENTO: sono visibili 2 esemplari; il maschio sormonta la femmina agganciandosi al suo carapace.

ALTRO (indicare altri tipi di comportamento):

NOTE:

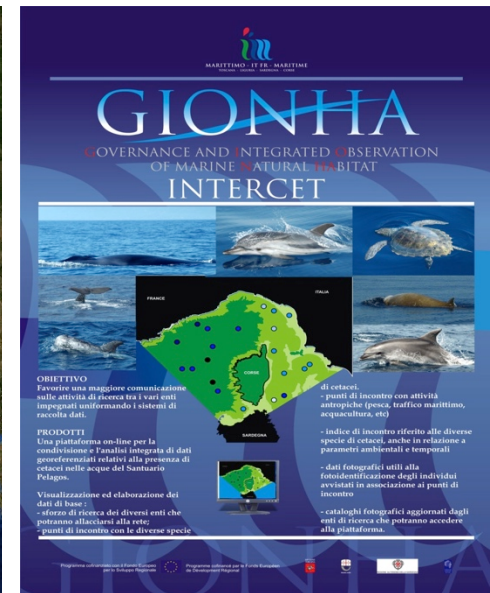
DOC. FOTOGRAFICA: SI/NO	DOC. VIDEO: SI/NO
CONTATTO AUTORE:	

Intercet platform

- * GIS shared database in a transboundary network to promote cooperation between researches employed for sea turtles and cetaceans monitoring.



Contatore	ID_Avvistamento	Data	Zona	Specie	Tot_ind	N_Giovani	Ora_inizio	Ora_fine	Durata (minuti)	ID_Rilevamento	WP_inizio	WP_inizio_Lat	WP_inizio_Long	WP_fine
212	A112	13/05/2008	B	T. t.	8	1	17.05	18.48	103	R128	508	44,336	9,144	509



Operative office

Oristano section of IAMC-CNR



Physiotherapeutic centre



Administration office



Pre-releasing centre



Vet clinic



Pre-releasing and educational centre



Rehabilitation centre



Actual CReS network collaboration



Network system analysis

- * **Benefits:**

- * Procedures standardization → Efficiency
- * Optimization of resources

- * **Challenges:**

- * Strengthening the Mediterranean cooperation group
- * Conservation of the Mediterranean sea turtles populations



Thanks for your attention !

Contacts:

giuseppe.delucia@cnr.it

andrea.camedda@iamc.cnr.it

facebook.

CReS-Centro di Recupero del Sinis