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Tools for MPA governance: management plans
MAIA INTERNATIONAL WORKSHOP



Co-management and fisheries risk assessments : a case study within the French Natura 2000 network

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A Coruña, 12th May 2012



Summary

- MPA management planning
- Fishermen's knowledge
- Implementation of Natura 2000 in France
- Risk assessment methodology:
 - Suggested approach
 - Information on habitats
 - Information on fishing activities
 - Information on interactions
 - Overlaying information
- Conclusions



MPA management planning

- Main goals of MPAs :
 - Conservation and protection of natural resources
 - Restoration/recovery of damaged or overexploited zones
 - Increased fisheries' efficiency
 - Sustainable exploitation of resources
 - Increased knowledge of marine ecosystem functioning
 - Improvement of resource use and users interactions through management
 - Protection and promotion of historical, cultural and aesthetic heritage
- Taking into account both the ecological and social context of MPAs results in more integrated marine/coastal management within a given zone (Leleu, 2012)

MPA management planning

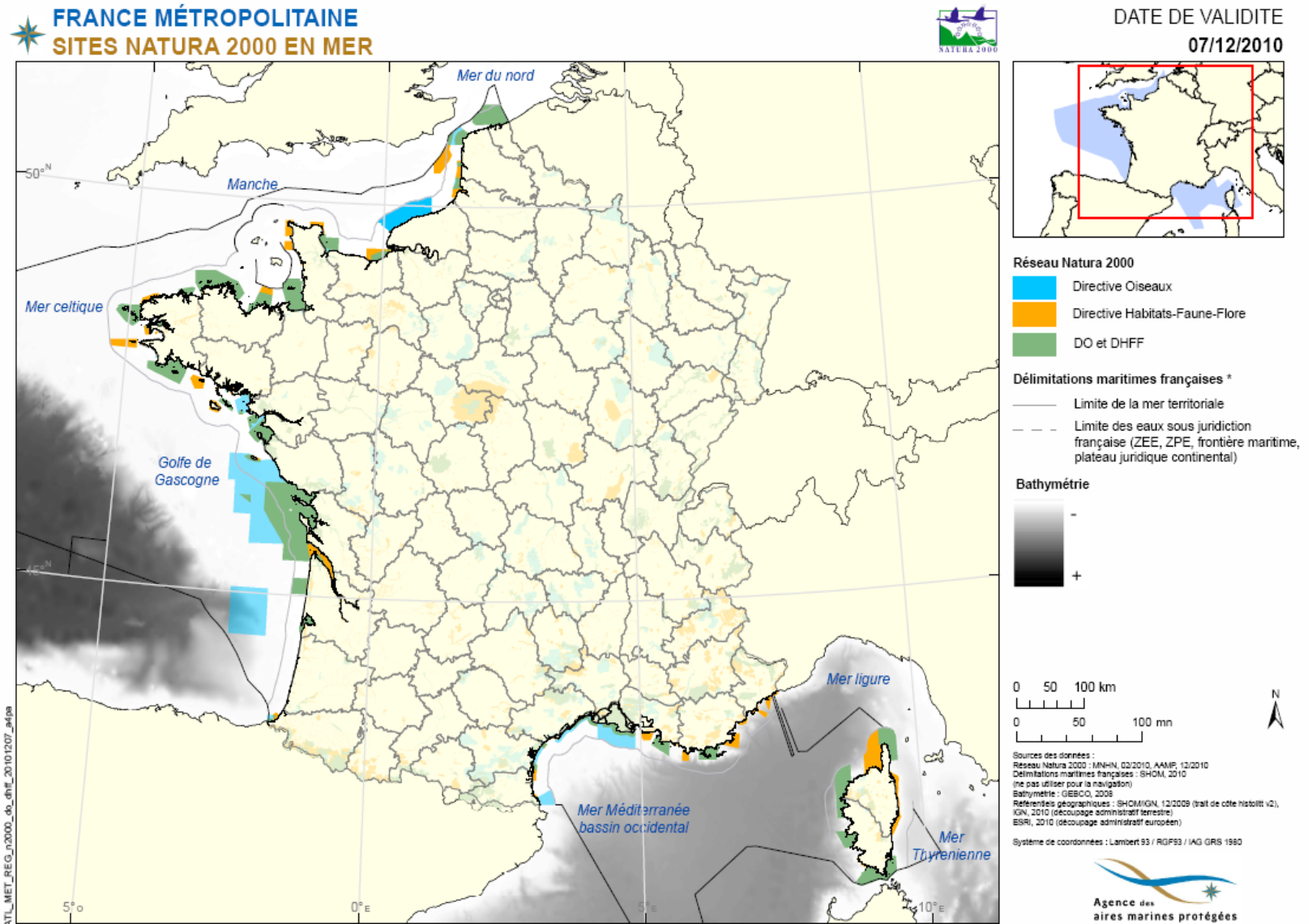
- Integrated approach :
 - Requires a good understanding of the distribution of human activities (temporal and spatial), particularly those concerned with fishing,
 - Involves visualizing activities in a cartographic form, and linking these to associated relevant data (quantitative and qualitative)
 - Provides a sound basis for management planning (Hall et al., 2006).
- Allows :
 - Identification of pressures and resultant (potential) impacts of fishing activities
 - Identification of effects of management measures on fishing activities (efficiency)
- Spatial information is therefore essential



Fishermen's knowledge

- Specificities of fishing activities make their characterization complex in a given area:
 - Diversity of practices (gears and “métiers”)
 - Spatial and temporal variability of the activities
 - Lack of data or monitoring (e.g. artisanal fisheries)
- Fishermen's knowledge is essential therefore as:
 - fishermen have detailed knowledge of stocks, the marine environment and fishing practices (Neis and al., 1999)
 - collaborative studies improve the quality and quantity of scientific understanding (particularly data resolution) (Johnson, 2007)
 - this information can provide alternative or/and complementary basis for sustainable management (Berkesn 1993 ; Freeman 1992 ; Gadgil et al. 1993 in Neis et al. 1999)

Implementation of Natura 2000 in France



Implementation of Natura 2000 in France

- Management based on a participative approach
- In each Natura 2000 site :
 - A **steering committee** (“comité de pilotage”) brings together a range of stakeholders, including site users, NGOs, relevant local policy makers and civil society
 - A **facilitator** (“opérateur”) is selected (one of the stakeholders of the steering committee)
 - The facilitator chairs the steering committee and ensures the development of the “**DOCOB**”
 - The DOCOB:
 - defines **conservation objectives** and suggested **management measures**
 - is based on **environmental** analyses and **socio-economic** information (including all activities within the site)
 - **Management measures** then introduced under various legislative procedures (contract, charter, regulation...)
- See S. Lecerf & A. Hubert presentation

A close-up photograph of a fish's head, focusing on the scales and the eye. The scales are light-colored with dark, wavy lines running across them. The eye is visible in the upper left corner.

Fisheries risk assessments within the French Natura 2000 network

Partners : Fisheries Ministry – Fishermen (CNPMM) – IFREMER – French MPA Agency – Environment Ministry

- **Needs :**
 - An operational and standardised method to implement the DOCOB and article 6 of the Habitats Directive
 - Based on standard, objective and transparent parameters
- **Issue :**
 - Homogenous method across the Natura 2000 network to insure coherence and equality in assessment/measures
- **Why « risk assessment » ?**
 - Past impacts are hard to quantify and discern (deterioration due to multiple activities) and dependent on long data series (rarely available).
 - ➔ A « **forward looking** » approach based on a risk assessment
 - **Risk** defined as : The **probability** that an **event** occurs and causes an **impact** (risk combines likelihood and severity of event)

Proposed methodology

Risk with Natura 2000 = Probability that a habitat (of greater or lesser sensitivity) is affected by a fishing event (of greater or lesser intensity)

➔ Overlay 3 types of information using GIS:

- I: **Information on habitats**
- II: Information on fishing activities (probability of occurrence and intensity)
- III: Information on interactions (habitat sensitivity and subsequent effects)



Proposed methodology

Risk with Natura 2000 = Probability that a habitat (of greater or lesser sensitivity) is affected by a fishing event (of greater or lesser intensity)

- **I: Information on habitats (3 parameters)**
 - Habitat distribution within the site (map)
 - Conservation status of habitats
 - Importance of the site for the network
- » Context parameters »

Proposed methodology

Risk with Natura 2000 = Probability that a habitat (of greater or lesser sensitivity) is affected by a fishing event (of greater or lesser intensity)

- **II : Information on fishing activities (occurrence probability and intensity, seasonality)**
 - **Fishing activity within the Natura 2000 sites (and over which habitats specifically)**
 - **Intensity and seasonality of fishing activities**



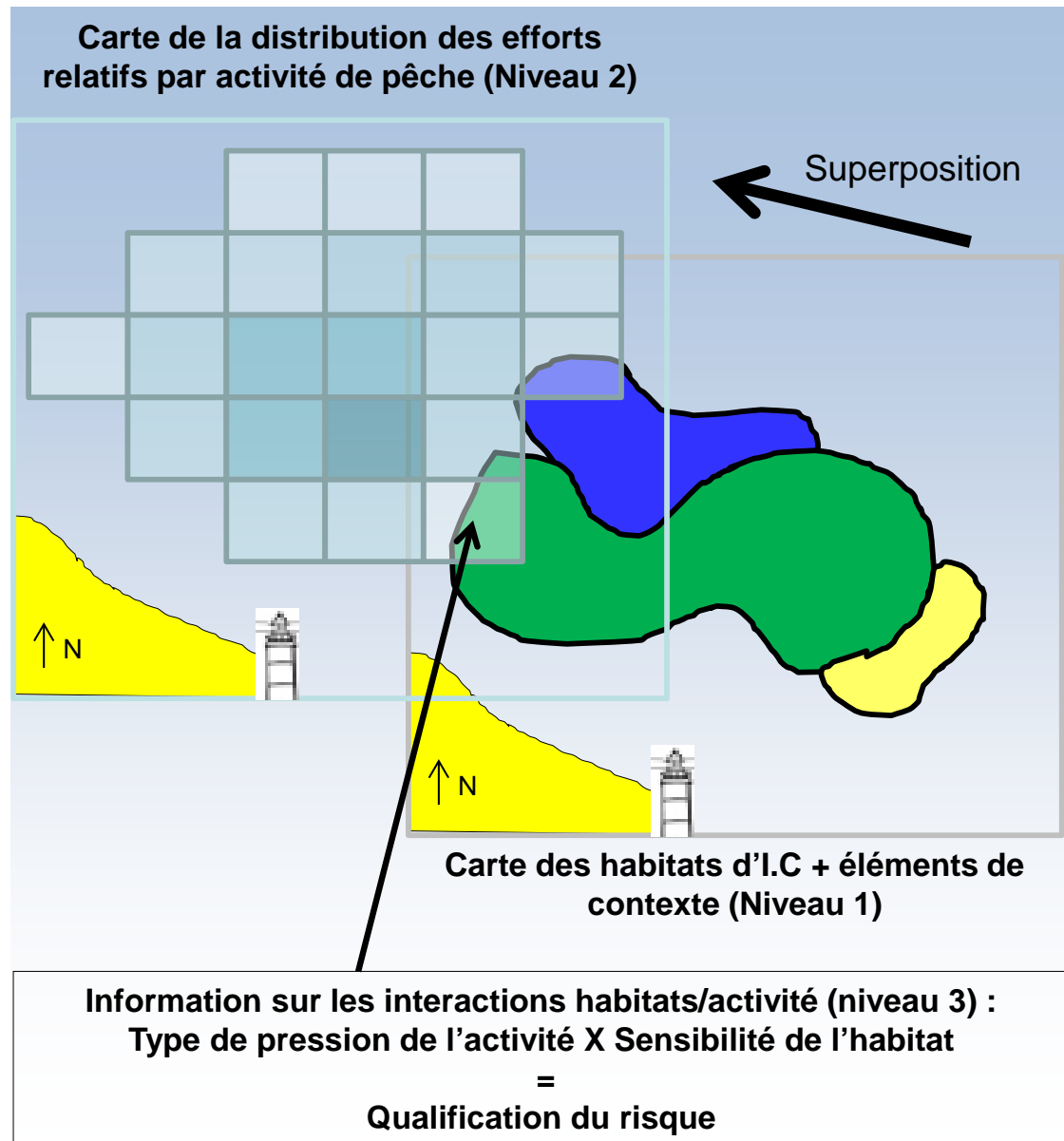


Proposed methodology

Risk with Natura 2000 = Probability that a habitat (of greater or lesser sensitivity) is affected by a fishing event (of greater or lesser intensity)

- **III: Information on interactions (effects and sensitivity)**
 - **Characterisation of physical pressures associated with fishing** (biological pressures not considered)
 - **Habitats sensitivity to physical pressures** (= fragility + recoverability)

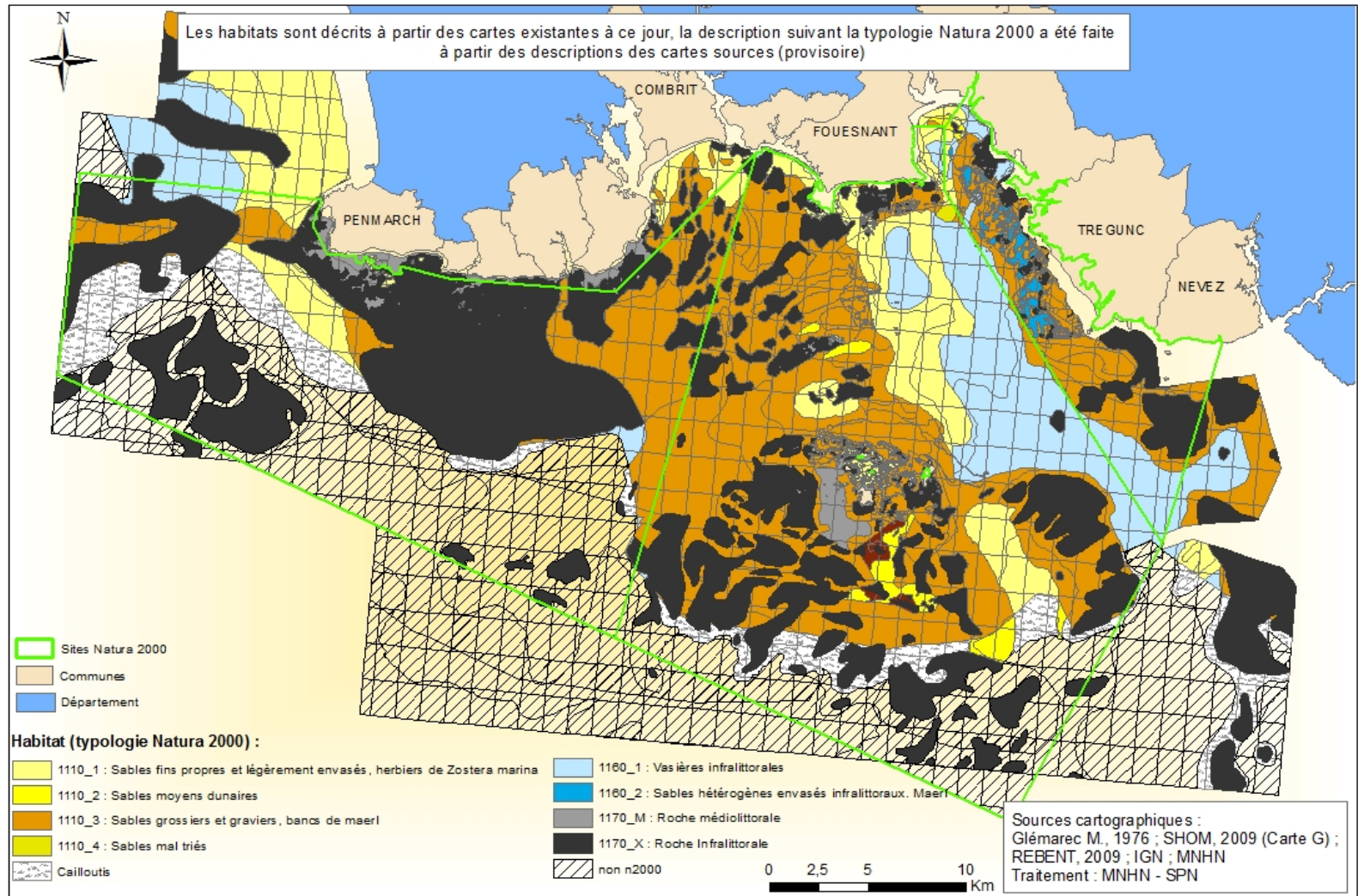
Proposed methodology



Information on habitats

1) Distribution of Natura 2000 habitats within 3 sites

Distribution des habitats naturels au sein des sites Natura 2000 de Trévignon, de l'Archipel des Glénans et des Roches de Penmarch

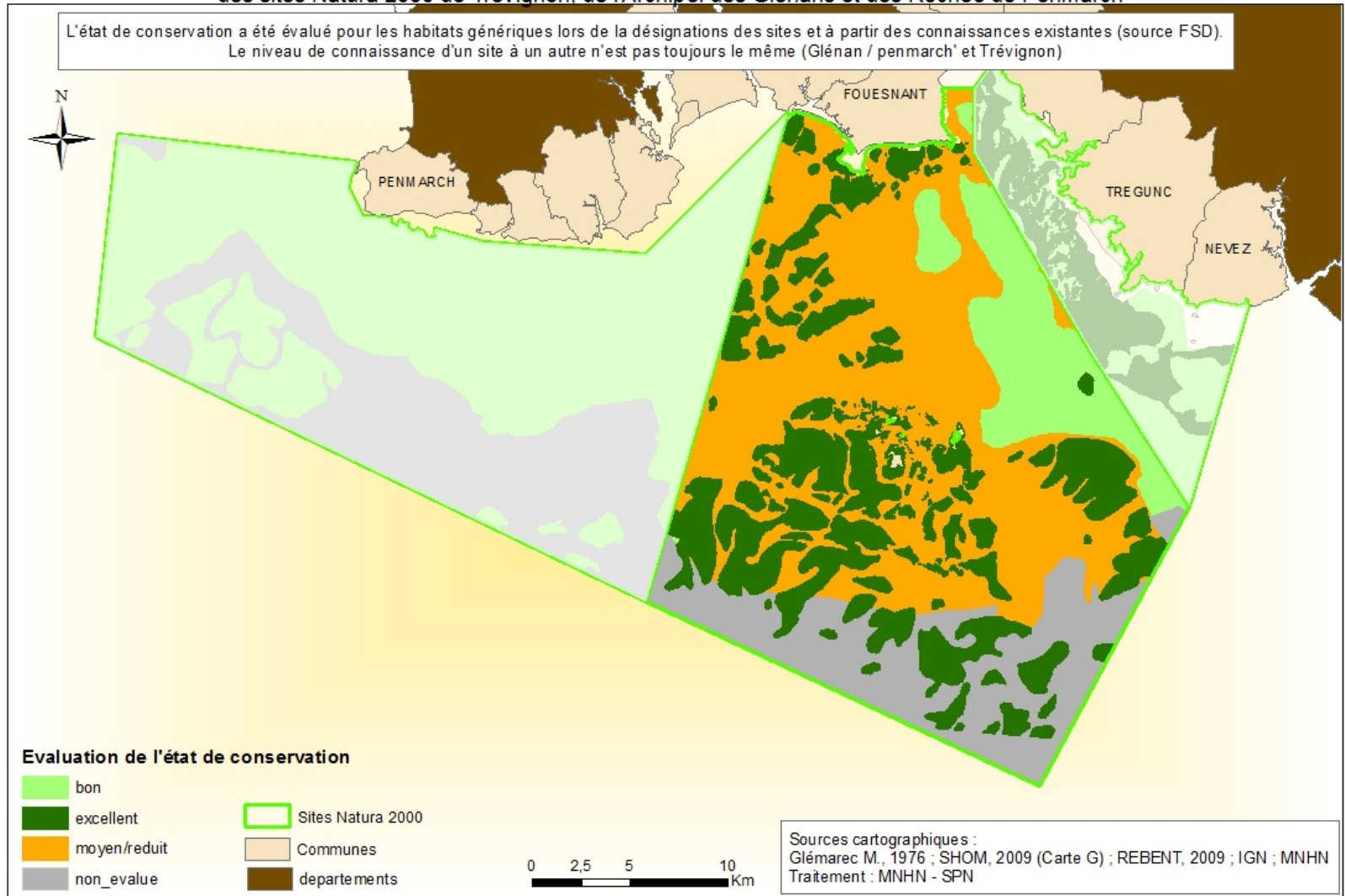


Information on habitats

2) Conservation status (2007 evaluation)

Evaluation de l'état de conservation des habitats (génériques)
des sites Natura 2000 de Trévignon, de l'Archipel des Glénans et des Roches de Penmarch

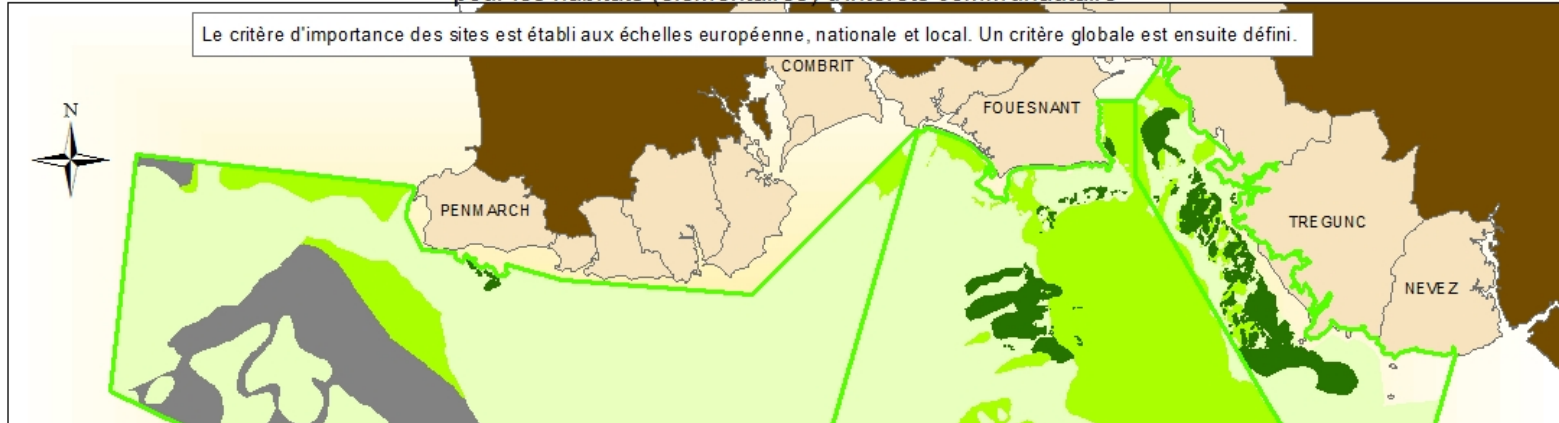
L'état de conservation a été évalué pour les habitats génériques lors de la désignations des sites et à partir des connaissances existantes (source FSD).
Le niveau de connaissance d'un site à un autre n'est pas toujours le même (Glénan / penmarch' et Trévignon)



Informations on habitats

3) Importance of the N2000 site for each habitat (preliminary results obtained)

Critère d'importance des sites Natura 2000 de Trévignon, de l'Archipel des Glénans et des Roches de Penmarch pour les habitats (élémentaires) d'intérêts communautaire



Defined at 3 scales :

- **European** : Priority habitat type
- **National** : Based on directive classification (article 1-c), regarding representativity at national scale
- **Local** : Location (coherence of network) / Habitat representativity within the site / Site specificities (function, distribution area limits)



Information on fishing activities

Distribution of fishing activities within the Natura 2000 site

Precision : **What, where, when and at which intensities do fishing activities take place within Natura 2000 sites ?**

Goal : Map of fishing activities within Natura 2000 site

Issue : - Identify fishing zones and their interactions with habitats
- Assess the importance (through fishing effort) of these zones for the industry

Two ways to collect data :

- 1) Boats **with** VMS systems
- 2) Boats **without** VMS systems

1) Aggregated VMS data interpretation (speed < 4,5 knots → effort distribution)

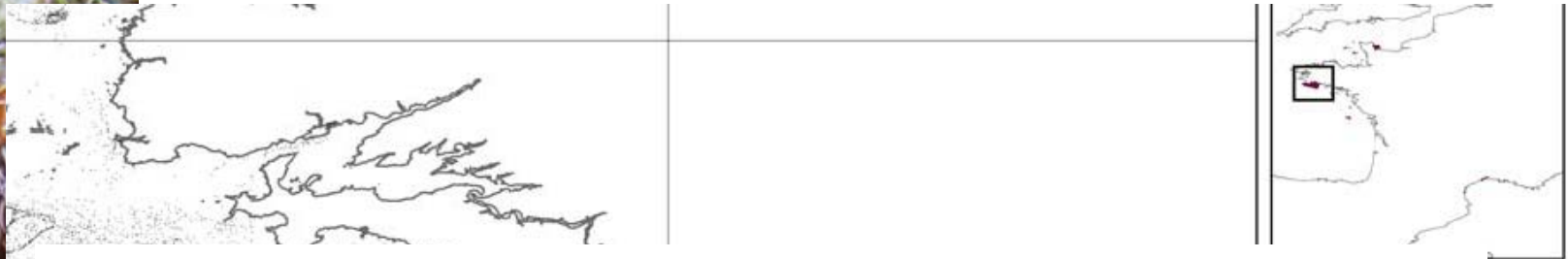
2) Description of fishing activities summarised per Natura 2000 site (number of boats, sizes, effort, port)

→ For some activities complementary information is needed (**through fishermen interviews**)

All data must be aggregated (legal consideration → vessels remain non-identifiable)

Information on fishing activities

Fishing activity distribution based on VMS 'pings'



Uncertainties regarding VMS interpretation within limited areas and along coastal zone due to :

- manoeuvres close to harbour
- fishing speed dependent on "metier"
- strong currents
- storms

Results can be presented via workshops to fishermen for feedback and improvement

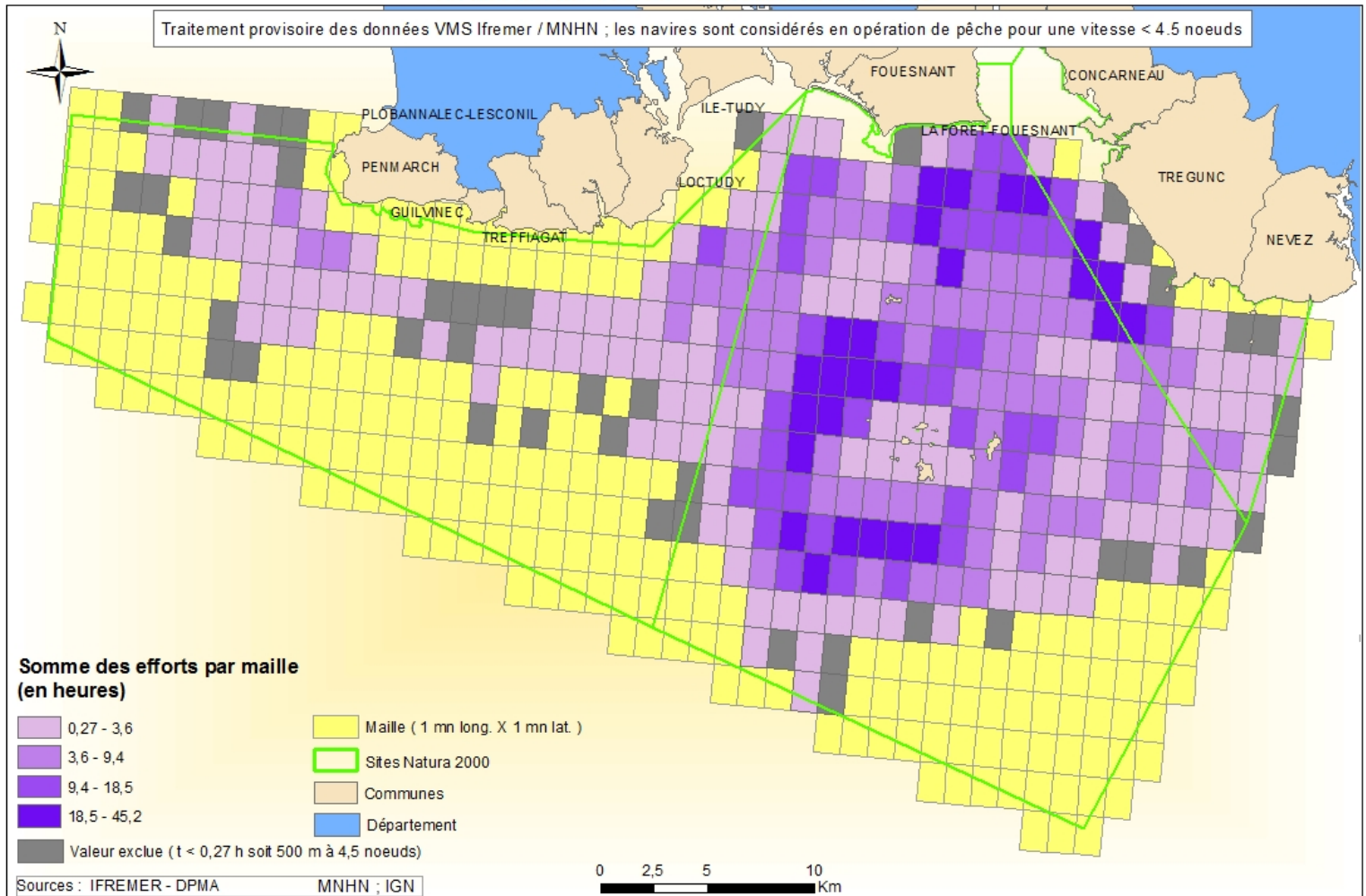
➔ Activities and ecological knowledge



Information on fishing activities

Provisional results using VMS data : Seine fishing
Boat size > 15 meters

Distribution des efforts de pêches pour les navires de plus de 15 mètres en 2009
au filet tournant au sein des sites Natura 2000

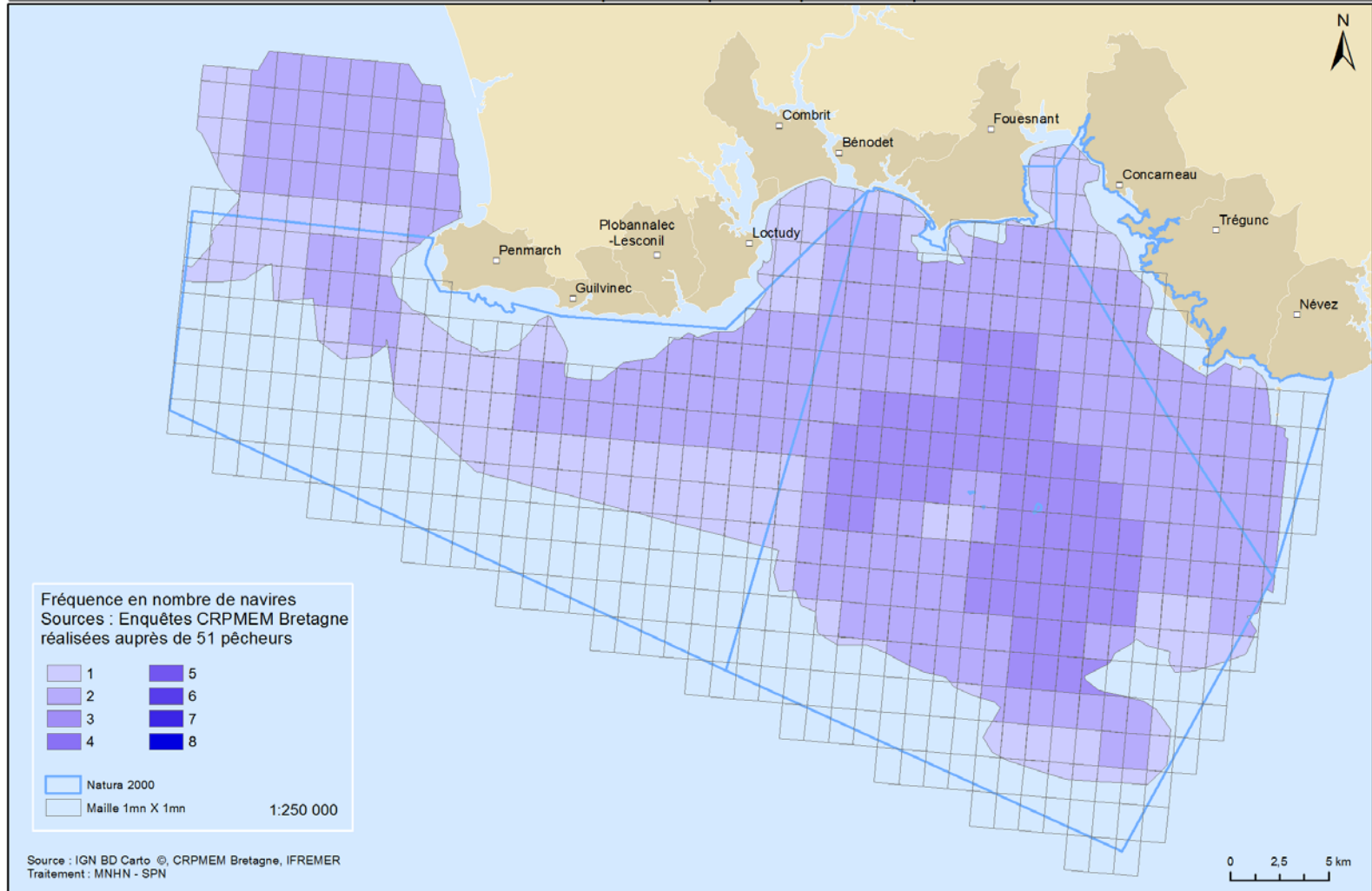


Information on fishing activities

Provisional results from interviews (Fishers organisation data) : seine fishing

Boat size > 15 meters

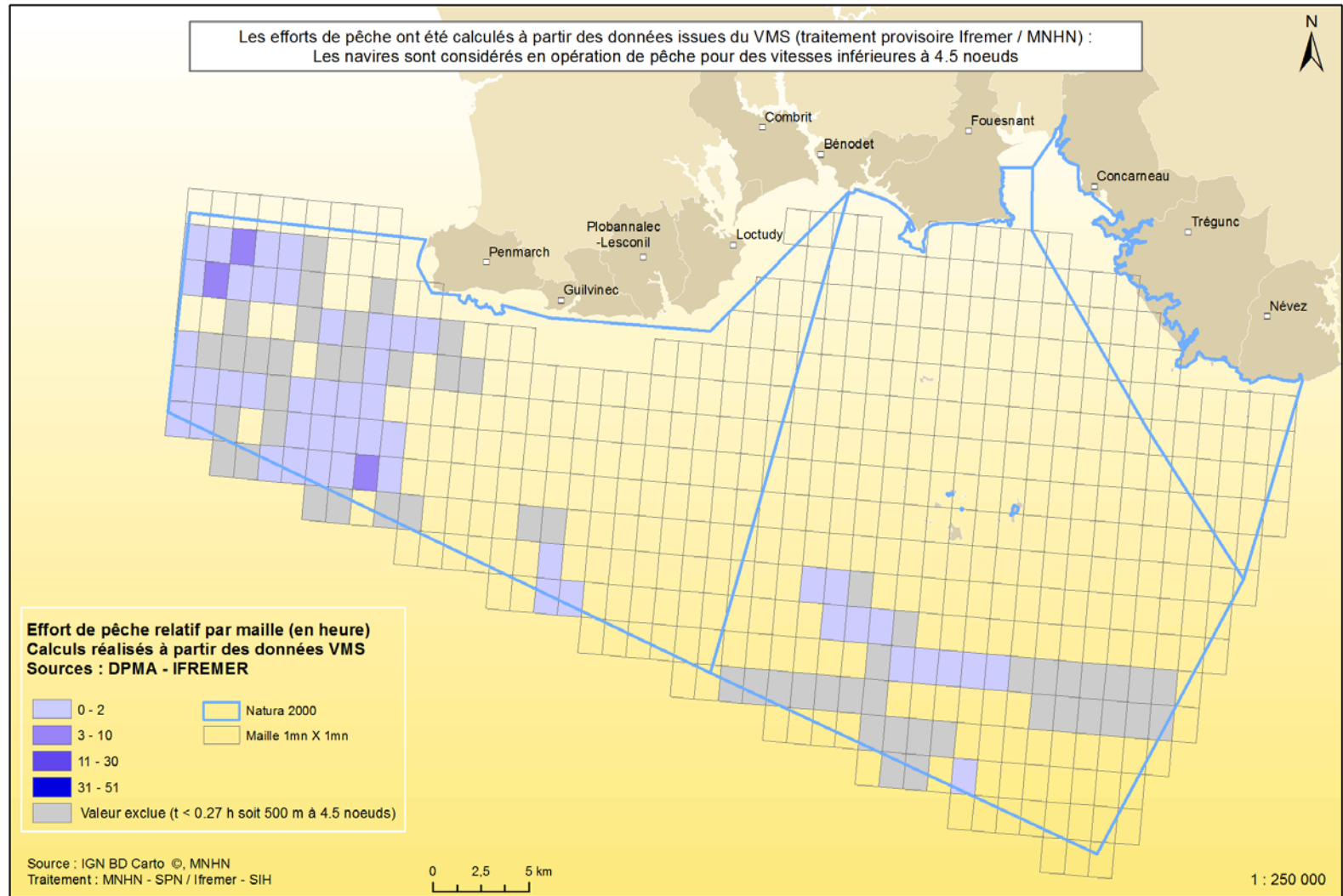
Fréquence des activités de pêche à la senne (en nombre de navires) au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon.
Données collectées à partir d'enquêtes auprès de 51 pêcheurs



Information on fishing activities

Provisional results using VMS data : Net fishing Boat size > 15 meters

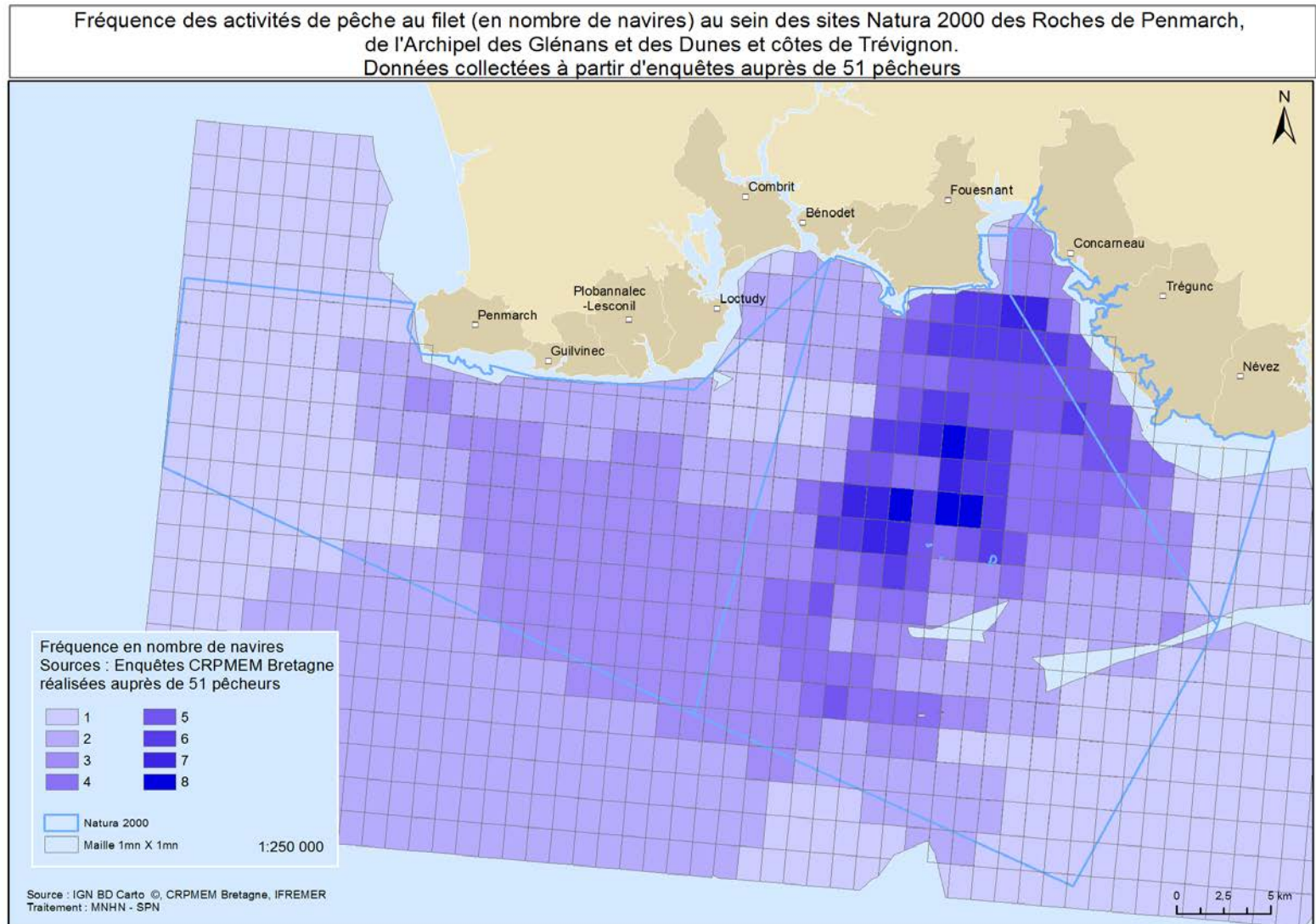
Distribution des efforts de pêche relatifs (en heure) des navires de plus de 15 mètres pratiquant le filet en 2009 au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon



Information on fishing activities

Provisional results from interviews (Fishers organisation data's) : Net fishing

Boat size < 15 meters



Information on interactions between fishing activities and marine habitats

Two parameters are taken into account, based on literature review : Sensitivity (1) and potential physical pressure of gears (2)

1) Habitat sensitivity

- ➔ Scientific expertise
- ➔ Suggested method : 'MARLIN approach' (Marine Biological Association of the UK)

The sensitivity of a habitat depends on its structural or characteristic species and is determined according to their :

- Fragility
- Recoverability

(See MARLIN sensitivity assessment and Tyler-Walters , 2009)

Expertise can be based on :

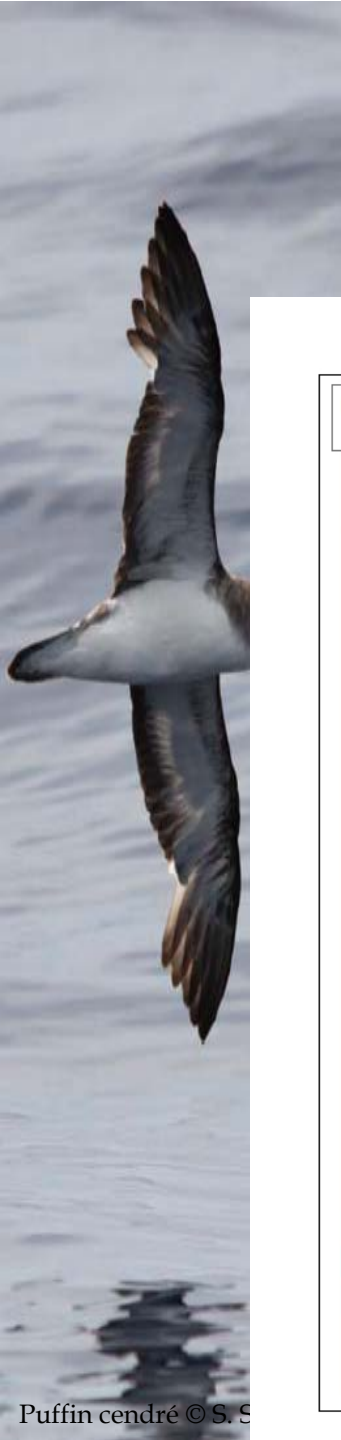
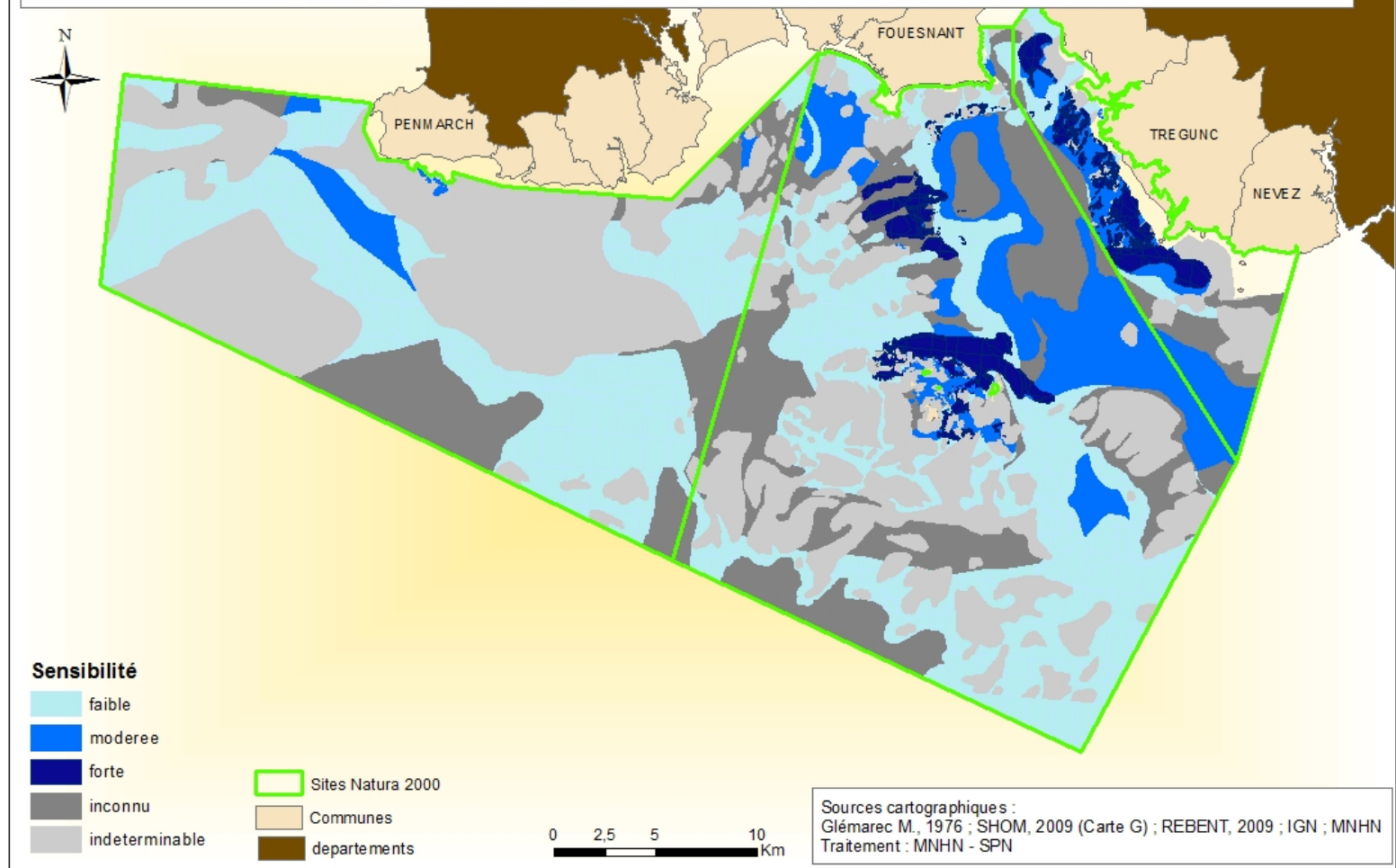
- Biological survey within Natura 2000 sites via the 'CARTHAM' programme (French MPA Agency)
- Literature reviews on the sensitivity of the characteristic species of French Natura 2000 habitats (MNHN)

Information on interactions between activities and habitats

1) Habitats sensitivity to physical pressure (theoretical results obtained)

Sensibilité des habitats d'intérêt communautaire (élémentaires) au sein des sites Natura 2000 de Trévignon, de l'Archipel des Glénans et des Roches de Penmarch

La sensibilité a été définie par rapport à une pression de type physique. Ce type de pression est commun à l'ensemble des engins de pêche en contact avec le fond. d'autre part les connaissances sur la sensibilité des espèces existent principalement pour ce type de pression.



Information on interactions between activities and habitats

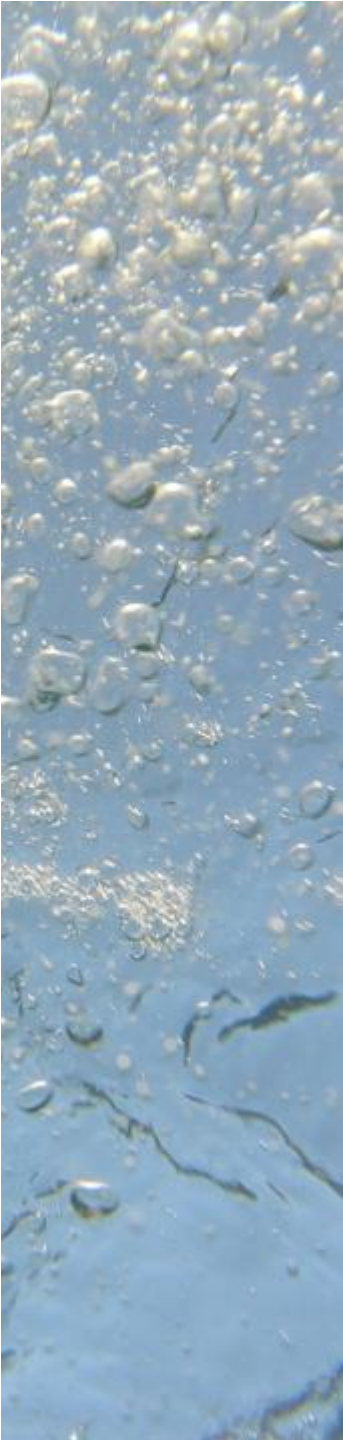
2) Potential physical pressure

Principle :

According to the type of gear, the potential physical pressure(s) can be determined

Means :

Matrix on the physical pressures associated with fishing gears developed in coordination with scientists and gear specialists (IFREMER)



Matrix : Fishing gears' interaction with Natura 2000 Habitats

HABITATS D'INTERET COMMUNAUTAIRE (PH/METIERS)	Crevettes de fond Crevettes pélagiques Crevettes à jetons Crevettes Remorquage par un bateau (Atlantique) Crevettes à jetons Remorquage par un bateau Méditerranée Crevettes méditerranéennes (Méditerranée) Crevettes à jetons Remorquage sans crevettes à jetons Remorquage à deux passes (Atlantique, Europe) Remorquage à deux passes (Méditerranée)											
1110 : Banca de sable à faible couverture d'eau permanente												
1110 - 1 : Sables fins propres et légèrement envasés, herbiers à <i>Zostera marina</i> (façade atlantique)	XXX		XXX	XXX							X	X
1110 - 2 : Sables moyens dunaires (façade atlantique)	XX		XX	XXX								Q
1110 - 3 : Sables grossiers et galets, banca de maerl (façade atlantique)	XXX		XXX	XXX							X	X
1110 - 4 : Sables mal triés (façade atlantique)	XX		XXX	XXX								Q
1110 - 5 : Sables fins de haut niveau (Méditerranée)					X			XX				II
1110 - 6 : Sables fins bien calibrés												
1110 - 7 : Sables grossiers et fins												
1110 - 8 : Sables grossiers et fins												
1110 - 9 : Galets infralittoraux (M)												
1120 : Herbiers à Posidonies (P)												
1130 : Estuaires												
1130 - 1 : Sables en mer à marée												
1130 - 2 : Sables vaseux et vaseux												
1140 : Rapières boueuses ou sableuses exondées à marée basse												
1140 - 1 : Sables des hauteurs de plage à Talitres (façade atlantique)												
1140 - 2 : Galets et cailloux des hauteurs de plage à Orchestre (façade atlantique)												
1140 - 3 : Sables de sable fin (façade atlantique)						X						Q
1140 - 4 : Sables dunaires (façade atlantique)												Q
1140 - 5 : Sables dunaires grossiers et envasés (façade atlantique)												
1140 - 6 : Sédiments hétérogènes envasés (façade atlantique)												
1140 - 7 : Sables supralittoraux avec ou sans laisses à dessiccation rapide (Méditerranée)												
1140 - 8 : Laisses à dessiccation lente dans l'ébène supralittoral (Méditerranée)												
1140 - 9 : Sables méditerranéens (Méditerranée)												
1140 - 10 : Sédiments d'origine méditerranéens (Méditerranée)												
1150 : Lacs côtiers												
1150 - 1 : Lacs en mer à marée (façade atlantique)												
1150 - 2 : Lacs méditerranéens						XXX		XX				Q
1160 : Grandes criques et baies peu profondes												
1160 - 1 : Vasières infralittorales (façade atlantique)				XXX								Q
1160 - 2 : Sables méditerranéens envasés infralittoraux, banca de maerl (façade atlantique)				XXX								X
1160 - 3 : Sables vaseux de mode calme (Méditerranée)											II	Q
1170 : Roches												
1170 - 1 : La roche supralittorale (façade atlantique)												
1170 - 2 : La roche méditerranéenne en mode abrité (façade atlantique)												
1170 - 3 : La roche méditerranéenne en mode exposé (façade atlantique)												
1170 - 4 : Les roches d'hermines (façade atlantique)	XXX											
1170 - 5 : La roche infralittorale en mode exposé (façade atlantique)								XXX				X
1170 - 6 : La roche infralittorale en mode abrité (façade atlantique)								XXX				X
1170 - 7 : La roche infralittorale en mode très abrité (façade atlantique)												X
1170 - 8 : Les cailloux ou vases permanents (façade atlantique)												
1170 - 9 : Les champs de blocs (façade atlantique)												
1170 - 10 : La roche supralittorale (Méditerranée)												
1170 - 11 : La roche méditerranéenne supralittorale (Méditerranée)												
1170 - 12 : La roche méditerranéenne inférieure (Méditerranée)												

Note : Local conditions must be taken into account (gear specificities, environmental conditions, cumulative effects...)

Information on interactions between activities and habitats

3) Determination of potential risks

Principle :

According to the 2 parameters (pressure and sensitivity) potential risk can be assessed

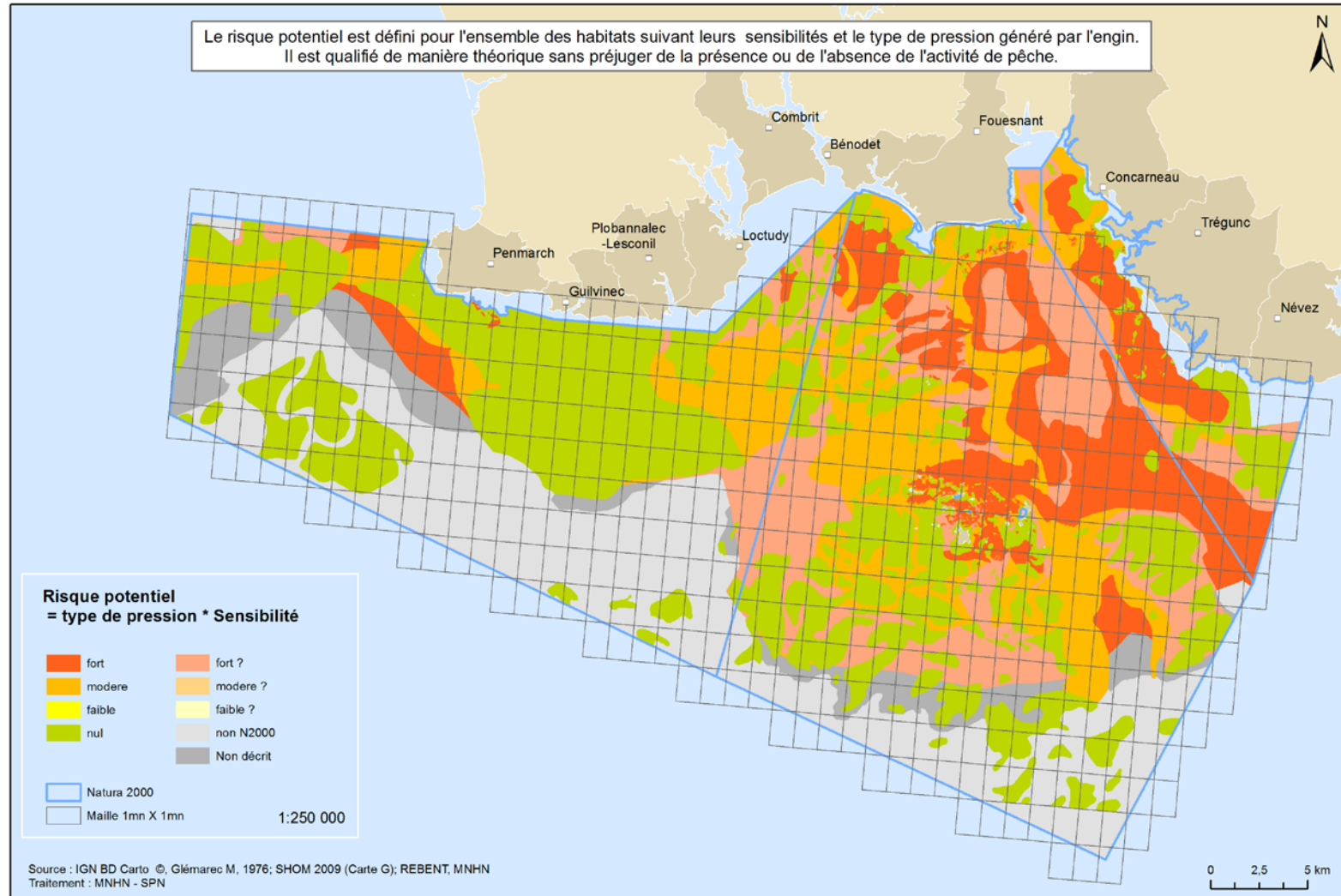
Means :

Potential risk		Pressure of the gear			
		High	Moderate	low	Not realevant
Habitat / Species sensitivity	High	High	High	Moderate	Not realevant
	Moderate	High	Moderate	low	Not realevant
	low	Moderate	low	low	Not realevant
	Unknown	= pressure value			

Information on interactions between activities and habitats

3) Potential risks (provisional results) : Dredge fishing

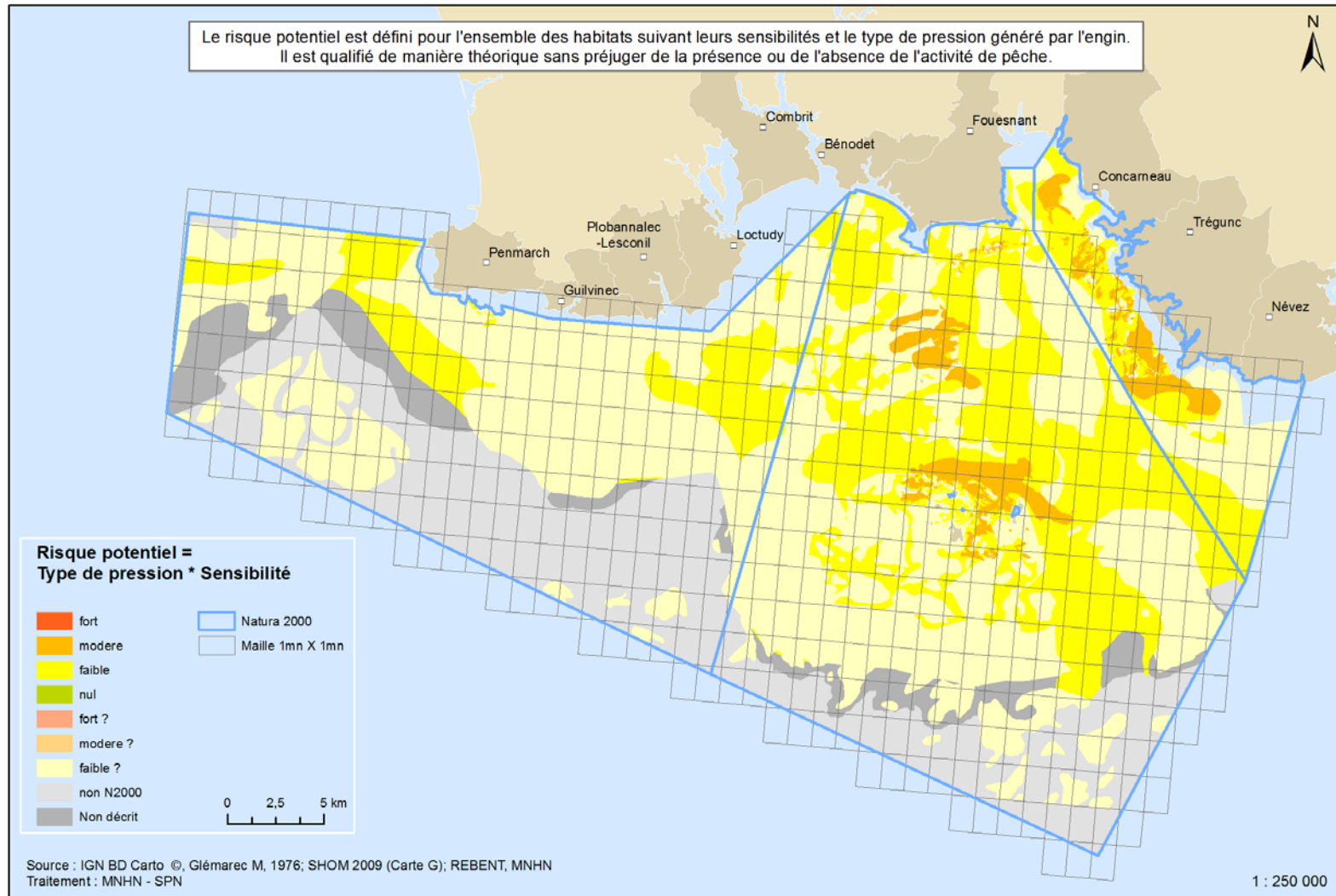
Risque potentiel de dégradation des habitats d'intérêts communautaire par les activités de drague au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon



Information on interactions between activities and habitats

3) Potential risks (provisional results) : Longline fishing

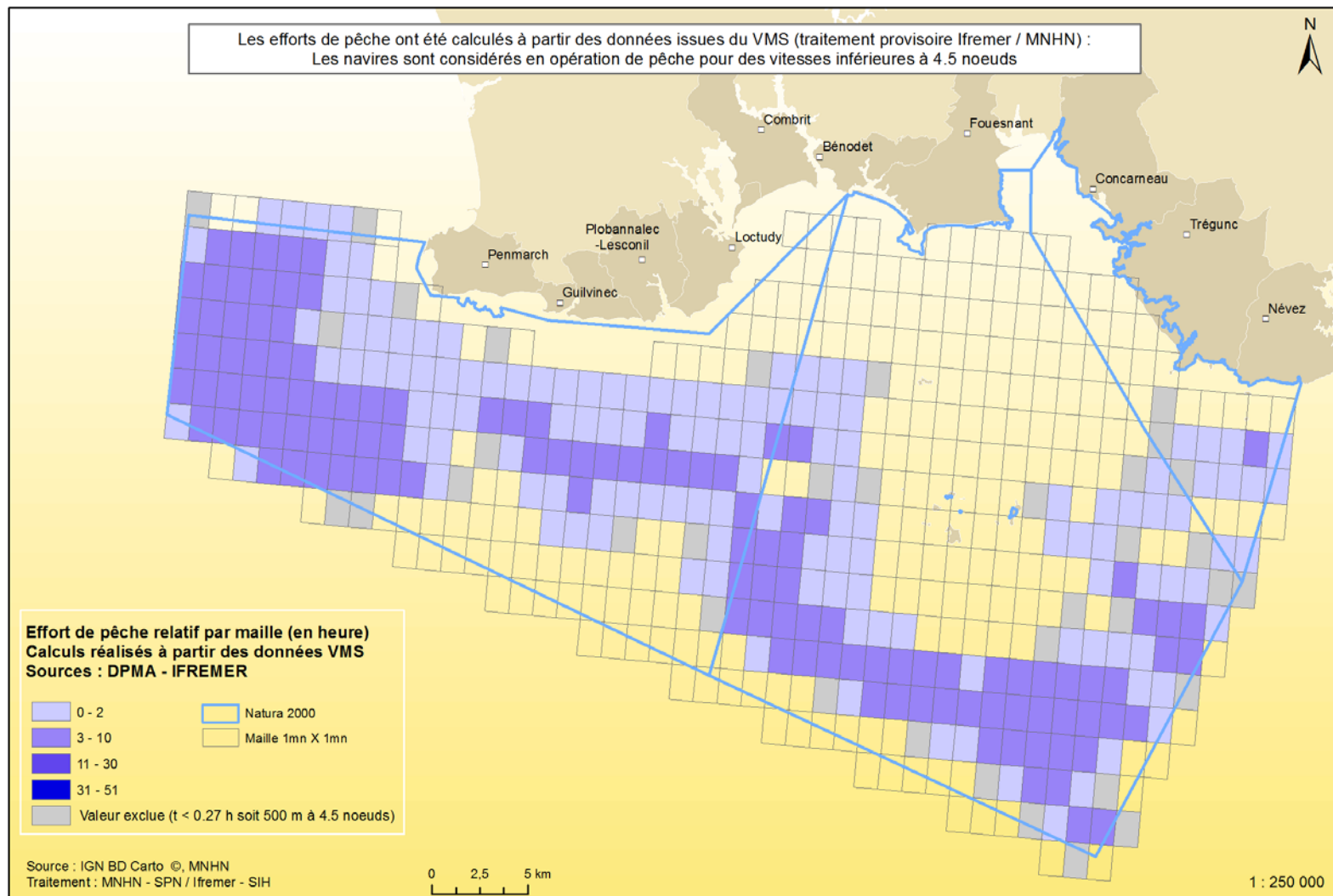
Risque potentiel de dégradation des habitats d'intérêt communautaire par les activités de palangre au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon



Information on fishing activities

Provisional results using VMS data : Longline fishing Boat size > 15 meters

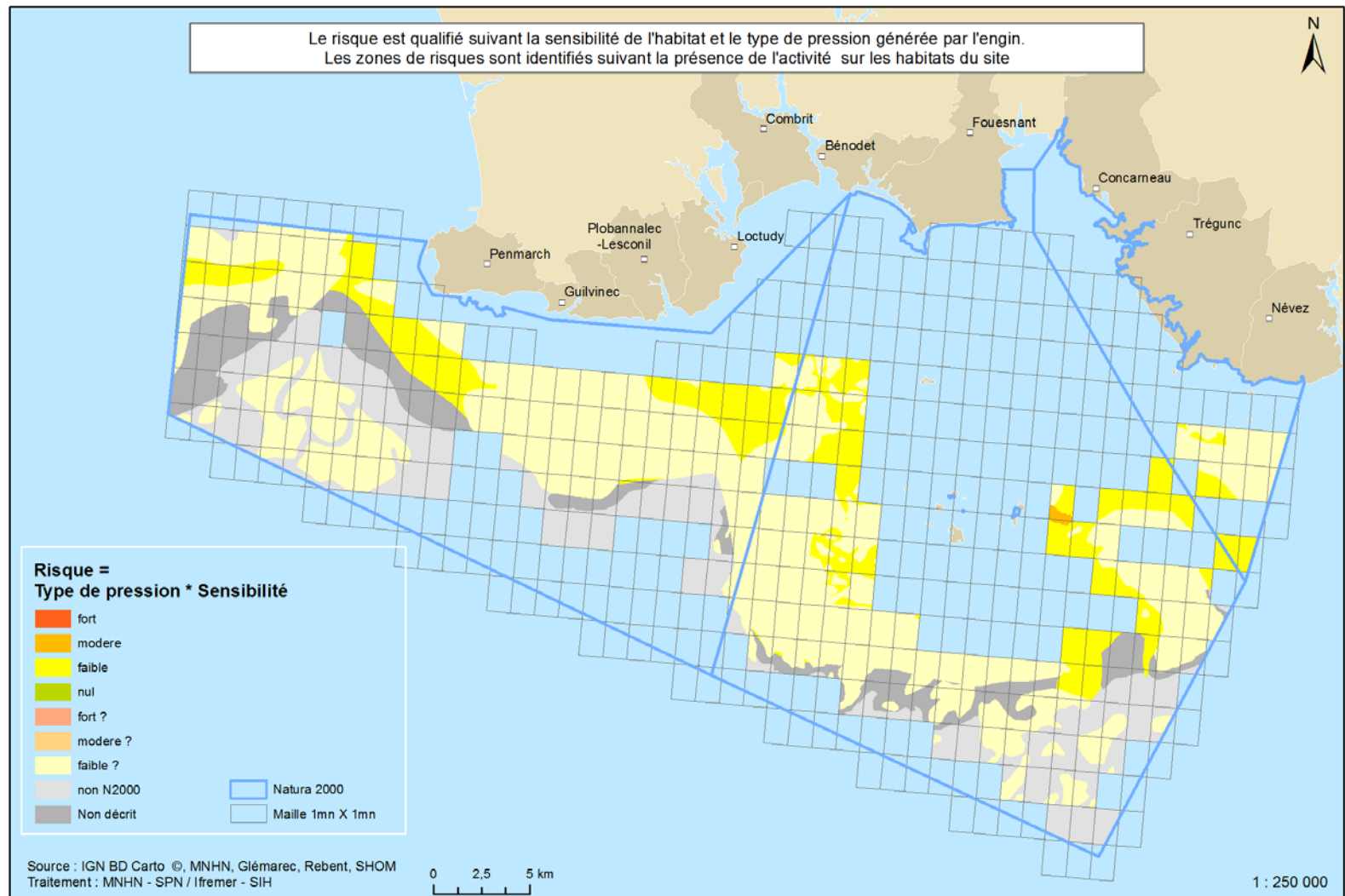
Distribution des efforts de pêche relatifs (en heure) des navires de plus de 15 mètres pratiquant la palngre en 2009 au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon



Overlaying information = risk assessment

Overlaying activity map / Potential risk map ; E.g. : Longlining

Risque de dégradation des habitats par les activités de palangre au sein des sites Natura 2000 des Roches de Penmarch, de l'Archipel des Glénans et des Dunes et côtes de Trévignon



Conclusions

The method allows us to compile and present information necessary to :

- Identify and qualify risks ;
- Inform and engage fishermen at each step of its application

Main issue is to :

- Identify the necessity (or not) of management measures or
- need for additional information regarding to the parameters.



Conclusions

- Uncertainties exist :
 - Characterization of fishing activities (VMS / interviews bias)
 - 'Tolerance' benchmark in respect to fishing effort
 - ➔ Is a quantitative assessment : - necessary ?
- possible ?
 - Qualification of interactions may be difficult according to local conditions, **gear specificity and associated pressures**, and type of **sensitivity assessment** ;
 - Cumulative effects
- Use of a participative assessment process at local scale should allow part of this uncertainty to be overcome (fishing characterization / interactions identification / collaborative study)



Conclusions

In fact, co-management :

- fosters greater openness and transparency in relation to both fisheries science and local knowledge;
- increased legitimacy for the regulatory system;
- enhanced levels of confidence, commitment, and compliance (Symes and Phillipson,1999).

As showed by Gray (2005) co-management also has some disadvantages as :

- potential lack of participation
- it can become unwieldy, time-consuming and costly
- it can add considerably to the time taken to reach decisions
- it can limit a government's ability to act swiftly and decisively
- it can shift the focus from long-term societal goals to local, short-term self-interest

Conclusions

Nevertheless the author confirms that :

- participation, despite its flaws, is inescapable for fishery governance
- link between participation and the ecosystem-based approach is crucial
- fishers' knowledge and collaboration are increasingly employed in fisheries governance

How far acceptance of participation is genuine rather than rhetorical, remains an open question.





Thank you!

Hugues Casabonnet

Chargé de mission "pêche et Natura 2000 en mer"

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