Fig. 5.36 - *Census number mean of the Omnivores guild (December 2006 – January 2007)*

Fig. 5.37 - *Census number mean of the Raptors guild (December 2006 – January 2007)*

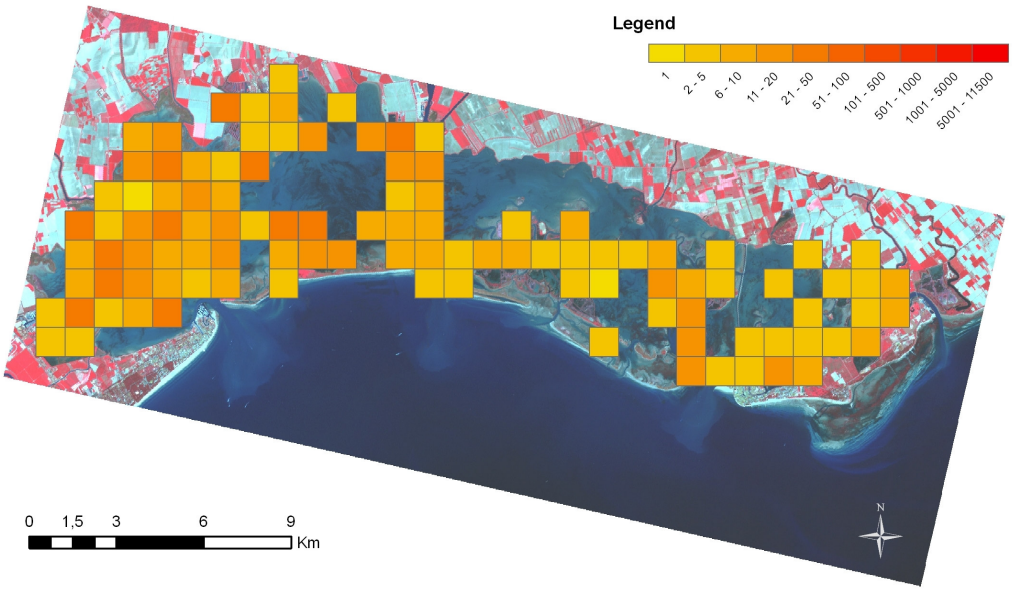


Fig. 5.38 - *Census number mean of the Swimming invertebratophagous guild (December 2006 – January 2007)*

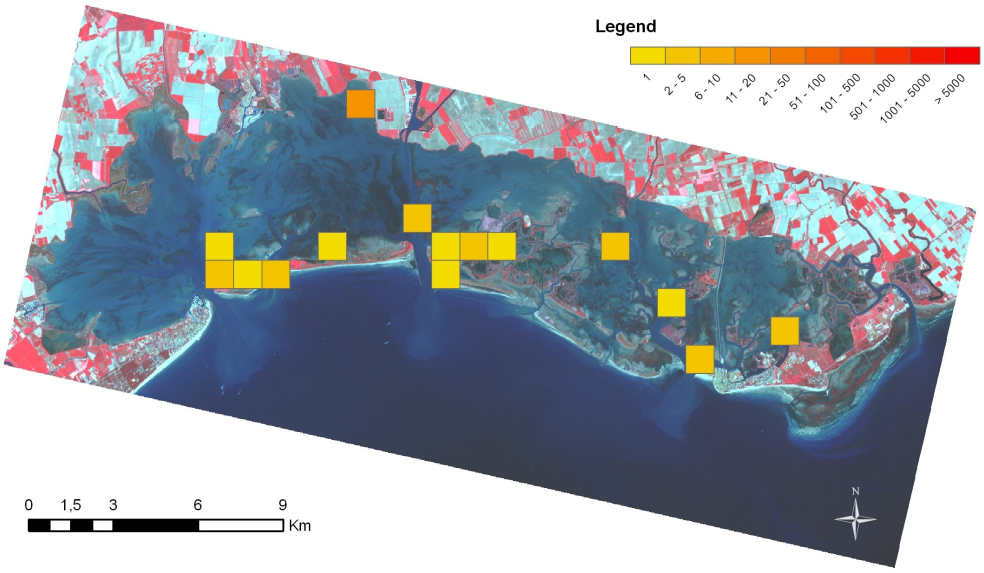


Fig. 5.39 - *Census number mean of the Flying ichthyophagous guild (December 2006 – January 2007)*

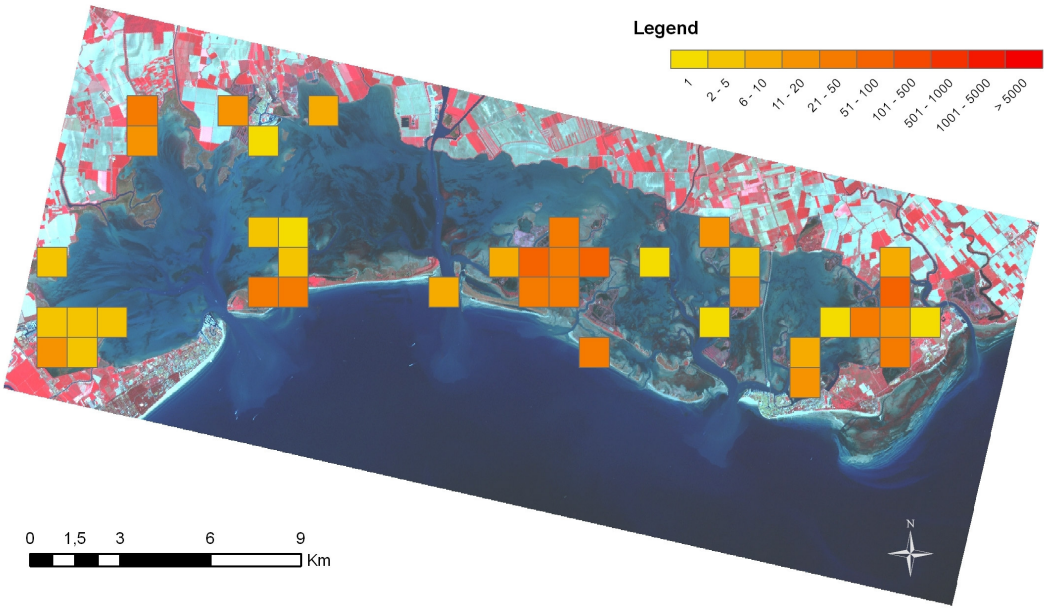


Fig. 5.40 - *Census number mean of the Peckers guild (December 2006 – January 2007)*

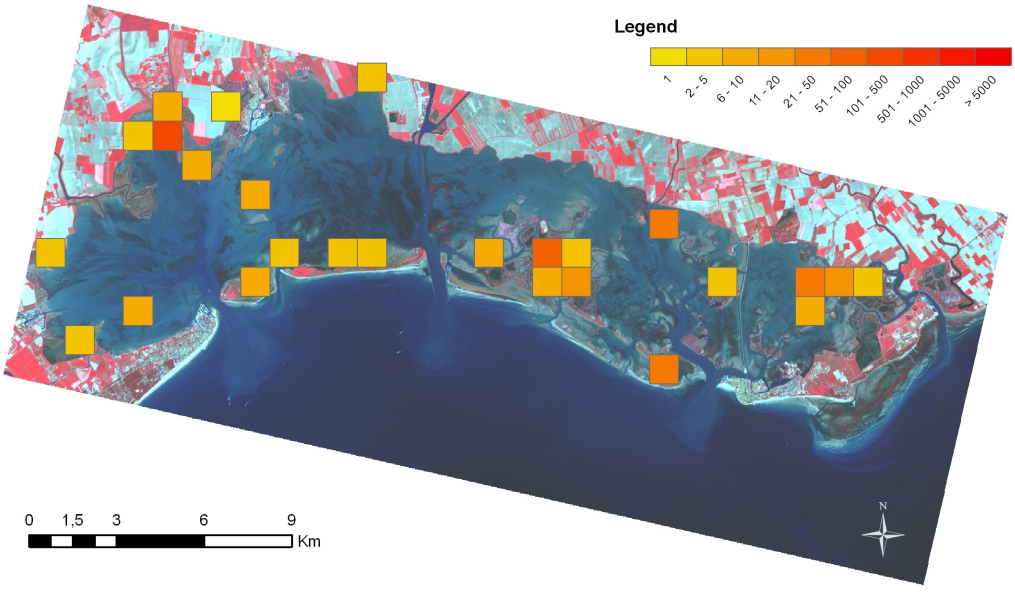


Fig. 5.41 - *Census number mean of the Scythers guild (December 2006 – January 2007)*

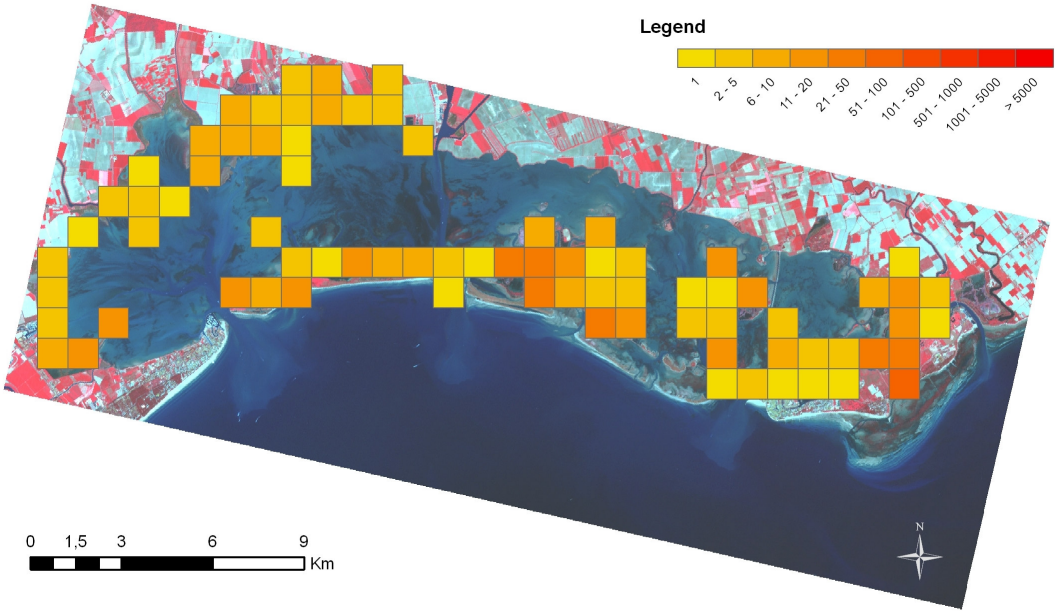


Fig. 5.42 - *Census number mean of the Wading ichthyophagous guild (December 2006 – January 2007)*

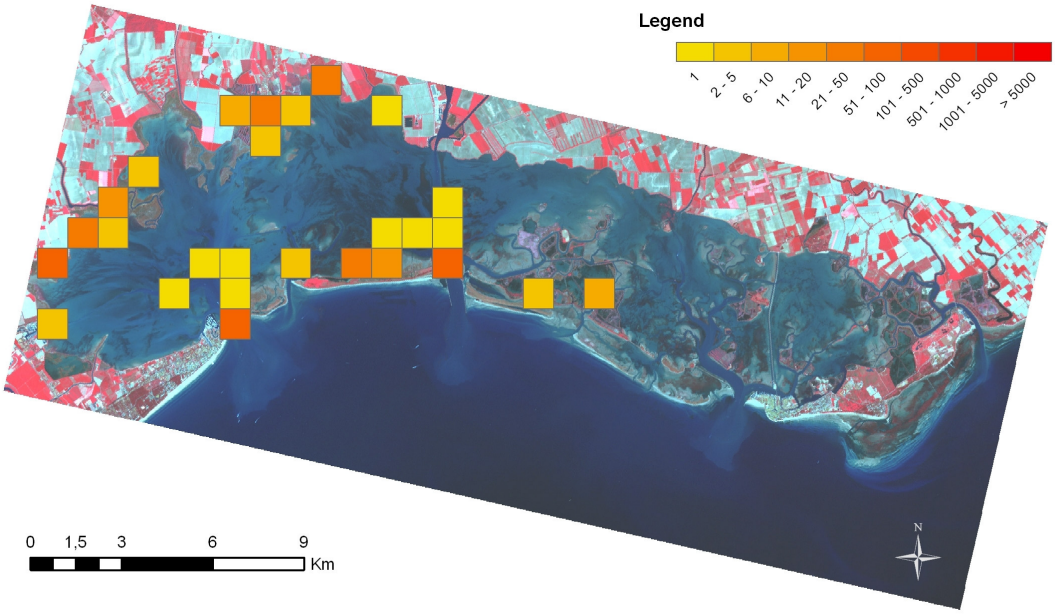


Fig. 5.43 - *Census number mean of the Predators of ground animals guild (December 2006 – January 2007)*

The guild abundance calculated for each ecological unit (the clusters identified by the dendrogram) was submitted to Correspondence Analysis (CA) in this way it was possible identify the major trends in the variation of the data and to distribute genes along continuous axes in accordance with these trends. CA does not assume that the data falls into discrete clusters and therefore represents continuous variation accurately. The results of CA performed with FactoMineR (R software) are shown in the Fig. 5.44.

The results of Correspondence Analysis, applied to waterbirds guild abundance per ecological unit (Tab.5.13, Tab.5.14), show that the first two components (Dim 1, 2) explain about 85% of total variability (Fig.5.44).

UE	PGA	DPH	SCY	DPO	DIP	SIN	WIC	SIC	FIC	PEC	PRO	MAL	OMN	RAP
1	20.0	18.1	0.0	4.5	0.0	7.2	3.9	2.9	0.7	0.0	6.3	9.1	21.9	0.0
2	0.0	31.5	11.5	1.2	1.5	9.2	1.7	4.2	0.0	0.6	0.4	5.5	4.2	0.1
3	0.4	274.6	5.8	60.3	40.2	3.5	10.1	7.4	0.2	14.9	8.9	0.0	49.6	0.1
4	5.7	4.9	0.4	33.3	141.7	7.9	2.6	3.8	0.6	2.1	5.4	5.2	21.1	0.4
5	1.3	381.6	2.0	18.6	6.3	5.9	3.5	5.2	0.2	4.0	1.0	0.0	32.9	0.0
6	5.9	18.0	1.2	56.7	268.8	11.2	2.2	2.3	0.0	4.0	4.8	3.2	25.2	0.4
7	0.2	523.6	0.0	3.7	2.2	7.4	0.9	3.2	0.0	1.1	1.4	3.8	10.8	0.0

Tab. 5.13 - *Mean values (December 2006, January and February 2007) of the guild abundance for the seven ecological units (EU).*

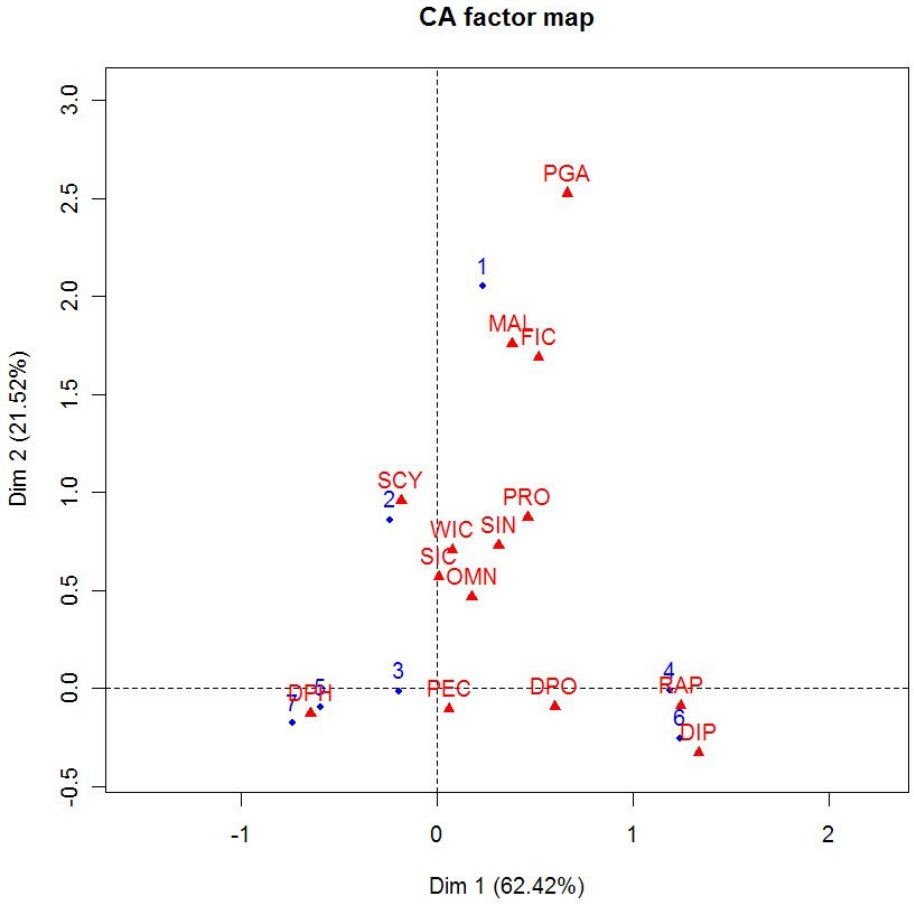


Fig. 5.44 - *Correspondence analysis biplot with the first two dimensions.*
▲ *Guilds (see the legend in table 5.13).*
● *Ecological Units.*

Code	Guid
PGA	Predators of ground animals
DPH	Dabbling phytophagous
SCY	Scythers
DPO	Dabbling poliphagous
DIP	Diving poliphagous
SIN	Swimming invertebratophagous
WIC	Wading ichthyophagous
SIC	Swimming ichthyophagous
FIC	Flying ichthyophagous
PEC	Peckers
PRO	Probers
MAL	Malacophagous
OMN	Omnivores
RAP	Raptors

Tab. 5.14 - *Guild codes used in Correspondence Analysis.*

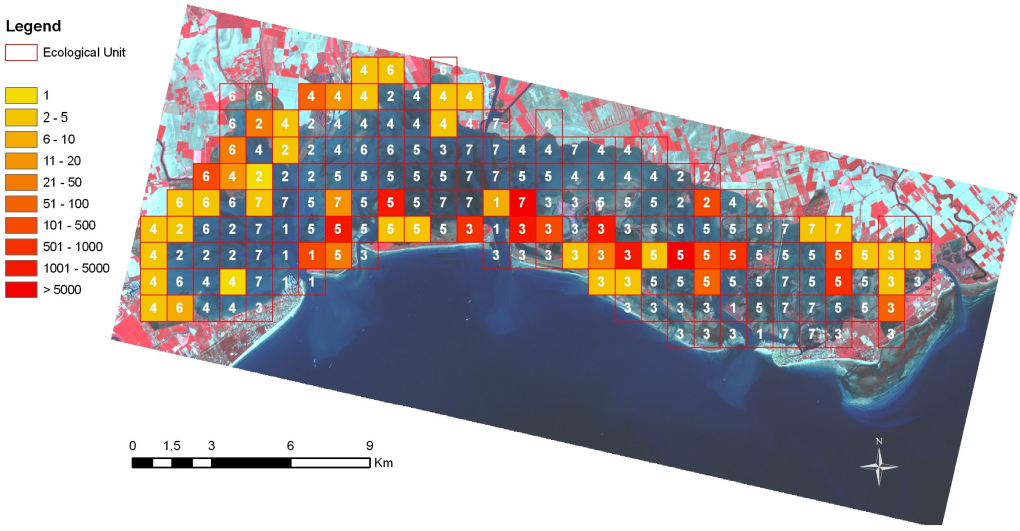
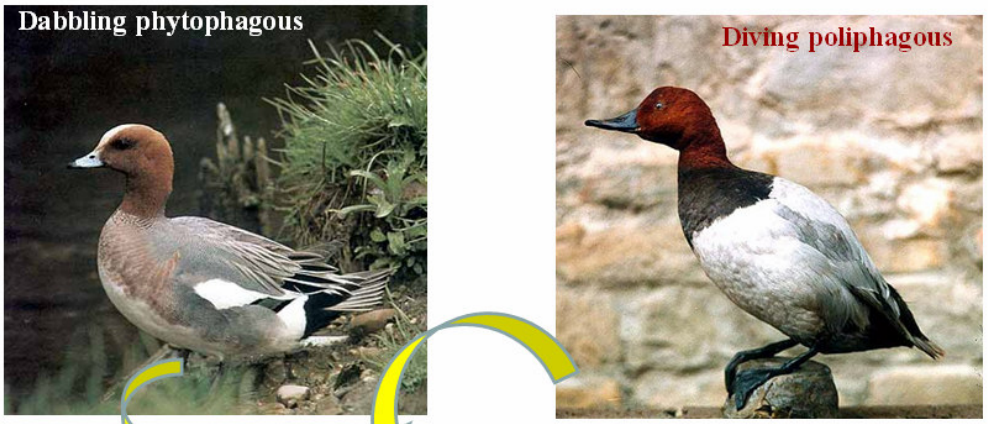


Fig. 5.45- *Census number mean of the Dabbling phytophagous guild (December 2006 – January 2007) superimposed by distribution of ecological units.*



UE	PGA	DPH	SCY	DPO	DIP	SIN	WIC	SIC	FIC	PEC	PRO	MAL	OMN	RAP
1	20.0	18.1	0.0	4.5	0.0	7.2	3.9	2.9	0.7	0.0	6.3	9.1	21.9	0.0
2	0.0	31.5	11.5	1.2	1.5	9.2	1.7	4.2	0.0	0.6	0.4	5.5	4.2	0.1
3	0.4	274.6	5.8	60.3	40.2	3.5	10.1	7.4	0.2	14.9	8.9	0.0	49.6	0.1
4	5.7	4.9	0.4	33.3	141.7	7.9	2.6	3.8	0.6	2.1	5.4	5.2	21.1	0.4
5	1.3	381.6	2.0	18.6	6.3	5.9	3.5	5.2	0.2	4.0	1.0	0.0	32.9	0.0
6	5.9	18.0	1.2	56.7	268.8	11.2	2.2	2.3	0.0	4.0	4.8	3.2	25.2	0.4
7	0.2	523.6	0.0	3.7	2.2	7.4	0.9	3.2	0.0	1.1	1.4	3.8	10.8	0.0

Fig. 5.46 *Census number mean of the guilds (December 2006 – January 2007) for the seven ecological units.*

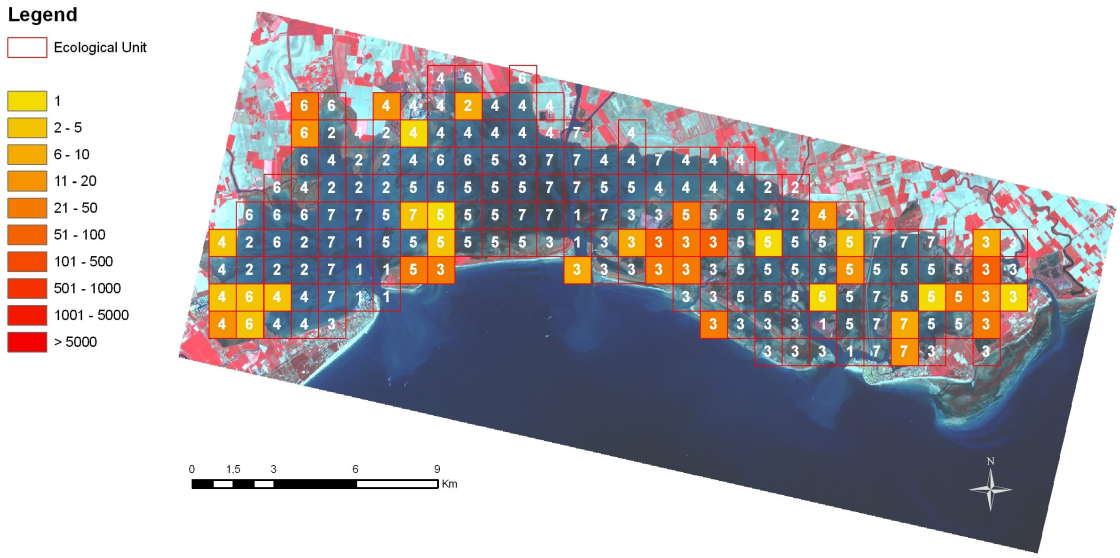


Fig. 5.47- *Census number mean of the Peckers guild (December 2006 – January 2007) superimposed by distribution of ecological units.*

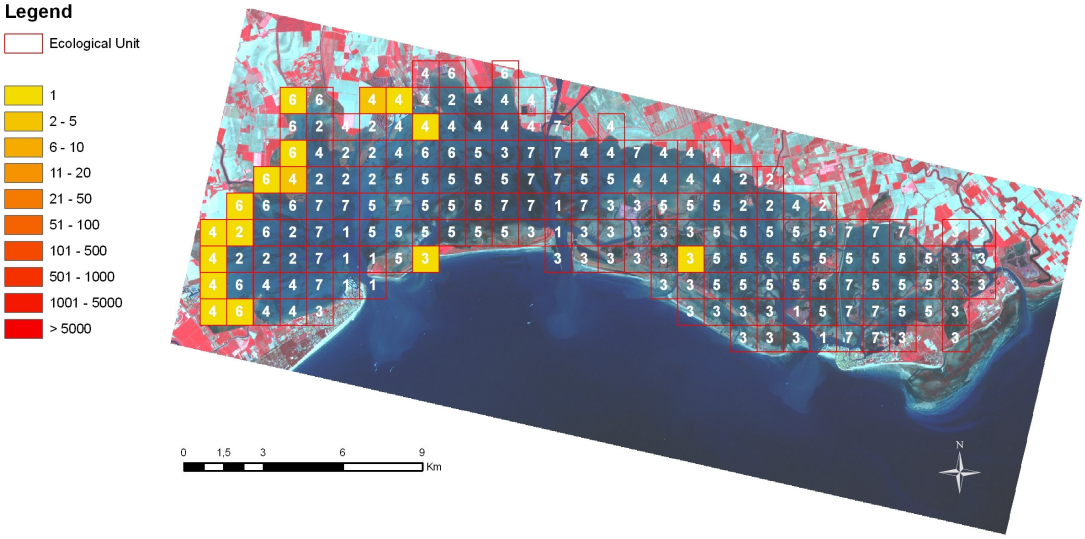


Fig. 5.48 *Census number mean of the Raptors guild (December 2006 – January 2007) superimposed by distribution of ecological units.*

The results show that the ecological unit with the greatest waterbird guild abundance (Fig. 5.45), dabbling poliphagous (DPO), is associated with clusters (ecological units) 7 and 5 characterized by a high presence of sea grass meadows (Fig. 5.3).

Peckers (PEC) and Probers (PRO) are present in cluster 3 which are the mud flat areas. An example on Peckers guild distribution in regards to the ecological units is shown in the figure 5.47. Raptors (RAP) are present in the clusters 6 and 4 which correspond to the reed beds (Fig. 5.48).

The correspondence analysis of the waterbirds census quantitative data and homogenous ecological areas (ecological units) confirms ecological preferences of the waterbirds species aggregated into trophic guilds for the winter month's period. GIS applications allowed visualisation and analysis of the waterbirds guilds spatial distribution. For the first time for the Grado-Marano lagoon area the data on guilds abundance was represented spatially and correspondence of particular guilds with the ecological unit of their preferences has been visualised.

The innovative methodology applied for the detailed characterisation of the lagoon area from the structural and functional ecological point of view had a significant result and could be adopted for the future investigations within the lagoon area and lagoon integrated management.

6. DISCUSSION

The standardised waterbirds monitoring programme developed within the frame of ANSER project gave an opportunity to count the lagoon sites in the same way every time the census made. The sites are counted systematically on a twice monthly basis during the ground census Daylight Time Count. The Aerial Survey census is performed once a month within the three days from the ground census. The decision was taken on integration of these two waterbirds census methods in order to achieve a complete coverage. The combination of the two census approaches would be the most appropriate survey for the lagoon area.

The waterbirds spatial database maintained and analyzed during the three years of the PhD project allowed our significant progress from both the methodological and technical point of view. An afford was made to set up the standard database structure in the way of its correct functionality. The designed waterbirds census databases have been verified, approbated and continuously modified according to the census standards and observer needs. We have facilitated the data entry creating the database recording forms, and provided the database with the tools for data control and validation. The design of the relational database and experience on integration join procedure of single databases was crucial for the further ornithological data elaborations. The databases were designed with a possibility for a future integration into a web system.

The design of an integrated database consisted of Daylight Time Count and Aerial Survey waterbirds censuses could serve in the future for all the Adriatic area waterbirds management program. This innovative system for ornithological data gathering, standardisation and storage has been an initial step in the whole project structure.

GIS play a key role for the waterbirds census data georeferencing. It appears to be a potential tool for the analysis of a huge amount of the ornithological data, examination of the waterbirds species, their spatial and temporal dynamics, and assessment of the richness values. GIS gives a possibility to present waterbirds monitoring results in a dynamic mode.

The flexibility of the procedure, proposed in the current research, depends on the concept of the Operational Geographic Unit (OGU) as a useful tool to integrate in a GIS georeferenced multisource data. A regular UTM grid of square cells (OGU), 1km×1km, was superimposed on the entire lagoon. The waterbirds census data were georeferenced according to this grid.

The use of remote sensing tools allows gathering information on different types of morphologies and habitat in the lagoon. Remote sensing techniques appeared to be of fundamental importance for the mapping of sea grass meadows distribution. Elaborations of the fine resolution satellite imagery ASTER gives exceptional results and it is a cost-effective. The high accuracy of the sea grass distribution map is achieved due to the high number of sampling points, taken during the field trips to the lagoon.

GIS is a powerful tool for the integration of biotic and abiotic factors with the aim to characterise the lagoon area from the structural and functional ecological point of view. The effectiveness of GIS was optimised by the combination of GIS and statistical analysis, and, in particular, by the application of multivariate methods. In this case GIS is not an isolated technology but a part of an integrated methodology of analysis. Using the Hierarchical Cluster Analysis technique it was possible to establish the homogenous ecological areas (ecological units), Principal Component Analysis was used to reduce the dimensionality of the factors considered. Subsequently, Correspondence Analysis gave attention-grabbing results in the evaluation of the relationship between waterbirds guild abundance and ecological units. In particular, the correspondence between sea grass meadows distribution and abundance of dabbling phytophagous guild is noticed.

The results obtained from this study show that sea grass meadows represent a fundamental trophic resource for aquatic birdlife in the lagoon. It is therefore indispensable to assess the distribution of phanerogam meadows and to identify the principal ecological parameters. In this context, GIS techniques allow us to integrate significant amounts of environmental data and multivariate analysis helps us to reduce the dimensionality of the data set.

While gathering information on biotic and abiotic factors we faced the lack of imperative data layers for the research (i.e. missing information on the bathymetry). It would be useful in the future to enhance the monitoring of the lagoon area and to get a better view on biotic and abiotic factors.

The integration of standard waterbirds census methods, relational databases for the ornithological data storing and analysing, remote sensing techniques, GIS technologies and multivariate statistical methods provides managers with a set of powerful and efficient tool for lagoon integrated monitoring. Finally, this work demonstrates the promising potentials in reforming the management frameworks of the numerous coastal wetlands in the Adriatic.

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Useful websites

http://anserproject.it
http://www.gis.com
http://www.wetlands.org/LinkClick.aspx?fileticket=XwyVOhMIKu0%3D&tabid=773&mid=5895
http://www.R-project.org/
http://CRAN.R-project.org/package=FactoMineR
http://www.ramsar.org/sitelist.doc
http://www.regione.fvg.it/rafvg/territorioambiente/dettaglio.act?dir=/rafvg/cms/RAFVG/AT9/ARG5/FOGLIA16/
http://www.regione.fvg.it/rafvg/territorioambiente/dettaglio.act?dir=/rafvg/cms/RAFVG/AT9/ARG5/FOGLIA13/#n1
http://www.forest-trends.org/biodiversityoffsetprogram/BBop%20library%202/Europe/Not%20Printed/Council%20Directive%201992%20NATURAL%20HABITATS%20Annex%20I.pdf
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:20070101:IT:PDF
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FIELD RECORDING FORM WATER BIRDS CENSUS
DTC+RC (Daylight Time Count + Roost Count)

ID Recording form DO NOT FILL IN (OFFICE USE ONLY)

ANSER Project

REGIONE AUTONOMA FRIULI VENEZIA GIULIA — RegioneEmilia-Romagna

DATE: … … / … … /200 (day/month/year)

TIME START:

TIME END:

WETLAND CODE:

Recording form n° ____ of _____

WETLAND NAME:

OBSERVERS:

VISIBILITY(*): Excellent Good Moderate Poor

CENSUS IN THE PAST? (*): Yes No

SEA STATE(*): Calm Medium Rough

CENSUS TYPE(*): Aerial Walking By boat By car Mixed Other

COVERAGE(*): PARTIAL COMPLETE

TIDE(*): High Low

SKY : (clear) 0 □ 1 /8 □ 2/8 □ 3/8 □ 4/8 □ 5/8 □ 6/8 □ 7/8 □ 8/8 □ (overcast) mist □ fog □

PRECIPITATION TYPE(*): None Rain Snow

WIND STRENGTH(*): Non Light Moderate Strong

THREATS OBSERVED(*): Not registered Non Limited High What kind ?

WETLAND CONDITIONS(*):
1.Normal 2. Dry (_____%) 3.Frozen (_____%) 4.Rough waters

PRECIPITATION INTENSITY(*):
Slight Moderate Heavy Violent

DISTURBANCE(*): Hunting Fishing Sport Works Military Boating People or pets walking

HUNTING IS FORBIDDEN(*):
Yes No Partly No information

(*) circle the proper term

NOTE:

TIME	SPECIES	MGRS ID	DAYLIGHT TIME COUNT	ROOST COUNT	NOTE

WETLAND NAME: **DATE:** … … / … … /200 **Recording form n° ___ of _____**

ANNEX I. - *ANSER wterbirds census field recording form*

Instructions for the ANSER waterbirds census field recording form compilation

General information

ID Recording form: ID code for the recording form in the main database (not to be compiled nether by observers not by local coordinators).

DATE: specify the date of birds census in the format day/month/year.

TIME START/TIME END: indicate the time of the beginning and the end of census (exclude the time spent for reaching the census area).

Recording form n°____of_____: specify the progressive and total number of the recording form been used for one wetlands (i.e. 2 of 5).

WETLAND NAME: Identify name of the wetland.

WETLAND CODE: Identify the wetland's code.

OBSERVERS: record the surname and full name of observers and eventual collaborators.

TIDE: Specify if the census been done within the low or high tide**.**

VISIBILITY (*)**::** record a qualitative level of visibility (atmospherically events and other eventual visible obstacles, such as vegetation, have to be taken in to consideration).

CENSUS IN THE PAST (*): specify if the area has been already an object of census in the past within the frame of ANSER project.

SEA STATE (*)**::** Specify the state of the sea according to the Douglas scale. The "state of the sea" is the locally observed motion of the waves generated by the combined effects of "wind sea" and "swell". The evaluation will be limited to the "wind sea" which is the motion of the waves generated by the wind blowing directly on the observed sea area or in its immediate vicinity.

Value to be specified in the recording form	The corresponded value in the Douglas scale	Description term	Waves average height (meters)
Calm	0	Calm (glassy)	-
	1	Calm (rippled)	0 - 0.10
Medium	2	Smooth	0.10 - 0.50
	3	Slight	0.50 - 1.25
	4	Moderate	1.25 - 2.50
Rough	5	Rough	2.50 - 4.00
	6	Very rough	4.00 - 6.00
	7	High	6.00 - 9.00
	8	Very high	9.00 - 14.00
	9	Phenomenal	over 14.00

CENSUS TYPE [(*)]**:** specify the way census has been done.

COVERAGE [(*)]**:** specify if the census has been done for all the zone (min 80% of overall area) or just for a part of the zone.

SKY: indicate the state of cover of the sky, expressed in eighth (es. 0/8 = completely serene sky; 8/8 = sky completely covered), and the eventual presence of mists or fogs.

PRECIPITATION [(*)]**:** indicate the presence and the type of precipitations.

WIND STRENGTH [(*)]**:** specify the strength of the wind according to the Beafort scale.

The scale of Beaufort is an empiricist measure of the intensity of the wind based on the state of the sea (refers to the open sea) or the conditions to us of the waves or on the effects of the wind to earth.

The value to be specified in the recording form	Number by Beaufort	Description	Waves height in meters	Specifications for use at sea	Specifications for use on land
Non	0	Calm	0	Sea like a mirror	Calm; smoke rises verticall
	1	Light air	0.1	Ripples without foam crests	Direction of wind shown by smoke drift, but not by wind vanes.
Light	2	Light Breeze	0.2	Small wavelets. Crests have a glassy appearance and do not break	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
	3	Gentle Breeze	0.6	Large wavelets and crests begin to break. Possible scattered white horses	Leaves and small twigs in constant motion; wind extends light flag.
Moderate	4	Moderate Breeze	1	Small waves with fairly frequent white horses	Raises dust and loose paper; small branches are moved.
	5	Fresh Breeze	2	Moderate waves with many white horses	Small trees in leaf begin to sway; crested wavelets form on inland waters.
	6	Strong Breeze	3	Large waves white foam crests. Probably some spray	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.

ANNEX II. - *Instructions for the ANSER waterbirds census field recording form compilation*

Strong	7	Near Gale	4	Mounting sea with foam blown in streaks downwind.	Whole trees in motion; inconvenience felt when walking against the wind.
	8	Gale	5.5	Moderately high waves with crests beginning to break into spindrift.	Breaks twigs off trees; generally impedes progress.
	9	Severe Gale	7	High waves with dense foam along the direction of the wind. Crests begin to roll over and spray may affect visibility	Slight structural damage occurs (chimney-pots and slates removed).
	10	Storm	9	Very high waves with long overhanging crests. Heavy sea roll and the surface is generally white. Visibility affected	Seldom experienced inland; trees uprooted; considerable structuraldamage occurs.
	11	Violent Storm	11.5	Exceptionally high waves. The sea is completely covered with foam patches lying downwind. Visibility poor	Very rarely experienced; accompanied by wide spread damage.
	12	Hurricane	14+	Huge waves. The air is filled with foam and spray. Sea completely white. Visibility bad	

THREATS OBSERVED (*)**:** indicate the entity and the typology of eventual found factors of threat observed within the zone.

WETLAND CONDITIONS (*)**:** indicate the state of the wetland in reference to the level of waters and the agitation of the water (also for the unrecognisable cases caused of atmospheric events).

PRECIPITATION INTENSITY (*)**:** to at sight indicate the own qualitative appraisal of the intensity of the precipitations.

DISTURBANCE (*)**:** record eventual types of disturbance.

HUNTING IS FORBIDDEN (*)**:** specify (if there is an information) if hunting within the zone is forbidden.

In the fields marked with the symbol (*)**, one or more terms are to be chosen by circling the proper ones.**

Information on the data to be collected:

TIME: indicate the exact hour (preferably taken from the GPS) of every single observation. If there is more then one group of the same species within the same survey unit, you may specify the hour of the very first observation.

SPECIES: record the English name of the species. In the same field recording form you must record each species. If the same species is observed within more than one sample unit (one square km grid), you have to record species as many times as many sample units species been refered.

ANNEX II. - *Instructions for the ANSER waterbirds census field recording form compilation*

MGRS ID: the identification code of the sample unit (one square km grid), according to the *Military Grid Reference System* coding, where the species have been observed.

DAYLIGHT TIME COUNT: specify the number of individuals observed within each sample unit. If more than one flock of the same species is observed within the same sample unit (one square km cell), total number of individuals has to be recorded.

ROOST COUNT: specify the number of individuals recorded within each sample unit: night roost and high tide roost. If more than one flock of the same species is observed within the same sample unit (one square km cell), total number of individuals has to be recorded.

NOTES: specify eventual useful notes, as an example, locality name etc.

N.B. The wetland's name, date and the progressive number of the recording form has to be repeated on the BACK of the recording form.

ID	IWRB	Euring	English_Name	Scientific_Name	Italian_Name	English_Name_Group
188	PLALE	01440	African Spoonbill	*Platalea leucorodia*	Spatola	Storks, Ibises & Spoonbills
200	PORAL	04250	Allen's Gallinule	*Porphyrio alleni*	Pollo sultano di Allen	Rails
201	PORMA	04260	American Purple Gallinule	*Porphyrio martinica*	Pollo sultano della Martinica	Rails
8	ANAAM	01800	American Wigeon	*Anas americana*	Fischione americano	Wildfowl
84	CICCI	01340	Arctic Skua	*Ciconia ciconia*	Cicogna bianca	Storks, Ibises & Spoonbills
226	STEPR	06160	Arctic Tern	*Sterna paradisaea*	Sterna codalunga	Gulls & Terns
130	LARAU	05880	Audouin's Gull	*Larus audouinii*	Gabbiano corso	Gulls & Terns
209	RECAV	04560	Avocet	*Recurvirostra avosetta*	Avocetta	Shorebirds
15	ANAFO	01830	Baikal Teal	*Anas formosa*	Alzavola asiatica	Wildfowl
205	PORPU	04110	Baillon's Crake	*Porzana pusilla*	Schiribilla grigiata	Rails
61	CALBA	05060	Baird's Sandpiper	*Calidris bairdii*	Gambecchio di Baird	Shorebirds
29	ANSIN	01620	Bar-headed Goose	*Anser indicus*	Oca indiàna	Wildfowl
53	BRALE	01670	Barnacle Goose	*Branta leucopsis*	Oca facciabianca	Wildfowl
148	LIMLA	05340	Bar-tailed Godwit	*Limosa lapponica*	Pittima minore	Shorebirds
28	ANSFA	01570	Bean Goose	*Anser fabalis*	Oca granaiola	Wildfowl
94	CYGBE	01530	Bewick's (Tundra) Swan	*Cygnus columbianus*	Cigno minore	Wildfowl
50	BOTST	00950	Bittern	*Botaurus stellaris*	Tarabuso	Herons & Bitterns
47	BALPA	30600	Black Crowned-Crane	*Balearica pavonina*	Gru pavonìna	Cranes
102	EUDRU	01390	Black Stork	*Eudocimus ruber*	Ìbis scarlàtto	Storks, Ibises & Spoonbills
93	CYGAT	20800	Black Swan	*Cygnus atratus*	Cigno nero	Wildfowl
82	CHLNI	06270	Black Tern	*Chlidonias niger*	Mignattino comune	Gulls & Terns
143	LARRI	05820	Black-headed Gull	*Larus ridibundus*	Gabbiano comune	Gulls & Terns
196	PODNI	00120	Black-necked Grebe	*Podiceps nigricollis*	Svasso piccolo	Grebes
149	LIMLI	05320	Black-tailed Godwit	*Limosa limosa*	Pittima reale	Shorebirds
113	GAVAR	00030	Black-throated Diver	*Gavia arctica*	Strolaga mezzana	Divers
117	GLANO	04670	Black-winged Pratincole	*Glareola nordmanni*	Pernice di mare orientale	Shorebirds
122	HIMHI	04550	Black-winged Stilt	*Himantopus himantopus*	Cavaliere d'Italia	Shorebirds
13	ANADI	01920	Blue-winged Teal	*Anas discors*	Marzaiola americana	Wildfowl
51	BRABE	01680	Brent Goose	*Branta bernicla*	Oca colombaccio	Wildfowl
146	LIMFA	05140	Broad-billed Sandpiper	*Limicola falcinellus*	Gambecchio frullino	Shorebirds
240	TRYSU	05160	Buff-breasted Sandpiper	*Tryngites subruficollis*	Piro piro fulvo	Shorebirds
52	BRACA	01660	Canada Goose	*Branta canadensis*	Oca del Canada	Wildfowl
131	LARCS	05927	Caspian Gull	*Larus cachinnans*	Gabbiano reale pontico	Gulls & Terns
75	CHAAS	04800	Caspian Plover	*Charadrius asiaticus*	Corriere asiatico	Shorebirds
221	STECA	06060	Caspian Tern	*Sterna caspia*	Sterna maggiore	Gulls & Terns
55	BUBIB	01110	Cattle Egret	*Bubulcus ibis*	Airone guardabuoi	Herons & Bitterns
183	PHOCH	20230	Chilean Flamingo	*Phoenicopterus chilensis*	Fenicòttero del Cile	Flamingoes
118	GLAPR	04650	Collared Pratincole	*Glareola pratincola*	Pernice di mare	Shorebirds
132	LARCA	05900	Common Gull	*Larus canus*	Gavina	Gulls & Terns
1	ACTHY	05560	Common Sandpiper	*Actitis hypoleucos*	Piro piro piccolo	Shorebirds

ANNEX III. - *ANSER Waterbirds check-list designed for Friuli Venezia Giulia*

153	MELNI	02130	Common Scoter	*Melanitta nigra*	Orchetto marino	Wildfowl
224	STEHI	06150	Common Tern	*Sterna hirundo*	Sterna comune	Gulls & Terns
105	FULAT	04290	Coot	*Fulica atra*	Folaga	Rails
176	PHACA	00720	Cormorant	*Phalacrocorax carbo*	Cormorano	Cormorants & Shags
91	CRECR	04210	Corncrake	*Crex crex*	Re di quaglie	Rails
71	CALDI	00360	Cory's Shearwater	*Calonectris diomedea*	Berta maggiore	Shearwaters
119	GRUGR	04330	Crane	*Grus grus*	Gru	Cranes
92	CURCU	04640	Cream-coloured Courser	*Cursorius cursor*	Corrione biondo	Shorebirds
106	FULCR	04310	Crested Coot	*Fulica cristata*	Folaga crestata	Rails
162	NUMAR	05410	Curlew	*Numenius arquata*	Chiurlo maggiore	Shorebirds
63	CALFE	05090	Curlew Sandpiper	*Calidris ferruginea*	Piovanello comune	Shorebirds
171	PELCR	00890	Dalmatian Pelican	*Pelecanus crispus*	Pellicano riccio	Pelicans
32	ANTVI	04410	Demoiselle Crane	*Grus virgo*	Damigella della Numidia	Cranes
60	CALAL	05120	Dunlin	*Calidris alpina*	Piovanello pancianera	Shorebirds
6	ALOAE	01700	Egyptian Goose	*Alopochen aegyptiaca*	Oca egiziana	Wildfowl
213	SOMMO	02060	Eider	*Somateria mollissima*	Edredone	Wildfowl
14	ANAFA	01810	Falcated Duck	*Anas falcata*	Anatra falcàta	Wildfowl
24	XXXXB		Feral Greylag Goose	*Anser anser f. domestica*	Forme domestiche di Oca selvatica	Wildfowl
18	XXXXA		Feral Mallards	*Anas platyrhynchos f. domestica*	Forme domestiche di Germano reale	Wildfowl
45	AYTNY	02020	Ferruginous Duck	*Aythya nyroca*	Moretta tabaccata	Wildfowl
20	ANAST	01820	Gadwall	*Anas strepera*	Canapiglia	Wildfowl
158	MORBA	00710	Gannet	*Morus bassanus*	Sula	Gannets
19	ANAQU	01910	Gargney	*Anas querquedula*	Marzaiola	Wildfowl
137	LARHY	05990	Glaucous Gull	*Larus hyperboreus*	Gabbiano glauco	Gulls & Terns
231	THRAE	01420	Glossy Ibis	*Threskiornis aethiopicus*	Ibis sacro	Storks, Ibises & Spoonbills
190	PLUAP	04850	Golden Plover	*Pluvialis apricaria*	Piviere dorato	Shorebirds
56	BUCCL	02180	Goldeneye	*Bucephala clangula*	Quattrocchi	Wildfowl
155	MERME	02230	Goosander	*Mergus merganser*	Smergo maggiore	Wildfowl
139	LARMA	06000	Great Black-backed Gull	*Larus marinus*	Mugnaiaccio	Gulls & Terns
138	LARIC	05730	Great Black-headed Gull	*Larus ichthyaetus*	Gabbiano di Pallas	Gulls & Terns
194	PODCR	00090	Great Crested Grebe	*Podiceps cristatus*	Svasso maggiore	Grebes
114	GAVIM	00040	Great Northern Diver	*Gavia immer*	Strolaga maggiore	Divers
218	STESK	05690	Great Skua	*Stercorarius skua*	Stercorario maggiore	Gulls & Terns
216	STEPA	05670	Great Skua	*Stercorarius parasiticus*	Labbo	Skuas
109	GALME	05200	Great Snipe	*Gallinago media*	Croccolone	Shorebirds
72	EGRAL	01210	Great White Egret	*Casmerodius albus*	Airone bianco maggiore	Herons & Bitterns
185	PHORO	01472	Greater Flamingo	*Phoenicopterus roseus*	Fenicòttero	Flamingoes
78	CHALE	04790	Greater Sand Plover	*Charadrius leschenaultii*	Corriere di Leschenault	Shorebirds
236	TRIOC	05530	Green Sandpiper	*Tringa ochropus*	Piro piro culbianco	Shorebirds
235	TRINE	05480	Greenshank	*Tringa nebularia*	Pantana	Shorebirds
10	ANACA	01842	Green-winged Teal	*Anas carolinensis*	Alzavola americana	Wildfowl

ANNEX III. - *ANSER Waterbirds check-list designed for Friuli Venezia Giulia*

48	BALRE		Grey Crowned-Crane	*Balearica regulorum*	Gru coronata	Cranes
35	ARDCI	01220	Grey Heron	*Ardea cinerea*	Airone cenerino	Herons & Bitterns
179	PHAFU	05650	Grey Phalarope	*Phalaropus fulicarius*	Falaropo beccolargo	Shorebirds
192	PLUSQ	04860	Grey Plover	*Pluvialis squatarola*	Pivieressa	Shorebirds
198	PORPP		Grey-headed Swamphen	*Porphyrio poliocephalus*	Pollo sultano asiatico	Rails
23	ANSAN	01610	Greylag Goose	*Anser anser*	Oca selvatica	Wildfowl
241	URIAL	06340	Guillemot	*Uria aalge*	Uria	Auks
225	GELNI	06050	Gull-billed Tern	*Sterna nilotica*	Sterna zampenere	Gulls & Terns
123	HISHI	02110	Harlequin Duck	*Histrionicus histrionicus*	Moretta arlecchino	Wildfowl
87	CIRCY	02610	Hen Harrier	*Circus cyaneus*	Albanella reale	Raptors
128	LARAR	05920	Herring Gull	*Larus argentatus*	Gabbiano reale nordico	Gulls & Terns
246	IBRID	24998	Hybrid species	*Hybrid species*	Specie ibrida	Hybrid species
136	LARGL	05980	Iceland Gull	*Larus glaucoides*	Gabbiano d'Islanda	Gulls & Terns
157	EGRIN	01200	Intermediate Egret	*Mesophoyx intermedia*	Airone bianco intermedio	Herons & Bitterns
169	PAGEB	06040	Ivory Gull	*Pagophila eburnea*	Gabbiano eburneo	Gulls & Terns
150	LYMMI	05180	Jack Snipe	*Lymnocryptes minimus*	Frullino	Shorebirds
74	CHAAL	04770	Kentish Plover	*Charadrius alexandrinus*	Fratino	Shorebirds
214	SOMSP	02070	King Eider	*Somateria spectabilis*	Re degli edredoni	Wildfowl
211	RISTR	06020	Kittiwake	*Rissa tridactyla*	Gabbiano tridattilo	Gulls & Terns
62	CALCA	04960	Knot	*Calidris canutus*	Piovanello maggiore	Shorebirds
244	VANVA	04930	Lapwing	*Vanellus vanellus*	Pavoncella	Shorebirds
129	LARAT	05760	Laughing Gull	*Larus atricilla*	Gabbiano sghignazzante	Gulls & Terns
67	CALML	05040	Least Sandpiper	*Calidris minutilla*	Gambecchio americano	Shorebirds
134	LARFU	05910	Lesser Black-backed Gull	*Larus fuscus*	Zafferano	Gulls & Terns
220	STEBE	06090	Lesser Crested Tern	*Sterna bengalensis*	Sterna di Ruppell	Gulls & Terns
184	PHOMI	01480	Lesser Flamingo	*Phoenicopterus minor*	Fenicòttero minóre	Flamingoes
34	AQUPO	02920	Lesser Spotted Eagle	*Aquila pomarina*	Aquila anatraia minore	Raptors
99	DENVI		Lesser Whistling Duck	*Dendrocygna viduata*	Dendrocigna facciabianca	Wildfowl
27	ANSEY	01600	lesser White-fronted Goose	*Anser erythropus*	Oca lombardella minore	Wildfowl
233	TRIFL	05510	Lesser Yellowlegs	*Tringa flavipes*	Totano zampegialle minore	Shorebirds
127	IXOMI	00980	Little Bittern	*Ixobrychus minutus*	Tarabusino	Herons & Bitterns
203	PORPA	04100	Little Crake	*Porzana parva*	Schiribilla	Rails
100	EGRGA	01190	Little Egret	*Egretta garzetta*	Garzetta	Herons & Bitterns
228	TACRU	00070	Little Grebe	*Tachybaptus ruficollis*	Tuffetto	Grebes
142	LARMI	05780	Little Gull	*Larus minutus*	Gabbianello	Gulls & Terns
76	CHADU	04690	Little Ringed Plover	*Charadrius dubius*	Corriere piccolo	Shorebirds
66	CALMI	05010	Little Stint	*Calidris minuta*	Gambecchio comune	Shorebirds
219	STEAL	06240	Little Tern	*Sterna albifrons*	Fraticello	Gulls & Terns
147	LIMSC	05270	Long-billed Dowitcher	*Limnodromus scolopaceus*	Limnodromo pettorossiccio	Shorebirds
103	EUDMO	04820	Long-billed Dowitcher	*Charadrius morinellus*	Piviere tortolino	Shorebirds
90	CLAHY	02120	Long-tailed Duck	*Clangula hyemalis*	Moretta codona	Wildfowl

ANNEX III. - *ANSER Waterbirds check-list designed for Friuli Venezia Giulia*

217	STEPO	05660	Long-tailed Skua	*Stercorarius pomarinus*	Stercorario mezzano	Skuas
17	ANAPL	01860	Mallard	*Anas platyrhynchos*	Germano reale	Wildfowl
3	AIXGA	01780	Mandarin Duck	*Aix galericulata*	Anatra mandarina	Wildfowl
151	MARAN	01950	Marbled Teal	*Marmaronetta angustirostris*	Anatra marmorizzata	Wildfowl
86	CIRAE	02600	Marsh Harrier	*Circus aeruginosus*	Falco di palude	Raptors
238	TRIST	05470	Marsh Sandpiper	*Tringa stagnatilis*	Albastrello	Shorebirds
140	LARME	05750	Mediterranean Gull	*Larus melanocephalus*	Gabbiano corallino	Gulls & Terns
89	CIRPY	02630	Montagu's Harrier	*Circus pygargus*	Albanella minore	Raptors
111	GALCH	04240	Moorhen	*Gallinula chloropus*	Gallinella d'acqua	Rails
58	CAIMO	01750	Muscovy Duck	*Cairina moschata*	Anatra mùta	Wildfowl
96	CYGOL	01520	Mute Swan	*Cygnus olor*	Cigno reale	Wildfowl
166	NYCNY	01040	Night Heron	*Nycticorax nycticorax*	Nitticora	Herons & Bitterns
247	NONEL	24995	Not listed species	*Not listed species*	Specie non in elenco	Not listed species
170	PANHA	03010	Osprey	*Pandion haliaetus*	Falco pescatore	Raptors
120	HAEOS	04500	Oystercatcher	*Haemantopus ostralegus*	Beccaccia di mare	Shorebirds
191	PLUFU	04842	Pacific Golden Plover	*Pluvialis fulva*	Piviere orientale	Shorebirds
88	CIRMA	02620	Pallid Harrier	*Circus macrourus*	Albanella pallida	Raptors
65	CALME	05070	Pectoral Sandpiper	*Calidris melanotos*	Piovanello pettorale	Shorebirds
173	PELRU	00900	Pink-backed Pelican	*Pelecanus rufescens*	Pellicàno rossìccio	Pelicans
25	ANSBR	01580	Pink-footed Goose	*Anser brachyrhynchus*	Oca zamperosee	Wildfowl
7	ANAAC	01890	Pintail	*Anas acuta*	Codone	Wildfowl
110	GALST	05210	Pintail Snipe	*Gallinago stenura*	Beccaccino stenuro	Shorebirds
42	AYTFE	01980	Pochard	*Aythya ferina*	Moriglione	Wildfowl
215	STELO	05680	Pomarine Skua	*Stercorarius longicaudus*	Labbo codalunga	Skuas
104	FRAAR	06540	Puffin	*Fratercula arctica*	Pulcinella di mare	Auks
199	PORPO	04270	Purple Gallinule	*Porphyrio porphyrio*	Pollo sultano	Rails
36	ARDPU	01240	Purple Heron	*Ardea purpurea*	Airone rosso	Herons & Bitterns
64	CALMA	05100	Purple Sandpiper	*Calidris maritima*	Piovanello violetto	Shorebirds
177	PHAPY	00820	Pygmy Cormorant	*Phalacrocorax pygmaeus*	Marangone minore	Cormorants & Shags
5	ALCTO	06360	Razorbill	*Alca torda*	Gazza marina	Auks
160	NETPE		Red-billed Pochard	*Netta peposaca*	Fistione beccorosa	Wildfowl
54	BRARU	01690	Red-breasted Goose	*Branta ruficollis*	Oca collorosso	Wildfowl
156	MERSE	02210	Red-breasted Merganser	*Mergus serrator*	Smergo minore	Wildfowl
161	NETRU	01960	Red-crested Pochard	*Netta rufina*	Fistione turco	Wildfowl
195	PODGR	00100	Red-necked Grebe	*Podiceps grisegena*	Svasso collorosso	Grebes
180	PHALO	05640	Red-necked Phalarope	*Phalaropus lobatus*	Falaropo beccosottile	Shorebirds
68	CALRU	05000	Red-necked Stint	*Calidris ruficollis*	Gambecchio collorosso	Shorebirds
239	TRITO	05460	Redshank	*Tringa totanus*	Pettegola	Shorebirds
116	GAVST	00020	Red-throated Diver	*Gavia stellata*	Strolaga minore	Divers
133	LARDE	05890	Ring-billed Gull	*Larus delawarensis*	Gavina americana	Gulls & Terns
77	CHAHI	04700	Ringed Plover	*Charadrius hiaticula*	Corriere grosso	Shorebirds

41	AYTCO	02000	Ring-necked Duck	*Aythya collaris*	Moretta dal collare	Wildfowl
222	STEDO	06140	Roseate Tern	*Sterna dougallii*	Sterna di Dougall	Gulls & Terns
210	RHORO	06010	Ross's Gull	*Rhodostethia rosea*	Gabbiano di Ross	Gulls & Terns
167	OXYJA	02250	Ruddy Duck	*Oxyura jamaicensis*	Gobbo della Giamaica	Wildfowl
229	TADFE	01710	Ruddy Shelduck	*Tadorna ferruginea*	Casarca	Wildfowl
182	PHIPU	05170	Ruff	*Philomachus pugnax*	Combattente	Shorebirds
144	LARSA	05790	Sabine's Gull	*Larus sabini*	Gabbiano di Sabine	Gulls & Terns
125	HYDPE	00520	Sacred Ibis	*Hydrobates pelagicus*	Uccello delle tempeste	Storm-petrels
59	CALAA	04970	Sanderling	*Calidris alba*	Piovanello tridattilo	Shorebirds
227	STESA	06110	Sandwich Tern	*Sterna sandvicensis*	Beccapesci	Gulls & Terns
159	MYCIB	01290	Scarlet Ibis	*Mycteria ibis*	Tàntalo africàno	Storks, Ibises & Spoonbills
44	AYTMA	02040	Scaup	*Aythya marila*	Moretta grigia	Wildfowl
126	IXOEU	01000	Schrenck's Little Bittern	*Ixobrychus eurhythmus*	Tarabusino orientale	Herons & Bitterns
175	PHAAR	00800	Shag	*Phalacrocorax aristotelis*	Marangone dal ciuffo	Cormorants & Shags
230	TADTA	01730	Shelduck	*Tadorna tadorna*	Volpoca	Wildfowl
40	ASIFL	07680	Short-eared Owl	*Asio flammeus*	Gufo di palude	Raptors
11	ANACL	01940	Shoveler	*Anas clypeata*	Mestolone	Wildfowl
193	PODAU	00110	Slavonian Grebe	*Podiceps auritus*	Svasso cornuto	Grebes
165	NUMTE	05400	Slender-billed Curlew	*Numenius tenuirostris*	Chiurlottello	Shorebirds
135	LARGE	05850	Slender-billed Gull	*Larus genei*	Gabbiano roseo	Gulls & Terns
154	MERAL	02200	Smew	*Mergus albellus*	Pesciaiola	Wildfowl
108	GALGA	05190	Snipe	*Gallinago gallinago*	Beccaccino	Shorebirds
26	ANSCA	01630	Snow Goose	*Anser caerulescens*	Oca delle nevi	Wildfowl
242	VANGR	04910	Sociable Plover	*Vanellus gregarius*	Pavoncella gregaria	Shorebirds
223	STEFU	06230	Sooty Tern	*Sterna fuscata*	Sterna scura	Gulls & Terns
189	PLEFA	01360	Spoonbill	*Plegadis falcinellus*	Mignattaio	Storks, Ibises & Spoonbills
204	PORPZ	04080	Spotted Crake	*Porzana porzana*	Voltolino	Rails
33	AQUCL	02930	Spotted Eagle	*Aquila clanga*	Aquila anatraia maggiore	Raptors
232	TRIER	05450	Spotted Redshank	*Tringa erythropus*	Totano moro	Shorebirds
2	ACTMA	05570	Spotted Sandpiper	*Actitis macularius*	Piro piro macchiato	Shorebirds
124	HOPSP	04870	Spur-Winged Plover	*Hoplopterus spinosus*	Pavoncella armata	Shorebirds
38	ARDRA	01080	Squacco Heron	*Ardeola ralloides*	Sgarza ciuffetto	Herons & Bitterns
57	BUROE	04590	Stone Curlew	*Burhinus oedicnemus*	Occhione	Shorebirds
202	PORMG	04120	Striped Crake	*Porzana marginalis*	Voltolino striato	Rails
249	ANSFF	01571	Taiga Bean Goose	*Anser fabalis fabalis*	Oca granaiola di taiga	Wildfowl
12	ANACR	01840	Teal	*Anas crecca*	Alzavola	Wildfowl
70	CALTE	05020	Temminck's Stint	*Calidris temminckii*	Gambecchio nano	Shorebirds
245	XENCI	05550	Terek Sandpiper	*Xenus cinereus*	Piro piro del Terek	Shorebirds
43	AYTFU	02030	Tufted Duck	*Aythya fuligula*	Moretta	Wildfowl
30	ANSSR	01574	Tundra Bean Goose	*Anser fabalis rossicus*	Oca granaiola di tundra	Wildfowl
39	AREIN	05610	Turnstone	*Arenaria interpres*	Voltapietre	Shorebirds

ANNEX III. - *ANSER Waterbirds check-list designed for Friuli Venezia Giulia*

178	PHALA	00849	Unid. Cormorants & Shags	*Phalacrocorax spp.*	Cormorani non identificati	Cormorants & Shags
21	DUCKS	01949	Unidentified Anatidae spp.	*Anas spp.*	Anatre non identificate	Wildfowl
31	ANSER	01659	Unidentified Anser spp.	*Anser spp.*	Oche non identificate	Wildfowl
46	AYTHY	02059	Unidentified Aythya spp.	*Aythya spp.*	Morette non identificate	Wildfowl
69	CALID	05129	Unidentified Calidris spp.	*Calidris spp.*	Piovanelli non identificati	Shorebirds
73	WADER	05659	Unidentified Charadrii spp.	*Charadrii spp.*	Limicoli non identificati	Shorebirds
79	CHARA	04839	Unidentified Charadrius spp.	*Charadrius spp.*	Corrieri non identificati	Shorebirds
83	CHLID	06289	Unidentified Chlidonias spp.	*Chlidonias spp.*	Mignattini non identificati	Gulls & Terns
164	NUMEN	05439	Unidentified Curlews	*Numenius spp.*	Chiurli non identificati	Shorebirds
115	GAVIA	00059	Unidentified Divers	*Gavia spp.*	Strolaghe non identificate	Divers
107	FULIC		Unidentified Fulica spp.	*Fulica spp.*	Folaghe non identificate	Rails
197	GREBE	00129	Unidentified Grebes	*Podicipedidae spp.*	Svassi non identificati	Grebes
37	ARDEI	01259	Unidentified Herons & Bitterns	*Ardeidae spp.*	Ardeidi non identificati	Herons & Bitterns
145	LARUS	06009	Unidentified Larus spp.	*Larus spp.*	Gabbiani non identificati	Gulls & Terns
174	PELEC	00919	Unidentified Pelican	*Pelecanus spp.*	Pellicani non identificati	Pelicans
207	RALLI	04319	Unidentified Rallidae spp.	*Rallidae spp.*	Ralli non identificati	Rails
97	SWANS	01559	Unidentified Swans	*Cygnus spp.*	Cigni non identificati	Wildfowl
237	TRING		Unidentified Tringa spp.	*Tringa spp.*	Totani non identificati	Shorebirds
98	DENJA		Velvet Scoter	*Dendrocygna javanica*	Dendrocigna indiana	Wildfowl
152	MELFU	02150	Velvet Scoter	*Melanitta fusca*	Orco marino	Wildfowl
208	RALAQ	04070	Water Rail	*Rallus aquaticus*	Porciglione	Rails
101	EGRGU	01180	Western Reef Heron	*Egretta gularis*	Airone schistaceo	Herons & Bitterns
163	NUMPH	05380	Whimbrel	*Numenius phaeopus*	Chiurlo piccolo	Shorebirds
80	CHLHY	06260	Whiskered Tern	*Chlidonias hybrida*	Mignattino piombato	Gulls & Terns
172	PELON	00880	White Pelican	*Pelecanus onocrotalus*	Pellicano comune	Pelicans
85	CICNI	01310	White Stork	*Ciconia nigra*	Cicogna nera	Storks, Ibises & Spoonbills
112	GAVAD	00050	White-billed Diver	*Gavia adamsii*	Strolaga beccogiallo	Divers
9	ANABA	01900	White-cheecked Pintail	*Anas bahamensis*	Codóne delle Bahàmas	Wildfowl
22	ANSAL	01590	White-fronted Goose	*Anser albifrons*	Oca lombardella	Wildfowl
168	OXYLE	02260	White-headed Duck	*Oxyura leucocephala*	Gobbo rugginoso	Wildfowl
121	HALAL	02430	White-tailed Eagle	*Haliaeetus albicilla*	Aquila di mare	Raptors
243	VANLE	04920	White-tailed Plover	*Vanellus leucurus*	Pavoncella codabianca	Shorebirds
81	CHLLE	06280	White-winged Black Tern	*Chlidonias leucopterus*	Mignattino alibianche	Gulls & Terns
95	CYGCY	01540	Whooper Swan	*Cygnus cygnus*	Cigno selvatico	Wildfowl
16	ANAPE	01790	Wigeon	*Anas penelope*	Fischione	Wildfowl
49	BARLO	05440	Wilson's Phalarope	*Bartramia longicauda*	Piro piro codalunga	Shorebirds
181	PHATR	05630	Wilson's Phalarope	*Phalaropus tricolor*	Falaropo di Wilson	Shorebirds
4	AIXSP	01770	Wood Duck	*Aix sponsa*	Ànatra spòsa	Wildfowl
234	TRIGL	05540	Wood Sandpiper	*Tringa glareola*	Piro piro boschereccio	Shorebirds
212	SCORU	05290	Woodcock	*Scolopax rusticola*	Beccaccia	Shorebirds
206	PUFYE	00462	Yelkouan Shearwater	*Puffinus yelkouan*	Berta minore	Shearwaters

187	PLAAL	01449	Yellow-billed Stork	*Platalea alba*	Spàtola africàna	Storks, Ibises & Spoonbills
141	LARMH	05926	Yellow-legged Gull	*Larus michahellis*	Gabbiano reale	Gulls & Terns

BirdLife IBA Factsheet

IT062 Grado and Marano lagoon

Country/Territory	Italy
Administrative region(s)	Friuli-Venezia Giulia
Central coordinates	13o 19' East 45o 45' North Map
Area	29455 ha
Altitude	0 - 5m
Criteria	

Site description A large, shallow tidal lagoon on the north Adriatic coast, fed by six rivers, 30 km in length and about 5 km in width, with six main connections with the open sea and a number of small islands and sandbars along the coast. The area is rich in tidal mudflats, sand-dunes and large reedbeds. The deeper parts of the lagoon are covered by eel-grass *Zostera* and sea lettuce *Ulva*; the mudflats have cord-grass *Spartina* and *Ruppia*; permanently exposed banks have *Salicornia* and the dunes are vegetated by grasses (*Agropyron*, *Ammophila*), etc. There are fringing stands of *Scirpus*, *Phragmites* and *Salix* around the freshwater channels and rivers which enter the lagoon. The site also includes the final stretch (and mouth of) the Stella river, a lowland woodland, some agricultural areas, and the sea up to 5 m depth. Fishing, fish-farming, hunting, tourism and agriculture are the main uses of the area.

Habitats and percentage cover	
Artificial landscapes (terrestrial)	8
Coastline	-
Forest	3
Sea	14
Wetlands (inland)	-
Wetlands (inland)	-

Land-use and percentage cover		
agriculture	2	
fisheries/aquaculture	80	
hunting	70	
nature conservation and research	15	
tourism/recreation	5	
urban/industrial/transport	3	

Birds A very important site for waterbirds in winter (more than 100,000) as well as when breeding and on passage, with internationally important numbers of a wide variety of species. Species of global conservation concern that do not meet IBA criteria: *Aythya nyroca* (max. 1, winter). A total of 280 species recorded, of which about 100 breed. Winter waterbird counts are from January, from the period 1992-1994 unless otherwise stated.

Protection status National Low **International** Low1,450 ha of IBA covered by Regional Nature Reserve (Foci dello Stella, 1,450 ha). 128 ha of IBA covered by Regional Nature Reserve (Valle Canal Novo, 128 ha). 340 ha of IBA covered by Regional Nature Reserve (Valle Cavanata, 340 ha). 1,400 ha of IBA covered by Special Protection Area (Marano Lagunare e Foce dello Stella, 1,400 ha). 243 ha of IBA covered by Special Protection Area (Valle Cavanata, 243 ha). 243 ha of IBA covered by Ramsar Site (Valle Cavanata, 243 ha).

Conservation issues The main threats are: drainage; increased sedimentation of wetlands by mud from the dredging of channels; disturbance by tourists of breeding birds along sandbars; intensification of fish-farming; the extension of industrial and touristic infrastructure; illegal hunting; and motor-boating. Some or all of the site is covered by a management plan. There has been a regular census of wintering waterbirds and breeding gulls and herons since the 1970s. Since 1987 the Osservatori Faunistici di Gorizia e Udine has monitored breeding species regularly. *Cygnus olor* and *Anser anser* have been introduced as breeding species.

Threats and importance	
aquaculture/fisheries	medium
disturbance to birds	high
drainage	medium
dredging/canalization	medium
filling-in of wetlands	medium
industrialization/urbanization	low
infrastructure	low
natural events	low
recreation/tourism	medium
unsustainable exploitation	medium

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