

Evento finale Life PERDIX 28-29.11.2024

ECOMUSEO IMPIANTO IDROVORO DI
MAROZZO (FE)

Coordinatore beneficiario



Beneficiari associati



Cofinanziatore

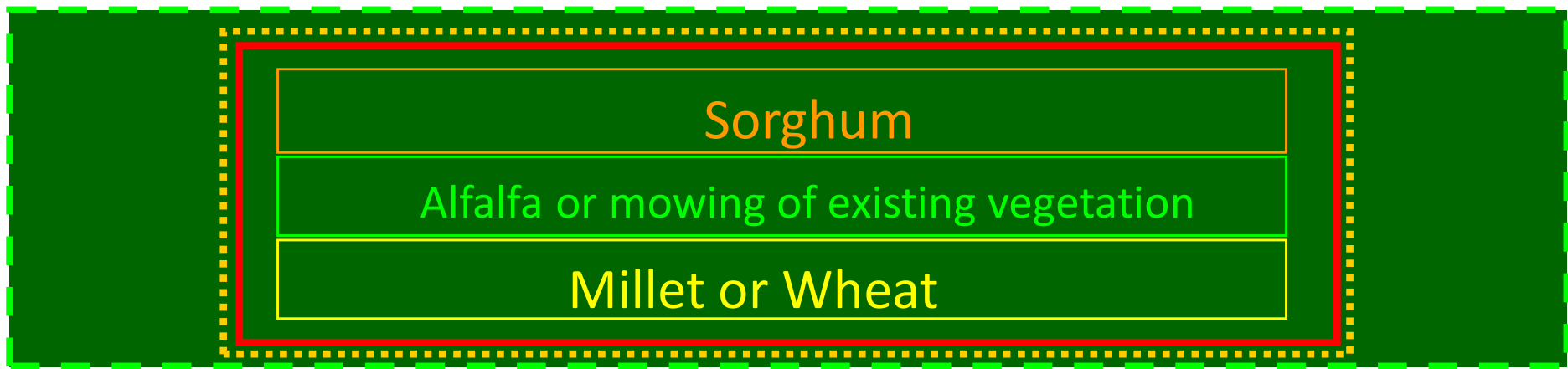


Other types of monitoring

- Environmental enrichments and bird communities
- Drone testing
- Sanitary monitoring
- Camera traps



Among the different measures, the project also included creating **environmental improvements** like sowing **disposable crops** in the enclosure areas to provide supplementary food for grey partridges from August, the release month, to the following winter.



— Enclosure area

..... Tillage (plowing and refinement) up to around the fence

— Sorghum

— Millet or Wheat

— Alfalfa or mowing of existing vegetation

Moreover the **delay of the harvesting wild herbs** near the enclosures furtherly **increased seeds availability** after the summer.



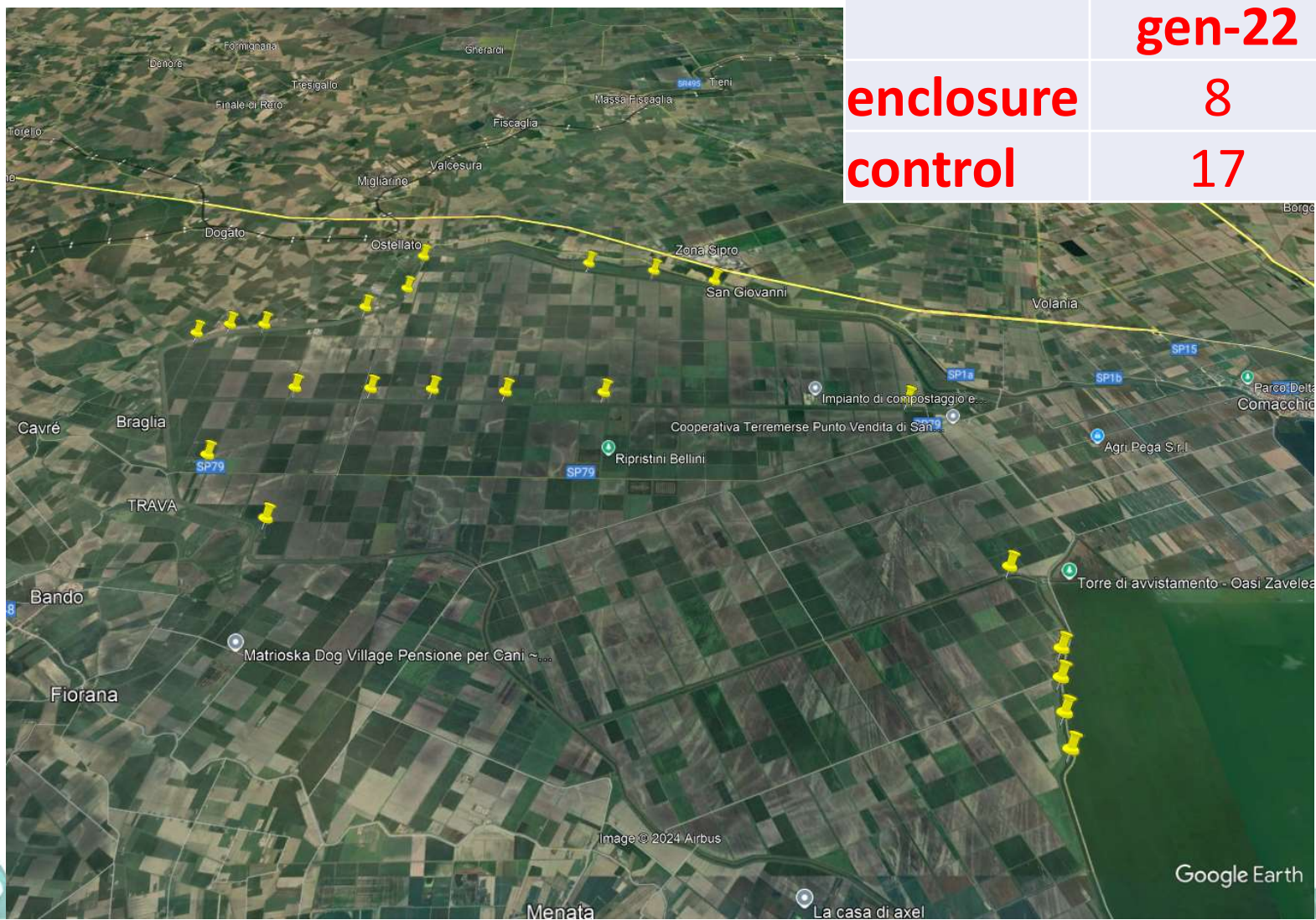
Effects of such seeding and in general availability of seeds on the **wintering bird communities** were investigated



In January and December 2022 and January 2023, **point counts** were conducted in **enclosure** areas where habitat management actions were carried out and in **control** areas.

10-min, 100 m radius, counting points

	gen-22	dic-22	gen-23
enclosure	8	18	18
control	17	14	14

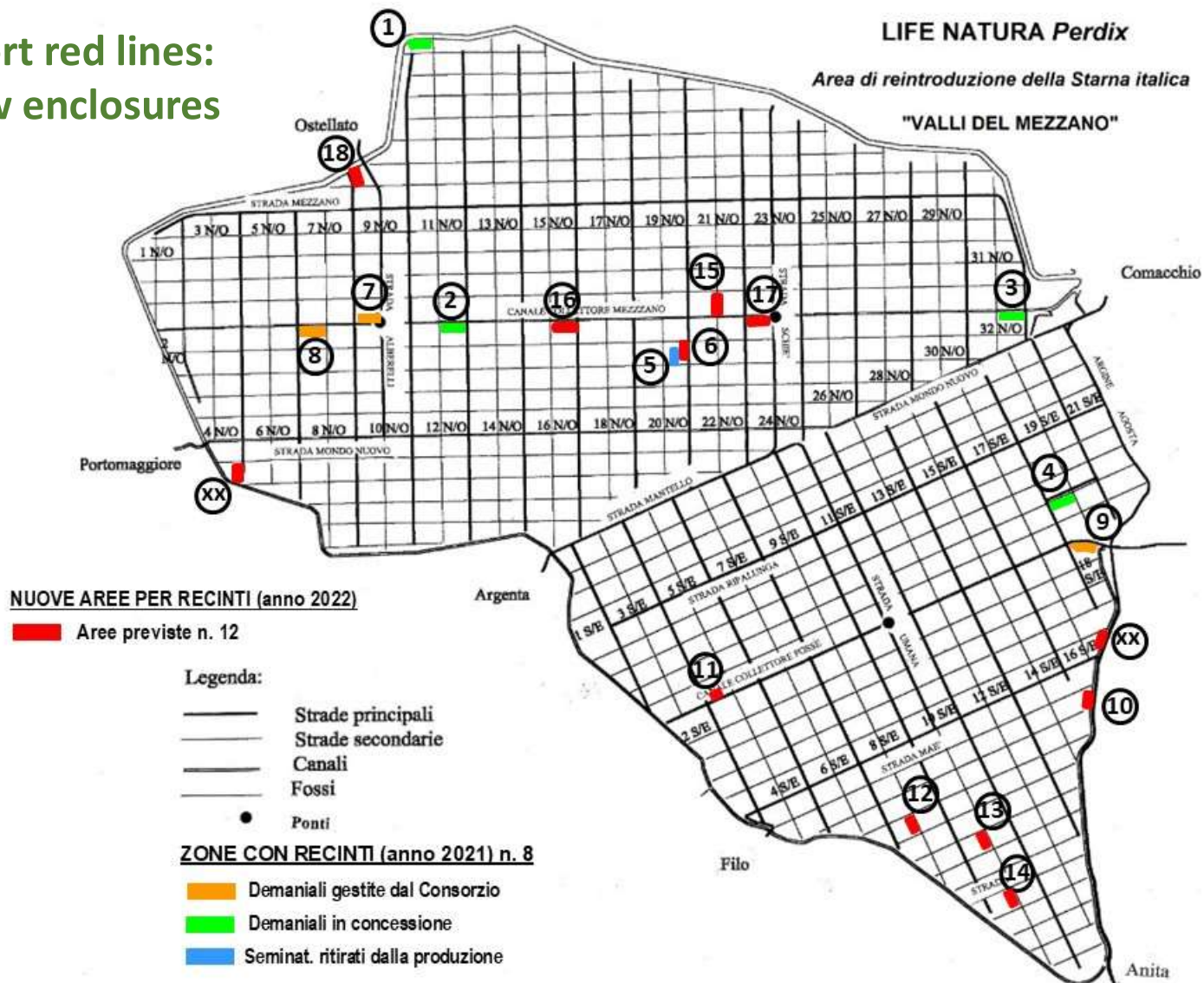


Short red lines:
new enclosures

LIFE NATURA Perdix

Area di reintroduzione della *Sterna italica*

"VALLI DEL MEZZANO"



81 species observed in winter belonging to different orders of birds

Galliformes

Anseriformes

Podicipediformes

Phoenicopteriformes

Columbiformes

Gruiformes

Ciconiiformes

Pelecaniformes

Suliformes

Charadriiformes

Strigiformes

Accipitriformes

Specie		Specie	
Fagiano comune	<i>Phasianus colchicus</i>	Poiana	<i>Buteo buteo</i>
Oca selvatica	<i>Anser anser</i>	Martin pescatore	<i>Alcedo atthis</i>
Oca lombardella	<i>Anser albifrons</i>	Picchio verde	<i>Picus viridis</i>
Volpoca	<i>Tadorna tadorna</i>	Picchio rosso maggiore	<i>Dendrocopos major</i>
Moriglione	<i>Aythya ferina</i>	Gheppio	<i>Falco tinnunculus</i>
Mestolone	<i>Spatula clypeata</i>	Smeriglio	<i>Falco columbarius</i>
Fischione	<i>Mareca penelope</i>	Lanario	<i>Falco biarmicus</i>
Germano reale	<i>Anas platyrhynchos</i>	Falco pellegrino	<i>Falco peregrinus</i>
Alzavola	<i>Anas crecca</i>	Ghiandaia	<i>Garrulus glandarius</i>
Tuffetto	<i>Tachybaptus ruficollis</i>	Gazza	<i>Pica pica</i>
Svasso maggiore	<i>Podiceps cristatus</i>	Taccola	<i>Corvus monedula</i>
Svasso piccolo	<i>Podiceps nigricollis</i>	Cornacchia	<i>Corvus corone</i>
Fenicottero	<i>Phoenicopertus roseus</i>	Cinciarella	<i>Cyanistes caeruleus</i>
Piccione domestico	<i>Columba livia</i>	Cinciallegre	<i>Parus major</i>
Colombaccio	<i>Columba palumbus</i>	Allodola	<i>Alauda arvensis</i>
Colombella	<i>Columba oenas</i>	Beccamoschino	<i>Cisticola juncidis</i>
Tortora dal collare	<i>Streptopelia decaocto</i>	Usignolo di fiume	<i>Cettia cetti</i>
Gallinella d'acqua	<i>Gallinula chloropus</i>	Codibugnolo	<i>Aegithalos caudatus</i>
Folaga	<i>Fulica atra</i>	Capinera	<i>Sylvia atricapilla</i>
Gru	<i>Grus grus</i>	Storno	<i>Sturnus vulgaris</i>
Cicogna bianca	<i>Ciconia ciconia</i>	Merlo	<i>Turdus merula</i>
Ibis sacro	<i>Threskiornis aethiopicus</i>	Cesena	<i>Turdus pilaris</i>
Airone guardabuoi	<i>Bubulcus ibis</i>	Pettiroso	<i>Erithacus rubecula</i>
Airone cenerino	<i>Ardea cinerea</i>	Codiroso spazzacamino	<i>Phoenicurus ochruros</i>
Airone bianco maggiore	<i>Ardea alba</i>	Saltimpalo	<i>Saxicola torquatus</i>
Garzetta	<i>Egretta garzetta</i>	Regolo	<i>Regulus regulus</i>
Marangone minore	<i>Microcarbo pygmaeus</i>	Fiorrancino	<i>Regulus ignicapillus</i>
Cormorano	<i>Phalacrocorax carbo</i>	Passera scopaiaola	<i>Prunella modularis</i>
Avocetta	<i>Recurvirostra avosetta</i>	Passera d'Italia	<i>Passer italiae</i>
Pavoncella	<i>Vanellus vanellus</i>	Passera mattugia	<i>Passer montanus</i>
Chiarlo maggiore	<i>Numenius arquata</i>	Pispola	<i>Anthus pratensis</i>
Beccaccino	<i>Gallinago gallinago</i>	Spioncello	<i>Anthus spinoletta</i>
Frullino	<i>Lymnocyptes minimus</i>	Ballerina gialla	<i>Motacilla cinerea</i>
Gabbiano comune	<i>Larus ridibundus</i>	Ballerina bianca	<i>Motacilla alba</i>
Gabbiano reale	<i>Larus michahellis</i>	Fringuello	<i>Fringilla coelebs</i>
Civetta	<i>Athene noctua</i>	Verdone	<i>Chloris chloris</i>
Gufo comune	<i>Asio otus</i>	Cardellino	<i>Carduelis carduelis</i>
Falco di palude	<i>Circus aeruginosus</i>	Verzellino	<i>Serinus serinus</i>
Albanella reale	<i>Circus cyaneus</i>	Strillozzo	<i>Emberiza calandra</i>
Sparviere	<i>Accipiter nisus</i>	Migliarino di palude	<i>Emberiza schoeniclus</i>
Nibbio reale	<i>Milvus milvus</i>		

Coraciiformes
Piciformes

Falconiformes

Passeriformes
32 species





In January 2022 the sowings in the enclosures had had a **little result** and few plants with seeds were available. Despite this species, **abundance** of birds was higher in **enclosures** ($A = 6,3$ birds/point) than in **control areas** ($A = 2,7$ birds/point), in particular, the abundance of **granivorous species** (i.e. *Fringilla coelebs*, *Emberiza schoeniclus*) was higher in the former.

		Gennaio 2022			
		recinti		controllo	
		media	ds	media	ds
passera mattugia	Passer montanus	-	-	-	-
fringuello	Fringilla coelebs	2,88	5,69	0,06	0,24
migliarino di palude	Emberiza schoeniclus	1,13	3,18	-	-
fagiano	Phasianus colchicus	-	-	0,35	0,70
gazza	Pica pica	0,38	0,52	0,12	0,33
pettirosso	Erithacus rubecula	0,13	0,35	0,18	0,39
ballerina bianca	Motacilla alba	-	-	-	-
cornacchia grigia	Corvus corone cornix	0,25	0,71	0,12	0,33
poiana	Buteo buteo	0,25	0,46	0,06	0,24
beccamoschino	Cisticola juncidis	-	-	-	-
codibugnolo	Aegithalos caudatus	0,38	1,06	0,06	0,24
gheppio	Falco tinnunculus	-	-	0,06	0,24
lui piccolo	Phylloscopus collybita	-	-	0,29	0,77
merlo	Turdus merula	0,13	0,35	0,24	0,56
tortora dal collare	Streptopelia decaocto	-	-	-	-
allodola	Alauda arvensis	-	-	-	-
cinciallegra	Parus major	0,29	0,49	0,18	0,39
cinciarella	Cyanistes caeruleus	-	-	-	-
fiorrancino	Regulus ignicapilla	-	-	-	-
ghiandaia	Garrulus glandarius	-	-	-	-
passera scopaiola	Prunella modularis	-	-	-	-
piccione domestico	Columba livia f.domestica	-	-	0,59	1,94
pispolo	Anthus pratensis	0,25	0,46	0,24	0,56
usignolo di fiume	Cettia cetti	-	-	-	-
colombaccio	Columba palumbus	-	-	-	-
picchio rosso maggiore	Dendrocopos major	-	-	-	-
Rampichimo comune	Certhia brachydactyla	-	-	-	-
Regolo	Regulus regulus	-	-	-	-
Scricciolo	Troglodytes troglodytes	-	-	-	-
Storno	Sturnus vulgaris	0,13	0,35	-	-
Codiroso spazzacamino	Phoenicurus ochruros	0,13	0,35	0,12	0,33
Falco di palude	Circus aeruginosus	-	-	0,06	0,24
Albanella reale	Circus cyaneus	-	-	-	-
Passera d'Italia	Passer italiae	-	-	-	-
	Abbondanza	6,29		2,71	
	Ricchezza	12		15	

Mean number of individuals per point count for each species detected in the enclosures and control areas. Abundance and Richness values are also reported

The following spring's sowings were more successful and in December the observed differences were clearer (enclosures A: 10,2 birds/ point; control areas A = 1,7 birds/ point. In addition to the two former species, *Passer montanus* particularly benefited from the intervention.

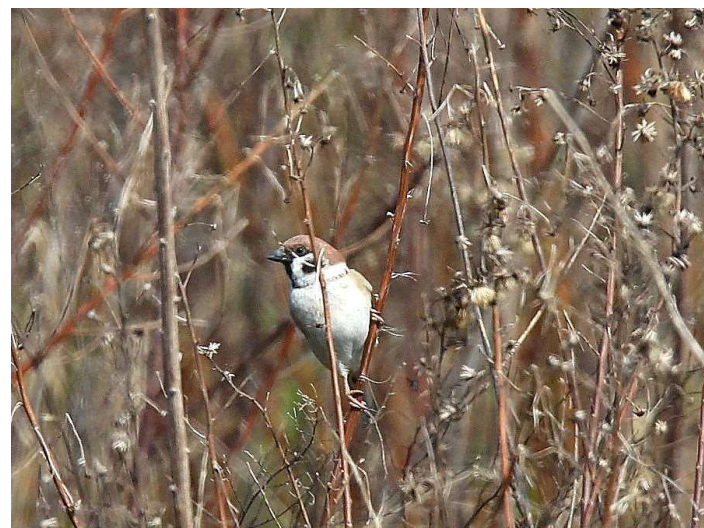
		Dicembre 2022			
		recinti		controllo	
		media	ds	media	ds
passera mattugia	Passer montanus	6,00	15,82	-	-
fringuello	Fringilla coelebs	0,72	2,37	0,07	0,27
migliarino di palude	Emberiza schoeniclus	0,61	1,14	-	-
fagiano	Phasianus colchicus	0,44	1,04	0,07	0,27
gazza	Pica pica	0,44	0,78	-	-
pettirosso	Erithacus rubecula	0,28	0,57	0,14	0,36
ballerina bianca	Motacilla alba	0,17	0,38	0,07	0,27
cornacchia grigia	Corvus corone cornix	0,17	0,51	0,07	0,27
poiana	Buteo buteo	0,17	0,38	0,07	0,27
beccamoschino	Cisticola juncidis	0,11	0,47	-	-
codibugnolo	Aegithalos caudatus	0,11	0,47	-	-
gheppio	Falco tinnunculus	0,11	0,32	0,14	0,36
lui piccolo	Phylloscopus collybita	0,11	0,47	-	-
merlo	Turdus merula	0,11	0,32	-	-
tortora dal collare	Streptopelia decaocto	0,11	0,47	-	-
allodola	Alauda arvensis	0,06	0,24	-	-
cinciallegra	Parus major	0,06	0,24	-	-
cinciarella	Cyanistes caeruleus	0,06	0,24	-	-
fiorrancino	Regulus ignicapilla	0,06	0,24	-	-
ghiandaia	Garrulus glandarius	0,06	0,24	-	-
passera scopaiola	Prunella modularis	0,06	0,24	-	-
piccione domestico	Columba livia f.domestica	0,06	0,24	0,07	0,27
pispolo	Anthus pratensis	0,06	0,24	0,14	0,53
usignolo di fiume	Cettia cetti	0,06	0,24	0,21	0,43
colombaccio	Columba palumbus	-	-	0,14	0,53
picchio rosso maggiore	Dendrocopos major	-	-	0,07	0,27
Rampichino comune	Certhia brachydactyla	-	-	0,07	0,27
Regolo	Regulus regulus	-	-	0,14	0,53
Scricciolo	Troglodytes troglodytes	-	-	0,14	0,36
Storno	Sturnus vulgaris	-	-	0,07	0,27
Codiroso spazzacamino	Phoenicurus ochruros	-	-	-	-
Falco di palude	Circus aeruginosus	-	-	-	-
Albanella reale	Circus cyaneus	-	-	-	-
Passera d'Italia	Passer italiae	-	-	-	-
Abbondanza		10,17		1,71	
Ricchezza		24		16	



In **January 2023**, likely due to the **reduction of seed availability**, the **differences** were a **little lower** (enclosures A: 5,6 birds/ point; control areas A = 1,3 birds/ point).

		gennaio 2023			
		recinti		controllo	
		media	ds	media	ds
passera mattugia	Passer montanus	1,67	5,90	-	-
fringuello	Fringilla coelebs	0,28	0,75	-	-
migliarino di palude	Emberiza schoeniclus	1,11	2,93	-	-
fagiano	Phasianus colchicus	0,17	0,38	0,23	0,60
gazza	Pica pica	0,50	0,79	0,21	0,43
pettirosso	Erithacus rubecula	0,06	0,24	-	-
ballerina bianca	Motacilla alba	0,11	0,32	-	-
cornacchia grigia	Corvus corone cornix	0,44	1,42	0,14	0,36
poiana	Buteo buteo	-	-	0,29	0,61
beccamoschino	Cisticola juncidis	0,06	0,24	-	-
codibugnolo	Aegithalos caudatus	-	-	-	-
gheppio	Falco tinnunculus	0,11	0,32	-	-
lui piccolo	Phylloscopus collybita	0,11	0,32	0,07	0,27
merlo	Turdus merula	-	-	-	-
tortora dal collare	Streptopelia decaocto	-	-	-	-
allodola	Alauda arvensis	-	-	-	-
cinciallegra	Parus major	-	-	-	-
cinciarella	Cyanistes caeruleus	-	-	0,07	0,27
fiorrancino	Regulus ignicapilla	-	-	-	-
ghiandaia	Garrulus glandarius	-	-	0,07	0,27
passera scopaiola	Prunella modularis	0,12	0,33	-	-
piccione domestico	Columba livia f.domestica	0,44	1,89	-	-
pipola	Anthus pratensis	-	-	-	-
usignolo di fiume	Cettia cetti	0,06	0,24	0,07	0,27
colombaccio	Columba palumbus	-	-	-	-
picchio rosso maggiore	Dendrocopos major	0,11	0,32	-	-
Rampichimo comune	Certhia brachydactyla	-	-	-	-
Regolo	Regulus regulus	-	-	-	-
Scricciolo	Troglodytes troglodytes	-	-	-	-
Storno	Sturnus vulgaris	0,11	0,47	-	-
Codirosso spazzacamino	Phoenicurus ochruros	-	-	0,07	0,27
Falco di palude	Circus aeruginosus	-	-	-	-
Albanella reale	Circus cyaneus	0,06	0,24	-	-
Passera d'Italia	Passer italiae	0,11	0,47	0,07	0,27
Abbondanza		5,62		1,30	
Ricchezza		18		10	





Sowing disposable crops of seed rich plants and the **delay of harvesting wild herbs** in the enclosure areas to provide supplementary food for grey partridges resulted in **higher number of farm birds in particular of passerine granivorous species**

These results agree with the expected ones and suggest the **importance of increased availability of seed-rich habitats** for partridge and farm granivorous birds



Breeding season

In each breeding season from 2021 to 2024, counting points were carried out also in **early spring** (March-April), when data on resident birds species are more effectively collected, and in **late spring** (late May – June), when information on summer breeders are collected.

These data gave information on **changes in bird community** between winter and spring occurring in areas of grey partridge release



114 Bird species observed in spring

Specie		Specie	
Quaglia	Coturnix coturnix	Nibbio reale	Milvus milvus
Fagiano comune	Phasianus colchicus	Nibbio bruno	Milvus migrans
Oca selvatica	Anser anser	Poiana	Buteo buteo
Oca lombardella	Anser albifrons	Upupa	Upupa epops
Volpoca	Tadorna tadorna	Gruccione	Merops apiaster
Moriglione	Aythya ferina	Ghiandaia marina	Coracias garrulus
Mestolone	Spatula clypeata	Martin pescatore	Alcedo atthis
Germano reale	Anas platyrhynchos	Picchio verde	Picus viridis
Alzavola	Anas crecca	Picchio rosso minore	Dryobates minor
Tuffetto	Tachybaptus ruficollis	Picchio rosso maggiore	Dendrocopos major
Svasso maggiore	Podiceps cristatus	Gheppio	Falco tinnunculus
Fenicottero	Phoenicopiterus roseus	Falco cuculo	Falco vespertinus
Piccione domestico	Columba livia	Lodolaia	Falco subbuteo
Colombaccio	Columba palumbus	Falco pellegrino	Falco peregrinus
Tortora dal collare	Streptopelia decaocto	Rigogolo	Oriolus oriolus
Tortora selvatica	Streptopelia turtur	Averla piccola	Lanius collurio
Rondone comune	Apus apus	Ghiandaia	Garrulus glandarius
Cuculo	Cuculus canorus	Gazza	Pica pica
Porciglione	Rallus aquaticus	Taccola	Corvus monedula
Gallinella d'acqua	Gallinula chloropus	Cornacchia	Corvus corone
Folaga	Fulica atra	Cinciarella	Cyanistes caeruleus
Cicogna bianca	Ciconia ciconia	Cinciallegra	Parus major
Spatola	Platalea leucorodia	Calandrella	Calandrella brachydactyla
Ibis sacro	Threskiornis aethiopicus	Alodola	Alauda arvensis
Mignattalo	Plegadis falcinellus	Beccamoschino	Cisticola juncidis
Tarabuso	Botaurus stellaris	Canapino comune	Hippoboscus polyglotta
Tarabusino	Ixobrychus minutus	Cannaiola comune	Acrocephalus scirpaceus
Nitticora	Nycticorax nycticorax	Cannareccione	Acrocephalus arundinaceus
Sgarza ciuffetto	Ardeola ralloides	Balestruccio	Delichon urbicum
Airone guardabuoi	Bubulcus ibis	Rondine	Hirundo rustica
Airone cenerino	Ardea cinerea	Lui piccolo	Phylloscopus collybita
Airone rosso	Ardea purpurea	Usignolo di fiume	Cettia cetti
Airone bianco maggiore	Ardea alba	Codibugnolo	Aegithalos caudatus
Garzetta	Egretta garzetta	Capinera	Sylvia atricapilla
Marangone minore	Microcarbo pygmaeus	Sterpazzola	Sylvia communis
Cormorano	Phalacrocorax carbo	Scricciolo	Troglodytes troglodytes
Avocetta	Recurvirostra avosetta	Sturno	Sturnus vulgaris
Cavaliere d'Italia	Himantopus himantopus	Tordo bottaccio	Turdus philomelos
Pavoncella	Vanellus vanellus	Merlo	Turdus merula
Chiurlo maggiore	Numenius arquata	Pigliamosche	Muscicapa striata
Piro piro culbianco	Tringa ochropus	Pettrosso	Erithacus rubecula
Totano moro	Tringa erythropus	Usignolo	Luscinia megarhynchos
Pantana	Tringa nebularia	Codirosso spazzacamino	Phoenicurus phoenicurus
Pettegola	Tringa totanus	Salimpalo	Saxicola torquatus
Gabbiano comune	Larus ridibundus	Culbianco	Oenanthe oenanthe
Gabbiano reale	Larus michahellis	Fiorellino	Regulus ignicapillus
Sterna comune	Sterna hirundo	Passera d'Italia	Passer italiae
Sterna zampenere	Gelochelidon nilotica	Passera mattugia	Passer montanus
Mignattino piombato	Chlidonias hybrida	Pispola	Anthus pratensis
Civetta	Athene noctua	Cutrettola	Motacilla flava
Assiolo	Otus scops	Ballerina bianca	Motacilla alba
Gufo comune	Asio otus	Fringuello	Fringilla coelebs
Falco pecchiaiolo	Pernis ptilorhynchus	Verdone	Chloris chloris
Falco di palude	Circus aeruginosus	Cardellino	Carduelis carduelis
Albanella reale	Circus cyaneus	Verzellino	Serinus serinus
Albanella minore	Circus pygargus	Strillozzo	Emberiza calandra
Sparviere	Accipiter nisus	Migliarino di palude	Emberiza schoeniclus





Data collected on breeding communities are useful also for comparison in possible future monitoring of:

- **environmental enrichments that require more time** in order to produce effects on bird community
- **new environmental enrichments**



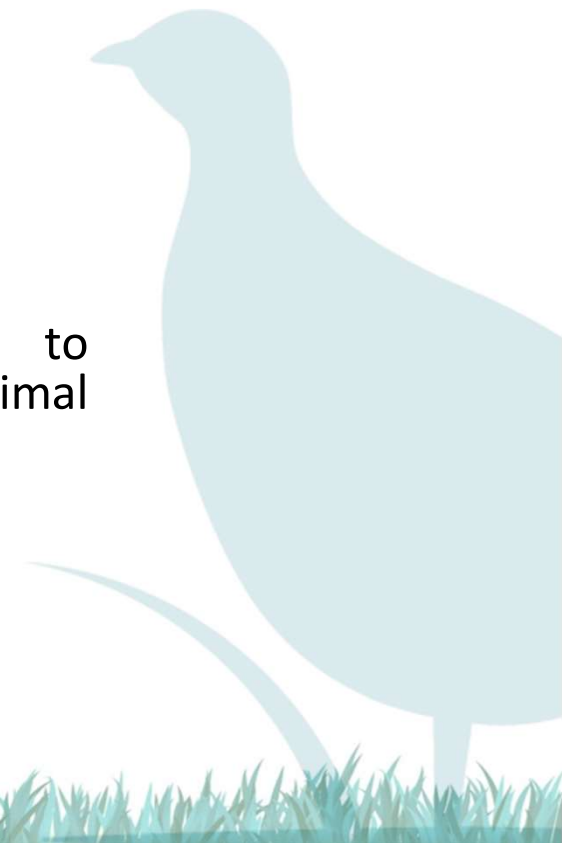
WILDLIFE MONITORING DRONE TESTING

From **2023** some **tests** with **UAVs (unmanned aerial vehicles)** or **drones** have been conducted. The goal was to find a **standardized methodology** to use drones in wildlife monitoring within the project.

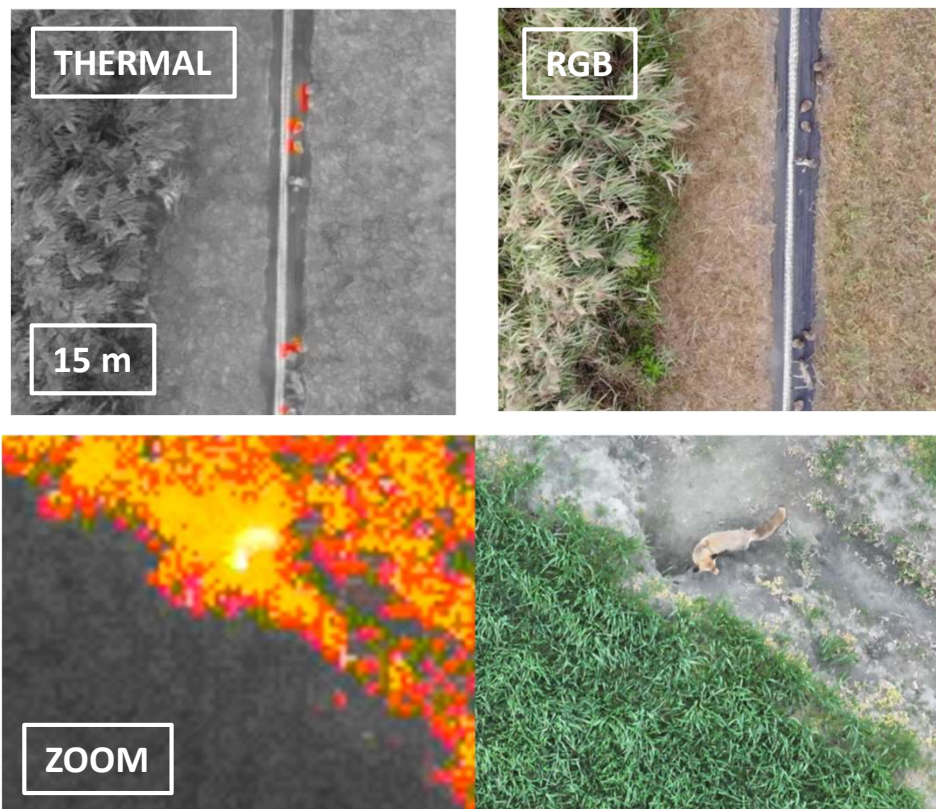
Thermal drone with double camera (RGB and thermal)

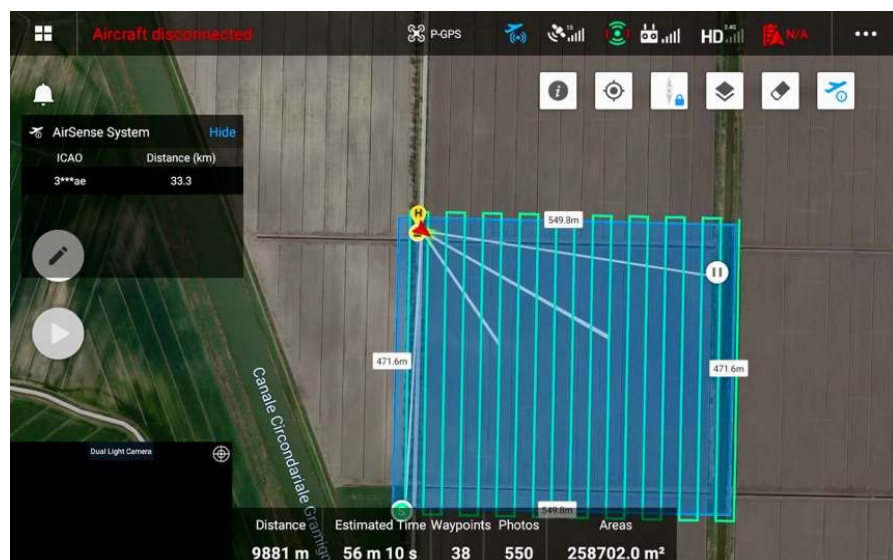
Definition of **flight altitude** based on the targeted species

Definition of **automatic flight missions** adjusted according to environmental conditions (e.g. temperature, air humidity, wind, animal activity times)



WILDLIFE MONITORING DRONE TESTING





Flight mission

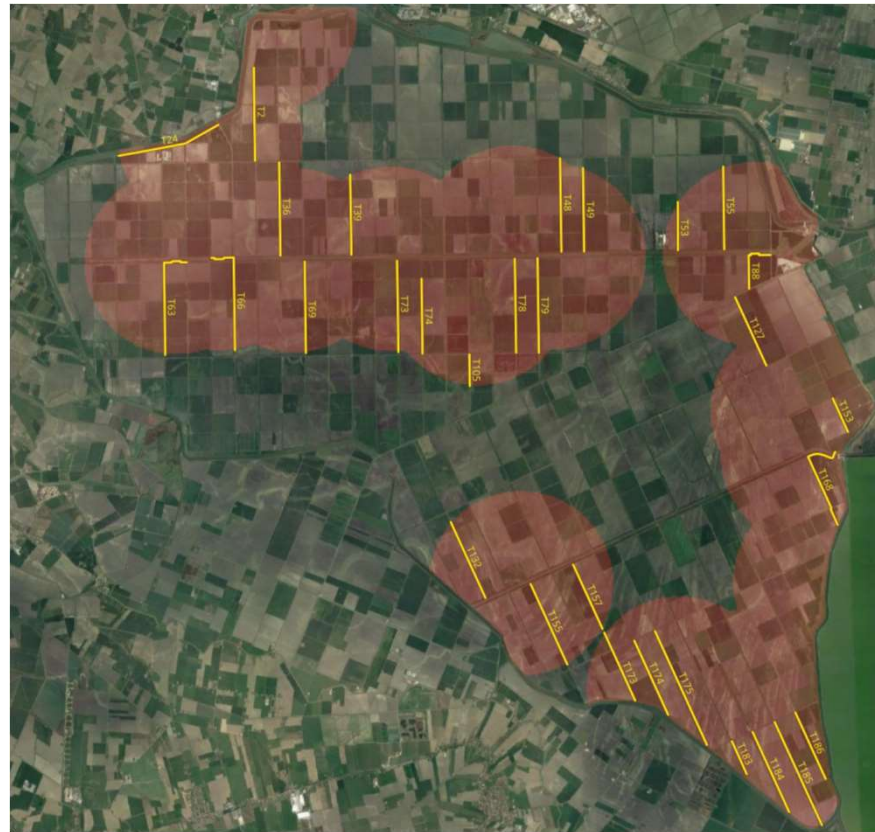
Orthophoto – Land use



RESULTS OF DRONE WILDLIFE MONITORING

Investigated transects:

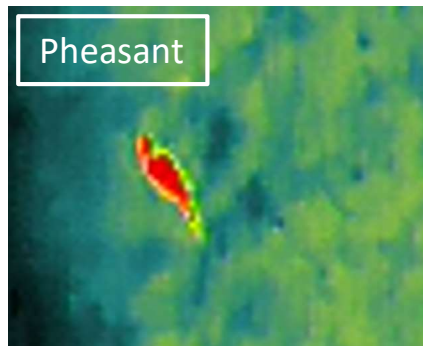
- 2 km buffer around grey partridge fences
- 30 randomly selected initial transects
 - flight height 15 m
 - flight speed 1.5 m/s
 - «one way» flights
- 10% frontal image overlap



RESULTS OF DRONE WILDLIFE MONITORING

- **Monitored grey partridges:**
 - Transects investigated from January 2024 to June 2024
 - One session per transect
 - 6 transects were successful in finding grey partridges
 - Other transects revealed the presence of other species

More sessions are needed for further investigations in future monitorings!



 PRE- RELEASE SAMPLING	BLOOD ANTIBODIES TO SELECTED AVIAN PATHOGENS POSITIVE/TESTED (%)			PARASITE IDENTIFICATION IN POOLS OF FECAL SAMPLES FROM BIRD TRANSPORT BOXES POSITIVE/TESTED (%)			
	Mycoplasma gallisepticum	Mycoplasma synoviae	Newcastle Disease	Coccidia	Coccidia, Capillaria	Coccidia, Capillaria, Heterakis	Capillaria
2022	20/271 (7.4)	0/271	58/240 (24.2)^	13/29 (44.8)	4/29 (13.8)	1/29 (3.4)	3/29 (10.3)
2023	4/230 (1.7)	0/230	—	10/34 (29.4)	5/34 (14.7)	0/34	8/34 (23.5)

^ Seropositivity in Newcastle Disease vaccinated birds

 POST-MORTEM SAMPLING	IAV DETECTION FROM CARCASSES POSITIVE/TESTED (%)	PARASITOLOGICAL FINDINGS FROM CROP AND/OR INTESTINE POSITIVE/TESTED (%)						
	Avian influenza [^]	Coccidia	Coccidia, Capillaria	Coccidia, Capillaria, Ascarids	Teniasis	Coccidia, Capillaria, Teniasis	Capillaria	Coccidia, Teniasis
2022	0/20	35/88 (39.8)	15/88 (17.0)	1/88 (1.1)	—	8/88 (9.1)	4/88 (4.5)	5/88 (5.7)
2023	0/28	12/44 (27.3)	2/44 (4.5)	—	3/44 (6.8)	—	4/44 (9.1)	1/44 (2.3)

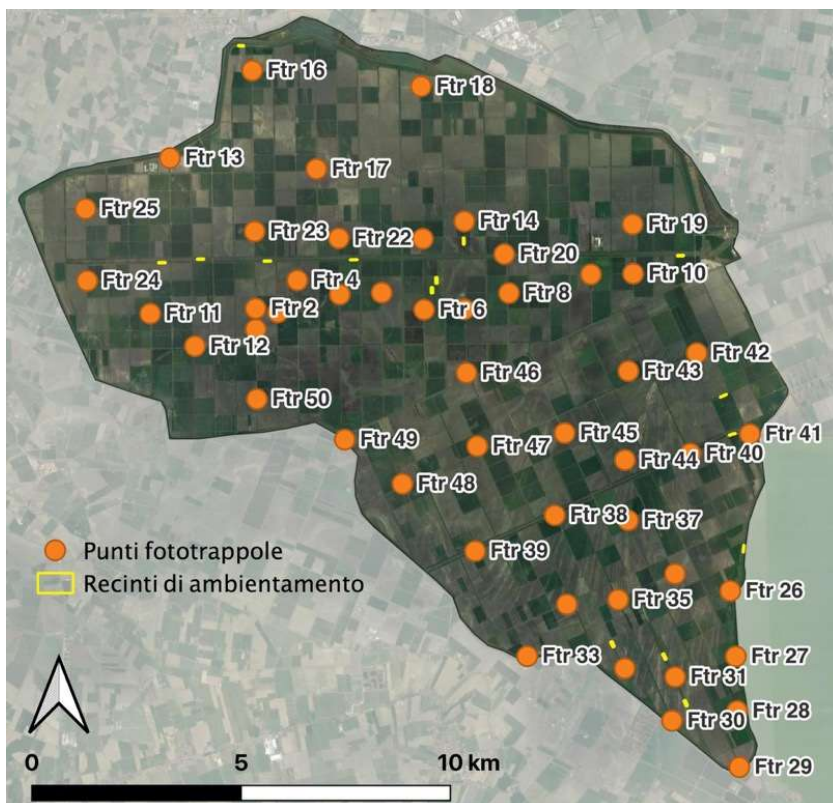
[^] Carcasses tested during HPAI emergency

CAMERA TRAP MONITORING

- From 2021 to 2022 **opportunistic monitoring** was conducted within acclimation enclosures and at sample points for control purposes, involving the monitoring of grey partridge activities and the detection of potential predators.
- In 2023 a **systematic monitoring** program was conducted at 50 sampling points distributed throughout the Mezzano Valley to track covies, pairs, and potential predators across the entire area.

Sampling points were selected mainly based on the distribution of feeding stations, the locations of individuals, pairs, or covies identified in previous months, and the presence of suitable habitats for the species.





Coveys



Pairs



Predators



Chicks



Thanks for the attention!

