

## Ornithological observations on an artificial pond in the Sicilian agricultural environment (Sicily, Italy)

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**ABSTRACT** The present paper originates from interesting wildlife and ecological observations made, in the period 2006-2011, on fifty-three species of birds frequenting a small artificial pond constructed in a Sicilian agro-forest environment (Caltagirone, CT). Reported data not only provide useful information to improve our knowledge of the avifauna of the SIC-ITA 070005 “Bosco di Santo Pietro” (Sicily, Italy), but also contribute to the understanding of the important ecological role of peculiar habitats such as artificial ponds.

**KEY WORDS** Birds, artificial pond, Sicily.

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### INTRODUCTION

Ponds and other small reservoirs of artificial water play an important role in the ecology of many bird species, especially if placed in dry habitats or agricultural ecosystems and often represent a valid alternative to natural environments (Lo Valvo et al., 1993; La Mantia, 1997; Ma et al., 2004; Barbera et al., 2005; Sánchez-Zapata et al., 2005; Kloskowski et al., 2009; Sebastián-González et al., 2010).

They are used by birds for trophic requirements and activities related to reproduction, and, often, by migratory species, as a stopover (Mascara, 1990; Guillemain et al., 2000; Castillo-Guerrero & Carmona, 2001). More generally, small pools of water allow some flora and fauna to settle in these peculiar environments where optimal conditions for development of these species occur. The present study provides a contribution to the understanding of these small and peculiar environments, and, moreover report new data useful to improve our knowledge of the avifauna of the SIC-ITA 070005 “Bosco di Santo Pietro” (Sicily, Italy).

### MATERIAL AND METHODS

The artificial pond under study is located in the Caltagirone Municipality (Sicily, Italy) in the

context of an agricultural environment represented by a productive olive grove endowed by trees the trunk diameter of which is 50 cm maximum. The pond was created in 2006 with an area of 9 square meters and a maximum depth of 25 cm; the presence of water is permanent due to the continuous inputs of fresh water through a pipe connected to a reservoir; the entire pond-perimeter is naturalized with big stones, twigs, and naturally grown herbaceous riparian vegetation.

The adjacent environment is characterized by almond and olive cultivated trees, *Eucalyptus* spp. and small pine (*Pinus pinea*) artificially planted trees and natural and semi-natural oak woods of the Site of Community Importance known as “Riserva Naturale Orientata Regionale del Bosco di Santo Pietro” (SIC –ITA 070005).

Census of birds that used, for various reasons, the artificial pond took place from the early months of 2006 up to July 2011; observations were made, monthly, from a bird-watching shed placed at 5 m from the pond shores.

For all surveyed species, a systematic list and ecological notes are provided. Species breeding in Sicily were obtained from recent literature (AA.VV., 2008) supplemented with personal observations; for “the Species’ Value” (total value standardized in cents) see Brichetti & Gariboldi (1992); for the Red List of breeding species see the

list provided by LIPU-WWF (1999); the checklist used is that by Baccetti et al. (2005, 2008).

The following protection lists were used:

- The Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive), adopted on April 2<sup>nd</sup> 1979.
- SPEC Categories (on the conservation status of breeding birds all over Europe):
  - SPEC 1. Species of global conservation concern, i.e. classified as Globally Threatened, Near Threatened or Data Deficient (BirdLife International 2004; IUCN, 2004; IUCN, 2008).
  - SPEC 2. Species concentrated in Europe and with an Unfavourable Conservation Status.
  - SPEC 3. Species not concentrated in Europe but with an Unfavourable Conservation Status.
  - Non-SPEC<sup>E</sup>. Species concentrated in Europe but with a Favourable Conservation Status.
  - Non-SPEC. Species not concentrated in Europe and with a Favourable Conservation Status.
  - W indicates that the category relates to the winter population.
- The Bonn Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Appendices I and II)
- The Bern Convention on the Conservation of European Wildlife and Natural Habitats 1979 with Appendix II (strictly protected fauna species) and Appendix III (protected fauna species).
- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) Washington, 1973, Appendices I, II, III.

## RESULTS

### *List of species*

#### Order FALCONIFORMES

##### Family ACCIPITRIDAE

*Buteo buteo* (Linnaeus, 1758)

Buzzard. This species is sedentary and occasionally visit the pond and frequent the area for food; it was observed perched on a perimeter-post. A pair breeds in the neighbour woods.

*Falco tinnunculus* Linnaeus, 1758

Kestrel. Sedentary species, frequent the pond for cleaning of the plumage (Fig. 1). A pair nests in the area that is frequented also for food.

#### Order CARADRIFORMES

##### Family BURHINIDAE

*Burhinus oediconemus* (Linnaeus, 1758)

Stone-curlew. Sedentary species, rarely attend the pond to clean the feathers. Specimens breed in the adjacent area.

#### Order COLUMBIFORMES

##### Family COLUMBIDAE

*Columba livia* Gmelin, 1789 domestic type, i.e. *Columba livia* var. *domestica*

Rock Pigeon. Sedentary, attend the pond and the adjacent area for food, and cleaning of the plumage.

*Columba palumbus* Linnaeus, 1758

Wood Pigeon. Sedentary, attend the pond as well as the adjacent area, for food, and cleaning of the plumage (Fig. 2). Specimens breed in the olive grove where the pond is located in. Both adults and young were observed.

*Streptopelia turtur* (Linnaeus, 1758)

Turtle Dove. Summer breeding species, attend the pond for food and for cleaning of the plumage (Fig. 3). Specimens breed in the olive grove where the pond is located in. Both adults and young were observed.

*Streptopelia decaocto* (Frivaldszky, 1838)

Eurasian Collared Dove. Sedentary species, attend the pond for food and for cleaning of the plumage. Both adults and young were observed.

#### Order CORACIFORMES

##### Family MEROPIDAE

*Merops apiaster* Linnaeus, 1758

European Bee-eater. Summer breeding species, frequent the pond for food, with family groups comprising a maximum of 35 individuals, from mid-August to late September. In the neighborhood there are some hives and a garden of Mediterranean plants, very attractive for wasps and other insects.

##### Family UPUPIDAE

*Upupa epops* Linnaeus, 1758

Hoopoe. Summer breeding species, frequent the pond and the adjacent area for food and nest

in the olive trees; breeding was observed in 2006 and 2008. Nests were placed in hollow trunks of large trees, a few cm above the ground (Fig. 4).

## Order PICIFORMES

### Family PICIDAE

*Dendrocopos major* (Linnaeus, 1758)

Great Spotted Woodpecker. Sedentary species, rarely attend the pond to clean the feathers. Specimens breed in the adjacent forest.

## Order PASSERIFORMES

### Family ALAUDIDAE

*Calandrella brachydactyla* (Leisler, 1814)

Greater Short-toed Lark. Migrant species, breeding in Sicily (AA.VV., 2008), irregularly observed in the area adjacent to the pond in April.

### Family HIRUNDINIDAE

*Hirundo rustica* Linnaeus, 1758

Barn Swallow. Summer breeding species, attends the pond for food and for finding material necessary for nests making (Fig. 5). Individuals breed in the buildings of the nearby area.

### Family MOTACILLIDAE

*Motacilla alba* Linnaeus, 1758

White Wagtail. Wintering species, nesting in Sicily (AA.VV., 2008), frequent the pond and the adjacent area for food and for cleaning of the plumage.

*Anthus pratensis* Linnaeus, 1758

Meadow Pipit. Wintering and migrant species, frequent the pond and the adjacent area for food and for cleaning of the plumage. The first arrivals were recorded at the end of October of these years; at least twelve migrating individuals were observed on February 10<sup>th</sup> 2008.

### Family TURDIDAE

*Turdus merula* Linnaeus, 1758

Blackbird. Sedentary species, rarely attend the pond to clean the feathers. Specimens breed in the adjacent forest.

*Turdus philomelos* Brehm, 1831

Song Thrush. Wintering species, frequent the pond and the adjacent area for food and for cleaning of the plumage.

### Family SYLVIIDAE

*Hippolais polyglotta* (Vieillot, 1817)

Melodious Warbler. Migrant species, irregularly attend the pond and the adjacent area for food and for cleaning of the plumage. It was observed in September of these years.

*Phylloscopus trochilus* Linnaeus, 1758

Willow Warbler. Migrant species, irregularly attend the pond and the adjacent area for food and for cleaning of the plumage. It was observed always in September.

*Phylloscopus collybita* (Vieillot, 1817)

Common Chiffchaff. Wintering and migratory species, regularly frequent the pond and the adjacent area for food and for cleaning of the plumage.

*Sylvia atricapilla* (Linnaeus, 1758)

Blackcap. Summer breeding species, migrant, partially sedentary. Specimens regularly attend the pond and the adjacent area for food and for cleaning of the plumage and breed in the adjacent woods. At least ten migrating individuals were observed in March 30<sup>th</sup> 2008.

*Sylvia borin* Boddaert, 1783

Garden Warbler. Nesting of this species in Sicily was mentioned but never proved yet (Corso, 2005; AA.VV., 2008). Birds regularly attend the pond for cleaning of the plumage and are presumed to nest in the area and in the adjacent forests. It was regularly observed from June to August of these years (Fig. 6).

*Sylvia communis* Latham, 1787

Greater Whitethroat. Summer breeding species, regularly attend the pond and the adjacent area for food and for cleaning of the plumage; specimens breed in the forests of the natural reserve.

*Sylvia cantillans* (Pallas, 1784)

Subalpine Warbler. Summer breeding species, irregularly attend the pond and the adjacent area for food and for cleaning of the plumage; specimens nest in the forests of the natural reserve.

*Sylvia melanocephala* (Gmelin, 1789)

Sardinian Warbler. Sedentary species, attend the pond for food and for cleaning of the plumage (Fig. 7). Specimens breed in the area and adjacent woods. Both adults and young birds were regularly observed.



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

- Figure 1. *Falco tinnunculus*.  
 Figure 2. *Columba palumbus*.  
 Figure 3. *Streptopelia turtur*.  
 Figure 4. *Upupa epops*.  
 Figure 5. *Hirundo rustica*.

**Family MUSCICAPIDAE**

*Muscicapa striata* (Pallas, 1764)

Spotted Flycatcher. Migrant species, breeding in Sicily (AA.VV., 2008), regularly frequent the pond and the adjacent area for food and for cleaning of the plumage. It was observed both in spring and autumn of these years.

*Ficedula albicollis* Temminck, 1815

Collared Flycatcher. Migrant species, irregularly attend the pond and the adjacent area for food and for cleaning of the plumage. It was observed always in April.

*Erithacus rubecula* Linnaeus, 1758

European Robin. Wintering species, breeding in Sicily (AA.VV., 2008), frequent the pond and the adjacent area for food and for cleaning of the plumage. First arrivals were recorded in the second half of October of these years.

*Phoenicurus ochruros* (Gmelin, 1774)

Black Redstart. Migrant, wintering and breeding species, frequent the pond and the adjacent area for food and for cleaning of the plumage. First arrivals were recorded at the end (in the third decade) of October of these years.

*Saxicola rubetra* (Linnaeus, 1758)

Whinshart. Migrant species; it was observed in the second week of January 2007 (Fig. 8).

*Saxicola torquatus* Linnaeus, 1766

African Stonechat. Sedentary species, rarely attend the pond for cleaning; specimens breed in the adjacent area.

**Family AEGITHALIDAE**

*Aegithalos caudatus siculus* Whitaker, 1901

Long-tailed Tit. Regularly attend the pond for food and for cleaning of the plumage, specimens breed in the adjacent woods. Families were constantly observed from June to August (Fig. 9).

**Family PARIDAE**

*Parus ater* (Linnaeus, 1758)

Coal Tit. In the adjacent area it is an irregular migrant species, in the pond area it was observed always in the third decade of October.

*Parus major* Linnaeus, 1758

Great Tit. Sedentary species, attend the pond for food and for cleaning of the plumage.

Specimens breed in the area and in the adjacent woods. Breeding individuals used nest boxes placed in the olive grove. Both adults and young birds were regularly observed.

*Cyanistes caeruleus* Linnaeus, 1758

Blue Tit. Sedentary species, attend the pond for food and for cleaning of the plumage. Specimens breed in cavities and cracks of buildings and in the adjacent woods (Fig. 10). Both adults and young birds were regularly observed.

**Family CETHIIDAE**

*Certhia brachydactyla* Brehm, 1820

Short-toed Treecreeper. Sedentary species, attend the pond for food and for cleaning of the plumage. Specimens breed in the area and in adjacent woods and, in addition, used nest boxes placed in the olive grove (Fig. 11). Both adults and young birds were regularly observed.

**Family ORIOLIDAE**

*Oriolus oriolus* Linnaeus, 1758

Eurasian Golden Oriole. Migrant and summer breeding species, irregularly attend the pond for drinking and the adjacent area for food; specimens breed in the forests of the natural reserve.

**Family CORVIDAE**

*Garrulus glandarius* (Linnaeus, 1758)

Eurasian Jay. Sedentary, common species, attend the pond for drinking and cleaning of the plumage (Fig. 12). Specimens breed in the area and in adjacent woods. Both adults and young birds were regularly observed in groups of 6-8 individuals.

*Pica pica* (Linnaeus, 1758)

Eurasian Magpie. Sedentary species, common, frequent the pond for food, cleaning of the plumage and finding material necessary for nest building (Fig. 13). Specimens breed in the adjacent area. Both adults and young birds were regularly observed in groups of 8-10 individuals.

*Corvus cornix* Linnaeus, 1758

Hooded Crow. Sedentary species, rarely attend the pond to drink. Specimens nest in the adjacent area.



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11

Figure 6. *Sylvia borin*.

Figure 7. *Sylvia melanocephala*.

Figure 8. *Saxicola rubetra*.

Figure 9. *Aegithalos caudatus siculus*.

Figure 10. *Cyanistes caeruleus*.

Figure 11. *Certhia brachydactyla*.

**Family STURNIDAE**

*Sturnus vulgaris* Linnaeus, 1758

European Starling. Wintering species, breeding in SE Sicily (see Lo Valvo et al., 1993), along with *Sturnus unicolor*, a few individuals frequent the pond and the adjacent area for food and for cleaning of the plumage. First arrivals were recorded in October of these years.

*Sturnus unicolor* Temminck, 1820

Spotless Starling. Sedentary species, common, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and in adjacent woods. Adults and young birds were regularly observed in groups of 15-20 individuals.

**Family PASSERIDAE**

*Passer domesticus italiae* (Vieillot, 1817)

House Sparrow. Uncommon species, attend the pond for drinking and cleaning of the plumage. The systematics of this species and its presence in Sicily are controversial (Corso, 2005; AA.VV., 2008).

*Passer hispaniolensis* (Temminck, 1820)

Spanish Sparrow. Sedentary species, common, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and in adjacent woods. Adults and young birds were constantly observed in groups of 8-10 individuals.

*Passer montanus* (Linnaeus, 1758)

Tree Sparrow. Sedentary species, common, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and in adjacent woods. Nesting individuals used nest boxes placed in the olive grove (Fig. 14). Adults and young birds were regularly observed in groups of 25-30 individuals.

**Family FRINGILLIDAE**

*Fringilla coelebs* Linnaeus, 1758

Chaffinch. Wintering and breeding in Sicily, uncommon, a few individual attend the pond and the olive grove for food and cleaning of the plumage. First arrivals were recorded last week of October of these years.

*Fringilla montifringilla* (Linnaeus, 1758)

Brambling. Irregular migrant species. It was observed in the second decade of March of these years, one single specimen at a time (Fig. 15).

*Carduelis chloris* (Linnaeus, 1758)

European Greenfinch. Wintering species, not common, breeding in Sicily; a few individuals frequent the pond and the olive grove for food and for cleaning of the plumage, along with other species of finches.

*Carduelis spinus* (Linnaeus, 1758)

Eurasian Siskin. Wintering and migrant species, common, more abundant in the winter of some years rather than in others. Specimens attend the pond and the olive grove for food and for cleaning of the plumage. First arrivals were recorded in last week of October and, in the spring, from February to the first decade of April of these years. This species nests on Mount Etna (CT, Sicily) (AA.VV., 2008).

*Carduelis carduelis* (Linnaeus, 1758)

European Goldfinch. Sedentary species, common, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and in adjacent woods. Adults and young birds were regularly observed in family groups.

*Carduelis cannabina* (Linnaeus, 1758)

Eurasian Linnet. Sedentary species, uncommon, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and in adjacent woods. Adults and young birds were constantly observed in family groups.

*Serinus serinus* Linnaeus, 1766

European Serin. Sedentary species, common, with a few wintering individuals; specimens attend the pond for drinking and cleaning of the plumage, and breed in the area and in adjacent woods. Adults and young birds were constantly observed in family groups and in groups of 30-40 individuals, with other finches.

*Coccothraustes coccothraustes* (Linnaeus, 1758)

Hawfinch. Wintering species, uncommon, attend the pond for drinking and cleaning of the plumage. From one to three individuals were observed in January and February of these years (Fig. 16).

**Family EMBERIZIDAE**

*Emberiza cirrus* Linnaeus, 1758

Cirl Bunting. Sedentary species, uncommon, attend the pond for drinking and cleaning of the plumage. Specimens breed in the area and adjacent woods. Adults and young birds were constantly observed.



Fig. 12



Fig. 13



Fig. 14



Fig. 15



Fig. 16

Figure 12. *Garrulus glandarius*.

Figure 13. *Pica pica*.

Figure 14. *Passer montanus*.

Figure 15. *Fringilla montifringilla*.

Figure 16. *Coccothraustes coccothraustes*.

Species	79/409	SPEC Categories	Berne C.	Bonn C.	CITES	National Value	Red List
<i>Buteo buteo</i>	-	-	A. II	A. II	A. I	46.3	-
<i>Falco tinnunculus</i>	X	SPEC3	A. II	A. II	A. I	46.4	-
<i>Burhinus oedicephalus</i>	X	SPEC3	A. II	A. II	-	-	VU
<i>Columba palumbus</i>	X	NonSPEC <sup>E</sup>	A. III	-	-	31.4	-
<i>Streptopelia turtur</i>	X	SPEC3	A. III	-	A. I	34	-
<i>Streptopelia decaocto</i>	X	-	A. III	-	-	22.5	-
<i>Merops apiaster</i>	-	SPEC3	A. II	A. II	-	43.8	VU
<i>Upupa epops</i>	-	-	A. II	-	-	41.3	-
<i>Dendrocopos major</i>	-	-	A. II	-	-	40.1	-
<i>Calandrella brachydactyla</i>	X	SPEC3	A. II	-	-	41.4	-
<i>Hirundo rustica</i>	-	SPEC3	A. II	-	-	33.5	-
<i>Motacilla alba</i>	-	-	A. II	-	-	37.2	-
<i>Anthus pratensis</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	65.5	-
<i>Turdus merula</i>	X	NonSPEC <sup>E</sup>	A. III	A. II	-	22.1	-
<i>Turdus philomelos</i>	X	NonSPEC <sup>E</sup>	A. III	A. II	-	36.1	-
<i>Hippolais polyglotta</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	39.8	-
<i>Phylloscopus trochilus</i>	-	-	A. II	A. II	-	-	-
<i>Phylloscopus collybita</i>	-	-	A. II	A. II	-	35	-
<i>Sylvia atricapilla</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	28.6	-
<i>Sylvia borin</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	40.1	-
<i>Sylvia communis</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	42	-
<i>Sylvia cantillans</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	46.2	-
<i>Sylvia melanocephala</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	39.9	-
<i>Muscicapa striata</i>	-	SPEC3	A. II	A. II	-	33.6	-
<i>Erithacus rubecula</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	-	-
<i>Phoenicurus ochruros</i>	-	-	A. II	A. II	-	34.8	-
<i>Saxicola rubetra</i>	-	NonSPEC <sup>E</sup>	A. II	A. II	-	47.6	-
<i>Saxicola torquatus</i>	-	SPEC3	A. II	A. II	-	34.2	-
<i>Aegithalos caudatus siculus</i>	-	-	A. III	-	-	36.3	LR
<i>Parus ater</i>	-	-	A. II	-	-	33.2	-
<i>Parus major</i>	-	-	A. II	-	-	27.8	-
<i>Parus caeruleus</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	41	-
<i>Certhia brachydactyla</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	41	-
<i>Oriolus oriolus</i>	-	-	-	-	-	33	-
<i>Garrulus glandarius</i>	-	-	A. III	-	-	36.8	-
<i>Pica pica</i>	-	-	A. III	-	-	31	-
<i>Sturnus vulgaris</i>	-	-	A. III	-	-	21.8	-
<i>Sturnus unicolor</i>	-	-	-	-	-	41	-
<i>Passer domesticus italiae</i>	-	-	A. III	-	-	29.4	-
<i>Passer hispaniolensis</i>	-	-	A. III	-	-	38.9	-
<i>Passer montanus</i>	-	-	A. III	-	-	24.7	-
<i>Fringilla coelebs</i>	-	NonSPEC <sup>E</sup>	A. III	-	-	29.9	-
<i>Fringilla montifringilla</i>	-	-	A. III	-	-	-	-
<i>Carduelis chloris</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	31	-
<i>Carduelis spinus</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	48.1	LR
<i>Carduelis carduelis</i>	-	-	A. II	-	-	27.9	-
<i>Carduelis cannabina</i>	-	SPEC2	A. II	-	-	36.1	-
<i>Serinus serinus</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	31.9	-
<i>Coccothraustes coccothraustes</i>	-	-	A. II	-	-	52.4	-
<i>Emberiza cirulus</i>	-	NonSPEC <sup>E</sup>	A. II	-	-	40	-

Table 1. Conservation Status of birds according to the most important national and international protection lists (see Material and Methods; VU=Vulnerable, LR= rare).

## DISCUSSION AND CONCLUSION

First observations on the use of the pond by sedentary avifauna occurring in the area, for bio-ecological activities of various kinds, were immediately made, a few days after the pond realization. In particular, Magpie, Sparrows (Spanish Sparrow and Tree Sparrow) and finches (Goldfinch and Serin) were the first users.

After four years, there have been many contacts (fifty-three species were observed) and nearly all of them were photographically documented. These species used the pond mainly for cleaning of the plumage, for food and drink, but also for getting the material necessary for nest construction (dried grass, twigs and mud).

For each surveyed species respective lists of protection, when present, are listed in Table 1. Despite of the small size of the habitat under investigation and taking into account that observations were made only on bird populations, the ecological role of this small artificial pond, also in relation to its surroundings, is markedly clear.

This preliminary study may be useful to stimulate close inspection and careful monitoring of these particular areas, especially in a region such as Sicily, particularly rich in extensive arid areas or great deal of land used for agricultural purposes.

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