URDAIBAI BIRD CENTER
ARANZADI SOCIETY OF SCIENCES

OSPREY RESTORATION PROJECT IN THE URDAIBAI BIOSPHERE RESERVE (BASQUE COUNTRY)

URDAIBAI OSPREYS

ANNUAL REPORT 2015

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BFA DFB Bizkaiko Foru Aldundia Diputación Foral de Bizkaia

EUSKO JAURLARITZA GOBIERNO VASCO

Highland Foundation for Wildlife
SCOTTISH CHARITY NO. SC023741

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SUMMARY

The osprey restoration program in the Basque Country started in 2013. The aim is to establish a founder population in the Biosphere Reserve of Urdaibai, which ultimately may help out the recolonization of estuaries and wetlands of northern Iberian Peninsula, thus promoting connectivity between the populations in Southern Iberia and continental France.

During this third year of the project, under the licence from Scottish Natural Heritage, 13 osprey chicks were translocated from Scotland to a hacking tower located at the Biosphere Reserve of Urdaibai (Biscay, Basque Country). The birds were kept in the hacking tower between 17 and 31 days. During this period the birds ate properly (271,19 g/day per bird) and all of them experienced positive growth. All birds were fitted with a backpack transmitter (1.70 g PP Biotrack), which was replaced by a satellite transmitter (30 g Microwave Argos / GPS Solar PTT) in the case of a single bird. One of the chicks suffers from epilepsy and died after having several seizures once released. After release, the birds stayed on average 32.4 days in the vicinity of the hacking tower and left Urdaibai between August 28 and September 9. The bird carrying satellite transmitter left Urdaibai on 5 September, reached Guinea Conackry on 20 September and then moved to the Ferlo River, (Northern Senegal), where it remained for a month.

In this third year of the project the first four sub-adult ospreys from the 2013 release returned from Africa. A male was photographed in an estuary on the northwest coast of the Iberian Peninsula and three other males have been repeatedly observed in the Urdaibai Reserve. One of the birds (P2, 2013) showed a strong homing instinct to a nesting platform and he carried sticks and algae to the nest. In addition, two of these males made some exhibition flights in the presence of a Scottish subadult female.

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1. Introduction

The osprey (*Pandion haliaetus*) restoration project in the Urdaibai Biosphere Reserve (Basque Country) set on in 2013. The project is an initiative of the *Aranzadi Society of Sciences* (www.aranzadi-zientziak.org) managed by the *Urdaibai Bird Center* (www.birdcenter.org) and is funded and supported by the Department of Environment of the County Council of Biscay and the Basque Government.

The program is developed under the guidelines of the *Osprey restoration project in the Urdaibai Biosphere Reserve* (Galarza & Zuberogoitia, 2012) and authorized by the Board of the Urdaibai Biosphere Reserve and the Wildlife Committee of the Spanish Ministry of Environment.

The main objective of this project is to set up a reproductive population of ospreys in the Basque Country. It contributes to the following sub-objectives:

- To increase the osprey breeding range and promote the connectivity between French and Southern Iberian populations.
- To increase social awareness about osprey conservation and about biodiversity in general, using the process as a tool for education.
- To promote the image of the Urdaibai Biosphere Reserve and ecotourism.

This report describes actions carried out in the third year of translocation, adaptation and release of young ospreys in Urdaibai. Given that the 2013 report described in detail the preparation process and the structures used for hacking, in the present report we refer only to significant technical aspects, in particular the changes or improvements made, the results of the process of hacking and releasing and the returns of birds released in previous years.

2. Nestling supply

The general agreement established in 2013 with the Government of Scotland (Scottish Natural Heritage), which guarantees the annual provision of 12 chicks, was maintained in 2014. This year 13 chicks were translocated because in 2014 only 11 ospreys could be collected.

Osprey habitat in Scotland (Loch Alvie)

3. Infrastructures

3.1. **Perches**

The number of artificial perches was increased in the vicinity of the hacking tower in order to facilitate landing and resting. More perches were installed in other parts of the marshes.

3.2. Breeding platforms

Nests or artificial platforms consisted basically of a metal platform 1x1 m that was filled with branches and fine plant material to reach a minimum height of 0.5 m. On this platform, a wooden perch 1.5 m high was installed. When sited in the marsh, the platform was usually attached to a wooden pole 5-7 m high, while in the woods the platform was fixed to a tree that stood in the landscape, usually a pine (*Pinus radiata* / *Pinus maritima*) or eucalyptus (*Eucalyptus globulus*).

Location of artificial breeding platforms was chosen on the following criteria:

- Minimum human disturbance: distance from roads, inhabited buildings and busy paths >300 m.
- The place selected and its surroundings (>300 m) should be within the area of maximum protection in the Reserve (Special Protection Area).

Ospreys released in 2015 using installed perches and platforms

Up to date a total of 14 platforms has been installed, 8 in the marshes and 6 in the forest. During 2015 maintenance was carried out on some of the platforms that had lost some of its structure during winter. To do this we had the help of volunteers and staff of the Fire Fighting Service of the County County of Biscay. (Gernika-Lumo).

Artificial platforms installed in the Urrunaga reservoir, Álava (left) and the Bay of Txingudi, Gipuzkoa (right)

Furthermore, in collaboration with the Araba County Council of Alava we installed a platform on the marsh Undurraga, within the system of the Zadorra River (Basque Country), located about 45 km South of the Urdaibai estuary. This platform is added to other two installed in previous years in Ullibarri-Gamboa, within the same system of reservoirs. In addition, in collaboration with the staff of the Interpretation Center of Plaiaundi Ecological Park another platform was built up in the Bay of Txingudi (Gipuzkoa, Basque Country), located about 70 km East of Urdaibai.

3.3. **Hacking area**

We cleared tall vegetation in the field on which stands the hacking tower and also we built one hide next to the control cabin in order to facilitate observation of the birds during the dependence phase.

Comb like structures installed in the electricity pylons located close to the hacking tower to prevent osprey perching during the dependence phase

3.4. **Obstacles in electricity pylons**

At least two birds of the project released to date have died by electrocution during their migration: P3 (2013) and NA (2014). All the birds released in Urdaibai often

perch on pylons located close to the hacking tower. Although these pylons are not dangerous it could be possible that the birds get accustomed to such structures which make more likely to use them and, therefore, more vulnerable to electrocution outside the Reserve. Therefore, in collaboration with the power company, comb-like structures were installed in the four electricity pylons close to the hacking tower to prevent birds resting on them. The installation of these obstacles was quite effective, since none of the individuals used these pylons during the dependence phase.

4. Reintroduction

4.1. **Nestling collecting and transportation**

Between July 4 and 8, thirteen nestlings (8 male and 5 female) were collected in Moray and the Highlands (Scotland). This operation was conducted by Roy Dennis, Highland Foundation for Wildlife, and had the cooperation of several volunteers and a staff member of the reintroduction programme. Nestlings were collected only from nests containing more than one chick and when body condition was good. On three occasions two chicks were collected from nests containing three nestlings. All nestling were weighed and measured (length of wing, tail and tarsus) *in situ*. After removal from the nest, nestlings were kept in four pens according to their age, and fed three times daily, at the headquarters of the *Highland Foundation for Wildlife*, located near Forres (Moray, Scotland). They were identified with metal rings of the *Aranzadi Society of Sciences* and yellow colour PVC rings supplied by the *Doñana Biological Station*. While in Forres, nestlings were examined by Jane Harley, from the *Strathspey Veterinary Centre* (Grantown on Spey), certifying the good body condition and health of the individuals.

Collecting the osprey chicks in Scotland

Table 1. Weight of nestlings when collected from the nest, on arrival to Urdaibai and when fitted with transmitter in the hacking tower.

Osprey	Sex	Collecting	Arrival	Transmitter
32 P0206	M	1330 g (07/07/15)	1200 g (09/07/15)	1346 g (28/07/15)
33 P0207	M	1360 g (07/07/15)	1296 g (09/07/15)	1372 g (24/07/15)
34 P0208	M	1345 g (07/07/15)	1293 g (09/07/15)	1360 g (24/07/15)
35 P0209	F	1033 g (07/07/15)	1055 g (09/07/15)	1623 g (08/08/15)
37 P0060	F	1181 g (08/07/15)	1130 g (09/07/15)	1513 g (08/08/15)
N7 P0052	M	1401 g (04/07/15)	1325 g (09/07/15)	1469 g (24/07/15)
NF P0053	M	1332 g (04/07/15)	1334 g (09/07/15)	1411 g (24/07/15)
NJ P0054	M	1514 g (04/07/15)	1401 g (09/07/15)	1464 g (03/08/15)
NR P0055	F	1737 g (04/07/15)	1541 g (09/07/15)	1729 g (28/07/15)
NU P0056	F	1355 g (05/07/15)	1261 g (09/07/15)	1572 g (03.08.14)
NT P0057	F	1309 g (05/07/15)	1195 g (09/07/15)	1348 g (03/08/15)
NX P0058	M	1355 g (05/07/15)	1311 g (09/07/15)	1375 g (28/07/15)
PX P0059	M	1216 (05/07/15)	1215 g (09/07/15)	1202 g (28/07/15)

* osprey with PTT

On the morning of July 8, nestlings were taken in a transit van from Forres to Aberdeen airport, where they were fed before being transported to London by plane. From London the individuals were transported on another flight to Madrid where the birds were fed with anchovies (*Engraulis encrasicolus*). Finally,

transportation from Madrid to the Basque Country was carried by van, arriving at the area of hacking in the morning of July 9. Aitor Galarza (*County Council of Biscay*) accompanied the birds during transport. On arrival, the veterinary service of the project examined the birds. Apparently all the nestlings were in good condition despite the fact that most of them had experienced a slight weight loss since collecting from the nest (Table 1). We took a sample of feather of each osprey for sexing using molecular techniques.

Roy Dennis and Jennifer Clark ringing the birds in Forres (Scotland)

Osprey arrival to the hacking tower (left). Mar Del Arco and Javier Elorriaga, staff of the project, examining the birds and taking feather sample (right)

4.2. **Stay in the hacking tower**

Except the first cage, which housed only 4 birds, the rest hosted 3 chicks, grouped according to their plumage development. Those who were siblings (33/34, N7/NF,

UN/NT, NX/PX) were installed in the same cage. During their stay in the tower birds were fed four times daily. The food was pre-weighed and the amount consumed was noted. At first the fish were given in small pieces, removing large scales and bones, increasing the size of the pieces and the amount of scales and fish bones as the days passed. Prior to each new intake of food uneaten remains were removed from the cages.

Checking the ospreys through the CCTV system from the control cabin

The ospreys were mainly fed on thick-lipped grey mullets, *Chelon labrosus*, directly caught in the estuary by the staff of the project.

Table 2. Growth rates from date of collecting in nest to the arrival in Urdaibai, and growth rates during the stay in the hacking tower. The mean daily food intake of each bird in the hacking tower is also shown (July 9-24).

	Daily growth rate from nest to arrival (%)	Dif (g)	Daily growth rate during hacking (%)	Dif (g)	Daily food intake (g)
32	- 4.80	- 130	+ 0.54	+ 146	267.9
33	- 2.30	- 64	+ 0.36	+ 76	246.27
34	- 1.93	- 52	+ 0.32	+ 67	226.30
35	+ 1.06	+ 22	+ 1.62	+ 568	329.09
37	- 4.31	- 51	+ 1.09	+ 383	345.83
N7	- 1.35	- 76	+ 0.68	+ 144	232.29
NF	+ 0.009	+ 2	+ 0.36	+ 77	211.22
NJ	- 1.86	- 113	+ 0.17	+ 63	276.78
NR	- 0.82	- 196	+ 0.61	+ 188	298.36
NU	- 2.31	- 94	+ 0.94	+ 310	343.17
NT	- 2.90	- 114	+ 0.49	+ 153	315.41
NX	- 1.08	- 44	+ 0.24	+ 64	224.26
PX	- 0.02	- 1	+ 2.71	+ 552	208.64

Young ospreys were observed directly through the spyglass windows and through the CCTV system to monitor the amount of food eaten and observe their behaviour.

No hierarchical conflicts between individuals were observed and we did not need to manipulate any of them.

The average amount of food daily eaten per individual was 271.19 g (range=208.64-345.83). All the birds gained weight during the stay in the hacking tower (Table 2).

Fishing grey mullets at Urdaibai

Table 3. Period of stay in the hacking tower and period of dependence

Osprey PVC ring	Arrival date	Release date	Days in hacking tower	Departure date	Days before departing
32	09/07/15	30/07/15	21	03/09/15	35
33	09/07/15	26/07/15	17	03/09/15	39
34	09/07/15	26/07/15	17	04/09/15	40
35	09/07/15	10/08/15	31	06/09/15	27
37*	09/07/15	10/08/15	31	-	-
N7	09/07/15	26/07/15	21	03/09/15	24
NF	09/07/15	26/07/15	17	03/09/15	24
NJ	09/07/15	05/08/15	26	05/09/15	31
NR	09/07/15	30/07/15	21	28/08/15	29
NT	09/07/15	05/08/15	26	08/09/15	34
NU	09/07/15	05/08/15	26	05/09/15	31
NX	09/07/15	30/07/15	21	06/09/15	38
PX	09/07/15	30/07/15	21	05/09/15	37

* epylepsia

Nestlings remained in the hacking tower between 17 and 31 days (see Table 3). During the stay in the tower (18 July-3 August) the mean maximum temperatures was 27ºC (range= 20-31ºC) and the mean minimum temperatures was 16.7ºC (range= 12-20ºC) (*in situ* measure)

Processing of fish close to the hacking tower

4.3. **Release and first flight**

A couple of days after noticing that the birds started moving against the front mesh, we opened the hacking tower cages. Before dawn we distributed fish on the feeders and quietly opened the front panels so that the birds could decide themselves when to fly out of the cages. Staff and volunteers discreetly followed from a distance to check the birds leaving hacking cages and the first flights.

Figure 10. First flights

We conducted four openings of the hacking tower. Some individuals were changed from one cage to another depending on their stage of development. The sequence of opening and release of birds is shown in Table 4.

Table 4. Opening days

Date	Ospreys
26 July	33, 34, N7, NF
30 July	32, NR, NX, PX
05 August	NJ, NT, NU
10 August	35, 37

4.4. **Dependence phase**

The dependence period was 32.4 days (range: 24-40 days, n=12) (Table 3), similar to that observed in North American (32.5 days) (Stinson, 1978) and Scottish (30.4 days) (Bustamante, 1995) natural populations, and shorter than that observed in reintroduction programs of Andalusia (38.3 days) (Muriel *et al*., 2010), Portugal (44 days) (Palma & Beja, 2011) and Italy (48.7 days) (Monti *et al.,* 2012).

After the first release day, food was provided once a day before dawn. First fishing attempts were reported the first week after release. Notably, most of the ospreys tried fishing, although, as expected in these cases, no successful fishing events were observed. Fishing attempts gradually increased in intensity.

Released ospreys perching in an artificial nest and in the feeders.

4.5. **Intraspecific interactions**

During all the dependence period, the juveniles showed a semi-gregarious behaviour with frequent visual and vocal contact, and often using the feeders, perches and artificial nests together. We observed up to six individuals on the same feeder and the same artificial platform. We noted the absence of aggressive or hierarchical interactions that reduce the feeding of subordinate birds. During the dependence phase the young ospreys coincided with three returned subadult males and one female born in Scotland in 2012. The released ospreys often were observed in the company of these subadults, especially with P2 from which they begged for food. The presence of P2 in the nesting platform was very positive because it promoted several birds to fly directly to the platform from the hacking tower when releasing.

4.6. **Interspecific interactions**

We recorded 50 interactions with other bird species: marsh harrier (Circus aeruginosus (24), crow (*Corvus corone*) (17), buzzard (*Buteo buteo*) (2), peregrine (Falco peregrinus) (2), hobby (Falco subbuteo) (1), yellow-legged gull (*Larus michahellis*) (1), black-headed gull (Larus ridibundus) (1) and grey heron (Ardea cinerea) (1). Ospreys chased other birds in 40 cases, while the ospreys were chased in 10 cases (crow, marsh harrier, hobby and peregrine). These interactions are considered normal, physical contact or apparent negative results did not occur.

4.7. **Human disturbances**

Humans caused flight reaction of ospreys at least on six occasions: boat (2 times), canoes (2 times), helicopter (1 time) and fisherman (1 time). When possible, people causing disturbance were warned of temporary restrictions on use and to leave the area voluntarily. Once the disturbance finished, frightened birds returned to the area and recovered their normal activity, usually in less than an hour.

4.8. **Veterinary care**

All birds were clinically examined on arrival and they showed no signs of illness. However, in later days we notices that the osprey 37 regurgitated frequently and had a little left cheek swelling that disappeared after a few days. On August 8 this

same bird had an epileptic attack that recovered in minutes. On august 10th it was released as planned but it took seven days to take food from the feeders, which is an unusual behaviour. On August 19th it suffered another seizure while eating on a feeder, he fell down and was picked up by our staff. Then it was transported to the Care Center for Wildlife of Gorliz where it died a few hours after suffering successive attacks both during transport and at the care center itself.
Except for this incident, no other issue had problems or showed symptoms of sickness during stay in the tower of hacking, so handling was not necessary.

Except for this incident, nor other ospreys did not show any symptoms of illness during their stay in the hacking tower, so it was not necessary any handling.

5. Telemetry

Each bird was equipped with VHF radio-tags (*Biotrack* PP 1.70 g), attached to a pair of back feathers, and were tagged during the night, two days before the release. These transmitters were used to detect daily the individuals, to know the departure date and eventually to locate and rescue them in emergency situation. This VHF device was replaced with a satellite transmitter to one bird.


Tracking during the release days

Preliminary results of the monitoring of juvenile ospreys through satellite transmitters (30 g Microwave Argos / GPS Solar PTT) point to a decline, yet to be determined, of the rate of survival in tagged individuals. For this reason, the team decided to reduce the monitoring program with satellite transmitter to only two individuals but finally only one was installed (PX).

As in previous years, we used a trap with nooses installed on a feeding platform approximately a month after the release of the birds. Only one of the birds could be captured and tagged with the satellite transmitter PX (Mandela) that was attached to the back using a harness of Teflon. Transmitter installation was carried out by Roy Dennis, project consultant.

Left: PTT deployed by Roy Dennis with the help of Ian Perks and Edorta Unamuno (middle). Right: PX Migration route to Africa.

It was observed that PX had increased its weight 552 g, at a rate of +1.27 g per day (data corrected by the biomass of the bird) from the installation of the transmitter in the tower hacking until further capture (38 days). He departed the same day (September 5th) so that the information provided by its transmitter was only useful to determine the day of departure and to know the migratory route and wintering area. On the 20th of September he arrived in Guinea Conackry after crossing Morocco, Mauritania, Senegal, Gambia and Guinea Bissau. Later he settled for a month in the Ferlo (15º43'17 "N, 15º36'14" W) River, a tributary of the Senegal. Finally, he settled in the Northern bank of the Gambia River (15º31’55”N, 15º51’44”W).

PX in his wintering area of the Gambia River (November 2015)

6. First returns

We have recorded the return of four birds from the 2013 cohort, three in the Urdaibai Reserve and the Undurraga reservoir (Alava), and a fourth in Ribadeo (Asturias). These preliminary results are very positive, both for early return of the first birds and for the large number of individuals involved comparing with the results of similar ongoing or conducted reintroduction programmes in Europe (Table 6).

Table 6. Starting year, first returns and number of birds returned the first year, and first breeding year in European reintroduction programmes (Casado & Ferrer, 2007; Mackrill et al., 2013; Palma & Beja, 2014)

	Start	**First return/birds**	**First breeding**
Rutland Water (England)	1996	1999 (3rd year)/2	2001
Odiel and Cádiz (Andalucía)	2003	2007 (4th year)/5	2008
Alqueva (Portugal)	2011	2014 (3rd year)/1	-
Urdaibai (Basque Country)	2013	2015 (2nd year)/4	-

Localities in Northern Iberian Peninsula where returned individuals were observed in 2015.

P1 (2013)

Photo trapped in Vegadeo (Ribadeo estuary, Asturias) on April 27 and 28.

P1 perching on an artificial nest in front of Vegadeo (Asturias) (picture: FAPAS) and the estuary of Ribadeo (Galicia-Asturias)

P2 (2013)

Observations: May 20-May 22 (3 days) and June 2-September 17 (105 days). Not observed on September 7.

Location: Urdaibai Biosphere Reserve

Behaviour at Urdaibai:
- It stayed close to the released ospreys and no territorial behaviour exhibited with them during the fledging dependence phase.
- It often came to eat at the feeders.
- It transported nesting material to an artificial platform on several occasions at least in 12 days.
- It made display flights when a subadult female from Scotland AU4 (2012) was close to this platform and also when it was another returned male N4 (2013).

P2 at the marshes of the Urdaibai Biosphere Reserve

N3 (2013)

Observations: July 29-August 9, August 13, August 15-August 16, and September 4 (15 days)

Location: Urdaibai Biosphere Reserve (14 days) and Undurraga reservoir, Álava (1 day)

Behaviour at Urdaibai:
- It stayed close to the released ospreys and no territorial behaviour exhibited with them during the fledging dependence phase.
- It often came to eat at the feeders.
- It sometimes interferes with P2 (2013), chasing it to get it out of the nesting platform.
- It flies beside the Scottish subadult female AU4 (2012) and performs display flights at the same time that P2 (2013).

N3 *at the marshes of the Urdaibai Biosphere Reserve*

N4 (2013)

Observations: August 2-August 3, August 10-August 13 and August 31 (7 days)

Location: Urdaibai Biosphere Reserve

Behaviour at Urdaibai:
- It stayed close to the released ospreys and no territorial behaviour exhibited with them during the fledging dependence phase.
- It often came to eat at the feeders.
- It sometimes interferes with P2 (2013), chasing it to get it out of the nesting platform when the Scottish subadult female AU4 (2012) was in the area.
- In a single evening it comes to fish up to six times

N4 *feeding on one of the feeders in front of the hacking tower*


Left: Part of the staff of the project with the Scottish colleages: Edorta Unamuno, Mar Del Arco, Fraser Cormack, Roy Dennis, Ian Perks and Aitor Galarza (from left to right). Right: Scottish experts choosing a perch for installing a nesting platform in the reservoir of Urrunaga (Álava).

7. Meeting with the team of Scotland

With the aim of discussing the results obtained to date and introduce technical adjustments in order to improve the project a meeting of the staff of the *Urdaibai Bird Center* with Roy Dennis, senior advisor of the project was held in September. The meeting was also attended by the volunteers Ian Perks and Fraser Cormack who are part of the team that carries out the work for the supply of individuals in Scotland. Scottish team's visit was also used to explore the Urdaibai Reserve and reservoirs of Zadorra in order to identify potential nesting sites for the species.

8. Technical visits

In May we received the visit of part of the team that assist the recovery of the Bonelli eagle populations in Spain (Life12 / NAT / ES000701). In August, coinciding with one of the releasing days, we received the visit of Professor José Luis Tellería, from the Department of Zoology of the University of Madrid.

Left. Aitor Galarza (middle) with part of the staff of the recovery programme of the Bonelli Eagle in Spain: Itziar Almarcegui, Gloria Giralda, Javier Díez and Alfonso Llamas. Right: Part of the staff of the project with Professor Tellería (Mar del Arco, Aitor Galarza, Javier Elorriaga and José Luis Tellería)

9. Dissemination

9.1. Guided visits

During the dependence phase five guided visits were organized in order to observe the ospreys and disseminate the project. Around 75 people took part.

Figure 25. Guided visits to observe the released ospreys

9.2. Talks and conferences

October 2015
The Osprey in Urdaibai: recovering a conservationist icon. Txingudi marshes Interpretation Centre (Irún, Gipuzkoa).

October 2015
Restoring the Osprey to the Urdaibai Biosphere Reserve. Natura 2000 Biogeographical Process Atlantic Region Meeting. Biodiversity Centre of the Basque Country (Busturia, Biscay)

November 2015
Recovering the osprey by hacking. Practical course of Vertebrate Zoology. University of the Basque Country. Urdaibai Bird Center (Gautegiz Arteaga, Biscay).

9.3. TV and Radio

Visit of a team from the Basque Public Television (ETB) to the project facilities in Urdaibai

ETB (Basque Public TV)

- www.**eitb**.eus/es/.../**aguila-pescadora**-urdaibai-vuelve-jaun-zuria/

Basque Public Radio (Radio Euskadi). Several programs. To emphasize the programs developed weekly with Roge Blasco relating monitoring migratory journey of ospreys to Africa.

- www.**eitb**.tv/es/player/radio/radio-euskadi/2514820/3255846/
- www.blogs**eitb**.com/.../mandela-el-**aguila-pescadora**-atleta-en-vuelo-de-**urdaibai**-a-senegal/

9.4. Press and web

- www.lne.es/occidente/2015/05/...**aguila-pescadora**/1759624.html
- www.20minutos.es/.../regresa-**urdaibai**-primera-**aguila-pescadora**-programa- reintroduccion-sociedad-ciencias-aranzadi/
- www.elcorreo.com/.../primer-ejemplar-**aguila-pescadora**-20150522134105.
- https://www.euskadi.eus/informacion/...el-**aguila-pescadora**.../es/html
- www.deia.com/.../jaun-zuria-primer-**aguila-pescadora**-en-retornar-a-**urdaibai**
- www.deia.com/.../trece-polluelos-de-**aguila-pescadora**-llegan-a-**urdaibai**-desde-escocia-

Jose Mari Unamuno (right), Director of the Urdaibai Bird Center, talking about the project with the presenter Ander Iribar in the studios of the Basque Public Radio in Bilbao.

10. **Environmental education**

In 2014 we initiated an environmental education program as a main instrument to fulfill one of the priorities of the osprey restoration project: awareness on the conservation of biodiversity in general and the osprey in particular.

Several schools in the Basque Country take part in this program that is coordinated by the Urdaibai Bird Center in collaboration with the Department of Education and the Department of Environment of the Basque Government (Centre of interpretation of the marshes of Txingudi).

During this year 2015 there have been carried out the following activities:

***"Ospreys flyways linking communities"* Project**

It has continued with the participation, initiated three years ago, in the international project "Ospreys Flyways linking communities" coordinated by Tim Mackrill and Pete Murray (Rutland Water, Leicester, England) in which are involved schools in Europe, America and Africa. The main objective of this project is to develop a coordinated approach in the use of new technologies in education (Websites, Google Earth, Skype, ...), taking the osprey and their migration route as a vehicle to connect schools in different parts of the world. Among other activities in March the World Osprey Week (WOW) and in September the Bye Osprey Week (BOW) were held in which two public schools Urdaibai (Montorre and

Urretxindorra) shared by videoconference works with schools in Italy, England, America and Gambia.

https://www.youtube.com/watch?v=eLQF5N89rHI
https://www.youtube.com/watch?v=QxwH5Tp7sJQ
https://www.youtube.com/watch?v=99EzJarUkGc
https://www.youtube.com/watch?v=eLQF5N89rHI

Comic

It has been made the second chapter of a comic in which the recovery plan undertaken in collaboration with Scotland is explained in depth. This material has been distributed by schools and is available on the network.

The comic is being worked by the schools at different educational levels such as languages, visual arts or development of oratory as introductory material for the case monographic guided visits.

Travelling exhibition

The exhibition has been exhibited at the Urdaibai Bird Centre and at the Centre for Interpretation of Txingudi throughout the year and has been seen by thousands of people. Also, as proposed from the start, the exhibition has also been exposed in different schools in the Basque Country.

Didactic units and support materials

We have made two didactic units in Spanish and Basque to deepen the work of school before and after each visit to the osprey site. One of the units is aimed at students of Primary and Secondary to another. Both have separate materials for teachers and for students. This educational material is provided to the schools in order to optimize the site visit and provide continuity in subsequent work in the classroom.

Monographic visits

In October were carried out monographic visits to the Urdaibai Bird Center and the Center for Interpretation of Txingudi for those schools engaged with the environmental education program. A total of 27 schools (1,724 students and 84 teachers) were involved in these visits.

Each visit has consisted of the following areas:

1.- Introduction to migration
2.-Osprey and migration
3. Osprey exhibition
4.-The biology of the osprey:
- Identification by pictures and video.
- Migration in Urdaibai and other Basque wetlands.
- Travel friends (waterfowl species)
- The restoration program in the Biosphere Reserve of Urdaibai
- School Project "Ospreys Flyways linking communities"
- Tracking by GPS.
5.-Watching wetland birds with special dedication to Osprey

Series of talks in schools

During May six talks were given in different localities of the Urdaibai Reserve in order to promote engagement of schools in the project. Around 500 students from seven schools in the region assisted the talks.

Triptych.

A triptych describing synthetically the Osprey recovery project and the way to take part in it was published. This booklet can be downloaded on the project website and will be available in all schools taking part in the project.

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12. **Acknowledgements**

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