TECHNICAL REPORT

ACTION A.3

Investigate attitude towards fish-eating birds and identify potential conflict sites in Romania

Romanian Ornithological Society/Birdlife Romania

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1. Introduction.

The interactions between fish-eating bird species (many under strict protection by law) and fish stocks, particularly those under commercial culture, harvest or part of a fishery is subject of much controversy, especially during recent decades. Ecological, environmental and nature conservation necessities run alongside commercial pressures on exploited fish populations. The situation is even more complex given the fact that the fish farms involved are not always small surface artificial water basins destined for intensive aquaculture but very often large natural lakes or large scale surface dams that are complex ecosystems designated as protected areas (Natura2000 Special Protected Areas in most cases), which are home to, and are part of the distribution range of many protected bird species.

In Europe, and in eastern European countries even more so, conflict may arise between those involved in (especially) the fresh water fishing industry and fish-eating species of which cormorants *Phalacrocorax carbo* are the most blamed for economic losses. In southern and south-eastern Romania, the two strictly protected pelican species (Great white Pelican *Pelecanus onocrotalus* and Dalmatian Pelican *Pelecanus crispus*) are often regarded as a source of considerable economic loss due to perceived high consumption of fish alongside cormorants. This conflict can lead to direct persecution most often by deliberate disturbance of birds in their feeding areas, but on occasion, illegally, also shooting. It is certain that in wetlands where fishery is an important activity there is often a negative attitude of fishermen towards pelicans as livelihood threatening competitors. However, much of the hostility is based on lack of accurate information about the actual impact of DP on fish, which combined with the perceived restrictions set by the status of Natura 2000 create a hostile attitude.

The most significant areas including the distribution range of the pelican species comprise the Danube and lower Danube basin with its adjacent lakes used nowadays as fisheries, the coastal wetlands-lakes and the large area of the Danube Delta Biosphere Reserve which covers the Delta itself and the large coastal lagoon area of Razelm-Sinoie. Apart from the Danube Delta Biosphere Reserve, commercial fishing in all these areas is organized through the long-term concession of lakes and ponds to private companies often times in a continuation of fishery operations inherited from the socialist era, which currently overlaps with the current status of these wetlands as Natura2000 Special Protected Areas. As such, conservation requirements of the bird species need to be harmonized with the economic activities such as commercial fishing and farming and potential conflict needs to be identified and reduced or eliminated.

The Dalmatian Pelican is the largest of the pelican species worldwide, a water bird species that is classified as ‘Near Threatened’ in the global IUCN Red List with a decreasing population trend (The IUCN Red List of Threatened Species). In the European Red List Assessment of 2015 the species was downgraded from ‘Vulnerable’ to ‘Least Concern’. The species is listed in Annex I of the Birds Directive, Appendix II of the Bern and Bonn Conventions and in Annex II of AEWA. The species has been classified as “Vulnerable” in the Red List of Bird species in Romania in 2022. In Romania the species is resident and partial migrant/dispersive. It breeds in the Danube Delta and in the vicinity, while adults outside of the breeding season and immature birds disperse along the lower Danube (variable numbers remain in different parts of DDBR), extensively using the large lakes and wetlands as feeding and roosting areas, in congregations of up to several hundred individuals. Considerable numbers are to be found also along the Danube River itself and its islands. Occasionally, concentrations of more than

400 individuals may be found on the reservoirs along lower Olt River. Greater numbers are recorded outside of the breeding season, before wintering.

The present study is part of the action A3 of the Conservation of the Dalmatian pelican along the Black-Sea Mediterranean Flyway project ("Pelican Way of LIFE"), which aims to investigate the Investigate the attitude of key stakeholders such as fishermen, owners of fisheries, national agencies etc. towards fish eating birds and identify potential conflict sites. As such, this is the first study/initiative of this kind to be implemented in Romania, and the results are expected to guide decisions that should result in minimizing the potential conflict.

2. Scope, objectives.

The study was conducted as part of the Pelican Way of Life, with three objectives in mind:

1. Investigating the attitude of key stakeholders including fishermen and owners of fisheries and reservoirs towards fish-eating birds;
2. Collecting information on losses or perception of losses;
3. Identifying potential sites with risk of persecution.

The intended sites were Tasaul-Corbu Lakes, Lake Suhaia, Lake Dunareni, Valea Mostistea, Lake Oltina, Lake Galatui, Iezerul Calarasi, Lake Bugeac, Danube Delta and Razim-Sinoie complex, Valea Oltului Inferior and Bistret, all sites were populations of Dalmatian pelicans are likely to be present.

3. Materials and methods.

Fieldwork was conducted between March 2022 and March 2023 in three main project areas, with additional interviews covering two other sites (Table 1).

Table 1. Interviews distribution by project area.

Area	N of interviews
Călărași/ Mostiștea/ Gălățui/ Frăsinet	5
Danube Delta Biosphere Reserve (including Razim-Sinoe)	28
Bugeac/ Oltina/ Dunăreni	13
Tașaul	1
Valea Oltului Inferior	1
Bucharest	2
Total	50

Data was collected by an independent researcher using 50 semi-structured interviews, 44 in person, 5 by phone, and 1 via email. Participants were recruited from two stakeholder categories: (1) people directly involved in the fishing activity (fishery owners/operators/managers, fishermen) and (2) people from the local community, the local

administration, and experts who have knowledge of the general local context in which fishing takes place as well as of the fishermen-fish eating birds interactions (Table 2).

Table 2. Distribution of interviewees by stakeholder category.

Category of participant	N of men	N of women	Total
Fishery owners/ management staff	8	1	9
Hired fishermen (working in the fishery)	9	0	9
Independent fishermen	10	0	10
Local administration representatives	5	4	9
Community members	8	1	9
Other	2	2	4

The interview guide followed seven main topics:

1. General description of (fishing) activity, recent and projected trends, general social, economic context;
2. Issues affecting the fishing activity;
3. Presence of fish-eating birds (species, numbers, trends, general behavior);
4. Problems (if any) caused by fish-eating birds;
5. Measures taken by fishermen and fishery operators against fish-eating birds;
6. Proposed solutions for the problems confronted by fisheries/fishermen, focusing on fish-eating birds;
7. Other issues (hunting in the area, issues raised by interviewees).

Notes were taken during the interviews, transcribed, and coded for analysis following the topics included in the interview guide as well as other topics raised during the interviews. Since the sample was not statistically representative, no numerical generalizations can be made. Therefore, the analysis was thematic and wholistic, aiming to generate an image of the ways in which people understand, relate to, and behave towards fish-eating birds as well as explain these attitudes and behaviors through reference through the economic, social, and cultural context in which they take place.

4. Findings.

This section presents the findings of the study, with a focus on the perceptions and attitudes of those directly involved in fishing operations in the study area, as well as on their self-reported behaviors. The objective of the analysis was to build an image of the main ways in which fishermen and fishery owners, administrators, and workers understand their own activities and their relationship to fish eating birds and the larger ecosystem, and why they might be pushing towards particular kinds of measures. Such an understanding could open productive avenues for mitigating some of the conflicts and finding common ground for sustainable future solutions. Central to the analysis was contextualizing the bird-human conflict. Rather than being seen it in isolation or as some kind of primordial conflict, it is analyzed as the product of a dynamic economic, social, and environmental context.

4.1. Fishing and fisheries.

With the exception of the Danube Delta area, commercial fishing in the project areas is organized through the long-term concession of lakes and ponds to private companies, often times in a continuation of fishery operations inherited from the socialist era: in several cases, either the beneficiary of the contract or those working in the fishery in specialized or management positions used to work in the fishery prior to 1989. Moreover, part of the infrastructure is inherited, as well (buildings, dams, reproductive ponds, water pumps), and due to its age and outdated technology, is generating large operating costs. Investments in infrastructure tend to be found in the case of smaller operations or fish-hatcheries, which tend to be more profitable. For example, one fishery operator in the Mostiștea area said he would never get involved in operating larger ponds and prefers to produce fish fry, as this type of business is more predictably profitable. Another one south of the Danube Delta bought and repurposed a former industrial area near the water into reproductive facilities as a response to the low profitability of their larger fishing operation.

It is significant that the continuity with the 1989 era is visible in the technological process and a reverence for a scientific approach to fish rearing. Almost all fishery administrators and technical staff proudly detailed the complicated technological process of "producing" fish, made references to pisciculture research institutes, and invoked the authority of "specialists" when asked for solutions. The industrial logic of the fishery operations sometimes comes into conflict with their explicit realization that fisheries operate in open systems, connected to larger bodies of water (Danube, larger lakes) and vulnerable to outside factors (climate change, predators, pathogens).

Commercial fisheries as economic ventures—according to the interviewees—are highly unpredictable due to the long production process (except for hatcheries). Several interviewees pointed out that one has to introduce young fish (fry) and wait for 3-4 years for the "harvest," period which creates a heightened perception of vulnerabilities and risks and possibly distorts profitability calculations. For example, in the case of most interviews, when adding up all the kinds of losses a fishery undertakes (birds, diseases, poaching, frogs, etc.), the total percentage of losses exceeded 100%.

There is generally a low connection between the commercial fishery and the local community where it is located, according to interviews with fishery operators/workers and members of the local administration and community. Typically, few people work in the fishery (the numbers have been drastically reduced) and the only contribution to the local community is paying some (low) salaries and local taxes. Fishery operators rarely sell locally, and they see the local community generally as a source of poachers and problems. Moreover, in several places (at Oltina in particular), there was an open conflict between the local community and the fishery over two issues. First, the infrastructure, which was inherited from the pre-1989 era and privatized was no longer available to the local community, for example roads and dams. Second, the fishery operators were seen as behaving recklessly toward their neighbors, sometimes generating floods in agricultural fields or inhabited areas. There was also a perception in some local communities that the commercial fishery's control over the water and the fishing opportunities is unfair and a break with a local tradition in which most people fished freely to feed their families.

In the Danube Delta area, fishing is done by independent fishermen, who have to register as authorized individual businesses, pay yearly taxes and receive individual fishing quotas and designated fishing areas, depending on their home location. The allocation of fishing grounds is inherited from a period when part of the fishing rights in the area were privatized, and it resulted in strange allocations, often tens of kilometers away. Fishermen cannot sell their catch directly, they must sell it to authorized distributors (*cherhanale*), which hold a disproportionate power on the market and are seen as corrupt and unfair. Moreover, there are fishing restrictions in regard to species, size, and period. These arrangements result in illegal fishing activity: fishermen often try to fish closer to home, sometimes putting pressure on local lakes and channels, and sell some of the catch informally evading restrictions.

4.2. Perceptions of and attitudes towards fish-eating birds.

4.2.1. Species and numbers

About half of the interviewees mentioned only two categories of birds, without differentiating between the species: cormorants and pelicans. The rest, with a few exceptions, mention other broader categories, again, without identifying species: herons, ducks, geese, and "small birds" (shore birds). One interviewee also indicated the presence of terns (Bugeac). With the exception of the Danube Delta fishermen, they saw all birds present in and around the water (ducks and geese included) as fish eating, although at the center of their complaints were mainly the cormorants and the pelicans.

Only two of the people directly involved in fishing indicated that they are aware that there are two distinct pelican species. However, several talked about pelicans that "stay for the winter," using the warmer weather and the local abundance of fish as explanations for their winter presence.

Those involved in fishing (administrators or workers) tended to have only a very vague idea about the number of birds present and feeding in their fisheries. When probed for more precise numbers, they responded by referring me to "those who do monitoring programs." They all, however, thought that the number of birds present in the site is excessive and more than the system can support: one interviewee actually used ecology terms to explain the relationship and also insisted that it is not in the birds' interest to allow them to multiply beyond the carrying capacity, as this leads to poor nutrition, low immunity, diseases.

Cormorants were perceived as the most abundant species, with numbers in the thousands in most sites. Interviewees generally used "thousands" without a precise number, with a few exceptions: Valea Argovei (2-3000 cormorants) and Ciocănești (10000 from a nearby colony). Some knew where the colonies were located, either near the Danube or in nearby forests.

Several interviewees were more precise in indicating the number of pelicans and their dynamic (that the numbers fluctuate from year to year): Ciocănești (300-400 pelicans both in the winter and the summer), Ulmi/Mostiștea area (under 10), Bugeac (at one point 2500), Valea Argovei (400-500), Dunăreni (normally 3-400, but years with 600 or 2000). The rest of the interviewees said they had "many" pelicans, or "in the thousands."

What all interviewees had in common was that they all indicated that the number of fish-eating birds, and in particular cormorants and pelicans, has increased dramatically in the past few years, most blaming this on the birds' protected status, combined with the fact that they have no natural predators. A few, however, showed a more complex understanding of this dynamic, explaining that the destruction of habitats along the lower Danube and in the Delta, combined with climate change (drought and disappearance of wetlands) draws birds to safer feeding areas like fisheries. Fishermen from the Danube Delta also talked about the conflict between people and fish-eating birds as being generated by geomorphological changes in the delta, low Danube levels, and unsustainable fishing practices: there are less areas suitable for fish reproduction, there is less fish, and less places where fishing can productively take place, and this inevitably leads to conflict.

4.2.2. Attitudes toward birds and views on their characteristics and behavior

The cormorants tend to be universally hated by those involved in fishing, and in particular by those owning and operating fisheries. They are imagined as extremely intelligent and cunning, with complex fishing strategies in which they cooperate both with members of the same species as well as other species: "a bird smarter that the cormorant doesn't exist," "the devil in the shape of a bird, that what Antipa used to say." Cormorants, interviewees said, hunt by gathering the fish before attacking it. They are destructive, hurt more fish than they catch, leaving it hurt and vulnerable to diseases. Other species of birds, and pelicans in particular, fish cooperatively with the cormorants, dividing the prey (cormorants go for the smaller fish and pelicans for the larger). Some of the interviewees mentioned sizes and weights for the birds' preferences (below a half a kilogram for cormorants and over for pelicans). Some of the theories on cormorants are plainly strange: that they poke the fish in the eye, they eat continuously, they have a special acid in their stomachs that helps them digest prey faster, and that maybe they have worms in their digestive tracks that also eat the fish and make cormorants more destructive. One interviewee declared that there is absolutely no value in cormorants and all efforts to protect it are misguided: around one of his fisheries there are over 70 species of birds, and somehow they are all ignored, with cormorants being the object of all programs and protection initiatives.

According to the independent fishermen, both cormorants and pelicans have changed their behavior in the past years and have learned how fishermen operate, they recognize their tools and see opportunities for fishing in their proximity. Both types of birds come, sit on tools and steal fish from nets, often times getting tangled in them or damaging them.

Pelicans tend to be less hated, and in some cases they are the object of amused sympathy, even when they compete for the same fish as the interviewees. Most people lumped them in with the cormorants, but making cormorants the active agents of destruction, and pelicans as the secondary beneficiaries. Two people said that pelicans are valuable, since they tend to pick up the slower, sicker fish by the shore, which can prove useful in case of disease outbreaks among the fish. The independent fishermen in the Delta area had stories of encounters with pelicans, some of which can become friendly toward humans and behave like dogs, waiting for fishermen to throw them smaller fish or guts. A restaurant in the vicinity of a colony of Dalmatian Pelicans turned their presence into a tourist attraction, by throwing fish guts in the

morning just outside the restaurant terrace.

All fishery operators and workers and most of the independent fishermen resent the birds' protected status and see it as an unfair advantage at the expense of their own wellbeing. Several interviewees even said that according to the law and various policies birds are seen as more important than humans. In the Danube Delta proper, birds and humans are seen as competing for the same resources, which are getting more scarce: "but you cannot put the birds in the first place, and humans in the second—what else can you do here [but fish—our note], there is nothing else you can do, what other kind of living can you make?". A fishery operator in South Dobrogea insisted that measures have to be taken, otherwise "we will wake up one day and realize that humans are disappearing and only birds will remain."

4.2.3. View on ecosystems and biodiversity

Interviewees directly involved in fishing understand that their activity is connected to complex natural processes and that the success of their business depends on the health of the ecosystem. They explained how the health and growth of the fish depends on natural food, and how biodiversity generally benefits their business (for example, fish species diversity in the Danube). Also, fishery operators expressed concern about the quantity of pesticides and fertilizers used in the area, which can negatively impact the quality of the water in the ponds and lakes they are operating in.

At the same time, fishery operators see the ecosystem as amenable to intervention and see themselves as being in the right to make those interventions, in particular limiting the number of fish-eating birds. In the Danube Delta area, fishermen complained that channels and waterways have not been cleaned in years and that water is not reaching all places it used to, and this affects the fish habitats and their reproductive success.

Interviewees also expressed an understanding of the ecosystems in which they operate as being open and connected to events and processes in other places. They blame climate change and anthropic changes for the loss of wetlands in other parts and for the increased pressure birds put on the remaining habitats, including the lakes and ponds they are exploiting. The drying of the large islands on the Danube was seen as having catastrophic effects on fish populations.

In this context, several interviewees pointed out that the work they are providing—tending and protecting the lakes and ponds, feeding the birds—is ecologically valuable. One interviewee in particular quoted research that says that managed wetlands used for extensive pisciculture are more valuable than unmanaged ones in terms of CO2 capture, filtration of nitrates and phosphates, and energy that is ultimately consumed by birds. He insisted that this contribution needs to be scientifically documented in Romania, as well, and ultimately valued.

4.3. Losses due to fish-eating birds.

4.3.1. Perceived losses

In most interviews with fishery owners, administrators, and workers, fish-eating birds were

identified as the main problem, even when further discussion revealed that their fishing operations confronted multiple and more serious problems, even according to their own words. It was the first topic brought up in response to the question, "what kinds of problems/issues are affecting your fishery/activity?" Several informants explicitly said that they feel like all they do is feed the birds or work for the benefit of the birds, with no or little recognition. Several said that they are convinced that fisheries singlehandedly support Romania's population of fish-eating birds, and if fisheries disappeared, most of these birds would die of hunger. Conversely, some complained that in the near future, all fisheries will disappear because of the fish-eating birds.

The estimates for losses from birds vary widely, from 30% to 90%, and they tend to be calculated as a percentage of the expected yield (both in the case of the mature fish and fish fry production). One interviewee expressed losses in costs (he has to spend extra 30-40000 euros to make sure he has the yield he needs). The wide variation exists even in the same area, with lakes situated just 10 km apart (90% losses in Bugeac and 30% in Oltina). Most, however, indicated a percentage around 60%. Further discussion revealed that in many cases, the estimates also included losses from other causes, such as natural processes, diseases, other predators, poaching. The estimates for losses are sometimes accompanied by mentions of the quantity of fish a bird ingests a day, which circulate as a kind of folklore among those in the fishing business. In the Danube Delta area, the number was 4 kg a day per pelicans, and in other areas 3-5.

Interviewees feel confident that losses from birds are objectively substantial. While they offered estimates for these, when asked about compensations (how they should be calculated and paid), they said that independent "specialists" should come and calculate these losses and they would agree to those numbers. The response received from ANANP (the National Authority for Natural Protected Areas) suggests that the level of losses reported by fisheries owners and operators is overestimated and that no clear, definitive studies have been done to document them.

4.3.2. Other types of losses and problems. An integrated view on losses.

In-depth discussions with interviewees revealed that fish-eating birds are just one element in an assemblage of problems and challenges affecting their activity.

One interviewee said that this preoccupation with losses caused by birds (and framing the quantity eaten by birds as a loss) is fairly recent and due to the way fishery operators see their activity. Before 1989, he remembers that fisheries were organized around their mission as public utilities, producing fish for the population, and being integrated in a larger economy. Localized costs were not an issue. Birds used to eat fish before 1989, as well, but that was not seen as a loss, since it was not transformed into a cost figured into profitability calculations. Money for fuel, salaries, machinery came in from the centralized government. Now, fisheries are forced to operate as independent profit-centers, and they circumscribe all events and interactions to this capitalist logic. Everything is money, costs, lost profit. In this context, discussion of natural processes like rain or birds eating fish are framed in the same way fuel costs or salaries are.

Poaching

A major problem for almost all interviewees seems to be poaching, although estimates of its extent and dynamic varies greatly. In the Dunăreni area, the estimated loss was as low as 5%, but it went as high as 30% in other places. Poaching is perceived as a direct threat—many indicated that they were physically afraid and that poachers threaten to use physical violence. Although many connected it to the social context (poverty, lack of opportunities for locals), they saw it as a large-scale, almost industrial operation: poachers come with motorboats, nets, and large trucks for transporting the fish. They have distribution networks that make the fish disappear instantly. Fishery operators declared that they did not feel supported by the police or the justice system: poachers almost always get away free. Perceptions of the evolution of the problem vary: some said it is much worse than in the past, others that it got better. Differences might be due to the local economic and social context.

In the Danube Delta, discussions about poaching tended to be more nuanced and revealed a contextual understanding of the concept. Independent fishermen saw themselves as having the right to fish, and all the laws and regulations as an artificial and changing imposition on a local situation. Some said jokingly that they were all poachers before they were forced to get the authorizations. Others said that they sometimes fish in other areas than the ones designated for them, as they are unreasonably far away. Also, those who fish on family authorization (for consumption) fish more than what they are allowed and sell the fish to supplement their income, which could be construed as poaching. They said that the real poachers are those who are able to fish in large quantities and using illegal methods and are protected (or work with) the police.

Water

Another problem universally mentioned is drought and lack of water, which generates huge costs for those who have to pump the water and pay for it (especially when the Danube is low) and affects the reproduction process both in the fishery and in the wild. Lack of water is also blamed for bringing in more birds in direct competition with fishermen.

The State

Also, lack of support from the state (and in some cases hurdles put up by the state) was also mentioned as a major problem affecting the fisheries' viability. All fishery operators mentioned the incomplete legislation which makes subsidies and compensations impossible or insufficient, as well as negligence and incompetence on the part of various state institutions and agencies (a compensation program fisheries applied for turned out to be incorrectly applied, so fisheries had to return the money, resulting in possible bankruptcies). Independent fishermen also complained about the taxing system which forces them to pay taxes regardless of how much they fish, the sometimes illogical geographical allocation of fishing licenses (some are forced to fish long distances away from home), and the fish collection system (they cannot sell directly, but only through an authorized distributor).

Operating costs

Interviewees have complaint that rising costs (in particular fuel and electric energy) are affecting their bottom line and make surviving difficult, especially when coupled with steep competition from fish (both mature and young) coming from other EU countries where fish production is strongly supported by the state (many of the interviewees were well informed). Some of the costs are due to old equipment and infrastructure, some inherited from pre-1989 operations.

Invasive species

All fisheries complained about the accidentally introduced North African catfish (*Clarias gabriepinus*), which eats large quantities of small fish and generally affects their reproductive success. None of the interviewees offered clear estimates of the losses, but said they are worried for the future, as this species seems to not have predators (birds don't eat it) and excellent reproductive success. Fishermen in the Delta said they were not worried, as the species doesn't do well in their area.

Tourists

In the Danube Delta, a major problem is presence of tourists, and in particular of speeding boats, which scare away the fish and modify the waterways, making fishing difficult. Fishermen also complain that recreational fishermen put pressure on dwindling number of fish and that they are reckless in their methods and in keeping more fish than they need.

4.4. Measures taken against fish-eating birds.

A clear image of the extent of measures taken against fish-eating birds is impossible, as most of the respondents understand that disturbing or persecuting protected birds in protected areas is illegal and are reluctant to admit to taking these types of measures. Still, the response from the ANANP representative suggests that authorities are aware of the widespread use of these methods, although no measures are taken.

Only in two fisheries the interviewees admitted to using a wide array of measures: loud noises (gas cannons, horns and vuvuzelas), ultrasound machines, thin strings, nets, CDs on a string, gun shots, cutting down the reeds and vegetation to prevent birds from nesting or hiding, driving in their cars on the surrounding dams. One more interviewee admitted to driving cars to scare the birds, another said they tried loud noises, and two said they take no intentional measures, as this is illegal. At most, they hope that driving the boats while fishing would chase away the birds.

From interviews, it appears that there is a relationship between the size of the fishery and the likelihood to engage in disturbing or persecuting behaviors (at least declaratively). Those who admitted to using measures operate nurseries, which they see as more vulnerable and more likely to incur large and rapid losses (smaller fish), but also as easier to protect. Most of the others said that it makes no sense to try to protect large bodies of water (hundreds of hectares or more), as any measures prove to be expensive but ineffectual.

In the Danube Delta area, according to interviews with fishermen, members of the local

administration, and biologists working in the area, persecution is accidental, and not a widespread practice. Most often, birds get tangled in the fishing nets and die.

In the Olt Valley/Bistreț region no fisheries are operating as such, as the lakes are managed by the county council, and therefore persecution is isolated and accidental. The council representative interviewed said that prohibition of bird persecution will be enforced in the future, as well, and this has detracted potential fishery operators from getting involved in the area.

Overall, even when taken, the measures are universally seen as the work of Sisyphus, so much that some of the interviewees said that in reality there is nothing one can actually do against the birds. When asked what he does to reduce losses from birds, a fisherman said: "What can you do? There is nothing you can do. You curse and go home."

4.5. Solutions for limiting bird-caused damages and losses.

Interviewees saw two types of solutions for the difficulties fisheries are facing (some opted just for one or the other, but most for both).

First, they said they should be allowed to take direct measures against cormorants, specifically. Measures include killing them (shooting them themselves on site, allowing hunting in or around the site), scaring them with gunshots, reducing their numbers by destroying eggs or nests. The lethal solution seems to be favored by most, even though they understand its lower social acceptability. Some declared openly that "we should be allowed to shoot the birds" while others used euphemisms ("we should be allowed to work on their number"). Two types of justifications were offered: violent solutions are the only ones that would work and everybody else in the EU uses these kinds of solutions, why shouldn't we? In the Danube Delta there were also references to state organized killing practices from 1989, with hunters being paid to kill birds that came to feed on fisheries.

The second category of proposed solutions was connected to the state's approach to pisciculture and different types of state measures and policies.

Pisciculture, almost all fishery operators insisted, should be considered a type of agriculture. This would recognize the national strategic importance of this type of activity and would give access to different types of subsidies and facilities that make agriculture profitable (surface subsidies, fuel and salary subsidies). A particular kind of subsidy that was asked for by three interviewees was one that would subsidize part of the price of fish fry to be introduced in lakes and ponds.

Also, the state should compensate fisheries for the losses incurred due to fish-eating birds. The particular solutions (in terms of format, numbers, etc.) varied, but interviewees suggested that specialists (pisciculture engineers mostly, but also economists and biologists) should get involved in monitoring the situation and generating estimates on a scientific basis. A system of compensations for losses, suggested one interviewee, would make the state feel more responsible for the entire situation and would help introduce measures to directly limit the number of birds and their impact.

Other suggestions included clarifying the existing legal framework for fisheries as well as programs that would help fisheries modernize their operations through automatization and energy saving technologies. The ANANP representative suggested the use of positive methods, with rewards for fisheries that use measures and technologies that do not disturb birds.

5. Conclusions.

Fishery operators and managers that were interviewed have a negative attitude towards fish eating birds, and in particular cormorants. Pelicans tend to have a less negative image, but oftentimes they are lumped in with cormorants and suffer similar treatment. Fish-eating birds are seen as sentient characters, intelligent, cunning, and destructive.

Most fishery operators and fishermen have only vague estimates of the number of birds present in their area. The same can be said about the extent of the damage they induce. The lack of precision in estimating the damage can be blamed on the complexity and length of the fishery process and also on the varying willingness of the operators to include other factors in calculating overall losses.

Losses induced by fish-eating birds are one among a list of factors negatively affecting the fish yield: poaching, drought/lack of water, invasive species, and others. Birds tend to be blamed first and foremost due to the fact that their activity is more visible and their impact easier to comprehend. There also seem to be a culture a blaming the birds, sustained by a widely circulating folklore of birds' characteristics and behavior.

From interviews, it appears that lethal persecution of fish-eating birds is rare. More widespread is persecution that affects their ability to feed, rest, or nest: they are scared with loud noises, kept away with nets and wires, and chased away with cars or boats. Persecution is more likely to take place in cases when the birds' impact is more visible, and persecution is thought to be more effective. Thus, more persecution practices will be found in nurseries and small ponds, some in larger lakes and ponds, and only accidentally in public waters (Danube Delta and the Sinoe-Razim complex).

Although the intended target seems to be cormorants, other species will also become target, by virtue of their co-presence. Just because pelicans have a more positive image will not protect them from indirect persecution.

The main solutions proposed by most fishery operators/managers are (1) killing the birds/reducing their numbers through non-lethal solutions and (2) a system of compensations that would recognize the fisheries' losses. The measures reflect a fragmented view of nature in which some natural processes and elements are recognized as valuable, but that can be dis-assembled and manipulated for the benefit of people. The proposal that their activity be seen as a form of agriculture is thus coherent: thus, birds can be seen as pests and their removal as morally acceptable, and water, just like land, can be seen as a form of capital with all the associated rights.

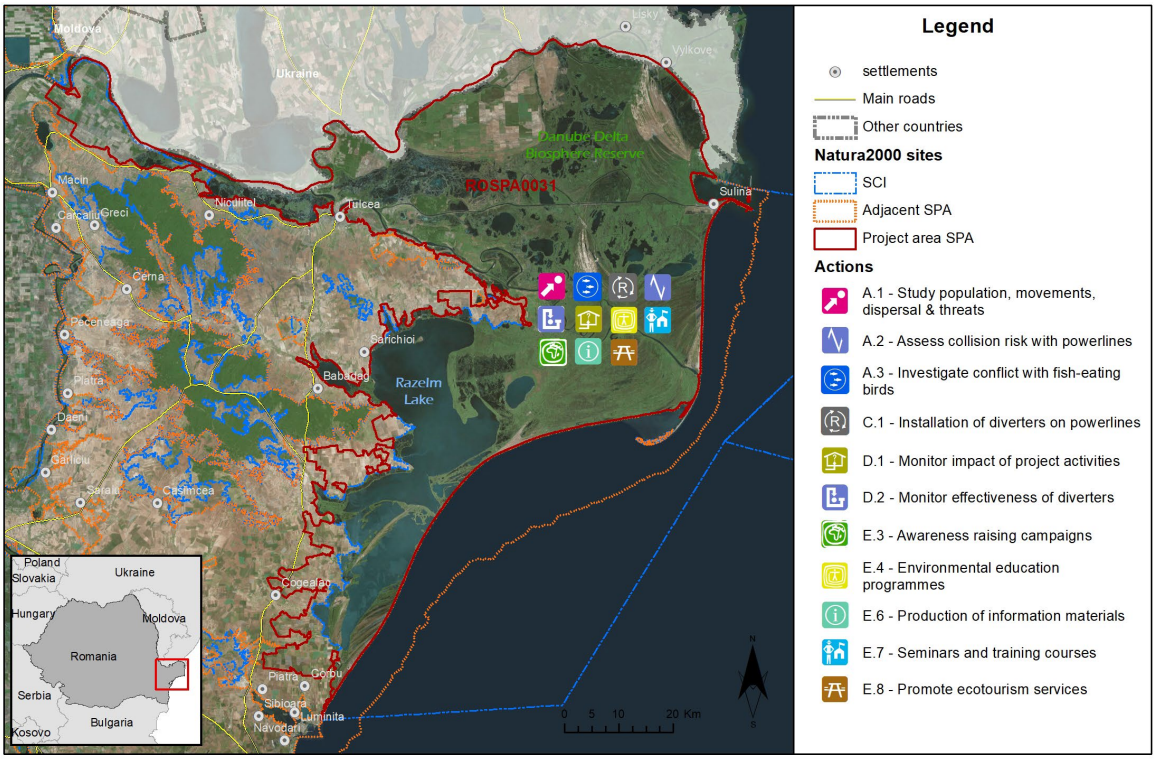
Therefore, in order to reduce or prevent persecution of fish-eating birds, prohibitive or

punitive measures will not suffice. Measures will need to address the way fishery operators understand their activity, either working with the capitalist logic (by conceptualizing producing fish as a provisioning service for the birds that needs to be compensated) or by destabilizing it to allow for a more harmonious relationship to the ecosystem and implicitly the birds. While recognizing operating fisheries as a form of agriculture has the potential to appease the operators in the short term, it could further encourage and justify an attitude of exclusion and persecution. An avenue that is worth exploring is incorporating local communities in the solutions. At least according to those participating in the study, people in the surrounding communities feel excluded from using or enjoying the lakes and ponds and the relationship between them and fishery operators is conflictual. Encouraging and shaping local stakes in the wetlands and their fauna can have the potential of supporting conservation measures and discouraging persecution ones.

6. Appendix 1. Maps of sites included in the study.

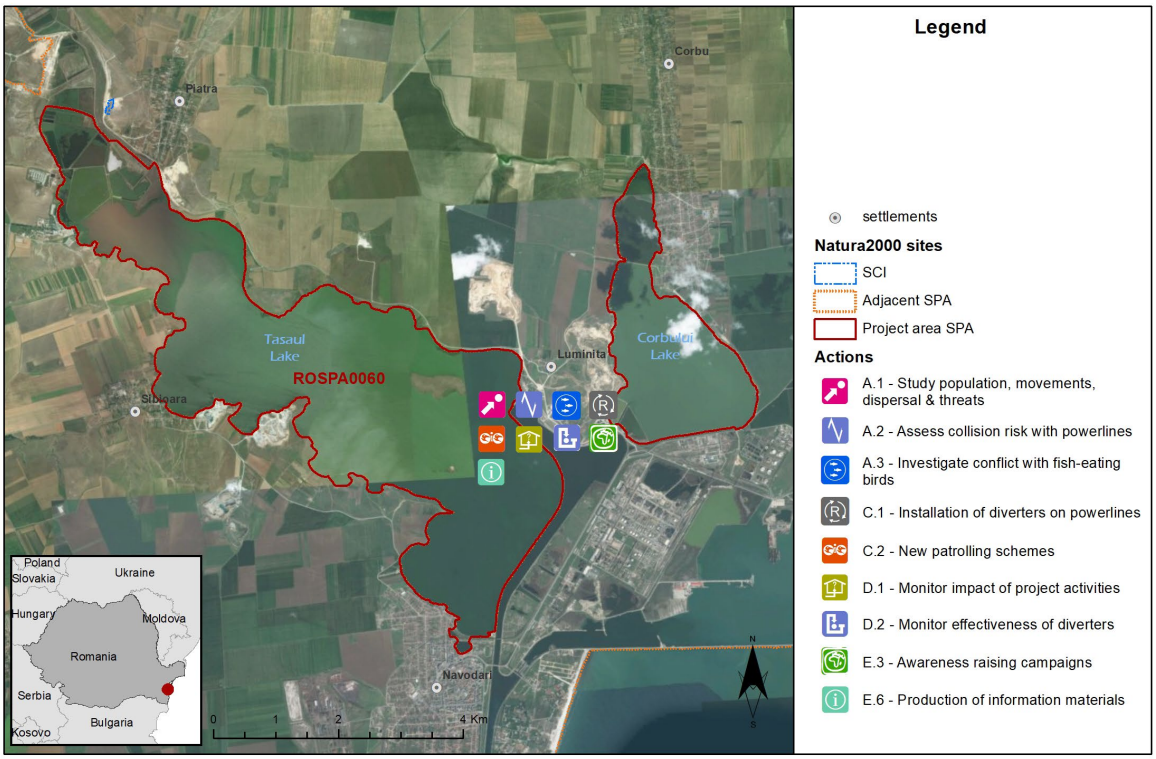
Project site 23 : Danube Delta and Razim-Sinoe Complex

SPA: ROSPA0031 Delta Danube Complexul Razim - Sinoe



Project site 13 : Lacurile Tasaul-Corbu

SPA: ROSPA0060 Lacurile Tasaul-Corbu

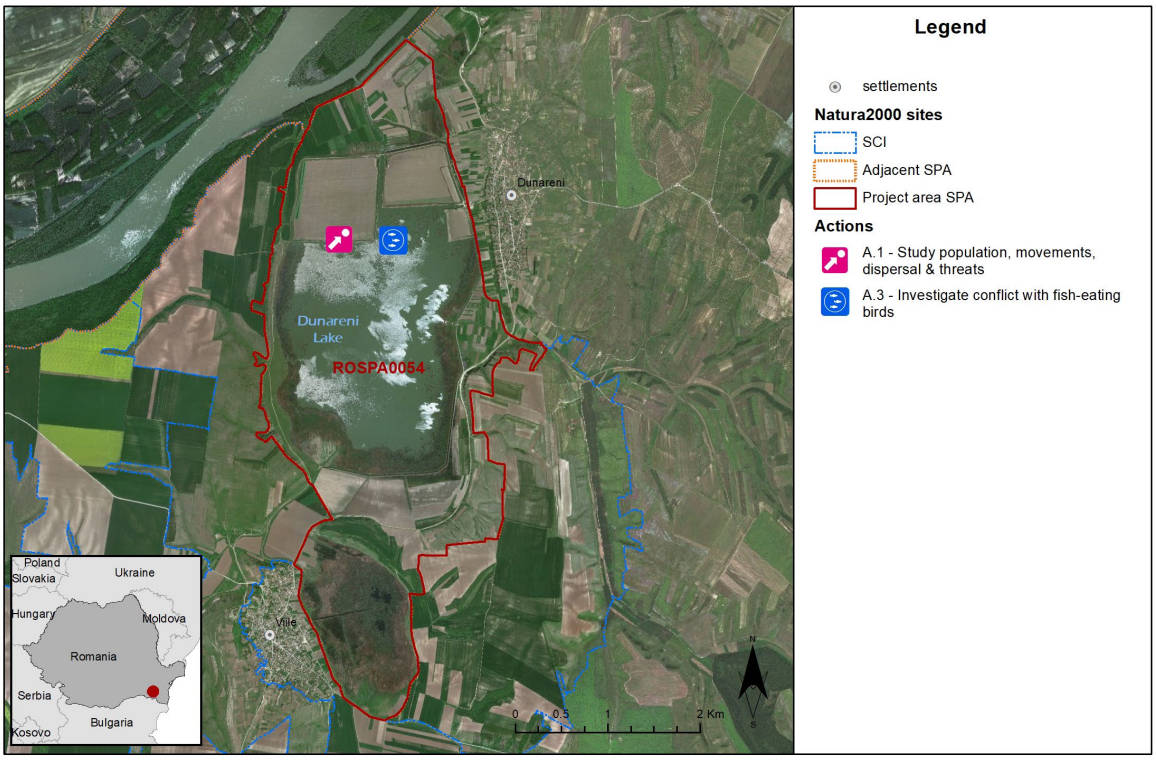


Project site 22 : Lacul Bugeac

SPA: ROSPA0053 Lacul Bugeac

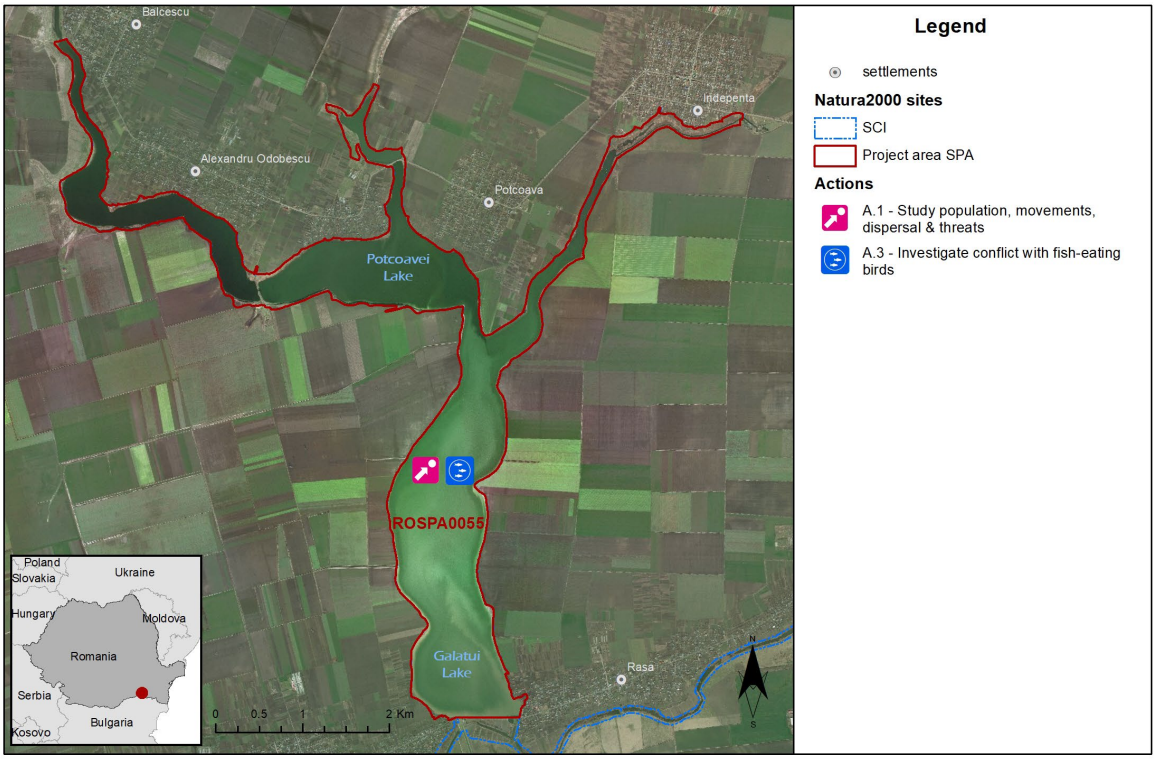
Project site 16 : Lacul Dunareni

SPA: ROSPA0054 Lacul Dunăreni



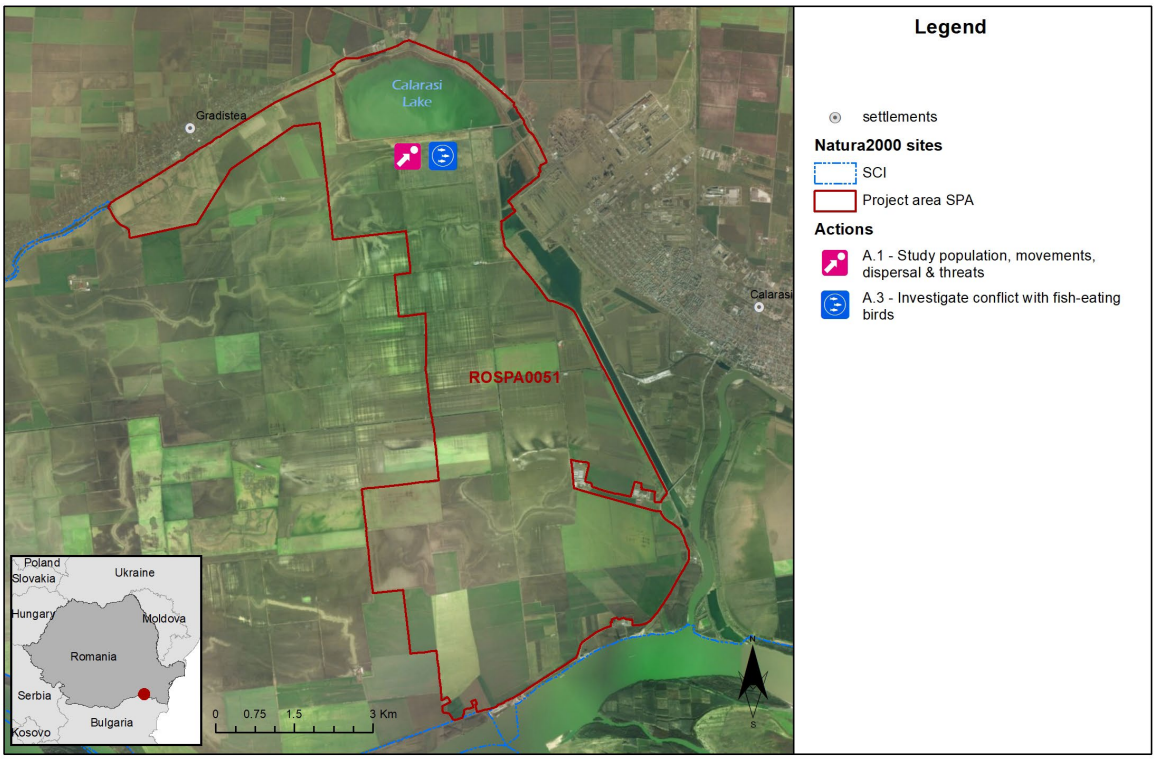
Project site 19 : Lacul Galatui

SPA: ROSPA0055 Lacul Gălătui



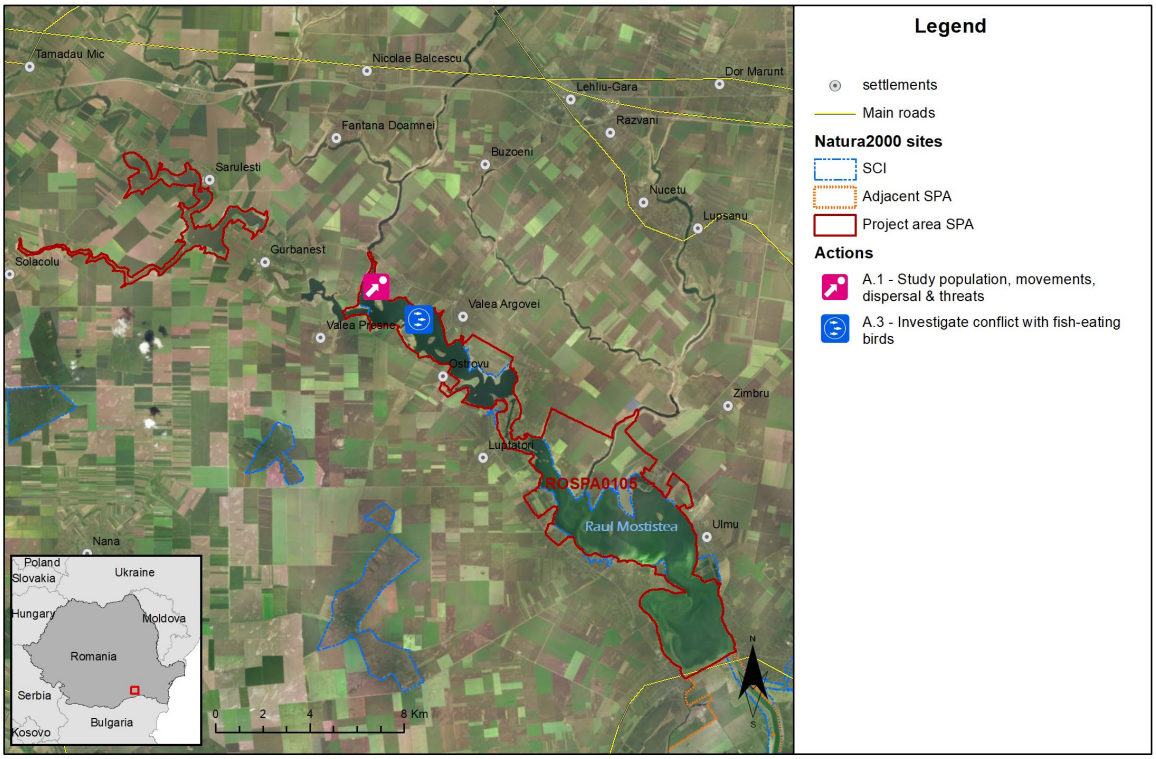
Project site 20 : Iezerul Calarasi

SPA: ROSPA0051 Iezerul Călăraşi



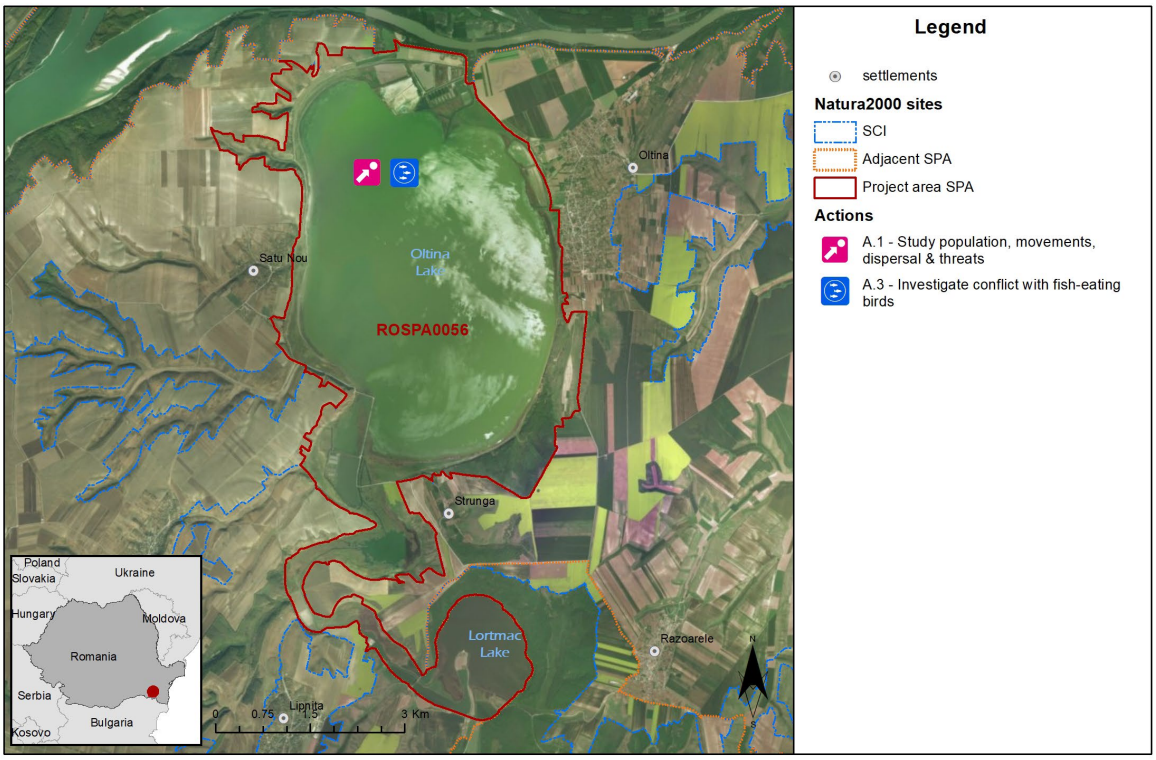
Project site 17 : Valea Mostistea

SPA: ROSPA0105 Valea Mostiștea



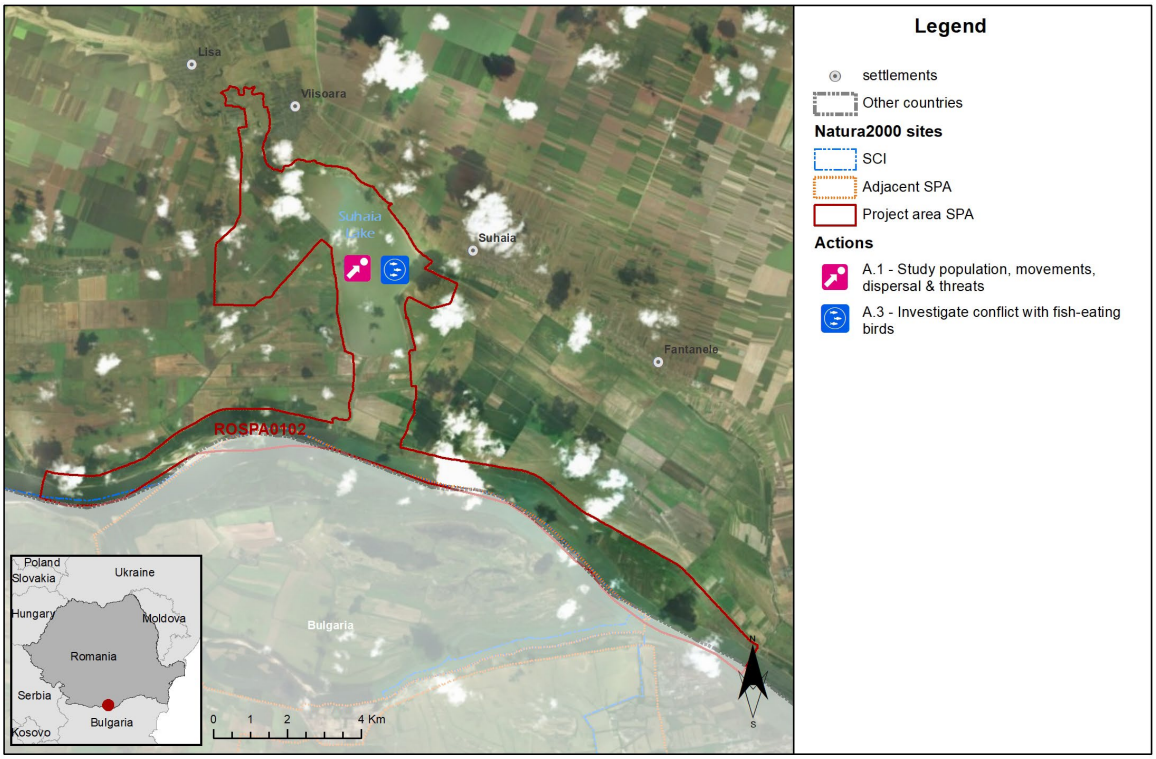
Project site 18 : Lacul Oltina

SPA: ROSPA0056 Lacul Oltina



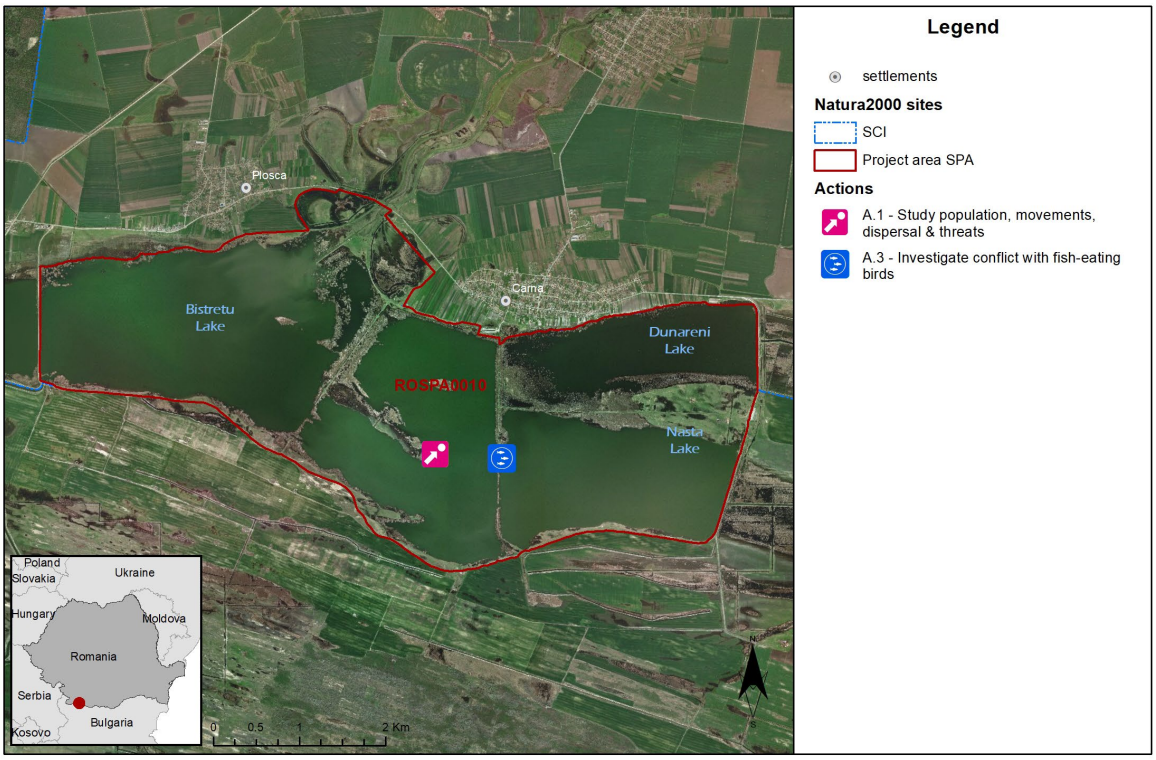
Project site 14 : Lake Suhaia

SPA: ROSPA0102 Suhaia



Project site 26 : Bistret

SPA: ROSPA0010 Bistreţ



Project site 24 : Valea Oltului Inferior

SPA: ROSPA0106 Valea Oltului Inferior