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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

36th meeting
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Specific Sites - Files open

**Akamas Peninsula
(Cyprus)**

**- REPORT OF THE ON-THE-SPOT APPRAISAL -
(10-11October 2016)**

*Document prepared by
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TERMS OF REFERENCE

- Examine the biological situation of the loggerhead sea turtle (*Caretta caretta*) and the green turtle (*Chelonia mydas*) in the Akamas Peninsula and Limni beaches (Cyprus), taking into account recent development plans and their pressure on the turtles nesting activity;
- Assess the possible impacts of the developments plans and infrastructures on the long-term survival of both species, in particular in Limni beach;
- Examine the effectiveness and possible shortcoming of protection measures taken following Recommendation No. 63 (1997) on the conservation of the Akamas Peninsula;
- Discuss with relevant competent authorities at the national, regional and local level, and concerned NGOs and examine with concerned stakeholders possible solutions that may ensure the survival and nesting of marine turtles in the area;
- Make appropriate recommendations to the Standing Committee to the Bern Convention.

INTRODUCTION

The nesting sites of the Akamas Peninsula in the context of loggerhead sea turtles in the Mediterranean

The Mediterranean loggerhead (*Caretta caretta*) sea turtle population is considered as a distinct Regional Management Unit (Wallace et al. 2010). This population shows a subpopulation substructure (Clusa et al. 2013), with major nesting areas in Greece, Turkey, Libya and Cyprus. The average documented number of nests is over 7200 per year in the entire Mediterranean (Casale et al. 2010).

The nesting sites at the southern (Lara/Toxeftra) and eastern (Chrysochou Bay) sides of the Akamas peninsula are considered as “major nesting sites” for the Mediterranean loggerhead population (*Caretta caretta*), and the southern site is also a major site for the Mediterranean population of the green turtle (*Chelonia mydas*) (Casale et al., 2010).

In my opinion, a successful management of these sites will have two important outputs: (i) a direct effect on the Mediterranean sea turtle populations, and (ii) an indirect effect on other areas through a successful and exportable example of management.

The effects of current management cannot be simply assessed through past-present trends of nest counts, because current management will show its effects (i.e. number of newborns entering the sea) only when these newborns will be adults and will come back to the nesting site to lay their clutches. For the long maturation time of sea turtles (e.g., Casale et al. 2011) this may require 2 decades.

REASONS OF CONCERN

Potential threats to sea turtles have been identified and reported by the NGOs, that I briefly summarise as follows:

- A plan for developing two golf courses, with a hotel and several hundred villas, in front of the eastern part of the Natura 2000 site (CY4000001 PERIOCHI POLIS-GIALIA.), which would cause light pollution (direct and in the form of sky glow) and human disturbance.
- Illegal activities – in terms of sea turtle protection - representing potential threats

ON-THE-SPOT APPRAISAL

Summary of the meetings and visits

The delegation was composed by Mr Paolo Casale and Mr Eladio Fernández-Galiano

10 October 2016

- Nicosia. Meeting with Public authorities at the Dept. of Environment:
 - Dept. of Environment
 - Dept. of Fisheries and Marine research
 - Dept. of Forests
 - Dept. of Town Planning
 - Game and Fauna Service
- Nicosia. Meeting with NGOs:
 - Cyprus Conservation Foundation Terra Cypria
 - Friends of Akamas
 - Ecological Movement of Cyprus
 - Initiative for the Protection of The Natural Coastline

11 October 2016

- Limni. Visit of the 2 nesting beaches, with:
 - Directorate of Environment
 - Directorate of Fisheries

- Directorate of Forests
 - Directorate of Town Planning
 - Marine Turtle Monitoring Team
 - Technical Team from Developers
- Limni. Meeting with municipalities:
- Mayor of Polis
 - President of the Community Council of Argaka
 - President of the Community Council of Pelathousa
 - President of the Community Council of Kynousa
 - President of the Community Council of Makounda
- Tara/Toxeftra. Visit of nesting beaches
- Directorate of Environment
 - Directorate of Fisheries
 - Directorate of Forests
 - Directorate of Town Planning
 - Marine Turtle Monitoring Team

Evaluation of the current and potential conservation status based on the on-the-spot appraisal

Background information about Limni area (source: Demetropoulos et al., 2015)

- The beach of Limni is 430 m long in total and the length of the turtle nesting beach is 380 m.
- In the period 2006-2015 the beach of Limni hosted 12.8% of loggerhead turtle nests in the “Polis – Gialia” NATURA 2000 site (averages: 51.7 and 403.5 nests per yr).
- In the period 2006-2015 the beach of Limni showed the highest loggerhead nest density (average 136.1 nests/km) of the “Polis – Gialia” NATURA 2000 site (average 136.1 nests/km)

Current status of the sea turtle nesting habitat

✓ *Polis – Gialia*

The nesting habitat (i.e. the beach area features that should allow nesting activity by adult females and incubation of eggs) appears in a good condition. Although I cannot compare with past conditions, the nesting habitat seems to be not permanently modified and its capacity of hosting nesting activity and egg incubation is not yet irreparably compromised by the current anthropogenic threats. However, the beach is relatively narrow, with only 3-5 meters (in the upper sector) free of pebbles at nest depth and available for nesting (Fig. 1). This represents an important vulnerability factor, especially where natural or artificial obstacles do not allow the sandy beach to shift inland in case of sea level rise under future climate change scenarios.

✓ *Lara/Toxeftra*

The nesting habitat (i.e. the beach area features that should allow nesting activity by adult females and incubation of eggs) appears in a very good and basically pristine condition (Fig. 2).

Current status of anthropogenic threats affecting sea turtle reproductive activity (excluding predation by animals)

✓ *Polis – Gialia*

On the basis of direct observation and of what was reported to me, the current anthropogenic threats are still spatially limited, affecting a low proportion of the whole nesting site, which appears mostly in good conditions.

Where present, anthropogenic threats are still at a medium/low level. They probably affect turtle reproduction, especially hatchling recruitment through disorientation from light pollution, and should not be allowed. For instance, the Hotel “Natura” is in front of the beach (Fig. 3) and this represents a high risk of both light pollution and human disturbance during the nesting/hatchling season.

✓ *Lara/Toxeftra*

The current anthropogenic threats are almost negligible, and are represented by a few cases such as beach use (Fig. 4) and an illegal kiosk (Fig. 5).

Predation

Predation on nests by foxes has induced to undertake specific actions like protecting nests with cages (Figs. 6 and 7). This predation should not be necessarily considered as a natural factor. Generally speaking, local populations of predators like canids are known to be favoured by human presence and associated food resources like rubbish. A trophic resource like sea turtle eggs, which is limited in time, cannot sustain a canid population over the year and would not cause its increase. On the other hand, sea turtle nests can be severely impacted by a canid population increased thanks to human presence and developments. Therefore, in such cases predation may be considered and tackled as an anthropogenic threat.

The increase of number of clutches laid in recent years (Demetropoulos et al., 2015) may be at least in part due to decades of intensive anti-predator nest protection. If so, this would be further evidence that the current reproduction success is highly conservation-dependent. In other words, without a continuous and intensive protection program, the local sea turtle populations might not be viable due to the predation pressure. This represents an important vulnerability factor. This situation is different from a desirable status for a sea turtle nesting site, which should allow the reproductive process (nesting, incubation, sea finding) to be successful under natural conditions, without intensive human assistance.

In such a situation it is crucial to (i) ensure the long-term prosecution and viability of the current protection program, (ii) assess the possible dependence of the fox population from human resources, and in case to manage foxes as an anthropogenic threat and undertake measures to control their populations.

Potential future problems

The planned construction of a golf complex including 2 golf courses, 1 hotel and ca. 800 villas in an area bordering ca. 400 m of nesting beach and extending for up to 4 km inland, represents the main reason of concern by NGOs. A debate with the company proposing the project has been focused in particular on the sustainability of the light pollution associated to the project.

Comments:

➤ *Light pollution.*

- ✓ From the debate it seems that two different concepts were confused/misinterpreted: precautionary approach and mitigation measures. Mitigation measures are those measures that aim to reduce the impact of an anthropogenic threat where it is already present and has a negative impact on the population. In such a situation, reducing at a minimum the threat is the maximum feasible ambition of the mitigation measures, but eliminating completely the threat – i.e. restoring a pristine habitat condition – may be unrealistic. On the other hand, in a pristine situation – i.e. without a specific anthropogenic threat already in place – and in a context of scientific uncertainty about the effects of a potential threat – due to the complexity of factors involved - the precautionary approach would recommend to avoid developing a potential threat to such an important and delicate habitat like a sea turtle nesting site. The latter case describes the current situation at Limni.
- ✓ The company has produced reports and plans which propose good light pollution mitigation measures. However, they actually regard a threat not already in place, for which both the impact (in terms of % increase of hatchling disorientation) and its mitigation (% disorientation reduced) cannot be measured. In other words, they are proposing to (i) create a potential threat that now

- does not exist and then (ii) mitigate this threat with the best mitigation measures available, (iii) assuming that these measures would reduce the effect totally, i.e. they would restore/maintain the pristine situation (which is highly unlikely by definition).
- ✓ The company and NGOs have produced reports - with opposite conclusions and recommendations – that are only based on theoretical considerations and analyses, because there is nothing to measure. However, at present neither of them - nor anyone else - can really prove that the light pollution will have or not an effect on hatchling orientation, just because the threat is not in place and the behaviour of hatchlings depends on several factors that cannot be easily predicted or perhaps even just listed. Only after the construction of the complex its effects on hatchling orientation can be measured against the pre-development situation. Unfortunately, if then an impact will be observed, restoring the initial situation would be difficult or probably impossible, because the best mitigation measures available would have been already implemented.
 - ✓ Specific comments:
 - The sky glow from a complex of ca. 800 villas cannot be realistically thought to be equal to zero, whatever the light-reduction/screening. The impact on hatchling orientation is difficult to foresee under theoretical bases only
 - Direct light pollution is more likely from lights close to the beach and two type of structures (hotel and houses) are planned to be built at ca. 200-300 m from the beach and on hills (Fig. 8). Such proximity and elevation represent high potential risks of direct light pollution. Due to elevation, the planned tree barriers planted at lower level would not represent effective barriers.
 - Once the complex will be in place, the high potential light pollution could only be minimized through perfectly implemented and enforced mitigation measures. In other words, the sea turtle reproductive success would be extremely dependent on a perfect management, and this represents a high vulnerability in a non-perfect world.
 - *Human disturbance.*
 - ✓ The company proposing the project has estimated ca. 3000 persons hosted by the complex (ca. 800 villas), with just a small percentage (15%) of them visiting the beach.
 - There is no guarantee that these will be the real figures.
 - The company's interest for building the complex in contact with a beach instead of far from the sea does not match well with the declared low percentages and low numbers of customers interested in the beach.
 - Even considering 3000 persons and 15% of them visiting the beach per day, it would make 450 persons on a coastal stretch of 400 m, i.e. >1 persons/m in a relatively narrow beach.
 - ✓ Even if the real number of visitors would be known – and it is not – it would be impossible to foresee the impact of this number of visitors on the reproductive success.
 - A high number of human bodies and possibly personal items (e.g. beach towels, umbrella, chairs, sun beds) would shade the beach and possibly alter the sand temperature at an unforeseeable degree.
 - Walking and other activities by a high number of persons can also have an effect on the whole beach which is difficult to foresee.
 - With such high numbers of persons in the complex, impeding access at night would be challenging to implement and the risk of breaking the rules would be realistic. Access at night would seriously disturb both the nesting and the hatching phases.

- ✓ Even a much lower number of beach visitors than the 450 estimated by the company would represent a threat just for their walking. Repeated walking on a nest can damage it and therefore humans - instead of foxes – would become the primary reason of the need of caging all nests. This would make turtles even more dependent on active human protection, with no hope of liberation from this need in the future.

➤ *Overall impact assessment.*

In addition to the intrinsic difficulty of estimating the potential impact of such a complex in terms of light pollution and human disturbance, doing this exercise for each development plan separately is pointless. Both light pollution and human disturbance have cumulative effects when acting on the same turtle nesting beach. For instance, even if an increased sky glow generated by a single project could be assumed to be low, the cumulative sky glow deriving from multiple projects in the same area would be certainly much higher. Regarding direct lights and human disturbance, while a single project would affect only a tract of the coast and therefore a minor part of the total nests in a nesting site, multiple projects could easily affect the majority of the coast and of the nests. For this reason, a project potentially affecting a nesting site should only be evaluated in the context of the entire development plan of the area. Apparently this was not the case for this golf complex, or at least the development plan of the entire area - in terms of potential impact on sea turtles – in an internationally used language such as English, was not brought to my attention .

CONCLUSIONS

- Cyprus hosts some of the few major nesting sites of loggerhead and green sea turtles in the Mediterranean. These species are considered as priority species to protect under several conventions and the EU Habitat Directive. In this respect, Cyprus has the honour and the responsibility of safeguard such rare sites in the interest of all European (and Mediterranean) citizens.
- Although currently limited in number and space, human activities potentially causing an impact do exist and represent a threat nowadays and for the future, especially if they will be imitated/replicated.
- Predation is an important potential threat, which has been successfully minimized for decades by an intensive nest protection program. However, such dependency represents an important vulnerability factor.
- The recent increase of annual loggerhead nest numbers in Chrysochou Bay (Demetropoulos et al 2015) is promising. If this increase is due to any management/condition of the nesting beach, it was the management/condition of decades ago, which increased hatchling recruitment at sea at that time and now results in the nesting activity by those hatchlings which have become adult in the meanwhile. The best approach in the interest of sea turtle conservation would be to maintain the past management/condition. Any alteration can affect hatchling production in ways difficult to foresee, and its effect will be observed only after decades for the long maturation of these animals.
- Development (e.g. buildings) in proximity of a nesting beach would represent a very high risk for the future of the local sea turtle population. The precautionary approach would suggest to avoid any development along the entire nesting sites (like “Polis – Gialia” NATURA 2000 site) or at least to have a wide buffer zone (in terms of distance from the beach), in order to rely to a minimum on a perfect (and probably utopian) implementation and enforcement of mitigation measures. The current boundaries of the “Polis – Gialia” NATURA 2000 site, which basically cover only the nesting beach, do not represent an adequate buffer zone.
- A nesting site should be considered as a unit, and managed as such. Since anthropogenic impacts are cumulative, any impact assessment should be done at the nesting beach level (i.e. a development plan of the entire area and with estimates of potential light pollution and human visitors at the beach) and not for individual sub-units (i.e. single projects), because each individual project might be independently considered as sustainable and therefore approved, but this would result in a non-sustainable overall effect by multiple projects.

- The potential economic value of sea turtles seems to be completely ignored by the local municipalities, with the result of considering turtles as an impediment to imitate the traditional coastal development occurring in most of the Mediterranean coasts instead of an economy more specifically based on rare natural attractions like sea turtles. Such a lack of connection of local economy and conservation represents a high vulnerability for the future of the local sea turtle populations.
- Regarding the Golf complex in Limni, assessments by the Company and NGOs (at least those at my knowledge) were too much focused on details and technicalities (especially about light pollution), suffered from a misconception of what a mitigation measure is (and can be measured) and lacked a broad perspective. The complex undoubtedly represents a high potential threat. This is obvious and does not need a deep analysis, since the impact of coastal development on turtle reproduction is well known worldwide. The only questions are (i) if such a potential threat would be effectively contained/mitigated by specific management measures, (ii) to which extent and (iii) if the remaining effect on sea turtles could be regarded as tolerable. To put in a pristine place such a potential threat and then try to mitigate it through mitigation measures, is an approach conceptually questionable and weak. Regarding specific threats, there are two major concerns. First, even in the most optimistic scenario the high number of visitors per day on the small beach would require not only a perfect management but also the physical protection of all nests forever, eliminating the possibility of a natural course for sea turtle reproduction. Second, the houses and hotel most proximal to the beach and placed on hills represent a high risk of direct light pollution which would require also in this case a perfect management. Therefore, as a whole the Golf complex represents a risky development plan which heavily relies of perfect management (in terms of mitigation measures) and enforcement. Due to the complexity of the factors involved, it may also have additional effects difficult to even imagine at present. Why such a Golf complex which can be realized in any inland or coastal area, should be only realized attached to one of the few major sea turtle nesting site of Mediterranean importance, is a key question for decision-makers.

RECOMMENDATIONS

- Remove the current human activities whenever possible (e.g. mobile kiosks, lights, etc.) and strictly manage the others in order to minimize their impact (especially in terms of light pollution and human disturbance).
- If not yet done, prepare a comprehensive development plan for each nesting site as a whole. Such a development plan should include a wide buffer zone with no development in proximity of the nesting beach. New development near the coast should be limited to few locations, favoring tracts already urbanized, where human presence is effectively managed. Potential increase of light pollution (direct and sky glow) and of human presence on the beach (n persons and density) should be estimated for the whole nesting site.
- In this respect, the Golf complex in Limni should be considered more carefully. A precautionary approach would suggest avoiding such a huge project in proximity to a nesting beach. However, in case the project will go on, part of the risk could be reduced by dropping at least the buildings closest to the beach (houses and hotel on the hills). This is similar to a previous recommendation of a 475 m buffer zone, which was not followed. Regarding the high human presence on the beach, this should be regarded as not compatible with a nesting beach. Although a precise threshold is difficult to be set under objective criteria, an order of magnitude of hundreds on the small Limni beach is obviously not sustainable. An arbitrary and precautionary low threshold in terms of persons per linear meter should be set by the local experts.
- In order to assess any future impact, the current (baseline) situation (e.g. hatchling orientation, hatching success, predation rate or attempts) should be assessed and made available.
- The long-term viability of the ongoing research and conservation program should be secured, since it proved to be successful and probably it will be even more crucial in the future because of increasing human pressure.

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Fig. 1.Limni. Turtle nests (indicated by cages) are only on the upper part of the beach, which is the only part with sand at nest depth and therefore suitable for nesting. Differently, in the lower part pebbles at nest depth make this part of the beach not suitable for nesting.



Fig. 2.Lara/Toxeftra beach.



Fig. 3.Limni beach.Hotel Natura.



Fig. 4.Lara/Toxeftra beach.Beach use.



Fig. 5.Lara/Toxeftra beach.Illegal kiosk.



Fig. 6.Lara beach.Cages for protecting turtle nests against predation by foxes.



Fig. 7. Lara beach. Cages for protecting turtle nests against predation by foxes.



Fig. 8. Limni beach. View from the top of the hill on which a hotel is planned.

Appendix



Convention on the Conservation of European Wildlife and Natural Habitats

Standing Committee

Recommendation No. ... (2016) of the Standing Committee, adopted on ... November 2016, on the conservation of the Akamas peninsula and the sea turtle nesting beaches East of Polis (Cyprus)

The Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, acting under the terms of Article 14 of the Convention;

Having regard to the aims of the convention to conserve wild flora and fauna and their natural habitats;

Recalling that Article 3 of the Convention provides that each Contracting Party shall take steps to promote national policies for the conservation of the habitats of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats;

Recalling that Article 4, paragraph 1, of the Convention provides that each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the conservation of the habitats of the wild fauna species, especially those listed in Appendix II to the Convention;

Recalling that Article 6 of the Convention provides that each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species listed in Appendix II to the Convention, particularly by prohibiting damage to or destruction of breeding sites;

Noting that *Caretta caretta* and *Chelonia mydas* are strictly protected species listed in Appendix II to the Convention;

Recognising the high natural value of the Akamas peninsula, both in its terrestrial and marine parts, especially as a little disturbed coastal area, a well-preserved forest and an extraordinary nesting area for the marine turtles *Caretta caretta* and *Chelonia mydas*;

Noting that the future of *Caretta caretta* and *Chelonia mydas* populations in the Mediterranean are largely dependent on the maintenance of conservation activities in both Kyparissia (Greece) and Akamas Peninsula and nesting beaches East of Polis (Cyprus), as these two regions are those in which nesting has been growing steadily in the last ten years;

Noting that the beach of Limni and the other Natura 2000 area East of Polis have also an exceptional value for nesting of *Caretta caretta*;

Referring to the field study (or conservation management plan) carried out by the World Bank in 1995, whose findings and guidance are still largely valid;

Recalling its Recommendation No. 63 (1997) on the conservation of the Akamas Peninsula, Cyprus, and in particular of the nesting beaches of *Caretta Caretta* and *Chelonia mydas* and noting that substantial parts of that recommendation have not yet been implemented even if they are still appropriate and pertinent;

Noting with satisfaction that, in spite of the shortcomings in the implementation of its 1997 recommendation, the Government of Cyprus has not yet authorized any development in the vicinity of the beaches of Lara and Toxeftra, and has de facto followed the last nineteen years much of the guidance offered by the World Bank study for the sustainable development of the villages;

Concerned that a very substantial development in the immediate vicinity of the Natura 2000 area of Limni, including a hotel and 792 villas, may affect negatively and irreversibly the value of the Limni beach for marine turtle nesting; noting in particular that the development is planned close to part of Limni beach that has the highest nesting density of the whole Natura 2000 area East of Polis;

Concerned that such development may be the start of a more important development for intensive tourism of the areas surrounding Natura 2000 beaches East of Polis;

Referring to the report by Dr Paolo Casale on the visit to Akamas [document T-PVS/Files (2016) 44],

Recommends that the Government of Cyprus:

1. Declare the whole of the Akamas peninsula a national park, comprising a marine and a coastal area, the National Forest Park and the land between the sea on the West and the Forest Park areas, including all areas uphill of the beaches of Lara and Toxeftra, thus facilitating an integrated management of the extraordinary biological diversity of the area; include in the national park the protected Natura 2000 area East of Polis, (CY 4000001 PERIOCHI POLIS-GIALIA), so as to facilitate a coordinated management and protection of sea-turtle nesting beaches in NW Cyprus;
2. Define, in the context of the national park some buffer zones that would ensure the long time preservation of the biological and landscape values protected, avoiding any new development in the whole area except in the vicinity of the villages, following, as it has been done in the last twenty years, the suggestions of the 1995 World Bank for a sustainable development of the area;
3. Create a national park authority that would coordinate the different administrations with competences in the national park, thus facilitating an effective implementation of protection measures, with scientific staff and wardens;
4. Reinforce the littoral and other relevant laws so as to avoid the establishment of buildings close to the sea line in any part of Akamas and giving priority to development near the villages and “in depth”, at suitable distances from the sea in the areas where some development is foreseen by the World Bank report;
5. In the context of the points above, implement a management plan that ensures conservation and regeneration of the Natura 2000 sites and their neighbourhood of the beaches of Lara and Toxeftra areas surrounding them, avoiding the construction of any new building, road, parking or other facilities and managing more efficiently access by people, particularly at night during the nesting season;
6. Abolish the tourist zone near Toxeftra, including it in the neighbouring conservation area, so as to avoid its likely damaging impacts on this area of great value for green turtle nesting;
7. Regulate access of people and vehicles to the beaches of Lara and Toxeftra, avoiding in particular the disturbance caused by mass tourism;
8. Close down illegal restaurants in the neighbourhood of the beaches of Lara and Toxeftra (including Aspros river restaurant);
9. Give protection to the seagrass communities in the Akamas-Limni area on which *Chelonia mydas* feeds;

On the planned development in Limni:

10. Ensure, by an independent environmental impact assessment, that the environmental values protected by the Natura 2000 area - in particular their exceptional value as nesting beaches for *Caretta caretta* - will not be significantly negatively affected by the development; in that context, as the development is of considerable size, make sure that there is no housing or lighting in a buffer areas at least 200 metres from the limits of the Natura 2000 site;
11. Avoid the creation of a new road perpendicular to the coastline, as lights of vehicles will point directly to the beach and surrounding waters, likely affecting negatively both orientation of hatchlings and attractiveness of the beach for nesting females; maintain the acacia forest along the existing road as it protects the beaches from light pollution;
12. Suspend the implementation of the development planned in Limni, including related infrastructure, until a Strategic Environmental Assessment will be completed taking into account the possible effects on sea turtle nesting and putting specific emphasis on cumulative effects of all development activities (the present project plus the new developments permitted in the present spatial planning) on the Natura 2000 area East of Polis, taking also into account the social aspects;
13. Keep the Standing Committee regularly informed about the progress in the implementation of this Recommendation.