IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 29 September 2014

Please note: this is an archived Conservation Outlook Assessment for Isole Eolie (Aeolian Islands). To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Isole Eolie (Aeolian Islands)

SITE INFORMATION

Country:
Italy
Inscribed in: 2000
Criteria:
(viii)

Site description:
The Aeolian Islands provide an outstanding record of volcanic island-building and destruction, and ongoing volcanic phenomena. Studied since at least the 18th century, the islands have provided the science of vulcanology with examples of two types of eruption (Vulcanian and Strombolian) and thus have featured prominently in the education of geologists for more than 200 years. The site continues to enrich the field of vulcanology. © UNESCO

SUMMARY

2014 Conservation Outlook

Good with some concerns

Although the current state of the geological values for which the WH site was inscribed is good and their condition is stable, there are significant concerns regarding the deteriorating state of the site´s other important biodiversity values. These concerns are all the more noteworthy in light of the major threat of mass tourism, which has been compromising the conservation of the site´s natural heritage since its inscription and threatening the islands´ notable endemic species. The absence of a functioning management system to implement conservation measures is a major issue, compromising the site´s future capacity to conserve its values.

Current state and trend of VALUES

Good
Trend: Stable

The geological values of the site are in good condition and well preserved.

Overall THREATS

Very Low Threat

The geological values for which the site was inscribed do not appear to be impacted by any threats. However, important biodiversity values of the site are being seriously affected by a number of threats, namely mass tourism, erosion, invasive species. These threats are all the more significant in light of the fact that the site has various endemics due to it being an archipelago of isolated vulcanic islands. This isolation also makes the site highly vulnerable to any anthropogenic changes. Although the Lipari port enlargement project was suspended in 2010, there is a chance that the project will be revived. There are also indications that the environmental impact could be significant. However, the available information does not indicate to what extent the World Heritage values of the

site could be affected by this potential threat.

Overall PROTECTION and MANAGEMENT

Serious Concern

The fact that no management entity has been effectively in place to manage the site since its inscription in 2000 is of serious concern. Also of concern is that the site´s management plan, which although detailed and comprehensive, was only prepared a decade after the site's inscription and relies on a management structure that does not exist: the National Park that the State Party claimed was created in 2007 but that has not been instituted. Although the protected area legal framework is relatively solid, it is fragmented and has various loopholes that threaten the conservation of ecologically important areas. Some of the protected areas lack the necessary resources and implementation tools to guarantee effective conservation measures. The complex, weakly coordinated and multi-layered governance system in Sicily seems to be one of the main obstacles to the implementation of the nine World Heritage Center recommendations issued in 2007, only one of which has been implemented. The lack of a coordinated management system also explains the significant void that exists when it comes to stakeholder involvement and awareness-raising activities related to the World Heritage site and its values.

FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ **Outstanding volcanic phenomena**
Criterion:(viii)

The Aeolian archipelago is one of the most outstanding examples of volcanic island-building and destruction, and ongoing volcanic phenomena in the world (UNESCO website, 2013).

▶ **Geological processes**
Criterion:(viii)

The islands represent a rich field for volcanological studies of on-going geological processes in the development of landforms (UNESCO website, 2013).

▶ **Contribution to volcanology and geology**
Criterion:(viii)

The islands have provided two of the types of eruptions (Vulcanian and Strombolian) to the fields of volcanology and geology, and have featured prominently in the education of geoscientists for over 200 years (UNESCO website, 2013).

Other important biodiversity values

► Wetlands

Although most of the archipelago´s wetlands have disappeared, there are two very significant – albeit small – and fragile wetland areas left, offering a key habitat for bird conservation. The Stagno di Punta Lingua saltlake on Salina and the marshland on the Isthmus on the island of Vulcano are the two main environments that offer an important stopover for migratory birds. In addition, the Punta Lingua swamp is populated by various halophytes, such as Salsola sola, Suaeda vera, Atriplex prostrata, as well as by a number of interesting luto-halobius invertebrates that can only be found on this site, like Tachys dimidiatus, Tachyura parvula, and Colotes obsoletus (Ministero dell´Ambiente, 2010). Stagno di Punta Lingua and the lagoon of Vulcano Isthmus represent the only examples of “coastal lagoon” occurring in the whole archipelago. The coastal lagoons are listed as priority habitat in the Annex of 43/02 EU Directive. In particular, the Isthmus of Vulcano Island is considered the most important area for birds within the Nature 2000 Site ITA030044, which covers the whole archipelago. Most of the recorded species are listed in the Annex of 147/09 EU Directive (Regione Siciliana, Assessorato Territorio e Ambiente, 2009; Lo Cascio, 2012).

► Rich seabed

The Aeolian archipelago´s seabed is one of the best conserved and richest in the Mediterranean Basin. Among the species found are Cnidarians such as Attinia equina, Condylactis aurantiaca, and Anemone solcata, as well as a number of interesting echinoderms such as the five-point starfish (Echinaster sepositus), Ophioderma longicauda, various species of urchins, brightly coloured gorgonians (Paramurica clavata, Funicella cavolinii, Funicella singularis) and the spirograph Spirographis spallanzanii. However, the most interesting species populating the Aeolian seabed are seahorses (Hippocampus hippocampus), Pinna nobilis mollusks (the largest bivalves in the Mediterranean) and exceptional corals, including the extremely rare red coral (Corallium rubrum), and Parazoanths axinellae, a Cnidarian similar to that forming barrier reefs (Ministero dell´Ambiente, 2010).

► Unique evolution of natural environment linked to the volcanic

nature of the islands

The particular interaction between the biotic and abiotic systems that has occurred throughout the archipelago´s evolution has provided a landscape and environment that are unique, comprising a multitude of geological, biological and anthropological elements; as islands, the Aeolians are an “ideal laboratory” for “studying the evolution of the central Mediterranean region´s ecosystems and communities” (Ministero dell´Ambiente, 2010). The islands are also noteworthy for their endemic species (UNESCO website, 2013), which are inextricably linked to the volcanic nature and evolution of the islands (Ministero dell´Ambiente, 2010).

► **Mediterranean island biodiversity**

These islands make an important contribution towards the conservation of biodiversity in the Mediterranean basin (IUCN, 1999). This value also alludes to the presence of continental European species reaching their southern limit of distribution (UNESCO website, 2013), and to the significant endemism that has evolved on these islands.

► **Protected bird species**

All of the islands are International Bird Areas (UNESCO, 2007a). 47 species of nesting birds protected nationally and internationally have been recorded (Ministero dell´Ambiente, 2010) including 10 under the Sicilian Red List of threatened bird species (UNESCO website, 2013). The islands are an important stopover for migratory or wintering birds, specifically for more than 260 species. Approximately 50% of the Italian ornithological fauna passes through this archipelago (Ministero dell´Ambiente, 2010; Regione Siciliana, Assessorato Territorio e Ambiente, 2009).

► **Endemic and threatened flora**

900 plant species have been recorded in the Aeolian Islands, including four endemic species (UNESCO website, 2013). This accounts for almost 17% of all Italian flora when the archipelago represents only 0.038% of Italy´s surface area. While there are fewer endemic plants than on other island ecosystems, the exclusive Aeolian endemics are extremely interesting from

the ecological and biogeographical perspectives and many are included in the protected lists of international conventions, such as CITES, Berne Convention, and the Habitats Directive. The islands are home to unique endangered species, such as Silene hicesiae, considered by IUCN as one of the fifty most threatened species of Mediterranean flora and categorized as critically endangered (Ministero dell´Ambiente, 2010). The strict endemics of the Aeolian Islands now are six and include also Bituminaria basaltica, Erysimum brulloi, and Genista thyrrena. Both Bituminaria basaltica and Erysimum brulloi are strictly endemic of one island, respectively Filicudi and Alicudi (Ferro, 2009; Minissale et al., 2013).

► Important mammals

Mammals include one endemic subspecies, Eliomys quercinus leparensis, and seven species of bat have been reported (UNESCO website, 2013), including one on the IUCN Red List (Ministero dell´Ambiente, 2010).

► Newly discovered and endemic reptiles

Seven species of reptiles are present in the archipelago, including the recently described endemic lizard Podarcis raffonei (UNESCO, 2007a).

► Endemic invertebrates

Invertebrate fauna seems relatively well known, with over 15 endemic species described (UNESCO website, 2013), although it is quite likely that there are still endemic insects to be identified (Ministero dell´Ambiente, 2010).

► Seagrass beds

The limited sandy seabed found in this volcanic archipelago is populated by large meadows of Posidonia oceanica, serving as nursing grounds for numerous marine species (Ministero dell´Ambiente, 2010).

► Important fish species

The specific conditions of the Aeolian marine environment allow for the extensive growth of both pelagic microalgae and underwater vegetation,

thereby ensuring the settlement of a large amount of plankton and benthic species while providing nurseries for numerous fish including those of commercial value. For example, there are 37 species of teleostei, the coastal fish group which includes the Dusky Grouper (Epinephelus marginatus), a rare species. Moving away from the coast, where the waters are deeper, there are a large number of fish that are rare in other areas such as amberjacks (Seriola dumerili), mackerels (Lichia amia), mahi-mahi (Coyphaena hippurus), tuna fish (Thunnus thynnus), and sword fish (Xiphias gladius) (Ministero dell´Ambiente, 2010).

► **Important and rare cetaceans**

5 species of cetaceans have been recorded in Aeolian waters, including 20 specimens of the common whale (Balaenoptera physalus), 16 Sperm Whales (Physeter macrocephalus), and several groups of dolphins such as Bottlenose Dolphins (Tursiops truncatus), and Stenellae (Stenella coeruleoalba). In addition, there have been a few sightings of the common dolphin (Delphinus delphis) which, despite its name is actually considered very rare, and Risso’s Dolphin (Grampus griseus) (Ministero dell´Ambiente, 2010).

Assessment information

Threats

Current Threats

Very Low Threat

The geological values for which the site was inscribed do not appear to be impacted by any threats. However, important biodiversity values of the site are being seriously affected by a number of threats, namely mass tourism, erosion, invasive species. These threats are all the more significant in light of the fact that the site has various endemics due to it being an archipelago of isolated vulcanic islands. This isolation also makes the site highly vulnerable to any

anthropogenic changes.

▶ Agricultural/ Forestry Effluents

Low Threat

Numerous protected species living on the Aeolian Islands are threatened by the use of pesticides and weed-killers, such as the Eleonora´s Falcon (Falco eleonorae) and many other protected bird species. Of particular concern are chlorine-based pesticides which are particularly dangerous to the Aeolian birds of prey as they are the most susceptible to the negative effects of bio-accumulation (Ministero dell´Ambiente, 2010).

▶ Solid Waste

Low Threat
Inside site

Waste (from building materials, abandoned cars and construction machinery) is filling up a vast volcanic beach on Stromboli (IUCN Consultation 1, 2013). On Lipari, the Vallone fiume Bianco riverbed was used as an illegal dumping ground for old cars, refuse from an olive oil press and other garbage (Ministero dell´Ambiente, 2010).
Open landfills are also a threat to local bird species, although decreasingly so due to the closure and decommissioning of public landfills(Ministero dell´Ambiente, 2010).

▶ Avalanches/ Landslides

Very Low Threat
Inside site

On Vulcano, landslides can threaten specific slopes of the volcanic structure (Ministero dell´Ambiente, 2010).

▶ Household Sewage/ Urban Waste Water

High Threat
Inside site

The new sewage treatment plant of Vulcano Island is currently under construction in the slopes of the active La Fossa crater, at short distance from the access of the path to the volcano. The new plant would dramatically disrupt the natural geometry and morphology of the valley formed by

pyroclastic and sand deposits at the base of the crater. Also, a water pump belonging to this plant was built at short distance from the lagoon of the Isthmus (priority habitat of 43/92/EU directive, code 1150). The Isthmus pump represents also a remarkable threat for several bird species included in 147/09/EU directive and for the whole integrity of the Natura 2000 Site ITA030044 (IUCN Consultation, 2014; various news sources).

► Roads/ Railroads

Low Threat
Inside site

Habitat fragmentation occurs mainly on the islands of Salina, Vulcano and Lipari where the road infrastructure overlaps with ecologically sensitive areas. The consequent habitat loss is adversely affecting numerous protected species (Ministero dell´Ambiente, 2010).

► Shipping Lanes

Low Threat
Outside site

There is significant although heavily seasonalized maritime traffic which, although outside the WH site, negatively impacts some bird species, such as Hydrobates pelagicus, Calonectris diomedea and Falco eleonorae (Ministero dell´Ambiente, 2010).

► Fishing / Harvesting Aquatic Resources

Low Threat
Outside site

Fishing is mostly small-scale and artisanal. Nevertheless, fishing is a threat to cetaceans which are often caught in fishing nets, although this threat seems to have decreased in the recent years, and it is also significantly reducing the population of the protected deep-sea coral Corallium rubrum. Trawling activities affect numerous benthic species such as the protected bivalve Pinna nobilis. There is a certain risk of overfishing mainly due to an absence of a marine protected area which does not allow defining the restocking areas needed to compensate for fishing pressure. (Ministero dell´Ambiente, 2010; IUCN Consultation, 2014).

► Tourism/ visitors/ recreation

High Threat
Inside site

Mass tourism has been the answer for local communities seeking economic growth (Ministero dell´Ambiente, 2010), and it still seems to be the only type of tourism encouraged by local tourist operators (IUCN Consultation 1, 2013). Tourism is highly seasonal (Ministero dell´Ambiente, 2010), notwithstanding the promising push in 2007 in support of de-seasonalizing of the industry which was supported by many local stakeholders (UNESCO, 2007a). In fact, everything is geared towards a summer seaside tourism comprised of brief visits, intensive consumption and exploitation of resources with a high environmental impact (IUCN Consultation 1, 2013). A better management of several old trails existing in the islands and promotion of a new local identity through the National Park proposed in 2007 may instead help de-seasonalize tourism.
The increasing number of tourists and their lack of environmental sensitivity is a threat to the delicate ecological balance of the islands, as well as to specific species such as Eleonora´s Falcon, Falco eleonorae (Ministero dell´Ambiente, 2010), as revealed by the recent decline of the colony in Salina Island. Also, the occurrence of excessive nautical tourism (for instance, in the Pollara Bay, Salina Island) represents the main threat that affects the reproductive success of the local population of Mediterranean Storm Petrel, Hydrobates pelagicus. Uncontrolled tourism has led to the repopulation of some islands, such as Vulcano and, in some areas, the population doubles in the summer, such as in the Malfa municipality on the island of Salina (Ministero dell´Ambiente, 2010; Corso et al., 2009).
Smaller islands lack the necessary regulations to manage the daily influx of tourists (IUCN Consutlation 2, 2013). In other cases, legislation exists but is not enforced. For example, the protected Strombolicchio Reserve receives daily visits from unauthorized tourists who are unaware of the fragility of the islet´s ecosystems and who consequently threaten its endemic species (IUCN Consultation 1, 2013; Ministero dell´Ambiente, 2010).
Additionally, the large seagrass meadows of Posidonia oceanica, which are already limited to the few areas of sandy seabed, have been severely impoverished over the last few decades due to excessive and uncontrolled

anchoring by tourist boats (Ministero dell´Ambiente, 2010).

▶ Fire/ Fire Suppression

Low Threat
Inside site

Frequent fires are threatening bird species such as the protected Cetti´s Warbler (Cettia cetti), the tortoise Testudo hermanni, and the extremely rare Garden Dormouse (Eliomys quercinus liparensis). On Lipari, repeated fires are usually intentional and threaten the few island forests that are left (Ministero dell´Ambiente, 2010).
On the other hand, fires on Stromboli are mostly due to volcanic activity (Ministero dell´Ambiente, 2010) but the extent of their damage is unclear.

▶ Invasive Non-Native/ Alien Species

High Threat
Inside site
Outside site

Quite a few of the reforestation projects on the islands have made use of non-native species, such as acacia and eucalyptus, negatively affecting the growth of autochthonous populations. In addition, some invasive species such as eucalyptus make an already acidic soil even more acidic, preventing the growth of native species. Another problem concerns Carpobrotus which recently seems to have extended its distribution on coastal habitats (for instance, on Vulcano Island).
Especially exposed to exotic invasive species are the endemic species living on islands which, due to their geographical isolation, have no escape routes when a non-native species appears in their territory taking over their ecological niche. This is the well-known case of the Podarcis sicula or common Sicilian lizard which, once settled on the Aeolian archipelago, caused the almost total extinction of the endemic Podarcis raffonei, the so-called Aeolian lizard. The most recent populations of Podarcis raffonei survive, paradoxically, precisely because of their extreme isolation, entrenched in some rocks and stacks that have not yet been reached by its competitor (Ministero dell´Ambiente, 2010).

▶ Water Pollution

Low Threat

Marine pollution and, in particular, oil slicks, are threatening the Storm-petrel (Hydrobates pelagicus), the smallest marine bird in the Mediterranean. Other birds, such as the rare Manx Shearwater (Puffinus yelkouan) and marine organisms, such as the bivalve Pinna nobilis, are also threatened by environmental pollution.
The quality of subterranean waters throughout the islands is also jeopardized by organic pollution from sites used for the dumping of solid urban waste. Although these sites are no longer used, they have not witnessed any restoration projects. This, coupled with the high permeability of the volcanic terrain which permits extensive percolation and leaching, has led to groundwater pollution (Ministero dell´Ambiente, 2010).

► Household Sewage/ Urban Waste Water

Low Threat
Outside site

Non-toxic algal blooms are common in the summer months when the pressures of tourism are highest, breaking the ecological balance of marine ecosystems (Ministero dell´Ambiente, 2010).

► Erosion and Siltation/ Deposition

High Threat
Inside site

In recent decades, most of the islands have suffered the consequences of agricultural abandonment which have increased erosion and caused geological instability. The cessation of cultivation activities has led to the progressive deterioration of slopes which had been previously modified through water channelling, furrowing, terracing, and the construction of stone walls. These uncultivated areas only have thin vegetation coverage, leading to widespread runoff and a consequent increase in the loss of useful surface soil (Ministero dell´Ambiente, 2010).
In particular, on the northeastern part of Lipari, the progressive stripping of land has been aggravated by extensive pumice stone extraction (Ministero dell´Ambiente, 2010). Currently, Lipari´s abandoned quarry and its old mining spoil banks are suffering serious erosion problems, threatening the area´s hydrogeological balance (IUCN Consultation 2, 2013). This hydrogeological instability is creating serious safety hazards, especially given

that even basic security measures have not yet been employed (Legambiente, 2011).
The integrity of the geological values that merited inscription on the WH List does not seem to be threatened (IUCN Consultation Form 2, 2013), although it would be interesting to understand whether there is a risk of crater instability in Monte Pelato as alluded to by the World Heritage Centre in 2006 (UNESCO, 2006).

Potential Threats

Data Deficient

Although the Lipari port enlargement project was suspended in 2010, there is a chance that the project will be revived. There are also indications that the environmental impact could be significant. However, the available information does not indicate to what extent the World Heritage values of the site could be affected by this potential threat.

► Shipping Lanes

Data Deficient
Outside site

The Lipari port enlargement continues to be a highly controversial topic, notwithstanding the Regional government´s suspension of the proposed project in 2010 (Legambiente, 2011). In fact, it seems to still be a very real possibility with a potentially large environmental impact on the island (IUCN Consultation Form 2, 2013). The private company which would carry out the port enlargement, Società Condotte d´Acqua, has huge economic interests in the port´s enlargement and has lobbied to obtain the local government´s backing (Legambiente, 2011).
Although the WHC recommended an EIA for the Lipari port enlargement (UNESCO, 2007b), including an assessment of whether or not it affects the OUV (UNESCO, 2010a), this has not yet been provided by the SP. In 2010, however, it assured the WHC that there was no effect on the WH site (UNESCO, 2010a; UNESCO, 2010b) but it still is an issue of concern for IUCN and WHC (UNESCO, 2010b). In 2008, the SP itself recognized that the port enlargement would have a significant impact and would be more than what is necessary on the island (Repubblica Italiana, 2008). It claims the site´s management plan addresses alternatives (Repubblica Italiana, 2008), but the

only reference seems to be in Section 1 of Chapter 6 which very generically mentions the “use of low-impact removable structures” (Ministero dell´Ambiente, 2010).
According to Section 3.9 of the mission report, port development was not regulated by the Landscape Territorial Plan or by any other regulatory framework (UNESCO, 2007a). Therefore, the same concerns expressed during the monitoring mission are valid today: is the intention still to bring in large cruise ships, and what are the indirect effects of port enlargement on the WH site, such as a significant increase in tourists.
The available information does not indicate to what extent the WH site´s values and integrity are jeopardized by this particular threat.

Protection and management

Assessing Protection and Management

► Relationships with local people

Some Concern

Given the absence of a management entity and the lack of awareness within the local population relative to the WH site [refer to section on “Education and interpretation programs”], participatory approaches are very limited if not non-existent. In fact, there seems to be a general lack of communication with local stakeholders, and local sustainable initiatives are not encouraged (IUCN Consultation Form 2, 2013). There are also direct references to the difficult relations between local populations and the organizations managing protected areas. For example, local stakeholders have appealed the creation of a new Regional Nature Reserve on the island of Vulcano (Ministero dell´Ambiente, 2010). Similarly, the creation of a NP for the Aeolian archipelago was opposed locally partly due to a lack of stakeholder involvement (Legambiente, 2011; IUCN Consultation Form 2, 2013). In addition, although the management plan for the site is thorough and comprehensive, it is not clear how involved local stakeholders were in its creation. Furthermore, traditional knowledge regarding the use of natural resources (local craftwork, medicinal plants) is disappearing across the islands (Ministero dell´Ambiente, 2010) making it all the more important to

tap into this know-how before it is lost.

▶ Legal framework and enforcement

Some Concern

From a legal perspective, a significant portion of the Aeolian archipelago´s terrestrial surface is protected, enough to guarantee appropriate protection from anthropogenic pressures. All of the islands are partially or totally included in the WH site, and have a portion of their surface area designated as a Site of Community Interest (SCI) under the European Union´s (EU) Habitats Directive. In addition, the entire archipelago (both land and sea) is protected as a Special Protection Area (SPA) under the EU Birds Directive (Ministero dell´Ambiente, 2010). Although the WH site lacks any management plan and entity (see “Management System”), the legal constraints imposed by the Natura 2000 network (SCI and SPA) seem to be granting the area sufficient protection (IUCN Consultation 2, 2013). Nevertheless, there are several ecologically important areas that lack protection. For example, the Scoglio Faraglione, on the island of Salina and located in the middle of one of the most popular bays in the area (Pollara), does not have any protection status notwithstanding the fact that it hosts several species protected by European regulations (Ministero dell´Ambiente, 2010). There is also serious concern regarding the smaller islets which lack regulations to manage the daily access of tourists (IUCN Consultation, 2013). On the other hand, some areas have an adequate legal framework but lack implementation measures, resources or the necessary monitoring activities to ensure appropriate protection.
The whole Natural Reserve of Strombolicchio also lacks any form of control and protection due to its geographical isolation and to the inadequate resources of its management authority. The islet is in a state of semi-abandonment, which is a significant threat given the extreme ecological fragility of the site and its very high naturalistic and biological value (Ministero dell´Ambiente, 2010). Regulations actually prohibit access to the islet (except for scientific reasons) due to its status as an “integral reserve”, but there are no active measures in place to enforce this (IUCN Consultation 1, 2013). In fact, concerns regarding the non-implementation of protection measures on some islands were already expressed in the 2007 Mission Report (UNESCO, 2007a).

► Integration into regional and national planning systems

Data Deficient

In 2007, the Landscape Territorial Plan for the Aeolian Islands (Piano Territoriale Paesistico delle Isole Eolie) was the main guidance mechanism for the protection of all the archipelago and had been effectively implemented since 2004 (UNESCO, 2007a; UNESCO, 2007c). At the time, the two responsible agencies (the Regional Authority for Cultural Heritage and the Regional Authority for Territory and Environment) were well-coordinated, even though this had not always been the case (UNESCO, 2007a). More information is needed regarding its current application and effectiveness, as well as whether or not it has been improved or weakened given that it was due for revision in 2007 (UNESCO, 2007a).
At the regional level, there is also a Master Plan Agreement for the Minor Islands (Isole Minori), which in theory plays a coordination role on all issues affecting Sicily´s islands (Ministero dell´Ambiente, 2010; UNESCO, 2007a) but the actual implications of this plan on the WH site are not apparent. Similarly, it is unclear how well-integrated national, regional and local policies are in Sicily, as the National Park for the Aeolian Islands was opposed locally (Legambiente, 2011; IUCN Consultation 2, 2013).

► Management system

Serious Concern

A detailed and comprehensive management plan was commissioned by the Regional Government and drafted in 2008 (IUCN Consultation 2, 2013). It was deemed satisfactory by IUCN (UNESCO, 2007c; UNESCO, 2010a; UNESCO, 2010b) and a subsequent review, as per this assessment, came to a similar conclusion: the plan identifies the site´s values, threats and objectives and goes into thorough details on many aspects. However, concerns exist about whether this plan has been implemented at any level (IUCN Consultation 2, 2013).
In fact, the plan relies on a management structure that does not exist. It mentions that “the National Park of the Aeolian Islands [was] established through Law 244 dated 24 December 2007…[and] is responsible for safeguarding, valorising and promoting the Aeolian Islands and implementing [the management plan].” (Ministero dell´Ambiente, 2010). Various sources

assert that the NP has not been instituted (Legambiente, 2011; IUCN Consultation 2, 2013) and, in fact, it is not listed officially as an Italian NP (Federparchi website).
Throughout the years, the SP´s reports on the management structure have been confusing and contradictory, referring to three different management entities (Rappresentanza Permanente, 2009; Repubblica Italiana, 2008) which never seem to have translated into an effective and coordinated management system (IUCN Consultation 2, 2013; UNESCO, 2007a).

► Management effectiveness

Serious Concern

Absence of an effective and coordinated management system is of serious concern.

► Implementation of Committee decisions and recommendations

Some Concern

The SP has implemented only one out of nine recommendations issued by the WHC in 2007 in its Decision 31COM 7B.24, which were based on the UNESCO/IUCN monitoring mission of that same year. In 2010, the SP confirmed that the quarries on the island of Lipari had been permanently closed on 31 August 2007 (UNESCO, 2010b). In fact, in November 2008 the Catania Mining District inspected the area and confirmed the closure of the problematic PUMEX mine (Rappresentanza Permanente, 2009). In 2010, IUCN and WHC consider this point “comprehensively addressed” (UNESCO, 2010b). The key limitations to fully implementing other recommendations are mainly related to the absence of a coherent and well-coordinated governance and to a lack of the necessary management instruments, including specifically earmarked funds (Ministero dell´Ambiente, 2010). It is worth noting that unclear management has always been an issue, as the initial nomination was deferred in 1999 on the basis that management issues had to be clarified (UNESCO, 2007a).

► Boundaries

Some Concern

Fragmented protected areas, jagged borders, and weak buffer zones seem to be placing unnecessary pressures on the protected habitats that fall within

the WH site. Another factor limiting the effectiveness of the protected areas is their low perimeter/area ratio (Ministero dell´Ambiente, 2010).

► Sustainable finance

Some Concern

There is no indication that any funds have been allocated to manage the site, even though in 2010 the SP claimed that there was stable funding coming from the national and regional governments (UNESCO, 2010b). Supposedly, in March 2008 the UNESCO Sicily Foundation, which at one point was designated as the management entity received €70,000 (Rappresentanza Permanente, 2009) but no further information is available. Similarly, in December 2008 the national government allocated €500,000 to Sicily to raise awareness on WH sites. Additionally, in the event that the National Park proposal goes ahead, there are concerns that the budget cuts to Italy´s NP system could compromise the creation of this much-needed protected area (Legambiente, 2011).

► Staff training and development

Data Deficient

Data deficient

► Sustainable use

Mostly Effective

It seems like the Landscape Territorial Plan (PTP) of the Aeolian Islands is still the main guidance mechanism for the protection of the archipelago, including as a mechanism to restrict natural resource use especially through mining activities (UNESCO, 2007a). In general, natural resource use seems to be quite traditional both on land and at sea (Ministero dell´Ambiente, 2010).

► Education and interpretation programs

Some Concern

Despite assurances by the SP that resources had been committed to “educational/interpretive actions” (IUCN, 2000), more than a decade after the site´s designation there is still no collective understanding amidst the Aeolian residents regarding the significance of having WH status

(Legambiente, 2011; IUCN Consultation 2, 2013).

► Tourism and interpretation

Some Concern

Given the lack of any management system, there are no awareness-raising programs related to the WH site. Neither do the existing Nature Reserves promote the natural values nor have visitor centers (Ministero dell´Ambiente, 2010). For example, on Stromboli tourists are completely unaware of the richness of the area, and nothing is done to value the site or to attract quality tourists capable of appreciating it (IUCN Consultation 1, 2013). On the other hand, there are various well-prepared brochures on the nature trails of most islands but, unfortunately, these are not well-distributed (Ministero dell´Ambiente, 2010).
In addition, the ecotourism potential – the development of which was included as an unofficial recommendation in the 2007 monitoring mission report (UNESCO, 2007a) – has not been leveraged and remains generally untapped. The potential geo-tourism (i.e. linked to the geological and volcanic attributes of the site), which could help deseasonalize tourism, also remains undeveloped (Ministero dell´Ambiente, 2010)

► Monitoring

Serious Concern

There seem to be no monitoring programme for the World Heritage values of the site in place.

► Research

Data Deficient

The management plan makes reference to numerous and varied scientific sources (Ministero dell´Ambiente, 2010). However, there is no information on the knowledge base as a whole; neither is there any mention of research cooperation programs.

Overall assessment of protection and management

Serious Concern

The fact that no management entity has been effectively in place to manage the site since its inscription in 2000 is of serious concern. Also of concern is that the site´s management plan, which although detailed and comprehensive, was only prepared a decade after the site's inscription and relies on a management structure that does not exist: the National Park that the State Party claimed was created in 2007 but that has not been instituted. Although the protected area legal framework is relatively solid, it is fragmented and has various loopholes that threaten the conservation of ecologically important areas. Some of the protected areas lack the necessary resources and implementation tools to guarantee effective conservation measures. The complex, weakly coordinated and multi-layered governance system in Sicily seems to be one of the main obstacles to the implementation of the nine World Heritage Center recommendations issued in 2007, only one of which has been implemented. The lack of a coordinated management system also explains the significant void that exists when it comes to stakeholder involvement and awareness-raising activities related to the World Heritage site and its values.

▶ **Assessment of the effectiveness of protection and management in addressing threats outside the site**
Data Deficient

Data deficient

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Outstanding volcanic phenomena**
Good
Trend:Stable

There is no evidence to suggest that this value is threatened in any way; on the contrary, there are recent claims that the integrity of the geological values for which the site was inscribed is satisfactory (IUCN Consultation 2,

2013).

▶ Geological processes

Good
Trend:Stable

There is no evidence to suggest that this value is threatened in any way; on the contrary, there are recent claims that the integrity of the geological values for which the site was inscribed is satisfactory (IUCN Consultation 2, 2013).

▶ Contribution to volcanology and geology

Good
Trend:Stable

There is no evidence to suggest that this value is threatened in any way; on the contrary, there are recent claims that the integrity of the geological values for which the site was inscribed is satisfactory (IUCN Consultation 2, 2013).

Other important biodiversity values

▶ Wetlands

Although most of the archipelago´s wetlands have disappeared, there are two very significant – albeit small – and fragile wetland areas left, offering a key habitat for bird conservation. The Stagno di Punta Lingua saltlake on Salina and the marshland on the Isthmus on the island of Vulcano are the two main environments that offer an important stopover for migratory birds. In addition, the Punta Lingua swamp is populated by various halophytes, such as Salsola sola, Suaeda vera, Atriplex prostrata, as well as by a number of interesting luto-halobius invertebrates that can only be found on this site, like Tachys dimidiatus, Tachyura parvula, and Colotes obsoletus (Ministero dell´Ambiente, 2010). Stagno di Punta Lingua and the lagoon of Vulcano Isthmus represent the only examples of “coastal lagoon” occurring in the whole archipelago. The coastal lagoons are listed as priority habitat in the Annex of 43/02 EU Directive. In particular, the Isthmus of Vulcano Island is considered the most important area for birds within the Nature 2000 Site ITA030044, which covers the whole archipelago. Most of the recorded

species are listed in the Annex of 147/09 EU Directive (Regione Siciliana, Assessorato Territorio e Ambiente, 2009; Lo Cascio, 2012).

► Rich seabed

The Aeolian archipelago´s seabed is one of the best conserved and richest in the Mediterranean Basin. Among the species found are Cnidarians such as Attinia equina, Condylactis aurantiaca, and Anemone solcata, as well as a number of interesting echinoderms such as the five-point starfish (Echinaster sepositus), Ophioderma longicauda, various species of urchins, brightly coloured gorgonians (Paramurica clavata, Funicella cavolinii, Funicella singularis) and the spirograph Spirographis spallanzanii. However, the most interesting species populating the Aeolian seabed are seahorses (Hippocampus hippocampus), Pinna nobilis mollusks (the largest bivalves in the Mediterranean) and exceptional corals, including the extremely rare red coral (Corallium rubrum), and Parazoanths axinellae, a Cnidarian similar to that forming barrier reefs (Ministero dell´Ambiente, 2010).

► Unique evolution of natural environment linked to the volcanic nature of the islands

The particular interaction between the biotic and abiotic systems that has occurred throughout the archipelago´s evolution has provided a landscape and environment that are unique, comprising a multitude of geological, biological and anthropological elements; as islands, the Aeolians are an “ideal laboratory” for “studying the evolution of the central Mediterranean region´s ecosystems and communities” (Ministero dell´Ambiente, 2010). The islands are also noteworthy for their endemic species (UNESCO website, 2013), which are inextricably linked to the volcanic nature and evolution of the islands (Ministero dell´Ambiente, 2010).

► Mediterranean island biodiversity

These islands make an important contribution towards the conservation of biodiversity in the Mediterranean basin (IUCN, 1999). This value also alludes to the presence of continental European species reaching their southern limit of distribution (UNESCO website, 2013), and to the significant endemism that

has evolved on these islands.

► Protected bird species

All of the islands are International Bird Areas (UNESCO, 2007a). 47 species of nesting birds protected nationally and internationally have been recorded (Ministero dell´Ambiente, 2010) including 10 under the Sicilian Red List of threatened bird species (UNESCO website, 2013). The islands are an important stopover for migratory or wintering birds, specifically for more than 260 species. Approximately 50% of the Italian ornithological fauna passes through this archipelago (Ministero dell´Ambiente, 2010; Regione Siciliana, Assessorato Territorio e Ambiente, 2009).

► Endemic and threatened flora

900 plant species have been recorded in the Aeolian Islands, including four endemic species (UNESCO website, 2013). This accounts for almost 17% of all Italian flora when the archipelago represents only 0.038% of Italy´s surface area. While there are fewer endemic plants than on other island ecosystems, the exclusive Aeolian endemics are extremely interesting from the ecological and biogeographical perspectives and many are included in the protected lists of international conventions, such as CITES, Berne Convention, and the Habitats Directive. The islands are home to unique endangered species, such as Silene hicesiae, considered by IUCN as one of the fifty most threatened species of Mediterranean flora and categorized as critically endangered (Ministero dell´Ambiente, 2010). The strict endemics of the Aeolian Islands now are six and include also Bituminaria basaltica, Erysimum brulloi, and Genista thyrrena. Both Bituminaria basaltica and Erysimum brulloi are strictly endemic of one island, respectively Filicudi and Alicudi (Ferro, 2009; Minissale et al., 2013).

► Important mammals

Mammals include one endemic subspecies, Eliomys quercinus leparensis, and seven species of bat have been reported (UNESCO website, 2013), including one on the IUCN Red List (Ministero dell´Ambiente, 2010).

► Newly discovered and endemic reptiles

Seven species of reptiles are present in the archipelago, including the recently described endemic lizard Podarcis raffonei (UNESCO, 2007a).

► Endemic invertebrates

Invertebrate fauna seems relatively well known, with over 15 endemic species described (UNESCO website, 2013), although it is quite likely that there are still endemic insects to be identified (Ministero dell´Ambiente, 2010).

► Seagrass beds

The limited sandy seabed found in this volcanic archipelago is populated by large meadows of Posidonia oceanica, serving as nursing grounds for numerous marine species (Ministero dell´Ambiente, 2010).

► Important fish species

The specific conditions of the Aeolian marine environment allow for the extensive growth of both pelagic microalgae and underwater vegetation, thereby ensuring the settlement of a large amount of plankton and benthic species while providing nurseries for numerous fish including those of commercial value. For example, there are 37 species of teleostei, the coastal fish group which includes the Dusky Grouper (Epinephelus marginatus), a rare species. Moving away from the coast, where the waters are deeper, there are a large number of fish that are rare in other areas such as amberjacks (Seriola dumerili), mackerels (Lichia amia), mahi-mahi (Coyphaena hippurus), tuna fish (Thunnus thynnus), and sword fish (Xiphias gladius) (Ministero dell´Ambiente, 2010).

► Important and rare cetaceans

5 species of cetaceans have been recorded in Aeolian waters, including 20 specimens of the common whale (Balaenoptera physalus), 16 Sperm Whales (Physeter macrocephalus), and several groups of dolphins such as Bottlenose Dolphins (Tursiops truncatus), and Stenellae (Stenella coeruleoalba). In

addition, there have been a few sightings of the common dolphin (Delphinus delphis) which, despite its name is actually considered very rare, and Risso's Dolphin (Grampus griseus) (Ministero dell´Ambiente, 2010).

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**

Good

Trend: Stable

The geological values of the site are in good condition and well preserved.

▶ **Assessment of the current state and trend of other important biodiversity values**

High Concern

Trend: Deteriorating

Most of the site´s important biodiversity values are being adversely impacted and their conservation status is deteriorating over time.

Additional information

Key conservation issues

▶ **Lack of management system and capacity**

Local

The site has lacked a solid and coordinated management system since its inscription, and has been suffering the consequences of this void for over a decade. Various management entities seem to have been instituted, but their practical role has been ambiguous and their capacity to manage the site has proved ineffective. To date, no management structure is in place notwithstanding the recent creation of a comprehensive management plan for the World Heritage site. This issue could probably be best resolved at the national level, in close cooperation with the regional and local authorities. The institution of a National Park for the Aeolian archipelago, including both

terrestrial and marine areas, could fill this void and ensure the highest protection possible. In fact, the National Park has already been approved at the national level (although rejected locally), and the site´s management plan relies on it as the sole management entity.

▶ Fragmented legal protection

National

Although the WH site is protected by various local, regional and international protected area designations, these lack coordination and exclude some areas, including several ecologically significant and vulnerable ecosystems. The lack of implementation of conservation measures is also a problem in some areas, due to weak management or a lack of resources and financing. As with the first conservation issue (“Lack of a management system and management capacity”), this problem could probably be resolved at the national level, with the institution of a National Park which would grant the highest protection possible, clarifying and unifying the currently fragmented legal protection.

▶ Hazardous abandoned mining area (Lipari)

Local

Although the pumice mining activities on the island of Lipari which called for the 2007 monitoring mission have been permanently stopped and no new mines have been opened, there are serious concerns regarding the abandoned quarries. No security, rehabilitation or environmental restoration measures have been implemented following the closure of the mines, and the stockpiled material has never been removed notwithstanding a World Heritage Committee recommendation to do so. The abandoned quarries are now in a hazardous state where significant erosion is causing hydro-geological instability, casting doubt on the regional authority´s capacity to carry out the necessary cleanup.

▶ Lack of awareness and stakeholder involvement

Local

It is not surprising that there is a total lack of awareness locally regarding the values for which the site was inscribed and the benefits of having World Heritage status, given the absence of any effective management entity. Local, regional and national authorities have not engaged in participatory approaches when making decisions related to the site, and this lack of stakeholder

involvement has backfired suspending the creation of various protected areas, such as the Nature Reserve on the island of Vulcano or the National Park of the Aeolian archipelago. Similarly, the numerous tourists that visit the site in the summer months are also totally unaware of its outstanding natural heritage and significant biodiversity values. The institution of an effective and coordinated management structure open to using participatory approaches could significantly increase awareness.

▶ **Highly seasonalized mass tourism**

Local

This site has significant potential to attract quality tourism throughout the year, and yet it still relies almost totally on highly seasonal mass tourism. This uncontrolled seaside tourism that concentrates in the summer months is placing increasing pressures on the site´s very fragile biodiversity values, including its surrounding marine areas. Unfortunately, the ecotourism and geo-tourism (linked to the volcanic and geologic heritage) potential remains largely untapped placing unnecessary pressures on already frail local economies. The institution of a National Park would be a positive step towards reversing this increasingly damaging trend, helping to value the site´s natural heritage and deseasonalizing tourism.

Benefits

Understanding Benefits

▶ **Traditional agriculture**

Although the predominance of tourism has led to the decline of traditional agricultural practices, and a consequent loss of economic value on all islands except for Salina, there is an untapped potential linked to sustainable development. In fact, not only is the primary function of agriculture on the islands to preserve the landscape, but the integration of agricultural and touristic activities could be a good opportunity to promote tourism-related quality products produced locally. For example, there are several Aeolian specialties such as capers, raisins and Malvasia wine which are appreciated and sold nationally and internationally (Ministero dell´Ambiente, 2010).

► History and tradition

The archipelago boasts several archaeological sites of great interest, as well historic areas of high cultural value. Its main island, Lipari, has an archaeological museum which has the potential to be amongst the most important in the Mediterranean basin, if properly promoted. This benefit could be further developed through the creation of the long called-for scientific or eco-museum related to the old pumice mining industry on Lipari. This “regional Pumice museum” proposal is detailed in the WH site´s management plan and consists of an exceptional testimony of industrial archaeology, which once formed the basis of the island’s economy. The creation of this new museum, as well as the promotion of the existing archaeological one, could contribute significantly to the island economy by increasing jobs and creating an appeal for cultural tourism, thereby helping to deseasonalize current tourism patterns (Ministero dell´Ambiente, 2010).

► Outdoor recreation and tourism

Tourism is the main economic driver, but is limited to seasonal mass tourism focusing on brief seaside visits. There is significant potential to tap into the favorable climate, widespread tourism facilities, well-established service sector, and local hospitality to promote a year-round quality tourism based on the islands´ rich cultural, historical and natural heritage (IUCN Consultation Form 1, 2013; Ministero dell´Ambiente, 2010).

► Importance for research

The values for which this site was inscribed demonstrate how the Aeolian Islands are an invaluable resource in the study of volcanic island-building and destruction, as well as other volcanological phenomena (UNESCO website, 2013). In addition, the particular geographical position of the archipelago makes it a potential research laboratory (biogeography, ecology, geology, vulcanology, sustainable development) contributing significantly to the conservation of biodiversity in the Mediterranean bioregion (Ministero dell´Ambiente, 2010).

► Contribution to education

The site was inscribed for its priceless contribution to the fields of

vulcanology and geology, providing two types of volcanic eruptions which have featured prominently in the education of geoscientists for over two centuries. Once an effective management entity is created, it could use awareness-raising and educational activities to share this knowledge outside expert circles and bring it down to the local level.

Summary of benefits

This site´s benefits revolve around the tourist industry, which is already extensively developed but needs to be diversified and deseasonalized, shifting its focus to attracting quality tourists. The potential to develop a tourist industry based on sustainable development and year-round economic returns is significant due to the unique resources the Aeolian Islands can tap into. For example, it can promote local quality products produced by traditional agricultural practices. It could also foment alternative types of year-round tourism based on existing and potential cultural, archaeological, geological and environmental attractions.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Associazione pro Stromboli per la difesa del sito (Pro-Stromboli Association)		Created in 1994, this association of Stromboli´s local residents and regular visitors works to protect the island´s natural and historical heritage while promoting sustainable development initiatives. They are involved in a variety of projects, from beach cleanups to environmental education and awareness-raising activities with local residents, as well as setting up a voluntary fire brigade for the island.
2	Associazione Nesos – Island Biodiversity Research		The work of this NGO founded in 2011 focuses on the production of nature guides, ecotourism activities (trekking, nature walks for schools, etc.), and scientific research to obtain updated data on the biodiversity of the Aeolian and other Mediterranean islands.

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