

Executive summary

Lithophaga lithophaga is an endolithic mussel from the family Mitilidae, which inhabits limestone rocks. This species needs specific substrate for its growth and owing to its particular biology (slow growing) it is not suitable for commercial breeding. *L. lithophaga* has a very distinctive and well known date-like appearance.

L. lithophaga is distributed throughout the Mediterranean Sea. In the Atlantic Ocean it can be found on the Portugal coast and on the North African coast down to Senegal. It also inhabits the northern coast of Angola.

The sole purpose of *L. lithophaga* exploitation is human consumption. It is known that the harvesting of the species from the wild for international trade has detrimental impact on the species. The collection of *L. lithophaga* for the purpose of trade poses a direct threat to this species due to the loss of its habitat.

When *L. lithophaga* is harvested, the rocks it inhabits are broken into small pieces, often by very destructive methods such as pneumatic hammers and explosives. Broken rocks thus become unsuitable for colonisation by marine organisms. In addition to the direct threat to *L. lithophaga*, its collection reduces topographic heterogeneity, macroalgal cover and epibiota. The destruction caused by *L. lithophaga* exploitation seriously affects littoral fish populations. The over-exploitation of *L. lithophaga* has caused important local ecological damage in many Mediterranean areas. The restoration of littoral communities, once they are destroyed by *L. lithophaga* extraction, is very slow and often impossible.

L. lithophaga habitat presents an indispensable biotope for numerous marine species and the problem of its destruction could be compared with the destruction of stony coral reefs.

In a number of range states the exploitation of and trade in *L. lithophaga* are banned. However, trade in this species, both national and international, is taking place on a considerable scale. International trade in *L. lithophaga* takes place mainly in North West Africa and among the South East European countries, as well as between these countries and the European Union.

Despite the fact that *L. lithophaga* is included in several international multilateral agreements, the measures provided by these are not effectively applied. The control of international trade in *L. lithophaga* is neither effective nor sufficient.

A. Proposal

Inclusion of Mediterranean date mussel (*Lithophaga lithophaga*) in Appendix II in accordance with Article II, paragraph 2 (a)

B. Proponents

Slovenia and Italy on behalf of the Member States of the European Community

C. Supporting statement

1. Taxonomy

1.1 Class: Bivalvia

1.2 Order: Mytiloidea

1.3 Family: Mytilidae

1.4 Genus and species: *Lithophaga lithophaga* (Linné, 1758)

1.5 Scientific synonyms

Lithodomus dactylus Cuvier, 1817

Lithodomus lithophaga (Linné, 1758)

Lithophaga mytiloides Röding, 1798

Mytilus lithophagus Linné, 1758

1.6 Common names

al.: Shpues i shkembit

cat.: Dàtil de mar

cro.: Prstac, datulj, datula, kamotoč, morska datulja, prstić, prstavac

de.: Steindattel, Seedattel

engl.: Mediterranean date mussel, European date mussel, Date shell

esp.: Dàtil de mar

fr.: Datte de mer, Datte lithophage

gr.: Daktyli, Solina, Lithophagos

hebr.: Tamar-yam

ital.: Dattero di mare, Dattero marino, Dattolo di pietra, Forapietre

slo.: Morski datelj

2. Biological parameters

General appearance (adult): *L. lithophaga* has an elongate cylindrical shape with rounded ends. Posterior end is wider than anterior end. Umbo is placed somewhat anterior. Dorsal side is arched almost in the middle of the shell. Valves are thin. Concentric growth lines are clearly distinguished. Impression of the musculus adductor posterior is round and big, while anterior is small. (GONZALEZ et. al, 2000; MILIŠIĆ, 1991; RIEDL, 1991)

Measurements: Shell grows up to 12 cm in length, 34 mm in width and 70 g in weight (MILIŠIĆ, 1991; ŠIMUNOVIĆ & GRUBELIĆ, 1992).

Colour: Valves are auburn to chestnut coloured, mantle white-yellow to pale grey (GONZALEZ et. al, 2000; GRUBIŠIĆ, 1990; MILIŠIĆ, 1991; RIEDL, 1991). The colour and shape of *L. lithophaga* is very significant and greatly resembles palm date, which is reflected in its common names.

According to OZRETIĆ (2001), *L. lithophaga* is a very slow growing mussel. It needs 15 to 20 years to reach the size of 5-6 cm, when it is suitable for human consumption.

2.1 Distribution

L. lithophaga is distributed throughout the Mediterranean Sea. In the Atlantic Ocean *L. lithophaga* can be found upon the Portugal coast and on the North African coast down to Senegal. It also inhabits the northern coast of Angola.

L. lithophaga range states are: Albania, Algeria, Angola, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Gambia, Greece, Israel, Italy, Lebanon, Libya, Malta, Mauritania, Monaco, Morocco, Portugal, Senegal, Serbia and Montenegro, Slovenia, Spain, Syria, Tunisia, Turkey and Western Sahara.

2.2 Habitat availability

The species lives in the limestone rocks and is completely absent from volcanic rocks (ŠIMUNOVIĆ & GRUBELIĆ, 1992). On the rocky limestone shores *L. lithophaga* is a common and widely distributed species (MILIŠIĆ, 2000; LEGAC & HRS-BRENKO, 1982). According to ŠIMUNOVIĆ & GRUBELIĆ (1992) *L. lithophaga* populations are densest from the sea level to the depth of 8 m. In the depths greater than that they occur in smaller numbers but small denser aggregations are possible (ŠIMUNOVIĆ & GRUBELIĆ, 1992). *L. lithophaga* can also be found at the depth of 20 m and more (GONZALEZ et. al, 2000; MILIŠIĆ, 1991). *L. lithophaga* doesn't live in waters that are too brackish. It prefers habitats with strong currents (ŠIMUNOVIĆ & GRUBELIĆ, 1992). It chooses vertical rocks on which sedimentation is low, where it bores 10-20 cm long holes perpendicular to the rock surface avoiding other individuals of the species.

L. lithophaga habitats are mostly fragmented where the species is exploited (LIPEJ, 2001a). Rocks that have been broken into small pieces are moved by water currents and are thus unsuitable for colonisation by marine organisms (LIPEJ, 2001a & 2001b). When the rocky limestone habitats are destroyed, they cannot be restored. In Croatia, rocks hammered for *L. lithophaga* extraction retained a devastated appearance even five to ten years after the destruction, which shows that reinstallation of biocenosis is very slow.

Damage to littoral habitat shown by *L. lithophaga* extraction has been shown to be extremely widespread. In Italy, FRASAHETTI et. al. (2001) used a hierarchical sampling design to quantify the extent of rock damage due to *L. lithophaga* harvesting along 360 km of rocky coast of Apulia. They concluded that the extent of damage due to *L. lithophaga* collection is a strong source of disturbance. STAZIONE ZOOLOGICA ANTON DOHRN (1992/1993) mentions the serious danger brought on the coastal marine environment by the destructive harvesting of *L. lithophaga* in the gulf of Naples.

2.3 Population status

The maximum density of *L. lithophaga* is concentrated down to the depth of 5 m (GONZALEZ et. al, 2000). GONZALEZ et. al. (2000) estimate the population at 336 to 1600 individuals per m² in different seas. The lowest population density is in the Adriatic while the densities in the Ionian and Mediterranean Seas are higher. It has to be taken into account that the density of the population will depend on the age of the individuals and the season of the year. Thus on rocks with juveniles, the densities could be much higher. The densities are higher in the winter and spring months. Majority of the population consists of juveniles smaller than 4 mm. GONZALEZ et. al. (2000) cite that individuals larger than 5 cm represent approximately 4 % of the population and their density does not surpass 100 individuals per m². Although, where environmental conditions are more suitable, these populations can reach the density of more than 200 individuals per m².

2.4 Population trends

The data on population trends of *L. lithophaga* are very scarce. EKOLOGIJA (2002) states that with the development of tourist industry along the Adriatic coast, the populations of *L. lithophaga* have decreased considerably.

2.5 Geographic trends

The overexploitation of *L. lithophaga* has caused important habitat loss, mainly in some areas of the Italian, Croatian and Serbia-Montenegrin coast (Ministerio de Medio Ambiente, 2000). At some sites in Croatia populations have been seriously thinned out due to the overexploitation, both by local people and tourists (LEGAC & HRS-BRENKO, 1982).

2.6 Role of the species in its ecosystem

L. lithophaga is a pioneer species. It starts to inhabit bare limestone rocks after about 5 to 10 years they have been in the sea (PIEROTTI et. al., 1965). The first changes in the substrate facilitating *L. lithophaga* settlement are caused by the activity of a sponge *Cliona celata* (Grant) (ŠIMUNOVIĆ & GRUBELIĆ, 1992). *Cliona celata* starts penetrating the rock and after 5 to 10 years the surface of the rock is burrowed to such an extent that juvenile *L. lithophaga* can inhabit it (ŠIMUNOVIĆ & GRUBELIĆ, 1992). *L. lithophaga* inhabits the tunnels and penetrates deeper in the rock by dissolving it with acid. Numerous tunnels and holes burrowed by *L. lithophaga* are a basis for the settlement of endolithic, benthic and other sessile species (GONZALEZ et. al, 2000). Without *L. lithophaga* burrows, it would have been almost impossible for some species to inhabit new rocks.

Habitat destruction caused by the *L. lithophaga* fisheries reduces epibiota, macroalgal cover and topographic heterogeneity (FRASCHETTI et al, 2001; GUIDETTI et. al., 2002). GUIDETTI et. al. (2002) observed a decrease in species richness and total abundance, as well as in the population size of a number of species in the destroyed habitats. FRASCHETTI et. al. (2002) cite that the substrate destruction caused by *L. lithophaga* exploitation affects fish assemblages and populations.

Furthermore, according to OZRETIĆ (2001) the restoration of biological communities once destroyed by *L. lithophaga* extraction is very slow and often impossible.

2.7 Threats

It is known that the harvesting of *L. lithophaga* from the wild for the purpose of trade has detrimental impact on the species. It poses a direct threat to this species due to the loss of its habitat. In the shallow waters, divers often carry big rocks to the shore and then break them with hammers and chisels. Destructive methods such as pneumatic hammers and explosives are often used to collect the specimens (GUIDETTI et. al., 2002). EUROPEAN

COMMISSION (2002) states that there are warning signals indicating that the illegal use of explosives is still taking place. Most threatened is the littoral, down to 2 m of depth (ŠIMUNOVIĆ & GRUBELIĆ, 1992). The level of exploitation of *L. lithophaga* and consequently destruction of solid rock bottom is a cause of concern in many Mediterranean areas. According to GONZALEZ et. al. (2000), in Greece, Albania and Spain, the extraction of this marine resource is still carried out with traditional methods (hammers, chisels and pincers). GONZALEZ et. al. (2000) further state that in recent years, the exploitation of this species by means of destructive methods (pneumatic hammers and explosives) has begun in Morocco. According to SPUDIĆ & JELENIĆ (2001) such destructive methods are also used in Croatia, in addition to the hammer. According to FANELLI et. al. (1994), the devastating fishery of *L. lithophaga* causes the dismantling and destruction of large bottom areas on Mediterranean rocky shores. ALBANIA (2004) reports that great damage to the sea shore has been done by *L. lithophaga* extraction along the coast of Ksamili. The EUROPEAN ENVIRONMENTAL AGENCY (2002) states that the overexploitation of *L. lithophaga* in the Mediterranean Sea has led to a serious concern.

L. lithophaga is sensitive to polycyclic aromatic hydrocarbons (DUJMOV & SUČEVIĆ, 1990).

3. Utilization and trade

3.1 National utilisation

The main purpose of *L. lithophaga* exploitation is human consumption. According to BIANCHI (2002), *L. lithophaga* is a highly appreciated seafood and is still much sought for in the finest kitchens. GONZALEZ et. al. (2000) cite that this species is very appreciated for human consumption in some areas of the Mediterranean coast.

In Croatia this species has long been known and appreciated as a delicacy. With the development of tourist industry the species has become very much sought for on illegal market. In Slovenia, the species is occasionally offered illegally in some restaurants, particularly ones close to Italy. According to GONZALEZ et. al. (2000), the harvesting, trade and consumption of *L. lithophaga* are widely spread in the Spanish Mediterranean coast, although in an unequal way. While this activity has a great importance and tradition in the Balearic Archipelago (mainly in Mallorca and Menorca) and in the coasts of south Catalonia and the whole province of Castellón, in the rest of the coastal areas it is carried out on a smaller scale. In many cases, *L. lithophaga* that are extracted in the coast of Andalusia and Murcia are sold in Catalonia or Castellón. IZRAEL (2003) states that *L. lithophaga* is not exploited along its Mediterranean coast. In Turkey this species is not consumed as sea food and it is therefore not harvested (TURKEY, 2004).

It can be assumed that trends of exploitation and commerce of *L. lithophaga* will continue to increase. According to EUROPEAN ENVIRONMENT AGENCY (2002), the shell-fishing in Mediterranean Sea has increased by about 12 % in the past decade due to the intensive exploitation of bottom (demersal) stocks. Separate evaluation for *L. lithophaga* in the Mediterranean is not available.

3.2 Legal international trade

Due to the fact that marketing and export of *L. lithophaga* are banned in a number of range states, data on legal international trade are scarce. Since the species can in general not be traded legally, it is not covered by Customs or trade statistics. In cases where the species enters international trade, it is traded primarily for commercial purposes.

According to SERBIA AND MONTENEGRO (2004), until 2003, app. 30,000 kg of *L. lithophaga* have been exported to neighbouring countries every year. In 2002, Slovenian authorities received applications for imports of 8,000 kg of *L. lithophaga* from Serbia and Montenegro for the purpose of continuous commercial supply of the Italian market. In

Morocco, the existence of clandestine commerce in this species can not be excluded (MAROCCO, 2004). According to BOSNIA AND HERZEGOVINA (2003), *L. lithophaga* traded in that country mainly comes from Albania and Serbia and Montenegro. There are several enterprises registered for international trade in *L. lithophaga* in Bosnia and Herzegovina. FAO (2004) states that as to the foreign trade, international classifications commonly in use, such as the Harmonized System and the European Community Combined Nomenclature, do not include a code for *L. lithophaga* in the Mollusc section. Trade in *L. lithophaga* is likely to be classified under code »other molluscs« of the Combined Nomenclature (2004).

3.3 Illegal trade

Since in many range states the exploitation and marketing of *L. lithophaga* is banned, it can not be harvested or traded legally. However, illegal trade in *L. lithophaga*, both national and international, is taking place at a considerable level. The marketing of *L. lithophaga* takes place without the sanitary or veterinary control, thus posing a risk to humans.

In Croatia, according to SPUDIĆ & JELENIĆ (2001), the problem of illegal exploitation and export has become more evident every year. EKOLOGIJA (2002) states that in 2002 the Croatian authorities performed 153 controls. VLAH (2003) cites that only in one Croatian province 26 offences have been reported regarding trade in *L. lithophaga* during the 2002/03 season. According to CROATIA (2003), about 700 kg of *L. lithophaga* have been confiscated each year during the period from 2000 to 2002.

SLOVENIA (2004) reported 16 offences related to illegal trade in this species in 1999/2000. In the period 2000 – 2004 more than 850 kg of *L. lithophaga* were confiscated from Croatian, Italian and German nationals.

In Spain GONZALEZ et. al. (2000) report that the smuggling of substantial amounts of *L. lithophaga* from Morocco to Catalonia or Castellón was detected.

According to ITALY (2004) illegal fisheries and trade in this species is a well known problem. Important seizures of 4,720 kg of this species have been made by different Police bodies within the 1999 – 2004 period.

Shipments of *L. lithophaga* are usually smuggled in car cavities or specially prepared containers which are integrated in the vehicle. Such practice leads to the conclusion that illegal trade in *L. lithophaga* is highly profitable. ITALY (2004) states that prices for *L. lithophaga* on illegal market range from 35 to 60 EUR per kg. GONZALEZ et. al. (2000) state that in Spain specially prepared vehicles with build-in refrigerators are used for smuggling. Such vehicles are capable of transporting from 300 to 500 kg of *L. lithophaga*.

International trade in *L. lithophaga* mainly takes place in North West Africa and among the South East European countries, as well as between these countries and the European Union. On the basis of the available information it can be concluded that at least among Albania, Bosnia and Herzegovina, Serbia and Montenegro, Croatia, Italy, Germany, Morocco and Spain there is an long lasting and well organised illegal international trade in this species. The species has a high market value and the collection of specimens suitable for human consumption has become harder due to overexploitation on one hand and considerable sanctions for offences in some Mediterranean countries on the other.

3. 4 Actual or potential trade impacts

Trade is by no means beneficial to the status of the species in question. The species is exploited due to national and international trade. The increasing level of illegal marketing poses a threat to *L. lithophaga* and its habitat that provides nutrition, shelter and breeding grounds for numerous marine species.

3.5 Captive breeding or artificial propagation for commercial purposes

There is no evidence of possible captive breeding of *L. lithophaga*. Due to the fact that the species needs adequate substrate for its growth and owing to its particular biology (slow growing), the species is not suitable for commercial breeding.

4. Conservation and management

4.1 Legal status

4.1.1 National

Summary of legal status of *L. lithophaga* According to the responses from the range states:

ALBANIA (2003): *L. lithophaga* is included in the list of the threatened Mediterranean species with the current status »Threatened with extinction«.

CROATIA (2003): The species in question enjoys strict protection. The fishing, possession, buying, selling, export and import of *L. lithophaga* are strictly prohibited, as well as the destruction of its habitat. These activities may only be carried out exceptionally for scientific purposes, with the permit issued by the competent authority.

CYPRUS (2003): The species is protected under the international conventions ratified by the Cyprus Government (SPA Protocol and Bern Convention).

ITALY (2004): *L. lithophaga* is protected since 1988 by a ministerial decree. The harvesting, commerce and importation of this species are prohibited.

MAROCCO (2004): The exploitation of this species has been forbidden, although there are no legal acts justifying the implementation of relevant measures.

MONACO (2003): No special protection of *L. lithophaga*.

ISRAEL (2003): The whole Phylum Mollusca is declared a "protected natural resource". Collection, rearing of or trade in specimens of species concerned are not allowed without a special permit from the competent authority.

GREECE (2003): The exploitation of *L. lithophaga* is forbidden.

SERBIA AND MONTENEGRO (2004): For the purposes of the protection of the rocky littoral, the extraction, marketing and export of *L. lithophaga* has been forbidden since 2003.

SLOVENIA (2003): *L. lithophaga* has been strictly protected since 1993. Any taking, keeping, selling, mediating at sale, purchasing, donating and exporting of this species is prohibited.

SPAIN (2003): The species is protected by the decree transposing the Habitat Directive. Regional governments have modified their fishing regulations to reinforce the legal protection of the species under the environmental instead of fishing norms. Other measures are to include *L. lithophaga* in the National Catalogue of Threatened Species, under the category 'of special interest' and to develop conservation and sustainable development strategy for this species and its habitat.

SYRIA (2003): The species is protected by the Syrian General Strategy for the Protection of Marine Biodiversity Components, by Protected Marine Areas and through the implementation of other national legal instruments.

TURKEY (2004): The *L. lithophaga* populations distributed over the Turkish coasts are not considered to be under threat.

In many countries the harvesting of and trade in *L. lithophaga* are forbidden by law, but its illegal exploitation and trade still exist. Nowadays, this presents the greatest threat to the *L. lithophaga* and its habitat in addition to the import from countries where the species is not protected. HRS-BRENKO et. al (1991) pointed out the importance of the prohibition of any *L. lithophaga* collection, believing it to be the only way to protect both, the species and benthic biocenoses.

4.1.2 International

L. lithophaga is listed as a strictly protected species in several multilateral nature conservation agreements:

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) – Appendix II
- Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention) /Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Geneva Protocol) – Annex II
- Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive) – Annex IV

Bern Convention: The aim of this Convention is to conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States. Particular emphasis is given to endangered and vulnerable species listed in Appendices I and II. Under general provisions of this Convention, each Contracting Party shall take steps to promote national policies and take necessary legislative and administrative measures for the conservation of wild flora and fauna and their natural habitats. Furthermore, all forms of deliberate capture and keeping and deliberate killing, the possession of and internal trade in listed species should be prohibited.

Barcelona Convention/Geneva Protocol: This Protocol applies to the area of the Mediterranean Sea. The general protection regime also includes the seabed and its subsoil. Under its provisions, each Party shall take the necessary measures to protect, preserve and manage in a sustainable and environmentally sound way areas of particular natural value, notably by the establishment of specially protected areas, and to protect, preserve and manage threatened or endangered species of flora and fauna. Parties should regulate or prohibit fishing and taking of animals which originate in specially protected areas, as well as trade therein.

Parties shall control and, where appropriate, prohibit: the taking, possession or killing, the commercial trade, the transport and the exhibition for commercial purposes of these species, their parts or products.

Habitat Directive: With regard to the protection of species, the Directive requires Member States to take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range. Member States should prohibit all forms of deliberate capture or killing of specimens of these species in the wild. For these species, Member States shall also prohibit the keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before the Directive entered into force.

Table 1: Contracting Parties of international agreements in which *L. lithophaga* is listed

	Country	Bern Convention App II	Barcelona Convention Ann II	Habitat Directive Ann IV
1	Albania	•	•	
2	Algeria		•	
3	<i>Angola</i>			
4	<i>Bosnia and Herzegovina</i>		•	

	Country	Bern Convention App II	Barcelona Convention Ann II	Habitat Directive Ann IV
5	Croatia	•	•	
6	Cyprus	•	•	?
7	Egypt		•	
8	France	•	•	•
9	Gambia			
10	Greece	•	•	•
11	Israel		•	
12	Italy	•	•	•
13	<u>Lebanon</u>		•	
14	Libya		•	
15	Malta	•	•	?
16	Mauritania			
17	Monaco	•	•	
18	Morocco	•	•	
19	Portugal	•		•
20	Senegal	•		
21	Slovenia	•	•	•
22	Serbia and Montenegro			
23	Spain	•	•	•
24	Syria		•	
25	Tunisia	•	•	
26	Turkey	•	•	?
27	<u>Western Sahara</u>			

Bullet (●) indicates the contracting party (or European Union Member State). States non-parties to CITES are written in underlined Italics. (?) indicates uncertainty that the provisions are provided for in the Accession Countries to the European Union

The file on the Exploitation and Commerce of *L. lithophaga* in Spain was presented at the 20th meeting of the Standing Committee of the Bern Convention in 2000. The Convention Bureau considered that special attention should be devoted to this species in all the States parties to the Convention in order to avoid trade. The Convention's Secretariat stated that the listing of *L. lithophaga* in Appendix I of the Washington Convention would help put an end to trade in this species.

In Spain, according to MINISTERIO DE MEDIO AMBIENTE (2000), the legal protection of *L. lithophaga* that Habitat Directive contemplates had hardly had application before the late nineties by the regional fishing authorities. Although some legal protection existed by means of fishing legal rules, some exercise of coordination between regional and national and fishing and biodiversity conservation authorities proved to be necessary, in order to ensure a

proper application of the protection regulations by the current fishing control mechanisms. The same trends can be found in all countries.

Despite listing of *L. lithophaga* in several international multilateral agreements, the measures provided by these are not effectively applied. EUROPEAN COMMISSION (2002) reports that high impact techniques for the exploitation of *L. lithophaga* have long been forbidden, but there are indications that the prohibition is not well enforced.

4.2 Species management

4.2.1 Population monitoring

The population monitoring of *L. lithophaga* is based on the observation of the presence of its habitat (suitable rocky substratum). According to FRASCHETTI et. al. (2001), quantitative information about spatial patterns in subtidal hard substrate assemblages is scant.

FRASCHETTI et. al. (2001) surveyed 380 km of the coast along Apulia (Italy). The surveyed coast was divided into 8 adjacent sectors and replicate samples were taken by visual inspection at each of the 3 sites nested in each sector. Multivariate analyses indicated that assemblages differed consistently with spatial scale, variability being higher at the largest scale. Damage caused by *L. lithophaga* extraction was shown to be extremely widespread. A humped relationship between patchiness and disturbance by *L. lithophaga* gathering was obtained. In particular, patchiness at a small scale was highest at “intermediate” levels of damage, because disturbance produces patches of different size and/or age, leading to “mosaic” landscapes of epibenthic assemblages.

4.2.2 Habitat conservation

Range states that are parties to Bern Convention, and particularly those that have ratified the Barcelona Convention’s Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (see table 1), are obliged to provide for the conservation of the habitats of the concerned species. The European Union Member States are additionally obliged to ensure habitat protection according to Habitat Directive by designating protected areas. Such measures are usually provided in most range states.

4.2.3 Management measures

Up to date, the proponents did not receive any information on existing harvest rates, quota systems etc.

4.3 Control measures

4.3.1 International trade

The control of international trade of *L. lithophaga* is relatively weak. Despite the fact that the species is protected in many Mediterranean countries, in general the control of international trade in this species is not effective nor sufficient.

4.3.2 Domestic measures

In countries where the extraction of and trade in *L. lithophaga* are banned, the controls are carried out. The fines for offences are considerable in some range states. It is worth mentioning that according to CROATIA (2003), beside the regular fine which amounts to app. 800 to 4000 EUR, the additional fine of app. 7 EUR for each specimen is imposed for non-compliance with the provisions on the protection of *L. lithophaga*. In Slovenia, considerable fines are imposed for offences regarding this species, ranging from 1,000 to 22,000 EUR. ITALY (2004) states that penalties for the illegal fisheries, possession, trade and use of illegal fishing methods include imprisonment up to one year and fines up to 3,000 EUR. In some range states, e.g. Italy and Croatia, several educational campaigns on this species have been regularly carried out aimed at different target groups.

5. Information on similar species

L. lithophaga has a very distinctive and well known date-like appearance. It is generally unlikely to be confused with other related species. It is reasonable to expect that an informed non-expert would be able to make a firm identification.

Due to similarity in their ecological demands, several species within the genus *Lithophaga* are relatively morphologically similar to the *L. lithophaga*. They all inhabit the rocky substrate and the genus *Lithophaga* can actually be found in the seas all over the world but the populations of particular species are geographically separated from the populations of *L. lithophaga*. The specimens of *Lithophaga aristata* (Dillwyn, 1817) look like the *L. lithophaga*, but the length of adult specimens does not exceed 5 cm and one of its valves has an appendix posteriorly.

7. Additional remarks

L. lithophaga habitat presents an indispensable biotope for numerous marine species and the problem of its destruction could be compared with the destruction of stony coral reefs.

8. References

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- Bosnia and Herzegovina**, 2003, Neretva Canton, Ministry for Civil Engineering, Physical Planning and Environmental Protection, e-mail of 16th December 2003, signed by Mr Jaroslav Vego;
- Croatia**, 2003, Ministry of Environmental Protection and Physical Planning, letter of 19th December 2003, signed by Ivan Martinić, Ph.D. (Assistant Minister), e-mail of 9th December 2003, signed by Mrs Margita Mastrović (Focal point for SPAs Barcelona Convention);
- Cyprus**, 2003, Environmental Division, Department of Fisheries and Marine Research, Ministry of Agriculture, Natural Resources and Environment, e-mail of 22th December 2003, signed by Mrs Myroula Hadjichristophorou (Focal point for SPAs Barcelona Convention);

FAO, 2004, e-mail of 15th April, 2004 signed by Mrs Adele Crispoldi, Fishery Information, Data and Statistics Unit;

Greece, 2003, Technological Educational Institute of Thessaloniki, Department of Fisheries & Aquaculture, e-mail of 8th December 2003, signed by Sofia Galinou Mitsoudi, Ph.D. (Associate Professor);

Israel, 2003, Israel Nature and National Parks Protection Authority (CITES Scientific Authority), e-mails of 8th December 2003, signed by Simon C. Nemptzov, Ph.D., Mr Reuven Ortal and Mr Henk Mienis (expert);

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Monaco, 2003, ACCOBAMS Executive Secretary, e-mail of 15th December 2003, signed by Mrs Marie-Christine van Klaveren (Focal point for SPAs Barcelona Convention) and e-mail of 8th April 2004, signed by Mr Patrick Van Klaveren, permanent representative of UNEP.;

Morocco, 2004, The High Commissioner Secretary-General Responsible for Waters & Forests and for fight against desertification, letter of 2th March 2004, signed by Mr Mohamed Anechoum;

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