A. Proposal

The Genus *Latimeria* spp. is proposed for listing in Appendix I in accordance with Article II (1) of the Convention meeting the criteria A i) ii), B i) iv) and C i) ii) given in Annex 1 of Resolution Conf. 9.24. The species *Latimeria chalumnae* is already listed on Appendix I of CITES.

B. Proponent

The Federal Republic of Germany
France

C. Supporting Statement

For comparison and completeness of this proposal *Latimeria chalumnae* is also discussed.

Coelacanths (*Latimeria* spp.) are the sole survivors of an ancient Devonian lineage of crossopterygian fish, which played a pivotal role in the evolution of land-living tetrapods. The species with the extremely slow evolutionary rate and an enormous evolutionary age represents the classic example of a "living fossil". (FRICKE 1997).

1. Taxonomy

1.1 Class Sarcopterygii

1.2 Order Coelacanthiformes

1.3 Family Latimeriidae

1.4 Genus *Latimeria spp.* Smith, 1939
(including the species *Latimeria chalumnae* SMITH, 1939 and
Latimeria menadoensis POUYAUD & al., 1999)

1.5 Scientific synonyms

1.6 Common names

English:	Coelacanth	(for *Latimeria* spp.)
French:	Coelacanthe	(for *Latimeria* spp.)
German:	Quastenflosser	(for *Latimeria* spp.)
Spanish:		
Afrikaans:	Seelakant	(for *Latimeria* spp.)
Local:	Gombessa	(for *L. chalumnae*)
	Raja laut (= King of the sea)	(for *L. menadoensis*)

1.7 Code numbers

2. Biological Parameters

2.1 Distribution

Range states:	*Latimeria chalumnae*:	Comoros, South Africa (extinct)
	Latimeria menadoensis:	Indonesia

Comoros archipelago off Madagascar, South Africa (extinct), southeast Atlantic, western Indian Ocean, and a new population found off the northeast coast of Sulawesi.

(IUCN 1996; ERDMANN & al. 1998)

Additional populations and/or species may exist in the Indian ocean between the Comoros and Indonesia (see 2.3).

2.2 Habitat availability

L. chalumnae normally inhabits submarine caves formed through recent volcanic activity at about 180 metres below the 18 C isotherm. The depth range of *L. chalumnae* is 150 to at least 300 m. The Comorian coelacanth migrates vertically with the 18 C isotherm into shallower water at night. (FRICKE & PLANTE 1988).

The habitat of *L. menadoensis* appears similar to the habitat reported for the Comorian coelacanth. The two known Indonesian coelacanths were caught around a volcanic island known to have submarine caves, and at about the same depth. (ERDMANN & al. 1998; FOREY 1998).

2.3 Population status

According to the latest IUCN Red List of Threatened Animals (IUCN 1996) the global status of the species *Latimeria chalumnae* is Endangered, due to its small population size and limited distribution. There is only a small breeding population off two islands of the Comoros Archipelago in the western Indian Ocean. At least the same must be assumed for *Latimeria menadoensis* considering that only two specimens have been caught so far.

On 30 July 1998 a specimen of *L. menadoensis* was caught near the island of Manado Tua, north Sulawesi, Indonesia, almost 10.000 km from the only other known population in the Comoros Islands in the Indian Ocean. The first specimen probably belonging to this species was seen at the fish market on the island in 1995. (ERDMANN & al. 1998).

Interviews with over 300 fishermen revealed many persons who claimed to catch coelacanths and 5 fishermen who reliably seemed to have a knowledge of coelacanths as a past bycatch. According to ERDMANN in lit. (1999c) this indicates that the population might be much smaller than those of the Comoros. These interviews, combined with the vast distance from the Comorian archipelago, strongly supported the idea that the Indonesian coelacanths are part of an established north Sulawesi population and not simply "strays“ as has been suggested for the other specimens captured outside the Comoros (SCHLIEWEN & AL. 1993 after ERDMANN & al. 1998). It is unlikely that living coelacanth exist only in two small highly disjunct populations. (ERDMANN & al. 1998).

POUYAUD & al. (1999) described the north Sulawesi population as a distinct species and named it *Latimeria menadoensis*. He found some genetic differences in the base sequences of the mitochondrial DNA from cytochrome b and 12S rDNA genes and some morphological differentiation. According to ERDMANN & AL (1998 and 1999) there is an obvious difference in colour between the Comorian coelacanth and the Indonesian coelacanth (see 5).

Further expeditions in Indonesia and to the islands in the vast stretch of Indian Ocean between the Comoros and Indonesia may discover additional populations and/or species. Given the sparse evidence of additional sightings, it seems likely that any additional populations and/or species discovered would be small and endangered - particularly given the pressure that they might come under from collectors (ERDMANN in lit. 1999a).

2.4 Population trends

The population of *Latimeria chalumnae* at Grande Comore Island fell from 230-650 in 1991 to fewer than 300 in 1995. The estimates were based on counts of individually recognized fish in an 8-km stretch of coastline representing 9 % of the total suitable habitat at the island. Counts in 1994 indicated a reduction of sighted coelacanths of about 30 %. (HISSMANN & al. 1998).

Given an estimated Comoran population of just 500, and the species' low fecundity (it is a live bearer), this has been cause for concern (FRICKE 1995 after FOREY 1998).

Population trends in *Latimeria menadoensis* are unknown at present.

2.5 Geographic trends

The only natural home of the coelacanth was assumed to be the Comoros archipelago off Madagascar. Three specimens caught elsewhere in the western Indian Ocean are assumed to be strays swept away from the Comoros by the powerful Mozambique current. Erdmann and colleagues' announcement of finds of coelacanths off Sulawesi (ERDMANN & al. 1998) considerably extends the known geographical range of coelacanths. (FOREY 1998).

A discussion started whether both populations are isolated or not and when this might have happened. Springer (1999) hypothesizes a barrier isolating the distribution of coelacanths in the western Indian Ocean from those in the eastern Indian Ocean and/or Pacific Ocean.

Finally, in 1999 POUYAUD described the Indonesian population as the distinct species *L. menadoensis*.

However, for none of the two species - *Latimeria chalumnae* and *Latimeria menadoensis* respectively - a geographic trend of the population can yet be stated.

2.6 Role of the species in its ecosystem

The role of the coelacanth in his ecosystem is insufficiently known.

L. chalumnae feeds on small, bottom-living reef fishes (snappers, cardinal fishes) or mesopelagic fishes (lanternfishes) as well as on cuttlefish (MCCOSKER 1979, after BALON & AL. 1988). Besides temperature food restriction is the other main factor probably limiting the distribution of the coelacanth (FRICKE & al. 1988).

Although coelacanths have not as yet been recorded as the prey of other predators, they are likely to be taken by large deep-sea sharks such as the cowshark *Hexanchus griseus* as well as by oceanic or shallow-water sharks that occasionally hunt in deeper waters (BALON & al. 1988).

2.7 Threats

Latimeria chalumnae is captured by fishermen hand-lining for the oilfish, *Ruvettus pretiosus,* during night. Of the three previous specimens caught outside the Comoros, two were captured in trawl nets, off South Africa and Mozambique, and one specimen from Madagascar was caught in a gill-net. (BRUTON & al. 1992; BALON & al. 1988; HEEMSTRA & al. 1996; HISSMANN & al. 1998 and SMITH 1939).

Interviews with fishermen throughout north Sulawesi reveal that, although the oilfish is often caught by hand-line in this area, coelacanths have only been caught yet using deep gill-nets (ERDMANN & al. 1998).

A high fishing activity as well as the number and density of fishing territories have consequences for the fishing of *Latimeria* species.

The local artisanal fishery using traditional unmotorized outrigger canoes (locally called "galawa") is probably responsible for the decline of *Latimeria chalumnae* at Grande Comore Island (HISSMANN & al. 1998, PLANTE & al. 1998). An annual catch rate of two to four individuals with increasing intensity is reported and the survival of the coelacanth seems to be severely threatened if fishing pressure is not reduced (FRICKE 1997, after MILLOT & al. 1972, STOBBS & al. 1991 and PLANTE & al. 1998; HISSMANN & al. 1998).

So far, according to ERDMANN in lit. (1999c) the catch rate of coelacanths in North Sulawesi isn't anything like the catch rate in the Comoros but also gives cause for concern as the population might be much smaller.

Regarding the population of *L. menadoensis* further threats e.g. by dynamite fishery are still to be investigated.

Especially the warming up of ocean water would be a great problem for the coelacanths.

They have a strict temperature limitation. The fish doesn't migrate in water warmer than 20 C but prefers less than 19 C. Most of their time the animals spent in water below 18 C. (FRICKE & al. 1988).

3. Utilization and Trade

3.1 National utilization

Coelacanths are reputed to be unpalatable and of no nutritional value. They are caught by accident mainly during night while fishing for the oilfish *Ruvettus pretiosus* or other food fish.

Fishermen in Sulawesi reported to sell the useless and inedible coelacanth to middlemen fish buyers in Manado for a very cheap price. The middlemen fish sellers who also realized that the fish is not particularly valuable and very oily attempted to make the fish more attractive to unsuspecting buyers by naming the fish "ikan raja laut" or "king of the sea fish". They told to be able to sell the very occasional fish that they get, and that the typical buyer would be ethnic chinese who inevitably believed it was a type of deep water grouper highly sought after by Chinese for their male libido-enhancing qualities. (ERDMANN in lit. 1999c).

3.2 Legal international trade

As long as there is no protection for *Latimeria* spp. by Appendix I of CITES trade in this genus (excl. *L. chalumnae*) is possible and likely to exist if specimens become more available.

The World Conservation Monitoring Center reports the following transfers of *L. chalumnae* (WCMC CITES Trade Database, Cambridge, UK 1999):

1985: USA reported imports of 2 scientific specimens from South Africa.
1990: South Africa reported imports of 1 body from Seychelles,
USA reported imports of 50 kg. scientific specimens from the Comoros.
1991: South Africa reported imports of 1 body from the Comoros.
1992: Mozambique reported exports of 10 bodies to South Africa,
South Africa reported exports of 4 bodies to Indonesia,
Canada reported imports of 4 scientific specimens from South Africa.
1993: South Africa reported imports of 1 body from the Comoros.

At least 175 coelacanth (incl. the two Indonesian coelacanths), known to have been caught since 1938, are recorded in the CCC inventory (see 4.3) (BRUTON & COUTOUVIDIS 1991, BRUTON 1999, ERDMANN & AL. 1999).

Of the 140 coelacanths whose current whereabouts are known, 35 (25%) are in France, 19 (14%) are in the U.S.A., about 18 (11%) are in the Comoros and 8 (6%) are in Japan. Coelacanth specimens are currently housed in collections in 24 countries. A number of coelacanth specimens have been dissected and exist only as partial specimens. (BRUTON & COUTOUVIDIS 1991).

In earlier decades fishermen received approximate US $ 300-400 from the government of the Comoros for each *L. chalumnae* caught. The worldwide museum trade offered between US $ 400 and 2.000. At present no incentives are being paid and the commercial market value of dead and preserved coelacanths in the Comoros is negligible. (FRICKE 1997).

3.3 Illegal trade

Illegal trade is likely to exist in species which are so much sought after.

Coelacanths are large fishes and cannot be easily transported without being noticed. Illegal trade in the Comoros probably takes place to a limited extent. The black market in the Comoros offered formalin-fixed individuals for at most US $ 1.000.(FRICKE 1997).

In 1992 two live coelacanths were offered in Germany, each for US $ 130.000, on a pricelist of the international illegal aquarium trade. The whereabouts of the fish could not be traced. (FRICKE 1997).

In May 1999 a wealthy Indonesian live fish trader accompanied by a group of Japanese businessmen gave new deep shark gill-nets and new boats to Mr. Lameh Sonatham, the fisherman, who caught the second Sulawesi coelacanth. They claimed only trying to help the poor fishermen on Manado Tua island and asked Mr. Lameh Sonatham if he happened to catch any more coelacanths to bring them to the group on a island

nearby so that they could photograph the fish and then let it go. (ERDMANN in lit. 1999c).

3.4 Actual or potential trade impacts

Latimeria is probably one of the most sought after fish genus by collectors and scientists. Due to a small population size and a limited distribution any trade in coelacanths will damage the existing populations seriously.

There is already pressure in Manado from exotic animal collectors trying to obtain specimens of the recently discovered *Latimeria menadoensis* (ERDMANN 1999b). Five separate attempts of groups of foreigners have been documented who tried to come to the island Manado Tua and to offer money to the fisherman, who caught the second Sulawesi coelacanth, to help them catch a coelacanth. Two or three of these groups were representatives of the Japanese TOBA aquarium (which already tried to catch a live coelacanth at the Comoros, see below), one a private Japanese group and one a private German tourist. All of these attempts have been rejected. (ERDMANN in lit. 1999c).

The same will happen to every population/species of coelacanth which might be discovered in the future.

Coelacanths cannot be caught on demand and line-hooked specimens usually die shortly after capture (HAMELIN 1992 after FRICKE 1997). Expensive deep-diving facilities are necessary to spot and catch a live specimen. Nevertheless, live coelacanths for display would be a great economic incentive. Private companies might be willing to pay high prices for live coelacanths as exemplified by the US $ 2 million expedition by the TOBA aquarium (Japan) sponsored by Mitsubishi in 1989. A South African aquarium already claims to have the historical right to be the first to put a coelacanth on display. In 1996, during an international conference of zoo directors, the pros and cons of keeping coelacanths in captivity were discussed. (FRICKE 1997). As FRICKE (1997) remarked "In future, science will probably be an excuse for the first public display and this will be followed by an exponential increase in the market price. It is to be hoped that CITES regulations and the rarity of the fish will not allow an expanding aquarium trade."

3.5 Captive Breeding for commercial purposes (outside country of origin)

At present no living coelacanth in captivity, and thus no captive breeding of coelacanths are reported.
The recent discovery of *L. menadoensis* reopened the debate on capturing, studying and displaying a coelacanth in captivity (BRUTON 1999).

4. Conservation and Management

4.1 Legal status

4.1.1 National

Latimeria chalumnae:
[pending information of range state]

Latimeria menadoensis:
By April 1999 the Indonesian government passed Law No. 7/1999 which states that the Indonesian coelacanth is a national treasure and is officially protected by Indonesian law. Thus it is illegal to target the species for capture or to sell or buy Indonesian coelacanth specimens. (ERDMANN in lit. 1999c).
[pending confirmation of range state]

4.1.2 International

Latimeria chalumnae was listed in Appendix II of CITES on 1st of July 1995 and upgraded to Appendix I on 18th January 1990. The Comoros signed CITES in September 1994 and the convention entered into force on February 21, 1995.
Since the Indonesian population is regarded as a distinct species, namely *L. menadoensis*, it is not covered by CITES. This would happen to any new species of coelacanths which might be discovered in the future. Thus it is urgently needed to include all species of the genus *Latimeria* in Appendix I of CITES by changing the present listing into *Latimeria* spp.

4.2 Species management

4.2.1 Population monitoring

Although monitoring of coelacanths is extremely difficult and expensive the population of *L. chalumnae* was investigated at Grande Comore by the first underwater observations of Prof. Dr. Hans FRICKE in 1986 and 1987 (FRICKE & PLANTE 1988). Additional underwater observations followed (HISSMANN & al. 1998).
Population monitoring for the newly discovered Indonesian species *Latimeria menadoensis* is urgently needed.

4.2.2 Habitat conservation

Habitat conservation problems in coelacanths are mainly the same like those in other deep-sea fishes.
Both known specimens of *L. menadoensis* were caught in the Bunaken National Park (ERDMANN in lit. 1999c).

The Coelacanth Conservation Council (see 4.3) recommended that a series of marine nature reserves should be established around the Comoro Islands: These reserves should include a Coelacanth National Park along the southwestern shore of Grand Comoro and a resource area around this national park where bottom fishing at depths greater than 120 m should be prohibited, at least for part of the year. In addition, a marine park should be established around the northeast peninsula of Anjouan which is an area of peak coelacanth catches. (BALON & al. 1988).

According to PLANTE & al. (1998) the southwest coast of Grande Comore should be designated as a nature reserve and protected area where immediate protection measures should be taken.

4.2.3 Management measures

There is now a proposal to ban deep-set shark gill-nets within the Bunaken National Park, where both of the known Sulawesi coelacanths (*L. menadoensis*) were caught (ERDMANN in lit. 1999c).

Since the human population of Grande Comore depends on its fishery, it is not possible to prohibit fishing in areas with high coelacanth densities. Besides the improvement of the offshore fishery, international development programs should help to build up nearshore alternatives for traditional deep water angling. According to investigations made by the Fonds Européen de Développment (FED) program, Fish Aggregating Devices (FADs) installed nearshore along open oceanic islands have efficiency similar to those moored offshore. Nearshore FADs can easily be reached by paddle canoes. Preyfish aggregating in nearshore FADs are only caught in shallow surface water. Therefore FADs would relieve the fishing pressure on *L. chalumnae* and the population would be less threatened by an increasing inshore fishery. (PLANTE & al. 1998).

The Coelacanth Conservation Council (see 4.3) recommended research to determine whether a caught coelacanth can be released and survive recompression to 200 m. In this case, incentives should be provided for fishermen to release coelacanths that are caught. (BALON & al. 1988). According to an information of BBC Wildlife (HELLIER 1999) scientists may have found a way to prevent the accidental deaths of *L. chalumnae*. Once hooked, at cold depths of 150-200 m, and brought to the surface, the fish overheat and can die. If they survive, they are unable to swim down to their normal depth. Now the "Coelacanth Rescue Mission“, run by Jerome HAMLIN of the Explorers Club, has distributed "Deep Release Kits“ to Comorian fishermen with a barbless hook, a bag for weights and a line sewn into the back of t-shirts distributed free. If a fisherman catches a coelacanth, he has to fix the hook to the fish’s lower jaw and attach the weighted sack. When the fish returns to the cold bottom water, the fisherman must pull on his regular line, to release the hook and weighted bag.

The first attempts to catch a live coelacanth were unsuccessful and triggered international campaigns against these commercial undertakings. Scientists in Canada, Germany, Japan, South Africa and the USA opposed the ventures. South Africa took the lead in the conservation campaigns, and in Moroni, the capital of the Comoros, the Coelacanth Conservation Council was founded. (FRICKE 1997; BRUTON 1993, BRUTON & al. 1991 and STOBBS 1989 after FRICKE 1997).

The oil of the oilfish *Ruvettus* has medical value. Coelacanths are often caught while fishing for the oilfish. An artificial, traditionally acceptable, substitute for the *Ruvettus* oil could release the fishermen from the burden of the dangerous night-time fishing and would thus also decrease coelacanth landings. (STOBBS 1989

after FRICKE 1997).

Conservation measures should focus on providing local fishermen with fishing alternatives, but no financial support is in sight in the near future to slow down the increasing catch rates. The provision of Fish Attracting Devices (FADs) as an alternative fishing method in shallow water close to the shore but above the coelacanth depth was considered as the most promising measure to reduce the catch of coelacanths. Less then US $ 1 million would be sufficient to install the FADs, which would help both, the local fishermen and the coelacanth. (FRICKE 1997)

As coelacanths are difficult to observe in their deep natural environments, non-invasive methods could be applied to allow a view into the deep, for instance by installing permanent low light cameras. Commercial exploitation by tourist submarines could be avoided. A coelacanth information and visitor center could provide the local community with some income and an increase of employment due to the inflow of tourists who wish to see the coelacanth and, at the same time, promote conservation of the fish. (FRICKE & al. 1995 and GRAF 1995 after FRICKE 1997). Coelacanth conservation should focus on an increased local awareness of the need to protect a renewable natural resource for their own benefit. (FRICKE, 1997).

4.3 Control measures with regard to international trade

In 1987 an organisation which would co-ordinate research and conservation activities related to the coelacanth was formed and named the Coelacanth Conservation Council / Conseil pour la Conservation du Coelacanthe (CCC). The headquarters of the Council is in Moroni, capital of the Comoros, and the secretariat is now based at the MTN Scien Centre, in Cape Town, South Africa. Governmental officials of the Federal Islamic Republic of the Comoros expressed support for the Council. (BALON & al. 1988).

The CCC resolved to produce an inventory of all known specimens of the coelacanth that could be published and regularly updated. In this inventory all known specimens got a CCC number and the known information of each specimen like date, site and depth of capture, measures of the fish, condition on capture, current holding and other is listed. The first known coelacanth, captured in 1938, got the number CCC no. 1, the second Indonesian coelacanth the number CCC no. 175 (ERDMANN & al. 1999). So all museum, aquarium, university and private holdings of the coelacanth can be cross-referenced to this CCC list. (BRUTON & COUTOUVIDIS 1991).

Further additions and amendments to the inventory will be published in the occasional newsletter of the CCC in the scientific journal "Environmental Biology of Fishes“. The CCC hopes that the existence of this official listing of coelacanth specimens will encourage all countries to document the movement and location of coelacanth specimens more fully in future. (BALON & al. 1988). A further extension of this inventory project is to produce labels giving the CCC number of every coelacanth specimen listed. These labels will then be sent to all the individuals or institutions who have coelacanth specimens in their care with the request that the labels are attached to the specimens. (BRUTON & COUTOUVIDIS 1991).

5. Information on Similar species

Latimeria menadoensis is distinguishable from *Latimeria chalumnae* by colour. The live Indonesian specimen was distinctly brown. Living *Latimeria chalumnae* are usually described as steel-blue, although there are reports of dead specimens appearing brown. Especially between dead specimens of both species and probably also of other species of *Latimeria* spp., which might be discovered, a look-alike effect cannot be excluded.

Both known species share the same characteristic white mottling pattern, but the Indonesian species has numerous striking gold flecks over the entire dorsal surface of the body and fins. These are apparently a prismatic effect of light reflecting off the numerous denticles on the scales.
Although specimens of the genus *Latimeria* are easily distinguishable from other fish genera due to their characteristic appearance resident fishermen might think they are big specimens of rockcods (*Serranidae* spp.). According to ERDMANN in lit. (1999c) the Indonesian coelacanth is very occasionally sold to ethnic chinese who believe it is a type of deep water grouper, highly sought after by Chinese for their male libido-enhancing qualities.

6. Other Comments

The Scientific Authority of Indonesia agreed on protecting any new found *Latimeria*-species by enlarging the protection scope to the genus *Latimeria spp.* (SUMADBIHARGA in lit. 1999).

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