

1. Information about the target species or related species

List and briefly describe the elements that could be considered when making Non-detriment findings:

1.1. Biological and species status:

- Biological parameters: reproduction, growth, age at sexual maturity, longevity, productivity, resilience (or vulnerability) to harvest, r or K strategists
- Measures of population size and trends in these – numbers, biomass, age distribution and boundaries/definitions of populations (whether within national jurisdiction or not) etc
- Transboundary populations: identify and define populations which are shared across political boundaries, understanding any biological connectivity or distinctiveness of populations (or conversely whether populations are isolated)
- Local population (relevant for NDF). International population (part of the discussion) –
- Record and understand threats to populations – both direct and indirect and cumulative impacts

1.2. Takes/uses (e.g. harvest regime):

- Harvest scale:
 - o proportion of the population subject to harvest
 - o proportion of harvest destined for export
- Harvest characteristics: season, extractive, non extractive, methods, illegal harvest
- Drivers (causes) of harvesting pressure – commodities in demand, social economics, value of commodities, market trends
- Impact of removal on the wider ecosystem function including impact on non-target organisms through bycatch and any genetic impacts of selective harvest
- Sources of the specimen (wild, captive bred, ranched, other production systems) and their different impacts on wild populations (eg how often are specimens taken from the wild for use in captive

<p>production systems)</p> <ul style="list-style-type: none"> - Meaningful metrics (conversion factor) for measures of the trade or harvest (eg converting weight of conch meat to number of individual animals removed)
<p>1.3. Management, monitoring and conservation:</p> <p>Management</p> <ul style="list-style-type: none"> - Understand current and anticipated trade - Licences (feedback: landing reports, certificates, use permit conditions to require reporting and / or as a means of distributing effort or regulating harvest means) - Regulations - Quotas (justified/adaptive) - Training of harvesters (experience in harvest – health and safety) - Types of harvesters - Controlling harvest effort, input and output - Tenure - is the resource owned or open access. - Considering differences between measures in different jurisdictions - Use of specimen size limits to reduce impacts on populations (noting reasons for size limits and what is aimed to be achieved) - Limits on sex / life history stage - Build cooperation between range countries, especially where stocks are shared. <p>Monitoring</p> <ul style="list-style-type: none"> - “Stock” assessment (condition assessment) - Identify and use indicators as proxies for biological characteristics - Set reference point or thresholds and use these to trigger management interventions <p>Conservation</p> <ul style="list-style-type: none"> - Ecosystem function (how harvest may affect this) - Effects of the harvest on species - How much of population is really protected (what is the confidence in any refugia / no take/ no entry zones) - Measures to avoid localized depletion / concentration of effort
<p>2. Field methodologies and other sources of information.</p> <p>List and describe examples of field <u>methodologies</u> and other sources of information for monitoring populations and/or regulating harvests which could be utilized to obtain data on the elements described below.</p>

2.1. Biological and species status data (fishery independent data):

- Field surveys
- Local knowledge
- Repeatable standardized surveys
- Understanding the limitations of the information (and risks of any extrapolation)

2.2. Harvesting and trade data (fishery dependent data):

- Identify units of management)
- Distinction between data
- CPUE
- Indicators / proxies of trends in populations
- Market trends – eg in prices for commodities
- WCMC trade databases
- Customs data
- Seizures data

3. Data integration for NDF elaboration

List and/or describe data integration that could be helpful in formulating the non-detriment finding.

- Information generated for other places/species could be helpful
- Enhance data sharing and communications
- Seek expert consensus where data quantity and quality is poor.

4. List and describe the ways data quantity and quality may be assessed

- Size of the population vs size of the harvest indicates risk
- Scale information
- Mechanism to evaluate data quality (specially fishery dependent data) – cross references data sets
- Are different data sources converging or diverging?
- Feedback between management / scientific authorities, experts, over data sources and quality

5. Summarize the common problems, error, challenges or difficulties found on the elaboration of NDF.

- Limitation of information (see 2.1)
- Limited datasets / small sample sizes (risk of extrapolation)
- Distribution and species patterns (e.g. patchiness of distribution in some species), relative abundance

- Taxonomy
 - o Identification of the taxa (enforcement people – fisherman and scientist)
 - o Lack of availability of identification experts (few people knows)
 - o Differences between taxonomic level data is gathered at compared with level that has to be used under CITES
- Dealing with multispecies fisheries
- Identification of gender of some species (clams)
- Taking wider ecosystem view of impact of the fishery
- Bycatch impact on non target organisms
- External factors / events (no way to estimates real effects – risk analyzes) P. e. hurricanes, new parasites (diseases), invasive aliens – seek to anticipate and respond to future threats
- Cumulative effects eg climate change.
- Indirect / unintended consequences – eg impact of bombing or cyanide fishing
- Concentrated impacts of harvests leading to localized depletion
- Fisherman perceptions lead to targeting certain types of individuals (queen conch pearls – thought to be found more often in juvenile specimens)
- Verifying sources specimens (illegal take) / specimens may be routed through least strict controls
- Difficulty of tracking specimens in trade through chain of custody (harvester to trader to export etc)
- Expense and difficulty of acquiring relevant information (may cost more than value of fishery)
- Shift from wild harvest to captive production systems (depending on risk)
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6. Summarize the main recommendations which could be considered when making an NDF for this taxonomic group.

- See Annex for recommended guidance for non-detriment findings for aquatic invertebrates
- Adaptive approach based originally on little/poor data may enable, over time, better data / confidence in being able to set higher quotas (incentive for fishers to cooperate with data provision)
- The rationale for any NDF should be documented and the sources of information (experts / literature) should be cited.
- Generating databases available
- Parties should identifying gaps and research needs and publicize them to seek support for funding or to encourage research by

specialists

- Need to limit and spread effort of fishery
- Need for good outreach (to harvesters, industry, consumers and public) at both domestic and international level over reasons for fishery and need for controls on management

7. Useful references for future NDF formulation.

- Fish Base (www.fishbase.org)
- Reef Base (www.reefbase.org)
- Original CITES listing proposals
- Significant trade reviews
- CITES trade database and UNEP-WCMC
- FAO and related reports including technical consultations on CITES criteria for commercially exploited aquatic organisms
- Global Biodiversity Information Facility (GBIF www.gbif.org)
- Hexacoralarian of the world (www.kgs.ku.edu/hexacoral/index.html)
- Global coral reef monitoring network
- IUCN red list
- FAO. In prep. Technical guidelines on sustainable management of sea cucumber fisheries. Technical Guidelines for Responsible Fisheries. FAO. Rome.
- Toral-Granda, V.; Lovatelli, A. and M. Vasconcellos (eds.) 2008. Sea cucumbers: a global review on fisheries and trade. FAO Fisheries Technical Paper No. 516. FAO, Rome.