# A Proposal to Modify the Exploitation Status Descriptors in FIRMS by ICCAT

First Session of the FIRMS Technical Working Group Meeting
*Rome, Italy, 05-08 December 2005*

**The issue**

The current (November, 2005) reference terms used in FIRMS include the "exploitation status" of a stock or resource to describe its state; this Status can be described by any one of 12 terms. In the view of the ICCAT Secretariat, more clarity is required as to the exact meaning of some of these terms. More importantly, there should be a clear conceptual distinction between the terms that refer to stock abundance and those terms that refer to the intensity of fishing.

This document highlights some of the problems that are encountered when using the current set of descriptors and provides a proposal for a new set of descriptors. It is hoped that the Technical WG meeting will examine this proposal and make a recommendation to the FIRMS Steering Committee for a decision.

**The current set of descriptors**

Table 1 presents the current set of descriptors and illustrates some of the problems that can be encountered.

| DESCRIPTOR | COMMENTS |
|---|---|
| ***Condition of equilibrium*** | Not very informative. A stock could be maintained in equilibrium at a very low abundance level or at a very high abundance level. |
| ***Depleted*** | Informative about a low biomass level. But, how does it differ from "exhausted"? |
| ***Exhausted*** | Informative about a low biomass level. But, how does it differ from "depleted"? |
| ***Fully exploited*** | Not clear if the stock is experiencing an "optimal" level of fishing mortality, or if its biomass is at a level that results in maximum productivity, or both. |
| ***In recuperation*** | Not exclusive; a stock could be "depleted" and "in recuperation" simultaneously. "Rebuilding" or "Recovering" are more common than "in recuperation". |
| ***Moderately exploited*** | Not clear if the stock is experiencing a moderate level of fishing mortality, or if its biomass is at a level one should not worry about, or both. |
| ***No-specific assessment*** | Useful. |
| ***Over exploited*** | Not clear if the stock is experiencing a high level of fishing mortality, or if its biomass is below some limit, or both. |
| ***Uncertain*** | Useful, as long as it is applied in cases where there has been a specific stock assessment. |
| ***Under extreme stress*** | Not clear if this implies possible extinction; If so, could it be "endangered"? |
| ***Underexploited*** | Not clear if the stock is experiencing a very low level of fishing mortality, or if its biomass is close to the virgin level, or both. |
| ***Unexploited*** | Useful to indicate "virgin" status. |

A common occurrence highlighted in Table 1 is the potential ambiguity in the use of some terms that can imply either a fishing mortality rate or a biomass level. Also, cases in which fishing mortality and biomass have opposite levels are not contemplated (for example, a stock that is currently experiencing a moderate level of fishing mortality but which is overfished in terms of spawning biomass).

**Proposed modifications**

There are many ways in which the issues presented here could be addressed. This document presents two options.

***Option 1***

The first option is to retain a set of descriptors as close as possible to the current set, but making a distinction between fishing mortality and biomass. This will necessitate two sets of descriptors:

| EXPLOITATION RATE STATUS | STOCK ABUNDANCE STATUS |
|---|---|
| No fishing mortality | Virgin abundance |
| Low fishing mortality | High abundance |
| Moderate fishing mortality | intermediate abundance |
| High fishing mortality | Low abundance |
| | Depleted |
| | Endangered |
| | |
| Uncertain | Uncertain |
| Not assessed | Not assessed |

The exact terms to be used in such a system could be debated further but the table above should help to illustrate the proposal.

***Option 2***

The Second option also refers to fishing mortality and stock abundance separately but introduces reference points. This option has the advantage of providing additional information that users might want, for example, related to the precautionary approach.

| EXPLOITATION RATE STATUS | STOCK ABUNDANCE STATUS |
|---|---|
| No fishing mortality | Virgin abundance |
| Below reference level | Above reference level |
| At reference level | At reference level |
| Exceeds reference level | Below reference level |
| | Endangered |
| | |
| Uncertain | Uncertain |
| Not assessed | Not assessed |

The reference points in question could be either defined in a table, or simply explained in a "description" free-text entry. If a table is thought to be preferable, the FIRMS system should make reference to definitions in the literature. Typical reference points would be: Biomass: $B_{msy}$, $B_{pa}$, $B_{lim}$, $SPR_{30\%}$, etc. Fishing Mortality: $F_{msy}$, $F_{max}$, $F_{0.1}$, $F_{pa}$, $F_{30\%}$, etc.

The implementation of this option would be more useful if more than one entry was allowed for each exploitation rate and stock abundance. Each FIRMS Partner could be interested in listing primary and secondary reference points, for instance, to include information about targets separately from limits.

**Conclusions**

The current set of status descriptors is unsatisfactory for various reasons listed above, particularly the inability to discern exploitation rate from stock abundance.

The two options listed above are useful in different ways. Option 1 is simpler if the main objective is to facilitate "meta-analyses" by users who are not very familiar with fisheries terminology. Option 2 gives Partners more flexibility because it does not force them to interpret how the results of a stock assessment fit best into a limited set of descriptors.