

SERAWG-02-INFO-02

2<sup>nd</sup> Meeting of the Stock and Ecological Risk Assessment Working Group  
(SERAWG2)

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## **SIOFA splendid alfonsino management units for stock assessments and managements**

*Relates to agenda item: 3*

Info paper

SC Head of Delegation

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### **Abstract**

Based on available information (catch and oceanographic conditions), two management units (WEST and EAST with 80°E as the boundary) were agreed.

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## **SIOFA splendid alfonsino management units for stock assessments and managements**

SC Head of Delegations

(edited by Tom Nishida, SERA-WG Co-chair)

September 2 (Monday), 2019

We got four suggestions from Lee Georgeson (Australia) and Seok-Gwan Choi (Korea) and two external scientists, Ross Shotton (SIODFA) and Evgeny Romanov (expert in La Réunion, originally from Ukraine) (see Box 1, page 4). Many thanks for contributions. There are two clear different views on management units, (a) two (East and West) units by Georgeson and Choi and (b) five units (SIOFA areas) (1, 2,3a,3b and 45 together) by Shotton and Romanov.

The primary reason to propose two management units by Georgeson and Choi, is that large and mid-scale oceanographic currents and gyres driven by monsoons likely flows genes geographically wider areas. Thus, especially for fishing grounds in the Western region expanding to four SIOFA areas (area 1: Madagascar Ridge, 2: Mozambique Ridge 3a: N. SW IO Ridge, 3b:S. SW IO Ridge and 6: Mid Indian Ridge), they (genes) are likely well mixed by currents. This is clearly implied by the overlaid map with fishing grounds and currents (Fig. 1). The same situation can be applied for the Eastern region composed by two major fishing grounds (area 4: 90°E Ridge and 5: Broken Ridge) and they are considered as one management unit.

However, there are clear separation of fishing grounds between West and East (Fig. 1), which may little influence of gene flows between these two regions because of long geographical distances.

Although Romanov and Shotton support five management units, they (and fishers) may concerns of pre-judgements of miss-classified management units without clear scientific reasons. Especially, Romanov notes that the recent modelling study (Crochelet et al., 2019 in press) suggests potential high larvae dispersions within the SW Indian Ocean.

Based on these views, it will be wise for us to consider two management units (East and West) temporarily at this stage, until new scientific information on stock structures by genetic studies and/or other methods become available. This was suggested by Georgeson (So, his comments are not 2 cents, but worth million \$\$).

As a conclusion, our two tentative alfonsino management units will be “West’ and “East” with the boundary of 80°E (Fig.2) which is also the border between FAO Fisheries Statistical Area F51 and F57 (Fig. 3). “West” region includes fishing grounds in SIOFA areas 1,2,3a,3b and 6, while “East” for 4, 5 and 7 (Fig.2).

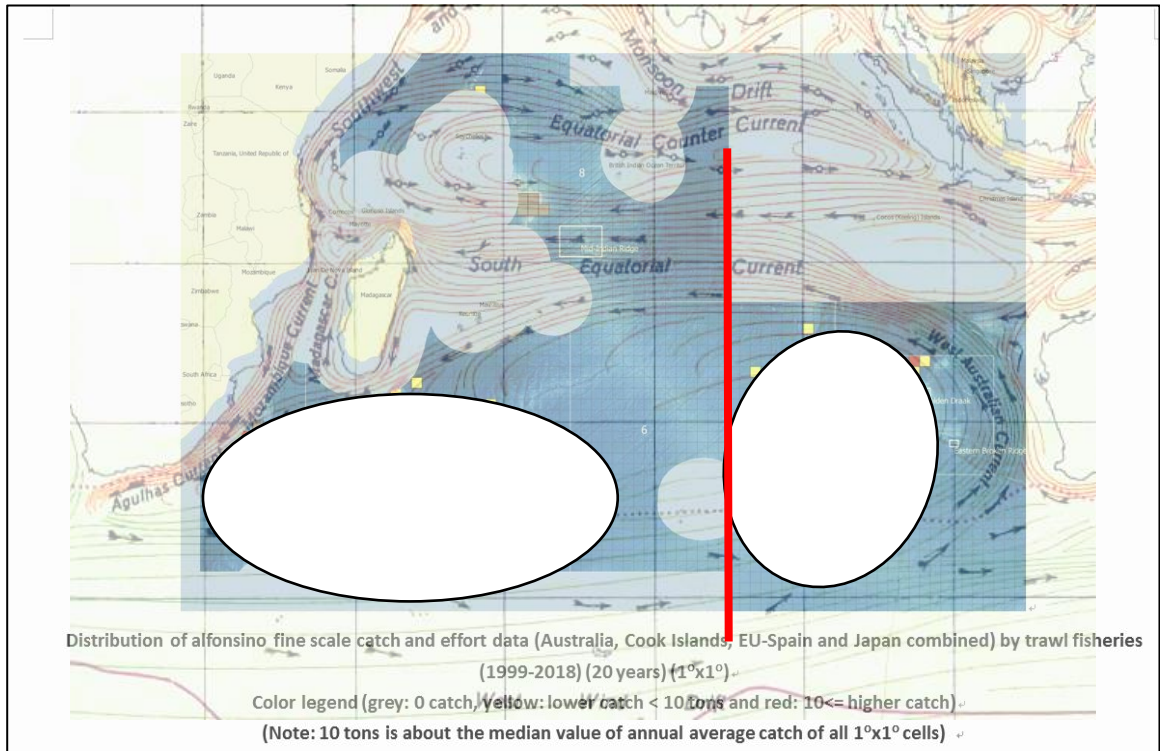


Fig. 1 Overlaid map with ocean currents and fishing grounds  
Locations of catch (10x10) are masked due to the confidential information

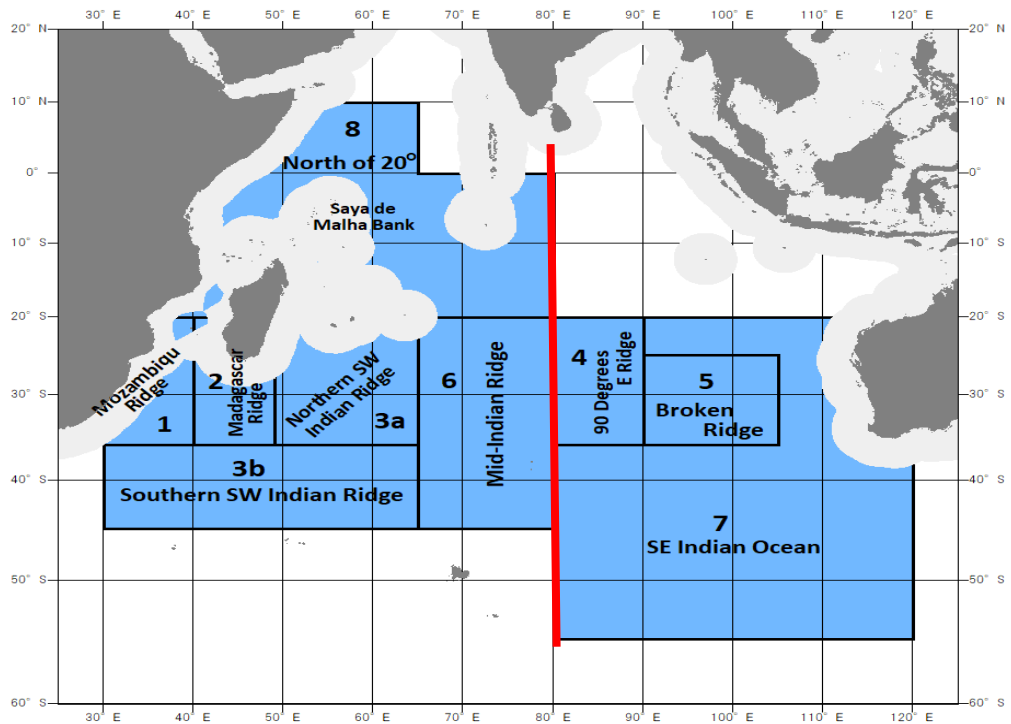


Fig. 2 SIOFA Statistical areas

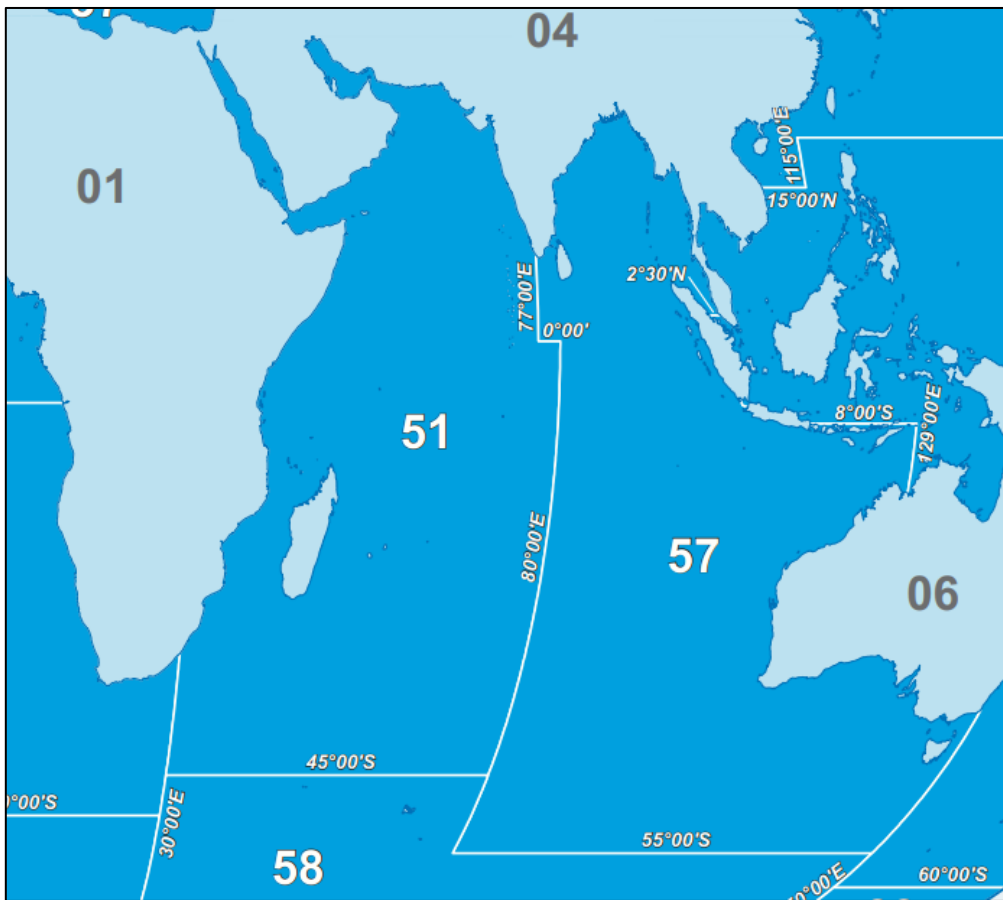


Fig 3 FAO Fisheries statistical areas (F51: Western and F57: Eastern Indian Ocean)

### **Box 1 Four Suggestion on Alfonsino management unit in SIOFA**

#### **TWO UNITS (EAST AND WEST)**

##### **(1) Lee Georgeson (Australia)**

My (very basic) understanding of genetic studies for BYS have suggested a high level of interoceanic mixing but extremely high intra-specific genetic diversity (and some reproductive isolation between 'stocks'). The high level of large, oceanic scale genetic mixing may suggest that management units for alfonsino based on prevailing oceanographic currents and gyres, which may act to constrain certain populations to certain areas (or at least influence reproductive connectivity), may be a sensible unit of assessment and management for this species.

Based on SIO currents/gyres, and the distribution of catches in the southern Indian Ocean, then in the absence of any other information it would may be prudent to first attempt assessment for an east and west 'management unit' which could be split at around 75°E. Without additional evidence or better understanding of the spatial intensity of catches, I struggle to see much justification for attempting assessment at a finer scale.

##### **(2) Seok-Gwan Choi (Korea)**

Our team discussed about the management unit for SIOFA alfonsino assessment with our fisheries information data. I also think the best thing that management unit for alfonsino assessment is decided by two units like as the East and West of 80E or 75E as Lee's proposal.

#### **FIVE UNITS (SIOFA STATISTICAL AREA 1,2,3a,3b and 45 TOGETHER)**

##### **(3) Ross Shotton (SIODFA)**

Five management units seem sensible. But great care is needed at this stage as I expect any proposed management areas will evolve to have corresponding catch/effort quotas and it is for this reason that we seek the wisdom of the skippers, who really do understand the fishery and behavioral dynamics of alfonsino in the SIO.

##### **(4) Evgeny Romanov (former IO demersal scientists from Ukraine)**

Five management units seem reasonable, but probably small stock may exist over Mid-Indian Ridge even though we do not recorded alfonsino there in commercial quantities. For eastern Indian Ocean stocks, you can probably consider 90°East Ridge and Broken Ridge as single stock. In the same time, we should consider potential larvae dispersion in the region. Recent modelling study (Crochelet et al., 2019 in press) shows that larvae dispersion rate is rather high.