Combine stressor sensitivities

*Compiled on Wed Aug 5 17:16:00 2020 by ohara*

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source('https://raw.githubusercontent.com/oharac/src/master/R/common.R')  
  
source(here::here('common\_fxns.R'))  
library(flextable)

# Summary

Stressor sensitivity is a very simplified version of stressor weights (see draft1 folder for complicated version). Here, we will simply note whether a given species is sensitive to a given stressor, using the IUCN impact weights (i.e. non-negligible impact score), ranked as 0-3 (no, low, medium, high impact) for later differentiation if necessary. For species with NA impact scores, we can imply sensitivity based on other fields, e.g. severity. This version of sensitivity is not related to the range of exposure, as the weight calculation was doing.

Sensitivity will denote whether a species range overlapping a stressor range constitutes an impact.

# Methods

Gather processed sensitivity dataframe.

spp\_incl <- get\_incl\_spp()

## Match threat codes to stressors

threat\_to\_stressor <- read\_csv(here('\_raw/iucn\_threat\_to\_stressor\_lookup.csv')) %>%  
 mutate(code\_main = str\_extract(code, '[0-9]+') %>% as.numeric(),  
 code\_short = str\_extract(code, '[0-9]+\\.[0-9]+')) %>%  
 mutate(stressor = str\_split(stressor, ';')) %>%  
 unnest(stressor) %>%  
 separate(desc, into = c('desc\_main', 'desc\_sub', 'desc\_subsub'),   
 sep = ': ', remove = FALSE)

## Parsed with column specification:  
## cols(  
## code = col\_character(),  
## desc = col\_character(),  
## stressor = col\_character(),  
## category = col\_character()  
## )

## Warning: Expected 3 pieces. Additional pieces discarded in 16 rows [45, 46, 47,  
## 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62].

## Warning: Expected 3 pieces. Missing pieces filled with `NA` in 62 rows [1, 2, 3,  
## 4, 5, 6, 11, 15, 20, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, ...].

thr\_to\_spp <- spp\_incl %>%  
 left\_join(threat\_to\_stressor, by = c('code', 'stressor', 'category')) %>%  
 mutate(desc\_main = sprintf('%s. %s', code\_main, desc\_main),  
 desc\_sub = sprintf('%s. %s', code\_short, desc\_sub)) %>%  
 select(code\_main, desc\_main, desc\_sub, stressor, iucn\_sid, category) %>%  
 filter(!is.na(stressor)) %>%  
 distinct()  
  
threat\_table <- thr\_to\_spp %>%  
 left\_join(read\_csv(here('\_raw/stressor\_names.csv')), by = 'stressor') %>%  
 group\_by(code\_main, desc\_main, desc\_sub, str\_desc) %>%  
 summarize(n\_spp = n\_distinct(iucn\_sid)) %>%  
 ungroup() %>%  
 arrange(code\_main, str\_desc) %>%  
 select(-code\_main) %>%  
 setNames(c('Threat category', 'Threat subcategory', 'Stressor', 'n spp'))

## Parsed with column specification:  
## cols(  
## stressor = col\_character(),  
## str\_desc = col\_character()  
## )

write\_csv(threat\_table, here('ms\_tables/s1\_table\_threat\_spp.csv'))  
  
flextable(threat\_table) %>%  
 theme\_vanilla() %>%  
 align(part = 'all', align = 'left') %>%  
 align(part = 'all', j = 4, align = 'center') %>%  
 # bg(bg = 'white', part = 'header') %>%  
 # border(border.bottom = officer::fp\_border(), part = 'header') %>%  
 font(font = 'Arial', part = 'all') %>%  
 fontsize(size = 8, part = 'all') %>%  
 width(1:2, width = 2.5) %>%  
 width(3, width = 1) %>%  
 merge\_v(j = 1:3)

| **Threat category** | **Threat subcategory** | **Stressor** | **n spp** |
| --- | --- | --- | --- |
| 1. Residential & commercial development | 1.1. Housing & urban areas | Direct human | 501 |
| 1.2. Commercial & industrial areas | 468 |
| 1.3. Tourism & recreation areas | 451 |
| 2. Agriculture & aquaculture | 2.4. Marine & freshwater aquaculture | Nutrient pollution | 36 |
| 4. Transportation & service corridors | 4.3. Shipping lanes | Shipping | 438 |
| 5. Biological resource use | 5.4. Fishing & harvesting aquatic resources | Artisanal fishing | 747 |
| Demersal destructive fishing | 313 |
| Demersal non-destructive high bycatch fishing | 246 |
| Demersal non-destructive low bycatch fishing | 67 |
| Pelagic high bycatch fishing | 206 |
| Pelagic low bycatch fishing | 69 |
| 6. Human intrusions & disturbance | 6.1. Recreational activities | Direct human | 460 |
| 6.3. Work & other activities | 20 |
| 9. Pollution | 9.6. Excess energy | Light pollution | 20 |
| 9.1. Domestic & urban waste water | Nutrient pollution | 19 |
| 9.3. Agricultural & forestry effluents | 9 |
| 9.1. Domestic & urban waste water | Organic chemical pollution | 7 |
| 9.2. Industrial & military effluents | 74 |
| 9.3. Agricultural & forestry effluents | 7 |
| 11. Climate change & severe weather | 11.1. Habitat shifting & alteration | Ocean acidification | 2 |
| 11.3. Temperature extremes | 406 |
| 11.5. Other impacts | 2 |
| 11.1. Habitat shifting & alteration | Sea level rise | 3 |
| 11.5. Other impacts | 1 |
| 11.1. Habitat shifting & alteration | Sea surface temperature extremes | 92 |
| 11.3. Temperature extremes | 472 |
| 11.5. Other impacts | 8 |