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amount of information for all stock being subject to fisheries exploitation. Most of these stocks
                                                                                                                              will have in the future, ~2020, time series of exploitation data more then 10 years long,
                                                                                                                              although the information about the biology will most likely be limited, due to the high
                                                                                                                                                                                                                                  Background
                                                                                                                              requirements of man power and logistics to process all the samples collected. These stocks
                                                                                                                              may not fit directly into the "data poor" stock definition, neither will they have enought
                                                                                                                              information to run sophisticated modelling methodologies. As scientists it is important think
                                                                                                                              ahead and start developing methods to deal with such a large number of stocks.
                                                                                                                                                                                                                                                                                                                                                          \P In the sense of adjusting the model during the MP
                                                                                                                                                                                                 world wide needs of fisheries advice
                                                                                                                                                                                                                                                                                                             🦞 Automatic stock assessment model 🚽
                                                                                                                                                                                                                                                                                                                                                         Not including the moment of conditioning the OM, which requires the best adjustement
                                                                                                                                                                                                available stock assessment methods
                                                                                                                                                                                                                                                                  1 The performance of the model is evaluated during the projections
                                                                                                                                                  ways to make stock assessment in the context of management advise more robust
                                                                                                                                                                                                                                                                                                             Massive data
                                                                                                                                                                                                      identify modules to build a MSE
                                                                                                                                                                                                                                                                                                              Model to be applied rapidly to a wide range of situations
                                                                                                                                                                                                    discuss progress of the initiative
                                                                                                                                                                                                                                                                                                                      Nominal effort
                                                                                                                                                                                                                                                                                                  Volume
                                                                                                                                                           O Introduction (E.Jardim)
                                                                                                                                                           O Identify and describe the problem (group)
                                                                                                                                                                                                                                                                                                                      Length frequencies
                                                                                                                                                               ☐ Summary of WKLIFE (M.Azevedo)
                                                                                                                                                                                                                                                                   💡 🕧 Moderate data stock
                                                                                                                                                                ☐ Summary of south hemisphere initiative report (I.Mosqueira)
                                                                                                                                                                                                                                                                                                                  information based knife edge mat ogive
                                                                                                                                                                ☐ Summary of GFCM WK on Elasmobranchs (G.Chato)
                                                                                                                                                                                                                                                                                                  biology  Indications for growth model
                                                                                                                                                               ☐ Management of a selection of stocks from N.America (A.Cooper)
                                                                                                                                                           O Compile a set of possible solutions to the problem (group)
                                                                                                                                                                                                                                                                                                  3 Index of abundance Discuss with genetics what could be used here
                                                                                                                                                        Thursday
                                                                                                                                                                                                                                                                                                             X effective population size Doesn't work well at yearly time scales
                                                                                                                                                           O Seminar to JRC on Fisheries Modelling (09:30 – 11:00)
                                                                                                                                                                                                                                                                                      😕 population size 🤘
                                                                                                                                                                                                                                                                                                             frequency of rare alleles
                                                                                                                                                                                                                                     Agenda
                                                                                                                                                                ☐ Welcome message by Alessandra Zampieri
                                                                                                                                                                                                                                                                                                             U May work for endareged species
                                                                                                                                                                ☐ MSE by Jose de Oliveira
                                                                                                                                                                ☐ Catch Dynamic Model by Ruben Roa
                                                                                                                                                                                                                                                                                                               monitor specifi genes that are linked to specific biological functions
                                                                                                                                                                ☐ Genetics and quantitative fisheries by Carvalho & Nielsen
                                                                                                                                                                ☐ Elaborate on advantages and disadvantages of each solution (group)
                                                                                                                                                                                                                                                                                                               indicators are still difficult to id and measure
                                                                                                                                                                                                                                                                                      (8) genetic diversity
                                                                                                                                                           O Revisit the solutions and decide which are the most promising (group)
                                                                                                                                                                                                                                                                                                               May work for endareged species
                                                                                                                                                           O Agree on a framework for testing: MSE, statistical analysis, simulated data, etc. (group
                                                                                                                                                                                                                                                                                                               reproductive success
                                                                                                                                                           O Discuss implementation and testing of the best solutions (group)
                                                                                                                                                                                                                                                                                                  markers easy to compare between labs and reproducible
                                                                                                                                                           O Elaborate on the expected outcome (group)
                                                                                                                                                                                                                                                                  🤎 🕗 Genetics
                                                                                                                                                           O Challenges and opportunities (group)

√ Monitor over time

                                                                                                                                                           O Workplan (group)

√ Stock ID →
                                                                                                                                                                                                                                                                                                                         \dashv % of individuals 
ceil
                                                                                                                                                                                                  Andrew Cooper (SFU - CA)
                                                                                                                                                                                                                                                                                                      Id biological representative characteristics
                                                                                                                                                                                                       Chato Osio (JRC - EC)
                                                                                                                                                                                                                                                                                                           time evolution of distribution may give indications of something "wrong" going on
                                                                                                                                                                                                    Einar Nielsen (DTU - DK)
                                                                                                                                                                                                                                                                                                           monitor specifi genes that are linked to specific biological functions
                                                                                                                                                                                             Ernesto Jardim (JRC - EC, chair)
                                                                                                                                                                                                                                                                                      visk indicator
                                                                                                                                                                                                                                                                                                           mixt stock analysis helps borrowing information between stocks
                                                                                                                                                                                                   Finlay Scott (CEFAS - UK)
                                                                                                                                                                                                                                                                                                              rate of change of "fast" allele frequency
                                                                                                                                                                                              Gary Carvalho (Bangor U - UK)
                                                                                                                                                                                                                                  Participation \
                                                                                                                                                                                                                                                                                     ? MSE
                                                                                                                                                                                                   Iago Mosqueira (JRC - EC)
                                                                                                                                                                                                 Jann Marthinson (JRC - EC)
                                                                                                                                                                                                Jose de Oliveira (CEFAS - UK)
                                                                                                                                                                                                                                                                                                                                     Model to be applied rapidly to a wide range of situations
                                                                                                                                                                                                  Leire Ibarriaga (AZTI - SP)
                                                                                                                                                                                                                                                                  💡 🕔 Biomass model/stock assessment model

√ Scaled

                                                                                                                                                                                                                                                                                                                                     Results must be used for advise on a quantitative basis
                                                                                                                                                                                              Manuela Azevedo (IPIMAR - PT)
                                                                                                                                                                                                                                                                                                                                      💡 surplus to get biomass and feed to length structure
                                                                                                                                                                                                      Ruben Roa (UKA - SA)
                                                                                                                                                                                                                                                                                                                    Referenced
                                                                                                                                      MSE as a mean to id the value of the information
                                                                                                                                                                                                                                                                                                               Conditioned on data moderate stock
                                                                                                                                                                                            MSE and a4a are on opposite sides
                                                                                                                                                  MSE to test the limits of the methods
                                                                                                                                                                                                                                                                                                               Standard procedures to test assumptions and conditions and give advise
                                                                                                                               Very qualitative not suitable (easily) to quantitative frameworks PSA GFCM elasmobranchs
                                                                                                                                                                                                                                                                                                                                                                                      Model to be applied rapidly to a wide range of situations
                                                                                                                       Look at and discuss approaches that could come up with Frefpnts that could be used as Fmsy
                                                                                                                       proxies
                                                                                                                                                                                                                                                                                                                       Biomass model/stock assessment model

√ Scaled

                                                                                                                                                                                                                                                                                                                                                                                      Results must be used for advise on a quantitative basis
                                                                                                                                                                                                                                                    a4a KOM
                                                                                                                                                                  Yes, YPR or %SPR Proxies for MSY based on LH
                                                                                                                                                                                                                                                                                                                                                                                       💡 surplus to get biomass and feed to length structure
                                                                                                                                                                              No major progress.  Where are we ?
                                                                                                                                                                                                                                                                                                                                                                     Referenced
                                                                                                                                                                                        How to get to the reference?
                                                                                                                                                                                                                                                                                                                        A set of LH & | other bio/gen relevant factors
                                                                                                                                                           Compile LH data into categories of the information available
                                                                                                                                                                                                                                                                                                                       A set of metric generators to HCR
                                                                                                                                                                              Information poor VS data poor
                                                                                                                                                                                                                                                                                                                     A set of HCR Generic, multi-element, switch on/off
                                                                                                                                                                    Science sets the thresholds
                                                                                                                                                                                                                                                                                                               ? (1) Which elements shoud constitute the standard
                                                                                                                                                                     Managers can't go above it
                                                                                                                                                                                                                                                                                                               Hard environment due to lawsuits
                                                                                                                                                                                                                 US management
                                                                                                                                                                                                                                                                                                                                                                    B_{obs}-B_{true}
                                                                                                                                                                   Managers set the risk level of overfishing
                                                                                                                                                                                                                                                                   💡 🐠 🕈 Assessment/advise methodology
                                                                                                                                                                                                                                                                                                                                                                                                                                        In my way back home, I was thinking about the overall statistic you were looking for to compare
                                                                                                                                                                                                                                                                                                                                                                                                                                        things. Instead of comparing only B_{true} and B_{obs} that would account for observation
                                                                                                              Methodologies to set the reference points and uncertainty has to be consistent across stocks
                                                                                                                                                                                                                                                                                                                                                                                                                                        and estimation error, I think we should also compare the catch established according to the
                                                                                                                                                If mixed fisheries protect the most vulnerable of the complex
                                                                                                                                                                                                                                                                                                                                                                                                                                         management procedure and the actual catch. So I was thinking on something like:
                                                                     Depending on the outcome there must be a different HCR, or a generic HCR
                                                                                                                                                                                                                                                                                                                                                                                                                                          C_{after implementation}/B_{true} / C_{from hcr}/B_{obs}
                                                                                                                                                    Management based on stock assessment model
                                                                                                                                                                                                            Model VS management
                                                                                                                                            stock assessment model depends on management needs
                                                                                                                                                                                                                                                                                                                                                                                                                                        In the numerator we have the actual harvest rate (the harvest rate in the operating model)
                                                                                                                                                                                                                                                                                                                                                                                                                                         and the denominator the theoretical harvest rate (the harvest rate in the management
                                                                                                                                                                   Method to id which models require attention (more assessment)
                                                                                                                                                                                                                                                                                                                                                                                                                                         procedure). This could also be written as
                                                                                                                                                                          Method to apply over a large range of stocks/situations
                                                                                                                                                                                                                                                                                                               Statistic to include the uncertainty of the system
                                                                                                                                                                                                                                                                                                                                                                                                                                          C_{after implementation}/C_{from hcr} / B_{true}/B_{obs}
                                                                                                                                                                                                                                                                                                                                                                     (C_{after implementation}/C_{from hcr}) / (B_{true}/B_{obs})
                                                                                                                     At the scale of the fishing operation NOT at the scale of the population dynamics
                                                                                                                                                                                                                                                                                                                                                                                                                                        And in this way, it could be interpreted as a measure of the trade-off between implementation
                                                                                       inserted manually or is there a statistical process ? — perturbations showing new input of fish to the fishery
                                                                                                                                                                                                                                                                                                                                                                                                                                        error and observation-estimation error. Being close to 1 could be interpreted as errors being
                                                                                                                                use biomass estimates to adjust a BioDyn replacing the CPUE index
                                                                                                                                                                                                                                                                                                                                                                                                                                         compensated and being able to manage "well" the system. The clear disadvantage is that it is
                                                                                                                                                                                                                                                                                                                                                                                                                                        not symmetric: goes in (0,1) in one side and (1,infinity) on the other.
                                                                                                                                                              High frequency data of catch and effort
                                                                                                                                                                                                            Catch dynamics model
                                                                                                                                                                                                                                                                                                                                                                                                                                         I don't know how a performance measure like this would work to measure the errors in the
                                                                                                                                                                                      Link with FLR \
                                                                                                                                                                                                                                                                                                                                                                                                                                        system. I have never tried or seen it. Then, of course you would need other performance
                                                      if a reference fleet is used the annual estimates can be compared because the area and
                                                                                                                                                                                                                                                                                                                                                                                                                                        measures according to the management objectives... but could something like this be
                                                                                                                                                           Works like a survey executed by the fleet
                                                                                                                                                                                                                                        Notes
                                                       selectivity will be constant
                                                                                                                                                           not so much as a HCR decision algorithm
                                                                                                                                                                                                                                                                                                                                                                 Ask Daniel Howell for spatial data
                                                                                      How the length of the time series impacts the results
                                                                                                                                                                                                                                                                                                   Simulate data that fits the definition of moderate data
                                                                       How violation of assumptions or fixed parameters impact the results
                                                                                                                                                                                                                                                                                                                                                                 NOAA toolbox
                                        that are id by genetics
                                                                                                                                                                                                                                                                                                                                                                 Link with WGMG
                                                                     What if we're exploring two pops with distinct biological characteristics
                                                                                                                                                              simulation framework for testing & co.
                                                 %pop => HCR
                                                                                                                                                                                                                                                                                                                                                                 conditional simulation of pop and fisheries and test assessment methods
                                                                                                                                                                                                                                                                                                    (1) Use real data that fits the definition of moderate data
                                                                                                                                                                                                          How can MSE helps?
                          migration into fishery
                                                                                                                                                                                                                                                                                                   Id relevant elements that are subject for testing
                                                    how robust if my HCR to breaking stock assessment assunmptions of closed population
                        migration into the SSB
                                                                                                                                                                                                                                                                                                    Write MSE using the ICES HCR
Will depend on the reliability of the abundance index Test model complexity, does a BioDyn model works better than a structured model
                                                                                                                                                                                                                                                                                                  Expand to more HCR HCR with parameter depending on objective
                                                                                                                                                                                                                                                                  ▲ Simulation experiment
                                                                                                                                        residuals = om bio - mp bio deal with biomass estimates
                                                                                                                                                                                                                                                                                                                    How the length of the time series impacts the results
                                                                                                                                                             As a framework for management advise
                                                                                                                                                                                                                                                                                                                    How violation of assumptions or fixed parameters impact the results
                                                                                                         Individuals that share a common gene pool and randomly breeding ———— Genetic stock 🕕
                                                                                                                                                                                                                                                                                                                                                                                               that are id by genetics
                                                                                                                                                                                                                                                                                                                    What if we're exploring two pops with distinct biological characteristics
                                                                                                                                                 Quantitative and qualitative change over time
                                                                                                                                                                                                                                                                                                                                                                                                                migration into fishery
                                                                                                                                                                                                                                                                                                                    how robust if my HCR to breaking stock assessment assunmptions of closed population
                                                                                                                                                                  INdependent demographics 🔟
                                                                                                                                                                                                                                                                                                                                                                                                                migration into the SSB
                                                                                                                                                                                Stability over time
                                                                                                                                                                                                                                                                                                                                                                                                           Will depend on the reliability of the abundance index
                                                                                                                                                                                                                                                                                                                    Test model complexity, does a BioDyn model works better than a structured model
                                                                                                                                                                   Get information at a finer scale
                                                                                                                                                                            Common currency
                                                                                                                                                                                                        Presentation
                                                                                                                                                                                                                         Genetics
                                                                                                                                                                                                                                                                                            short time visits
                                                                                                                                                                                                                                                                   100 Operationalise
                                                                                                                                                                                          IUU <sup>*</sup>
                                                                                                                                                                                                                                                                                            scientific meetings
                                                                                                                                                                                Genetic diversity
                                                                                                                                                                                                                                                                                            experts have some time for dev. and review during next year
                                                                                                                                             Moving from short term to long term or merging both
                                                                                                   Genomics allow to look at a large part of the genome and identify which genes are able to
                                                                                                   better differenciate the populations
                                                                                                                                                           using genomics to id sthomac content
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The implementation of the 2009 revision of the DCF generated the obligation to collect a large

Markers can change very rapidly or being very stable