Readme for running simple retrospective tradeoff analysis due to spatial closures

Scripts:

1. “Simple\_early\_closure\_scenario\_analysis.Rmd”. Does a lot, needs to be cleaned up.
   1. (1) Depends on “Match processed VMS data to fish ticket landings and revenue.Rmd”, which makes “DCRB\_CA\_vms\_2016-2018\_10d\_targets\_all\_attributes\_fishtix\_blue\_whales.RDS”
   2. (1a) depends on “VMS\_extracted\_metrics.R”, which makes “vms\_2016-2018\_10d\_targets\_all\_attributes\_blue\_whales.RDS”

Notes 1201019

Notes 110119

Whale risk should be a function of lines in the water with whales. Use VMS pings as proxy for now.

Fishery risk should be about foregone revenue or vessels ability to operate. Use $ or num vessels for now.

Sam linear risk code: makes wide df’s and I have imagined this as long df’s

* Should be able to grab humpback.sum and fish.out, join them and save that?

What are final df columns for considering tradeoffs under alt mgmt. scenarios

*Basic df*

* Temporal designations
  1. Year
  2. Month
  3. Early or late season: before/after Feb 1
  4. Winter or spring: before/after Apr 1
* Spatial designations

1. Grid cell
2. State
3. CA region: NorCA, CenCA
4. CDFW region: 4 digit codes
5. Hump BIA: 1 or 0
6. Blue BIA: 1 or 0
7. Hump annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
8. Hump long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018
9. Blue annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
10. Blue long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018

* Whale metrics
  1. Hump density
  2. Hump abundance
  3. Blue probability of occurrence
* Fishing activity metrics
  1. Num VMS pings
  2. Num VMS pings for sm DCRB vessels
  3. Num VMS pings for lg DCRB vessels
  4. Num DCRB vessels
  5. Num sm DCRB vessels
  6. Num lg DCRB vessels
  7. Total DCRB landings
  8. DCRB landings for sm vessels
  9. DCRB landings for lg vessels
  10. Total DCRB $
  11. DCRB $ for sm vessels
  12. DCRB $ for lg vessels

*Risk df*

* Temporal designations

1. Year
2. Month
3. Early or late season: before/after Feb 1
4. Winter or spring: before/after Apr 1

* Spatial designations

1. Grid cell
2. State
3. CA region: NorCA, CenCA
4. CDFW region: 4 digit codes
5. Hump BIA: 1 or 0
6. Blue BIA: 1 or 0
7. Hump annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
8. Hump long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018
9. Blue annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
10. Blue long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018

* Whale risk metrics

1. Hump abundance \* Num VMS pings
2. Hump abundance \* Num VMS pings sm
3. Hump abundance \* Num VMS pings lg
4. Blue occurrence\* Num VMS pings
5. Blue occurrence\* Num VMS pings sm
6. Blue occurrence\* Num VMS pings lg

* Fishery risk metrics

1. Num DCRB vessels
2. Num DCRB vessels sm
3. Num DCRB vessels lg
4. DCRB $
5. DCRB $ for sm vessels
6. DCRB $ for lg vessels

*Tradeoff df*

* Scenario: historic status quo and 8 other regional closures during spring only
* Abs value of hump whale risk metrics (3)
* Abs value of blue whale risk metrics (3)
* Abs value of fishery risk metrics (6)
* Relative value of hump whale risk metrics (3)
* Relative value of blue whale risk metrics (3)
* Relative value of fishery risk metrics (6)

What figures do I want to make

1. Time series of fishing activity, whale activity, whale risk, and fishing impacts by region and time period and scenario
   1. Region
      1. WA
      2. OR
      3. CA
      4. NorCa
      5. CenCa
      6. CDFW regions
      7. Hump BIAs
      8. Blue BIAS
      9. Hump annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
      10. Hump long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018
      11. Blue annual quartile: 0-25, 26-74, 75-100 calculated for each calendar year
      12. Blue long-term quartile: 0-25, 26-74, 75-100 calculated from 2009-2018
   2. Time period (2009-2018)
      1. Monthly
      2. Before Feb 1 v After Feb 1
      3. Before Apr 1 v After Apr 1 (after Apr 1 = spring)
      4. Annual
   3. Scenarios
      1. Historic status quo
      2. Fishing-focused closures
         1. Spring closures in CA
         2. Spring closures in CenCA only
         3. Spring closures in NorCA only
      3. Whale-focused closures
         1. Humpback centric scenarios
            1. Spring closures in hump BIAs only
            2. Spring closures in hump upper quartile cells only
         2. Blue centric scenarios
            1. Spring closures in blue BIAs only
            2. Spring closures in blue upper quartile cells only
         3. Hump and blue scenarios
            1. Spring closures in hump and blue BIAs
            2. Spring closures in hump and blue upper quartile cells
2. Maps by time period
   1. 2009-2018
   2. Annual
   3. Before Feb 1 v After Feb 1
   4. Before Apr 1 v After Apr 1 (after Apr 1 = spring)
3. Metrics
   1. DCRB fishing activity
      1. Fishing activity:
         1. Num VMS pings
            1. Num VMS pings for sm DCRB vessels
            2. Num VMS pings for lg DCRB vessels
         2. Num DCRB vessels
            1. Num sm DCRB vessels
            2. Num lg DCRB vessels
         3. Total DCRB landings
            1. DCRB landings for sm vessels
            2. DCRB landings for lg vessels
         4. Total DCRB $
            1. DCRB $ for sm vessels
            2. DCRB $ for lg vessels
         5. Owen’s VL estimates
   2. Whale activity
      1. Blwh prob occurrence
      2. Hump densities
   3. Whale risk
      1. Hump
         1. abundance \* fishing activity
         2. % of fishing activity in upper quartile of predicted hump abundance
      2. Blwh
         1. prob occurrence \* fishing activity
         2. % of fishing activity in upper quartile of predicted blwh occurrence
   4. Fishing impacts
      1. % change relative to historic status quo

Notes 100419

* Start by running 1b, then 1a, on full 2009-2018 matched VMS data and blue whale predictions
* Break up “Simple\_early\_closure\_scenario\_analysis.Rmd” code so the following happen in separate R scripts
  + Joining in vs out of BIAs to grid cells and assigning to CA regions and/or CDFW blocks