Working Draft - Data sets Under Consideration for WDFW Marine Spatial Planning Ecologically Important Areas Project

	Title	Data Type(s)	Survey Methods/Dates	Data details	Life History Stage	Timespan of Data	Geographic Scope+H14	Citation (data source)	Zone/ Strata (CMEC Standard)	Buffers	Citation
1	Catalog of Washington's Seabird Colonies	Polygons (islands, coves, points, or beach sections)	Various boat and on-colony surveys; May, June, July, August	Nesting abundance/counts by species/colony	Nesting	Late 1800s - present (will use 1960-present)	All of Washington's marine waters	Speich and Wahl 1989, Duff et al. 2014	Beach, Nearshore	Yes;300 m distrubance buffer and foraging buffers per species = Tufted puffin (3.96 km), Pigeon guillemot (0.12 km),Common murre (2.62 km),Rhinoceros auklet (3.65km), Cassin's auklet (12.62 km), Storm petrels (91.7 km),Cormorants(8.93 km)	Under development
2	Atlas of Seal and Sea Lion Haulout Sites	Polygons	Aerial surveys with photo interpretation;year round	Counts by species		1998-2013	All of Washington's marine waters	Jeffries et al. 2000, Duff et al. 2014	Beach, Nearshore	Yes; 300 ft (NOAA guideline), 6.5Km (average foraging distance)	Peterson et al. 2012
3	Seabird and marine mammal encounter rates	Polygons	Boat based line transect;May, June, July	Encounter rates by species per primary sampling unit and subunit (nearshore/offshore). Species included = marbled murrelet, tufted puffin, common murre, Cassin's auklet, ancient murrelet, rhinoceros auklet, Brandt's cormorant, double-crested cormorant, pelagic cormorant, harbor seal, harbor porpoise		2009-2013	Coastal Washington	Raphael et al. 2007, Duff et al. 2014	Beach, Nearshore	No	
4	Sea otter	Polygons, points	Aerial;June	Point occurrences of sea otters detected and summer concentration areas (polygons) from summer aerial surveys and expert knowledge		2012-2013	Coastal Washington	Jameson and Jeffries 2014, Duff et al. 2014	Beach, Nearshore	No	
5	Winter bird and mammal encounter rates	Rectangular strips	Aerial;February, March	Species encountered per linear km, most likely not included in analysis due to sampling period.		2011	Coastal Washington and Oregon	Evenson 2011, Duff et al. 2014	Nearshore, Oceanic	No	
6	Short-tailed albatross	Kernal density estimation predicted space use	GPS data from 8 tagged birds;Year-round	Use contours representing core and range use area (50%, 95%, and 99% isopleths) based upon fixed kernel UD (plug-in bandwidth selector)		2003-2011	Subset to coastal washington	Suryan et al. 2012.	Oceanic, Offshore	No	

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7	Snowy plover	Polygons	Repeated walking transects and nest searches; April-Sept	Area of suitable habitat surveyed annually for plovers during the nesting season. Area digitized by Scott Pearson and includes all known nests and bird detections during the nesting season. Also includes historically occupied sites that are currently unoccupied.	Breeding	1960-2010	Coastal Washington	Pearson et al. 2014	Beach	No	
8	Streaked horned lark	Polygons	Repeated walking transects and nest searches; April-Sept	Area of suitable habitat surveyed annually for larks during the nesting season. Area digitized by Scott Pearson and includes all known nests and bird detections during the nesting season.	Breeding	2006-2013	Coastal Washington	Ongoing unpublished research	Beach	No	
9	Seabird occupancy and predicted abundance	Occupancy and abunance surface	Modelled data using boat based survey results; Breeding season model: May, June, July, Aug Non-breeding season model: Sept. - April	Logistic model using covariates to predict occupancy and abundance	Likely a breeding and non-breeding season model	To be determined based on which years are appropriate	Coastal Washington	Under Development	Nearshore, Oceanic, Offshore	No	
10	Seabird diversity	Predicted all species (n=16) abundance surface	Modelled surface created by aggregating species specific models. Data based on various boat surveys; ;April-Nov primary	Predicted desnsities (from bagged decision trees) were standardized and then summed among all species.		1997-2008	California Current System	Nur et al. 2011	Nearshore, Oceanic, Offshore	No	
11	Sablefish	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Oceanic, Offshore	No	
12	Petrale Sole	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Oceanic, Offshore	No	

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13	Dover Sole	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Oceanic, Offshore	No	
14	Yelloweye Rockfish	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey and various visual surveys with covariates	Unlike the other EFH models, one of the two models for this species includes additional survey data taken from ad hoc submerisible and ROV studies.		2003-2012		NMFS 2013	Oceanic, Offshore	No	
15	Longspine Thornyhead	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Offshore	No	
16	Greenstriped Rockfish	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Oceanic, Offshore	No	
17	Darkblotched Rockfish	Modeled probability of occurrence	NMFS NWFSC bottom trawl survey (May-Oct) with covariates	NOAA has produced two predictive models based on different methods that we plan on compositing.	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)	2003-2012		NMFS 2013	Oceanic, Offshore	No	
18	Pacific Whiting	Trawl hauls mapped as polygons	Fishery logbooks and observer records	Fishing locations will be affected by econonomics (e.g. preferred size of fish) and bycatch avoidance yet catch per unit effor, adjusted annually, should reasonably reflect important habitats.	Fishery catches mainly 2+ year old fish.	2001-2014 (chosen to explore the effects of a large year class moving through the fishery).			Oceanic, Offshore	No	
19	Dungeness Crab	Sets mapped as lines	Fishery logbooks.	Crab fishing locations will be affected by economics and closed areas yet we expect that catch per unit effort, adjsuted by monthand year, will reasonably reflect important habitats.	Retained catch is limited to males over 6 1/4".	2009/10 fishing year through 2012/13 fishing year			Nearshore, Oceanic, Offshore	No	

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20	Pink Shrimp	Trawl haul	Fishery logbooks and observer records	Pink shrimp fishing locations will be affected by economics yet catch per unit effor will reasonably reflect important habitats.		2003-2012			Oceanic, Offshore	No	
21	Beach spawning forage fish spawning sites	Points or polygons representing beach	WDFW survey			2003-2012			Oceanic, Offshore	No	
22	Green Sturgeon	Polygon of Critical Habitat designation	NMFS Critical Habitat designation is based on consideration of various data sources and may exclude areas based on economics.	Critical habitat was designated by NOAA to include marine waters out to 110 meters (60 fathom).		2003-2012	NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)		Oceanic, Offshore	No	
23	Substrate Type	Polygon	Various	We are investgating various models of bethnic habitat types (e.g. rocky vs. sandy/muddy). Rocky habitats/hard substrates are less well sampled, attract many fish species, and are relatively rare and less resilient to disturbance than soft substrates.					Nearshore, Oceanic, Offshore	No	
23	Razor Claims	Polygons of Beach Sampling Units	WDFW survey of density				NWFSC bottom trawl survey covers *trawlable* habits in depths 55 m to 1280 meters (30-700 fm)		Oceanic, Offshore	No	
24	Kelp	Polygons representing floating kelp beds	WA Department of Natural Resources floating kelp long-term monitoring of the outer coast from 1989-2012 (late summer)	Photo interpretation of low tide aerial photography in the late summer		1989-2012	WA Coast Offshore waters	Berry et al. 2005	Nearshore	No	

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	Potential Datasets	**Potential Data Type(s)**	**Survey Methods**	**Notes**							
A.	Deep Sea Coral	Geopspatial model		We have not had time to investigate the quality of this model.				Guinotte and Davis (2014)	Oceanic, Offshore		Guinotte and Davies 2014
B.	Chinook Salmon	Points	Voluntary retention of fish for genetic samples	These are samples taken at sea by fishing vessels and so will not be expected to show all areas important to Chinook. We are strongly considering including the data as indicative of important salmon habitat yet have not had time to investigate the data fully.	Adults in marine environments				Nearshore, Oceanic, Offshore		
C.	Sardines, N. anchovy, Pacific mackeral,	Oceanographic conditions associated with habitat	Fishery logbooks or Sea Surface Temperature	Fishery logbooks are only available for sardines and will show that fishing occurs close to port. State waters are also closed to fishing. There are some that have modeled habitats based on sea surface temperature. We are unsure whether we can apply such methods over the timeline of this project and suspect that they would show that habitat exists regularly throughout the entire planning area.					Nearshore, Oceanic, Offshore		
D.	Albacore tuna	Points or oceanographic conditions	Fishery logbooks or modeled habitat.	Fishing logbooks only record a single fishing location per day. Some have modeled albacore tuna habitat based on sea surface temperature and chlorophyl a but we are unsure whether such methods could be incorporated into this project on time.	We typically see 2-5 year old fish off the U.S. West Coast				Nearshore, Oceanic, Offshore		
E.	Benthic species richness	Geospatial model	NWFSC Bottom Trawl Survey	This look at spatial patterns in species encountered by haul would add to the focal species approach but we are unsure whether will receive the data or be able to apply the model in time to add to the project.					Oceanic, Offshore		
F.	Leatherback Sea Turtle	Polygon of Critical Habitat designation	NMFS Critical Habitat designation is based on consideration of various data sources and may exclude areas based on economics.	Critical habitat designation covers entire planning area so it will contribute no contrast to the map.					Nearshore, Oceanic, Offshore		