

FT 272 Final Exam

- 1) Prince William Sound salmon fisheries are managed to meet escapement goals. This can best be described as
 - a. A moving target with escapement varying with run strength
 - b. A rigid goal that does not change even given additional scientific information
 - *c. A fairly consistent range that is maintained despite variation in run strength
 - d. PWS is managed using the total allowable catch (TAC) principle

- 2) Alaska state legislation dictates that salmon be managed in a sustainable manner
 - *a. True
 - b. False

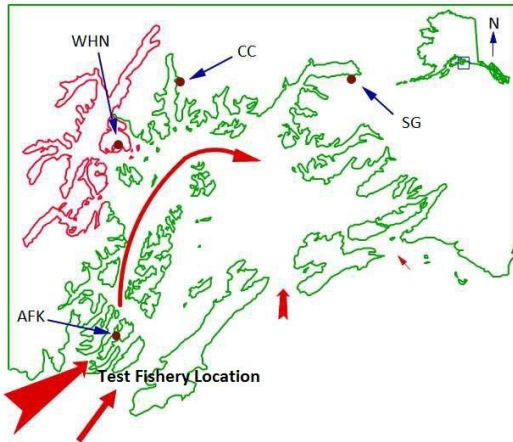
- 3) Alaska does not however have a policy that dictates managers meet escapement goals for salmon
 - a. True
 - *b. False

- 4) Biological Escapement Goals and Sustainable Escapement Goals vary in
 - a. Sustainable Escapement Goals are typically based on less information and use indices
 - b. Biological Escapement Goals are scientifically defensible
 - c. Sustainable Escapement Goals are typically more conservative
 - *d. All of the above
 - e. None of the above

- 5) Escapement Goals for a particular stock can and typically are changed for the following reasons
 - a. variation in run strength (returns)
 - *b. Increased scientific information about the stock
 - c. a strong return over 2 years
 - d. None of the above

- 6) Escapement goal ranges should allow for uncertainty in all of the following EXCEPT
 - *a. Economic value of stock
 - b. Measurement techniques
 - c. Variability in assessments of stock size
 - d. Climate and oceanographic variability
 - e. Varying abundance of populations within stocks

- Type: MT
- 7) Match the following stock assessment techniques with what they are estimating
 - a. Escapement = Weirs, towers, sonar, mark-recapture, aerial surveys
 - b. Harvest or 'catch' = fish tickets
 - c. Age Composition = scale samples



8) Hatchery locations and generalized salmon migration pathways.

- All are true of the PWS Salmon Test Fishery EXCEPT
- a. It provides initial run strength information to managers
 - b. It provides initial stock composition information to managers
 - *c. It takes place in the early winter when fish are still at sea
 - d. It provides initial sex ratio information to managers

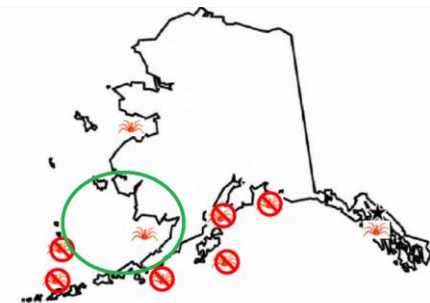
9) Salmon Management in Prince William Sound is done using Emergency Orders and rarely relies on annual openers

- *a. True
- b. False

Type: MA

10) Of the following Ecosystem Based Management practices discussed which two are used in Prince William Sound

- a. Reduce bycatch
- b. Marine reserves
- *c. Monitoring of population characteristics
- d. Catch share programs
- *e. Ecologically Sustainable Yield



11) Numerous Red King Crab fisheries have closed around the state. Identify the one indicated above

- a. Puget Sound Red King Crab
- b. Southeast Alaska Red King Crab
- c. Norton Sound Red King Crab
- *d. Bristol Bay Red King Crab

e. None of the above

12) Bering Sea-Aleutian Island Crab Management can be described as

- a. Federally managed
- b. State managed
- *c. Cooperatively managed
- d. Closed (there is no management)
- e. None of the above

13) Who is primarily responsible for conducting King Crab surveys in the Bering Sea?

- a. The North Pacific Fishery Management Council (NPFMC)
- *b. The National Marine Fisheries Service (NMFS)
- c. The Alaska Department of Fish and Game (ADF&G)
- d. The Alaska Board of Fish (ABOF)

14) The 3 – S harvest strategy or management approach allows only males to be taken. This is beneficial for all of the following reasons except

- a. It protects the eggs in the population
- b. One male can mate with multiple females
- c. Males are bigger and have longer legs and are more marketable than females
- *d. all of the above reasons are beneficial
- e. None of the above reasons are beneficial

15) A size restriction is put on male king crabs to ensure they are one molt above maturity. This ensures

- *a. The males have had the opportunity to mate at least once before entering the fishery
- b. The males have molted their softer juvenile shell off
- c. The males are not agitated by the fishery while they are molting because it is at the same time as mating takes place
- d. Only female king crabs are harvested

16) Crab Rationalization can be best described as

- a. A management strategy that allows for a larger catch to be harvested
- *b. A program that divides up the catch into shares to promote better management and a safer fishery
- c. A type of crab processing that is rational given the number of crabs needing to be processed
- d. A fair and meaningful way to divide up a fishery

Type: MT

17) Match the following impacts of crab rationalization with the perceived benefit or deficit to local communities

- a. Reduction in fleet size = decreases available jobs in coastal communities
- b. Extended season: greater flexibility in selecting fishing time and location = safer fishery
- c. Less gear: decreased pot lifts = Less ghost fishing, better conservation

18) Which is not a part of a king crab stock assessment

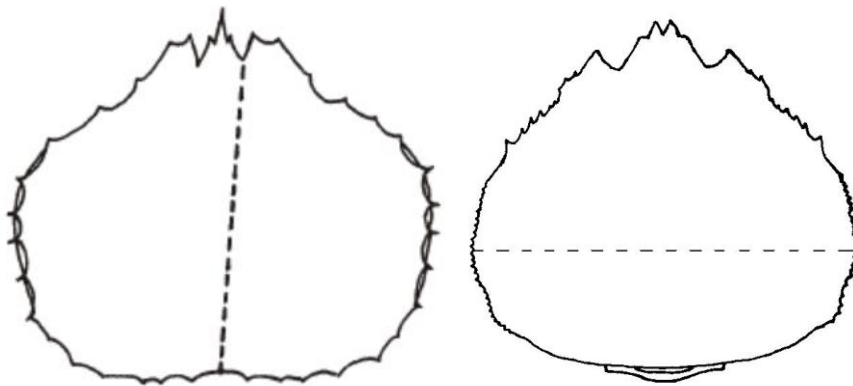
- a. Collecting life history data on the target species
- *b. Establishing a corrected equilibrium goal
- c. Establishing an abundance index
- d. Collecting information on the 'catch' or harvest



19)

The above image is of what part of a Bering Sea King Crab assessment

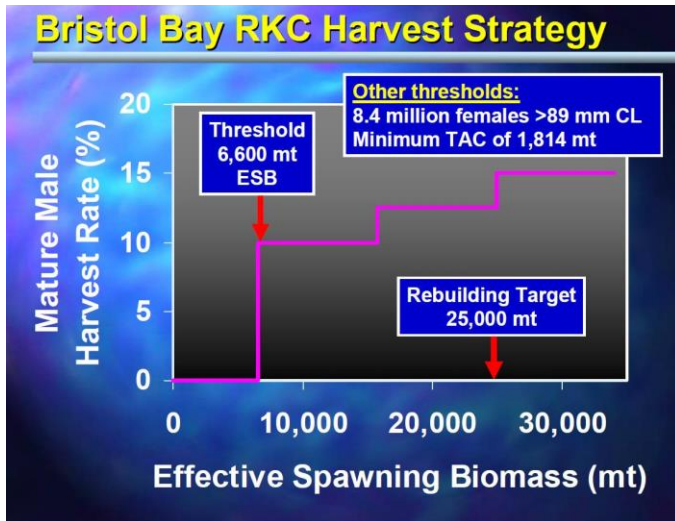
- a. Pot surveys
- *b. Trawl surveys
- c. Catch surveys
- d. Harvest surveys



20)

The above image depicts what type of Crab Biological data collection

- *a. Carapace length and width
- b. Crab sex comparison
- c. Crab shell condition
- d. Crab apron dimensions



21)

The above image summarizes the Bristol Bay Red King Crab Harvest Strategy. Based on this information at what Biomass do managers allow a harvest to be taken

- a. 0 (mt)
- *b. 6,600 (mt)
- c. 16,000 (mt)
- d. 25,000 (mt)

Type: MA

22) Of the following Ecosystem Based Management practices discussed which are used in the management of the Bering Sea King Crab fishery

- *a. Reduce bycatch
- *b. Marine reserves
- *c. Monitoring of population characteristics
- *d. Catch share programs
- *e. Ecologically Sustainable Yield

23) Southeast Sac Roe Herring Management can be described as

- a. Federally managed
- *b. State managed
- c. Cooperatively managed
- d. Closed (there is no management)
- e. None of the above

24) Southeast Sac Roe Herring Assessments have numerous data sources which is not a type of data collected for herring assessment

- a. Aerial survey of spawn
- b. Spawn deposition dive survey
- *c. Whale predation surveys
- d. Cast net samples
- e. Commercial fishery samples
- f. Winter test fishery samples

25) Aerial Herring surveys are primarily looking for

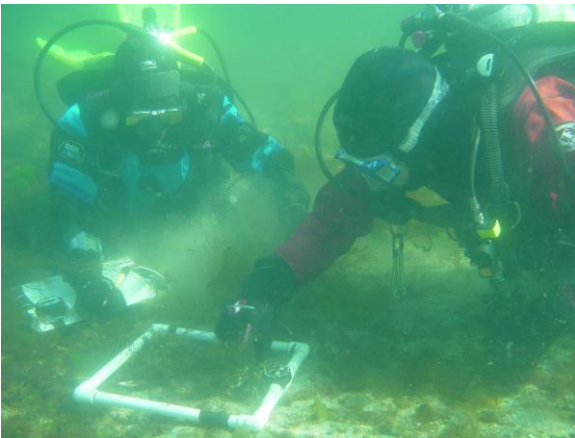
- a. Boats illegally fishing for Herring
- b. Schools of Herring
- *c. Herring spawn near the shoreline
- d. Divers collecting herring eggs
- e. None of the above



26)

Herring Spawn, (as seen in the picture above) at least what is typically visible, is actually

- *a. Herring milt or sperm
- b. Herring eggs
- c. Herring Spawning
- d. Marine mammals eating the herring spawn
- e. None of the above



27)

When conducting Herring spawn deposition surveys divers are counting or estimating what?

- a. Dead spawned out Herring
- b. The number of spawning fish
- *c. The number of eggs in 1/4 m quadrat
- d. The kelp blades the eggs are stuck to
- e. None of the above

28) Commercial Fishery samples are taken from commercial vessels during the fishery so that managers can get estimates of the catch age and weight composition

- *a. True
- b. False

29) Fishery assessments provide information that is then entered into an ASA model that provides managers with run forecasts. What does ASA stand for

- *a. Age structured analysis
- b. Age sex anomaly
- c. Average species assessment
- d. Aerial survey assortment
- e. None of the above

Type: MA

30) Of the following Ecosystem Based Management practices discussed which are used in the management of Southeast Sac Roe Herring

- a. Reduce bycatch
- b. Marine reserves
- *c. Monitoring of population characteristics
- d. Catch share programs
- *e. Ecologically Sustainable Yield

Type: MA

31) Select the two primary branches of Economics

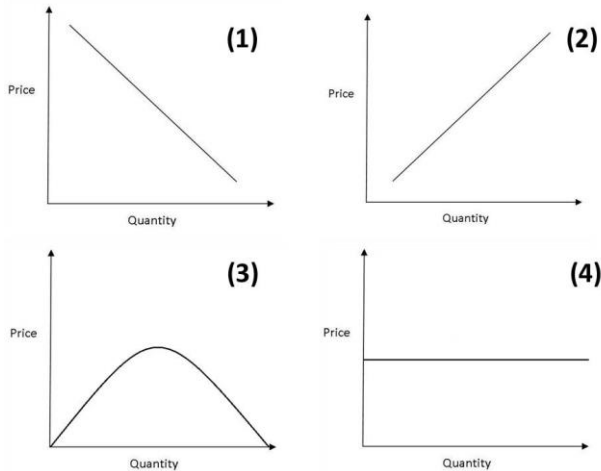
- *a. Microeconomics
- b. Minimizeconomics
- c. Paleoeconomics
- d. Monstereconomics
- *e. Macroeconomics

32) Economics is a science that studies production, distribution and consumption of goods and services in an economy

- *a. True
- b. False

33) The branch of economics that deals with larger elements of the economy such as taxation, stimulation, inflation, growth, unemployment is

- a. Microeconomics
- b. Minimizeconomics
- c. Paleoeconomics
- d. Monstereconomics
- *e. Macroeconomics



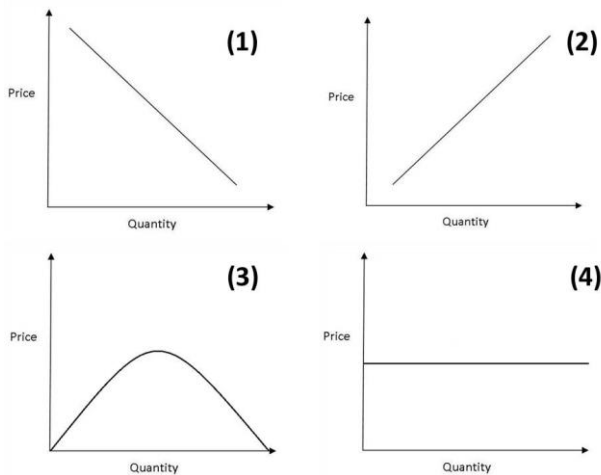
34)

The law of demand states that if all else is equal as the price of a product increases, quantity demanded _____ . Choose the graph that best describes this relationship

- *a. (1)
- b. (2)
- c. (3)
- d. (4)
- e. None of the above

35) In the demand relationship described above describe what would happen to the demand curve if the population's income increased

- *a. The demand curve would shift to the right increasing demand
- b. The demand curve would shift to the right decreasing demand
- c. The demand curve would shift to the left increasing demand
- d. The demand curve would shift to the left decreasing demand



36)

The law of supply states that if all else is equal as the price of a product increases, quantity supplied _____ . Choose the graph that best describes this relationship

- a. (1)
- *b. (2)
- c. (3)
- d. (4)

e. None of the above

37) All of the following will shift the supply curve to the left, lowering supply EXCEPT

- a. Increased production price of goods
- b. Increased price of a related or substitute good
- c. Decrease in the number of suppliers
- *d. Increased price of the good

Type: MT

38) Identify the following points on the Supply & Demand relationship in the figure above

- a. Shortage = (1)
- b. Surplus = (2)
- c. Equilibrium = (3)
- d. Supply Curve = (4)

39) The concept of market equilibrium is a challenging one but in general it can be explained by

- a. in times of surplus supply the price will fall and the market will move back toward equilibrium
- b. in times of surplus the price will rise and the market will move back toward equilibrium
- c. in times of shortage the price will rise and the market will move back toward equilibrium
- d. In times of shortage the price will fall and the market will move back toward equilibrium
- *e. A & C
- f. B & D

40) Given a situation like the Fukushima Nuclear disaster what impact will this have on the fisheries economy and supply and demand

- a. it will decrease the supply of fish because of nuclear die off
- *b. it will decrease the demand for fish by hurting consumer confidence in the product
- c. It will increase the supply of fish because they are easier to capture due to radiation
- d. It will increase demand due to isostatic rebound

41) Given an increased fuel prices for fisherman what impact will this have on the fisheries economy and supply and demand

- *a. it will decrease the supply of fish due to increased price of production
- b. it will decrease the demand for fish due to global warming and climate change
- c. It will increase the supply of fish because less boats can afford gas
- d. It will increase demand due to fuel and fish markets being linked

Total sales generated by the U.S. Seafood Industry (2011)
(thousands of dollars)

State	In-State Sales	State	In-State Sales
United States	129,386,335	Maine	1,734,058
California	20,053,619	Georgia	1,489,958
Florida	14,250,006	Oregon	1,351,116
Washington	8,026,068	Rhode Island	1,024,748
Massachusetts	7,754,140	North Carolina	795,541
New Jersey	6,563,733	New Hampshire	766,257
New York	5,102,910	Connecticut	740,263
Alaska	4,684,638	Hawai'i	694,228
Texas	2,277,959	Alabama	499,805
Virginia	1,866,659	Mississippi	247,106
Louisiana	1,801,568	South Carolina	88,131
Maryland	1,743,095	Delaware	43,746

Total Landings by State (2011)
(thousands of pounds)

State	Total Landings	State	Total Landings
Alaska	5,272,554	West Florida	77,687
Louisiana	1,285,875	Rhode Island	77,236
Virginia	494,028	North Carolina	67,483
California	408,181	East Florida	31,215
Mississippi	278,080	Hawai'i	29,289
Oregon	274,525	New York	27,104
Maine	269,923	Alabama	26,145
Massachusetts	255,798	Georgia	12,646
Washington	210,672	New Hampshire	12,321
New Jersey	175,516	South Carolina	12,116
Texas	98,111	Connecticut	7,078
Maryland	78,197	Delaware	4,921

42)

We examined Economic values of various seafood sectors and in total sales Alaska was 7th. This could be explained by

- a. High value east coast fish spp such as Scallops
- b. Larger landings by poundage in other states
- c. Other seafood sectors being included in calculations such as recreational fisheries
- d. A & B
- *e. A & C

Type: MA

Total Landings and Landings of Key Species/Species Groups (thousands of pounds)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total landings	9,436,477	9,505,337	9,688,745	9,712,427	9,484,055	9,309,281	8,357,614	8,060,769	8,248,510	9,867,148
Finfish & other	8,232,370	8,367,711	8,516,634	8,630,877	8,303,972	8,227,911	7,290,705	6,792,319	6,948,622	8,499,132
Shellfish	1,204,107	1,137,626	1,172,111	1,081,550	1,180,083	1,081,370	1,066,909	1,268,450	1,299,888	1,368,016
American lobster	83,087	71,683	90,073	87,809	92,609	80,842	88,106	100,507	116,248	126,264
Blue crab	175,574	170,890	174,561	159,242	166,133	156,599	162,192	176,184	199,334	199,149
Menhaden	1,755,398	1,590,510	1,495,240	1,243,807	1,304,250	1,484,230	1,344,468	1,570,733	1,473,329	1,874,995
Pacific halibut	80,977	78,862	79,181	76,264	71,897	69,967	67,000	59,812	56,460	42,877
Pacific salmon	561,489	669,998	738,746	899,759	663,567	886,054	659,196	705,063	787,712	780,066
Sablefish	40,734	47,998	52,851	51,296	46,842	43,884	43,314	42,826	40,318	41,284
Sea scallop	52,672	55,968	64,108	56,626	59,013	58,450	53,385	58,003	57,529	59,112
Shrimp	345,249	324,170	316,566	264,163	337,012	273,636	248,609	305,701	262,295	310,570
Tunas	49,632	61,762	56,323	44,252	49,923	50,642	47,878	49,062	48,001	49,708
Walleye pollock	3,333,647	3,361,261	3,353,236	3,410,065	3,400,810	3,066,600	2,276,144	1,866,171	1,947,578	2,810,787

43)

From the above table select the three most landed species in the United States

- *a. Menhaden
- b. American Lobster
- c. Shrimp
- *d. Pacific Salmon
- *e. Walleye Pollock
- f. Blue Crab

44) What impact did crab rationalization have on the number of boats participating in the fishery

- a. The number of boats increased
- *b. The number of boats decreased
- c. The number of boats stayed the same
- d. Rationalization closed the fishery

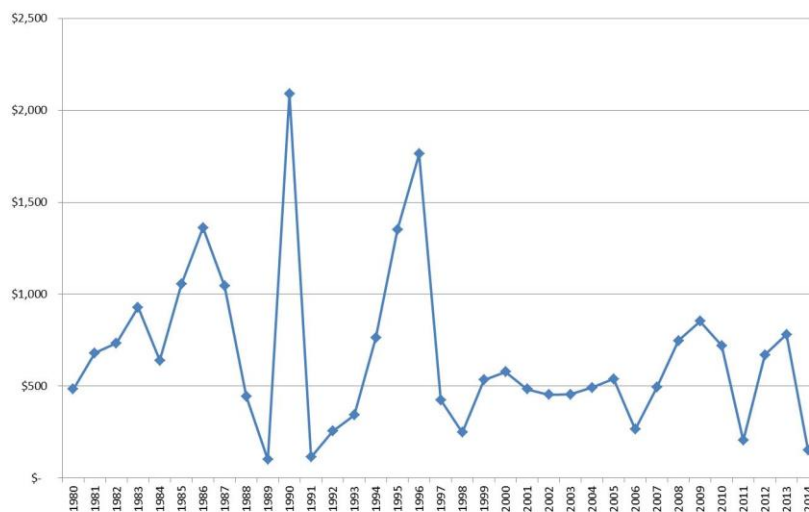
45) Crab rationalization reduced the number of jobs available in coastal communities and allocated the fishery among a smaller user group, increasing the economic gain for some and reducing it for others, but made the fishery easier to manage, more sustainable, and safer.

- *a. True
- b. False

46) Crab rationalization likely increased the quality of the product being processed and brought to market. This would do what to demand and price

- *a. Increase demand and increase price
- b. Increase demand but decrease price
- c. Decrease demand but increase price
- d. Decrease demand and decrease price
- e. None of the above

Price Per Ton for Sitka Sound Sac Roe Herring, 1980-2014



47)

In the above image you can see large spikes and falls in the price of herring select one possible reason for this based on economics

- a. A shortage of supply causes price to fall
- *b. A surplus of supply causes price to fall
- c. Equilibrium is undefined for the herring market
- d. Herring quality varies from year to year causing the price to fluctuate

48) The idea of rationalizing the Herring fishery in Sitka Sound would likely not have an economic impact on the local economy due to the size of the fishery

- a. True
- *b. False

49) What role does fishery economics play in fisheries management

- a. Management decisions are driven by economic factors in Alaska
- *b. Economics should be left out of management decisions which should focus on the fishery health
- c. Macroeconomics is too complicated to be calculated into fishery models
- d. Managers wait until the demand relationship is in equilibrium before establishing a harvest

50) What impact would positive marketing of fisheries and fisheries products have on the supply and demand relationship

- *a. Increase demand and increase price
- b. Increase demand but decrease price
- c. Decrease demand but increase price
- d. Decrease demand and decrease price
- e. None of the above

51) What are Fisheries?

- a. A livelihood
- b. A way of life
- c. An economic driver
- d. A healthy renewable food source
- e. A way we link ourselves to the environment
- *f. All of the above

52) The Law of the Sea is a body of customs, treaties, and international agreements by which governments maintain order, productivity, and peaceful relations on the sea.

- *a. True
- b. False

53) International Ocean Law was developed for all of these reasons EXCEPT.

- a. There are no boundaries in the ocean
- b. Fish and Pollution run throughout the ocean
- *c. Piracy was rampant on the high seas
- d. To resolve issues of fisheries and seabed ownership, and to balance nations rights
- e. To allow for coordination and cooperation among nation states

Type: MA

54) Select all of the ways in which we use the Ocean

- *a. Disposal of waste
- *b. As a source of energy
- *c. Natural resource extraction (including fisheries)
- *d. Marine biotechnology
- *e. Recreation and tourism
- *f. Transportation and Telecommunications

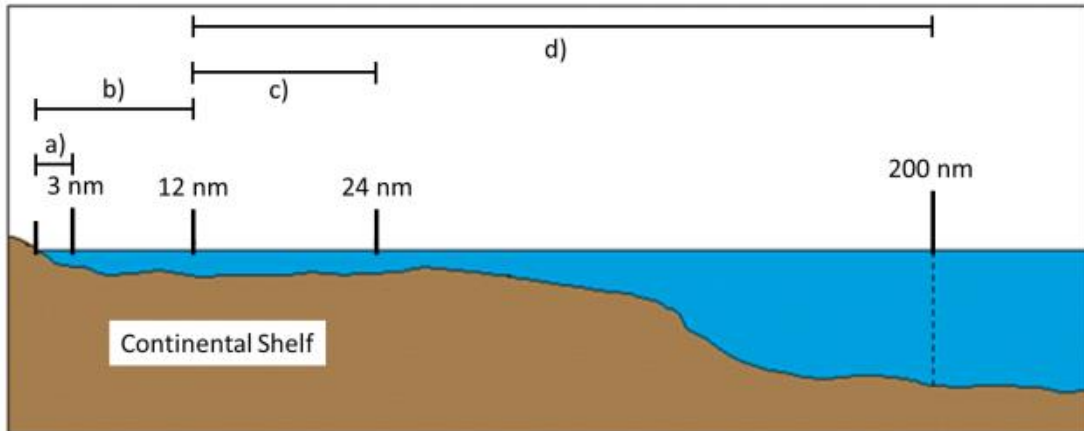


55)

The United Nations is a group of member states focused on maintaining international peace and security, developing friendly relations among nations and promoting social progress, better living standards and human rights.

- *a. True
- b. False

Type: MT



56)

Match the following terms with the above figure

- a. a) = State Managed Waters
- b. b) = Territorial Sea
- c. c) = Contiguous Zone
- d. d) = Exclusive Economic Zone

57) Roughly 10 – 12% of the global population

- a. eat fish
- *b. Earn their living in fisheries
- c. live near the ocean
- d. Are members of the United Nations



58)

Tragedy of the commons can best be described as

- a. Common resources are best utilized by all
- *b. Individuals acting on a common resource will put self-interest first
- c. Common resource utilization always ends tragically
- d. Immoral people destroy common resources

59) All are examples of fisheries that have collapsed EXCEPT

- a. Bluefin Tuna

- *b. Bristol Bay Salmon
- c. Atlantic Cod
- d. Haddock

60) The Magnuson-Stevens Fishery Conservation and management act was adopted to do all of the following EXCEPT

- *a. Combat unpopular legislation outlined in UNCOLS
- b. Extended control over fisheries in US waters to 200 nm
- c. Prevent overfishing by foreign fleets
- d. Allow overfished stocks to recover
- e. Conserve and manage fisheries resources

61) Ted Magnuson and Warren G. Stevens were two famous fisherman that the legislation was named after

- a. True
- *b. False



62)

Which of the following federal fishery management councils is Alaska represented by

- a. Alaska Fishery Management Council
- b. Northern States Fishery Management Council
- c. Alaska Department of Fish and Game
- *d. North Pacific Fishery Management Council

63) The primary tools that Fishery Management Councils use to manage fisheries are Fisheries Management Plans

- *a. True
- b. False

64) The Endangered Species Act has provisions to protect all of the following species EXCEPT

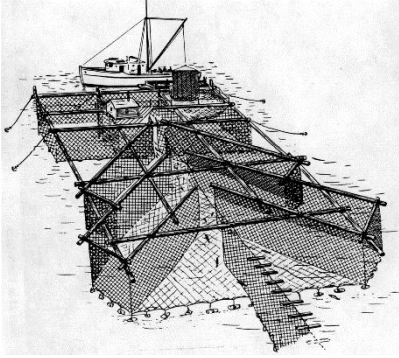
- *a. Pest Insects
- b. Plants
- c. Fish
- d. Spiders
- e. Skunks

Type: MA

65) Select the TWO designations that exist under the Endangered Species Act

- a. At risk
- *b. Threatened

- c. Susceptible
- *d. Endangered



- 66)
- Who benefited the most from fish traps in Alaska
- a. Alaskan Residents
 - *b. Out of state canary owners
 - c. Native Alaskans
 - d. Fish Processors

- 67) A need for state fisheries and resource management was one of the driving forces for Alaskan Statehood
- *a. True
 - b. False



- 68)
- The thing that Alaska's constitution takes into account that is extremely novel is
- a. It covers such a vast land area
 - b. It makes resource extraction the highest priority
 - *c. It mandates responsible and sustainable resource management
 - d. It doesn't relinquish complete authority of state resources to the federal government
- 69) In the state of Alaska the primary organization that makes fisheries laws is
- a. The Alaska Department of Fish and Game
 - *b. The Alaska Board of Fish
 - c. The Magnuson-Stevens Fishery Management Council
 - d. The Alaska Area Management Association
 - e. All of the above



- 70) The board of fish process is UNIQUE in what main way
- a. There is a panel of scientists that vote on issues
 - b. Proposals go through a public comment process
 - *c. Anyone can submit a proposal
 - d. The process is transparent
 - e. All of the above

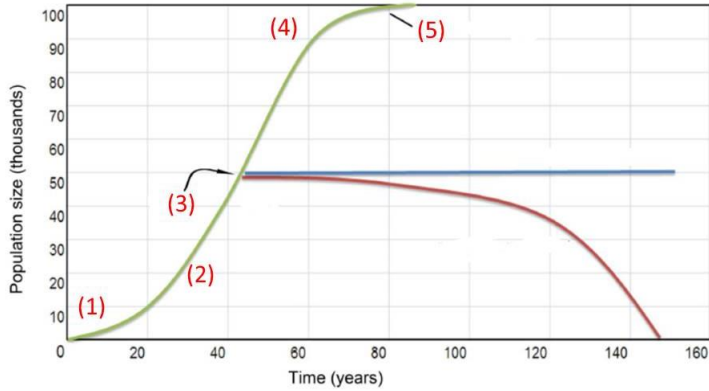
- 71) The advisory committees that provide recommendations to the board of fish
- a. Are made up of locals
 - b. Help develop proposal for submission
 - c. Evaluate proposals and make recommendations to the board
 - d. Provide a local forum for people to discuss fish and wildlife issues
 - *e. all of the above

- 72) Fishery management draws on fisheries science, political sway, and cooperate investment, in order to find ways to exploit fishery resources
- a. True
 - *b. False

- 73) Fishery management is like mathematics, it is a static field where guiding principles remain firm through the test of time.
- a. True
 - *b. False

Type: MT

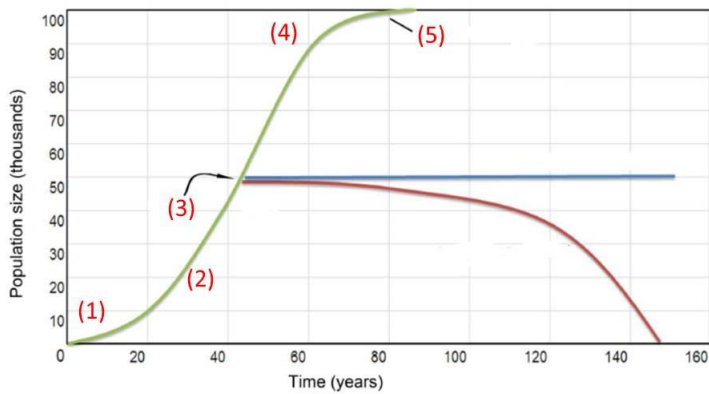
- 74) Match the following four vocabulary terms with their definitions
- a. Species = A group of fish capable of interbreeding successfully
 - b. Population = A summation of all the organisms of the same group or species, which live in the same geographical area, and have the capability of interbreeding.
 - c. Stock = An interbreeding group of fish that is distinguished by similar genetic, life history, phenotypic, or habitat characteristics and is managed as a unit
 - d. Recruitment = The number of fish that are added to the exploitable stock (available for harvest) each year due to either growth or migration of new fish into the area. This rate is variable and highly dependent on ocean conditions, habitat changes, fishing pressure, etc.



75)

On the above figure Identify Carrying Capacity (K)

- a. 1
- b. 2
- c. 3
- d. 4
- *e. 5



76)

On the figure above Identify Maximum Sustainable Yield (MSY)

- a. 1
- b. 2
- *c. 3
- d. 4
- e. 5

77) The following are all good examples of R strategist species EXCEPT

- a. Shrew
- b. Guppies
- *c. Rockfish
- d. Bunny Rabbits
- e. None of the above

78) Maximum Sustainable yield is calculated by

- *a. $1/2K$
- b. $2G$
- c. $1/3$ Carrying Capacity

- d. $n/2$
- e. None of the above

79) All of the following are examples of challenges associated with managing for MSY EXCEPT

- a. Estimation of population size is expensive
- b. It does not take into account ecosystem effects
- c. There are social pressures to overestimate stock sizes
- *d. It is too conservative of an approach often setting harvest levels too low

80) The Exclusive Economic Zone or EEZ came out of which piece of important fisheries legislation

- *a. United Nations Convention on the Law of the Sea UNCLOS (1982)
- b. Magnuson-Stevenson Fishery Conservation and Management Act (1976)
- c. Sustainable Fisheries Act (1996)
- d. National Environmental Policy Act (1970)
- e. Endangered Species Act (1973)
- f. Marine Mammal Protection Act (1972)

81) When describing the health, condition, and abundance of a fishery stock one is describing

- *a. A fisheries assessment
- b. Carrying capacity
- c. Maximum sustainable yield
- d. An index
- e. None of the above

82) Expensive, More systematic/Scientific, Repeatable and comparable, Allows for more biological information to be collected are all characteristics of which kind of fishery data collection method

- a. Fishery dependent
- *b. Fishery Independent

83) Biological information is typically collected during fishery assessments but doesn't necessarily serve as an indicator of stock health

- a. True
- *b. False

84) Estimation of salmon escapement is typically done with fish tickets and e-landing reports

- a. True
- *b. False



85) Estimating the age composition of a fishery stock is typically done using fish scales, fish otoliths, fish spines, and even bivalve shells. These structures are used because they share this in common

- a. They lay down concentric growth rings like trees

- b. They grow faster in summer than winter
- c. They grow faster in salt water than in fresh water
- *d. All of the above
- e. None of the above

86) When considering the interconnectedness of all components within an ecosystem, including fish, plants, marine mammals, climate, and humans, we are managing using_____.

- a. Environmentally Sustainable Yield (ESY)
- *b. Ecosystem based management
- c. Establishment of marine reserves
- d. Maximum Sustainable Yield (MSY)
- e. None of the above

87) Marine reserves are an important tool in fisheries management because they provide a refuge where typically biomass, density, and diversity of fish species decreases

- a. True
- *b. False

88) The basic principal behind the genetic fisheries management that we discussed in class was

- a. Individual fish within the same stock could be identified from one another so that paternal origins could be determined
- *b. Selected Fish from one stock could be distinguished from another stock so that managers could target fisheries and improve forecasting
- c. Simple sequence repeats (SSRs) or short tandem repeats (STRs) can be isolated to look at genetic straying of fisheries around natal streams
- d. Maintaining genetic diversity is important, but it is difficult to use as an in-season management tool at this time

89) Autonomous Underwater Vehicle's (AUV) are best used for

- a. Pissing off sharks
- b. Spying on Russians
- c. Pissing off sharks
- *d. A & C

Type: SA

90) In your own words describe the role of a fishery Assessment (2 Points)

Type: SA

91) The Future of fisheries management is based around _____ approaches