Korean Research Plan for Salmon in 2017

by

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Salmon are political resources due to the characteristics of transboundary distribution and economic importance. The interest in chum salmon biology in Korea was much increased since the establishment of the Inland Living Resources Center (Yangyang Salmon Station formerly) of Korea Fisheries Resources Agency 1980s. The enhancement program of chum salmon has been expanded thereafter, so that chum salmon were transplanted 18 streams in the coast of the Korean Peninsula. More than 10 million fry salmon have been released every year since the 2000s. On the other hand, however, the ecological research on salmon species was very limited until recently due to the lack of research program. Though the involvement to the North Pacific Anadromous Fisheries Commission (NPAFC) requires scientific investigation on salmon research of each member nation, the conspicuous increase in research funding was not achieved. Oceanic environments have been rapidly altered by climate change during the last a few decades and ocean ecosystems including salmon populations will be modified under the global warming situation. Especially, a special intention is needed for stocks in southern boundary of distribution such as Korean chum salmon.

1. To reveal the mechanisms of mass mortality of chum salmon during their early life in rivers and coastal areas in conjunction with the fluctuation of return rates, we will carry out the researches as follows;

  (1) Identification of prey and predator species for juvenile salmon in the rivers and coastal areas,
  (2) Stage-by-stage estimation of survival rate after releasing in the rivers and coastal areas,
  (3) Monitoring of environmental factors in the river and coastal areas,
  (4) Examination of growth rate during the early life history using size, otolith and DNA, and compare the growth rate between released juvenile salmon and wild juvenile salmon

2. Climate change effects on salmon distribution, migration route, and abundance will be investigated. This research includes
  (1) Continuous monitoring activities on environmental conditions in the Korean waters, and
  (2) Climate change effects on the biological characteristics of chum salmon returned to the Korean waters.

3. Otolith thermal marking on Korea chum salmon will be carried out to provide information about growth, survival during the early ocean life stage, and hatchery origins from 2017 release (2016 brood).

4. For the stock identification, we will develop new multiplex PCR set using microsatellite loci of chum salmon to investigate genetic variation and population structure of Korean populations.

5. Genetic structure of non-anadromous and anadromous cherry salmon populations will be investigated using mitochondrial DNA to collect baseline data for the strategy of conservation and management.

6. Parasites as biological tags for stock discrimination of the chum salmon in South Korea.
Parasites can be good biological tags because they are applied by nature at no cost. Parasites can be infected with susceptible host fishes when they enter into certain areas. Then if they move to the outside and are caught, researchers can infer that the fish had been in the endemic area for a period of time during their life. Hence, the host fish can be considered as naturally 'tagged' by parasites. However, if they do not pass the parasites endemic area, they will harbor no parasites. Therefore, researchers can discriminate each fish stocks and trace their migration routes with these biological tags
   (1) Monitoring of fish parasites in chum salmon migrating to Korea.
   (2) Korea and other counties returning salmon were compared by parasite infection status.
   (3) Development of biological tag for stock analysis.