

Counting Fishes in Aquaculture Ponds: Application of Imaging Sonars

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Abstract : The semi-intensive aquaculture in traditional earth ponds is the main rearing system in Southern Spain. These fish rearing systems are approximately two thirds of aquatic production in this area which has made a significant contribution to the regional economy in recent years. In this type of rearing system, a crucial aspect is the correct quantification and control of the fish abundance in the ponds because the fish farmer knows how many fishes he puts in the ponds but doesn't know how many fishes will harvest at the end of the rear period. This is a consequence of the mortality induced by different causes as pathogen agents as parasites, viruses and bacteria and other factors as predation of fish-eating birds and poaching. Track the fish abundance in these installations is very difficult because usually the ponds take up a large area of land and the management of the water flow is not automatized. Therefore, there is a very high degree of uncertainty on the abundance fishes which strongly hinders the management and planning of the sales. A novel and non-invasive procedure to count fishes in the ponds is by the means of imaging sonars, particularly fixed systems and/or linked to aquatic vehicles as Remotely Operated Vehicles (ROVs). In this work, a method based on census stations procedures is proposed to evaluate the fish abundance estimation accuracy using images obtained of multibeam sonars. The results indicate that it is possible to obtain a realistic approach about the number of fishes, sizes and therefore the biomass contained in the ponds. This research is included in the framework of the KTTSeaDrones Project ('Conocimiento y transferencia de tecnología sobre vehículos aéreos y acuáticos para el desarrollo transfronterizo de ciencias marinas y pesqueras 0622-KTTSEADRONES-5-E') financed by the European Regional Development Fund (ERDF) through the Interreg V-A Spain-Portugal Programme (POCTEP) 2014-2020.

Keywords : census station procedure, fish biomass, semi-intensive aquaculture, multibeam sonars

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