Surveying the stock of variegated scallop (\textit{Chlamys varia}) in pertuis charentais strait (France)

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The variegated scallop is a major fishing resource in the pertuis charentais strait, together with the common scallop and the glass eel.

\textbf{Aims} : Improvement of the quality of an annual abundance survey to monitor the abundance of variegated scalop in the Pertuis

\textbf{Biology} : hermaphroditic bivalve mollusc. 
\textit{Habitat} : sandy or muddy bottom with scattered stones or shells on which it is fixed.
\textit{Salinity} : from 30 to 40 %
\textit{Temperature} : between 8 and 19 °C

\textbf{Fishing} : Gear : 1 m large dredge (mesh 42 mm)
\textit{Commercial length} : 35 mm
\textit{Management} : Access to the fishery controled by licence, days and hours
(165 boats allowed but 70 to 90 boats fishing)

\textbf{Market} : Product mainly sold in the vicinity (90 %) of the Pertuis (~200 km)

\textbf{Process to build up a new sampling plan}

Since 1992, annual surveys of the Pertuis's stock have been carried out in a science-industry partnership by performing dredge hauls on the variegated scallop banks

However, until 2006 these surveys were a non-random search of the best areas of abundance. This process impeded to produce a fair estimate of change in abundance between years.

\begin{itemize}
  \item \textbf{Problems:}
    \begin{itemize}
      \item Surveyed areas have been different from year to year
      \item Many sectors rarely surveyed (1 or 2 times in 14 years)
      \item Large variations in abundance between close areas and succeeding years (e.g. opposite)
    \end{itemize}
\end{itemize}

\textbf{Conclusion}:
- Essential to standardize the surveyed areas in order to compare years between them.
- Need to carry out close hauls in order to properly assess the abundance.

\begin{itemize}
  \item \textbf{A sampling grid with hauls every 500 m}
\end{itemize}

\begin{itemize}
  \item \textbf{Designing a new survey}
    \begin{itemize}
      \item Method : Number of hauls proportional to the past abundance and its variability
      \item Results : La Flotte (77%), Roche du Sud (<1 %), Pointe du Chay (<1 %), Les Palles (<1 %), Marennos-Oléron (22 %)
    \end{itemize}
\end{itemize}

\begin{itemize}
  \item About 25 hauls per day
  \item A single professional boat to avoid sampling bias.
  \begin{itemize}
    \item Pertuis Breton (La Flotte bank) 2 days
      50 hauls of first priority and 24 of secondary priority
    \item Pertuis d’Antioche (Marennos-Oléron bank) 1 day + 1 day for extra work
      23 hauls of first priority, 24 of secondary priority and 15 of last priority
  \end{itemize}
\end{itemize}

The sampling plan had been implemented on september 2008 and results had allowed to improve the 2009 survey.