Designing High Seas MPAs that work: Practical solutions for monitoring, control and surveillance

Klaudija Cremers, Julien Rochette, Quinn Gordon & Alexandra Oliveira Pinto (IDDRI)

WHY THIS MATTERS

The credibility of future high seas marine protected areas (HSMPAs) established under the BBNJ Agreement will depend on their effective implementation and enforcement. Experiences from existing MPAs and high seas governance shows that monitoring, control and surveillance (MCS) is a decisive factor for compliance and enforcement. While the remoteness of areas beyond national jurisdiction (ABNJ) poses major challenges, recent technological advances offer practical, scalable and cost-effective solutions, provided they are embedded in a broader compliance strategy. States and coalitions championing HSMPAs should therefore integrate a site-specific compliance strategy that includes MCS activities into their proposal from the outset, combining emerging technologies with complementary policy, legal, technical and cooperation measures. Over the past two years, IDDRI has conducted extensive research on MCS tools and services, including through interviews and expert consultations. This work resulted in a Guide that aims to support States and stakeholders in integrating MCS considerations into HSMPA proposals. Its key messages are summarized below.

A FOUR-STEP ROADMAP FOR HSMPA PROPONENTS

Step 1 — Conduct a MCS capacity stocktake

Before designing new systems, proponents should assess what already exists:
— MCS tools and data already deployed by States, RFMOs or other sectoral bodies;
— Existing patrol capacity, vessel registries, and monitoring platforms;
— Institutional mandates and coordination mechanisms.

A Strategic Risk Assessment (SRA) can complement this stocktake by analyzing historical vessel activity (AIS/VMS, satellite data), identifying compliance risks, and informing the transition to live monitoring.

Step 2 — Match tools and services to site-specific needs

There is no one-size-fits-all MCS solution. The selection of MCS activities should be driven by:
— HSMPA conservation objectives and zoning;
— Types of activities and risks;
— Cost, coverage, accessibility, reliability, susceptibility to manipulation, and implications for privacy.

Effective MCS frameworks typically rely on a combination of tools, including AIS and VMS platforms, satellite imagery, remote sensing, and data analytics, rather than a single technology. Traditional patrol assets (vessels and aircraft) remain important for their deterrent effect, but are likely to rely on voluntary, in-kind contributions from capable States.

Step 3 — Use specialized MCS services where appropriate

Private companies and non-profit organizations increasingly offer integrated MCS services, including:
— Real-time vessel monitoring platforms;
— Satellite-based vessel detection, including "dark" vessels;
— Advanced analytics using AI and machine learning;
— Capacity-building for national and regional authorities.

In most cases, HSMPAs will not require building systems from scratch, but rather adapting and building upon existing MCS infrastructures, particularly those operated by RFMOs and other international organizations.

Step 4 — Deploy complementary policy and legal measures

Technology alone is insufficient. Effective MCS for HSMPAs requires:
— Capacity-building to analyse data and act upon it;
— Cooperation for joint maritime patrols, including burden-sharing;
— Stronger port State controls, notably through broader uptake of the Port State Measures Agreement;
— Judicial reforms to ensure technological evidence is admissible and sanctions are deterrent;
— Effective information sharing and interoperability across sectors and institutions.

The BBNJ Clearing-House Mechanism can play a catalytic role by facilitating access to data, technology transfer, funding, and technical expertise.

COST AND BURDEN-SHARING

A fully developed MCS framework relying heavily on technology could cost between USD175,000 and USD600,000 per year for management costs, but this scenario is unlikely to be the norm. In practice:
— The use of existing MCS frameworks can significantly reduce costs;
— Non-profit support and open-source data lower financial barriers;
— The more strictly protected the HSMPA, the lower the associated MCS costs;
— Patrol and enforcement efforts will often depend on voluntary State contributions, rather than dedicated HSMPA management budgets alone.

Costs must therefore be assessed on a site-by-site basis, taking existing capacities into account.

CONCLUSION

HSMPAs will only be effective if a compliance strategy is planned, resourced and coordinated from the proposal stage. This strategy should integrate MCS tools, combining emerging technologies with complementary policy, legal, technical and cooperation measures. By following a structured four-step approach and combining technology with enabling policy measures, States can turn HSMPAs from formal designations into operational conservation tools.