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BACKGROUND

ESFRI Landmarks were introduced in the ESFRI Roadmap 2016 as reference RIs and are pillars in the ERA landscape offering not only services to academic research, but also supporting development and innovation. Guaranteeing the excellence of the Landmark label, ESFRI has responsibility for monitoring the quality of the RIs listed in the ESFRI roadmap as Landmarks.

In the follow-up to the Competitiveness Council Conclusions of May 2018¹, and the pilot review of four Landmarks assessing the scientific status and their implementation, ESFRI has set up an ad hoc Working Group on “Monitoring of Research Infrastructures Performance”². It prepared a final report containing general criteria for Landmark and RI assessment and considerations for implementing an appropriate methodology in the future. This report addressed various aspects of Landmarks and developed a set of KPIs. The report was approved and published by ESFRI in December 2019³.

The ad hoc Working Group also recommended a quality standard for Key Performance Indicators (the “RACER-Criteria”)⁴ and a dialogue process between the RIs and the evaluating organisations to define the most appropriate KPIs that would at the same time fulfil the objectives of the ESFRI assessment.

In order to prepare and implement a fully consistent procedure for monitoring of ESFRI Landmarks, ESFRI has set up another working group, namely the “Monitoring Implementation Group”, with the mandate to propose a methodology for the monitoring of Landmarks on the ESFRI Roadmap. The working group has prepared a report, which identified options for implementation of Landmark monitoring by ESFRI and provided directions for further development of the ESFRI monitoring framework and for uptake of the ESFRI monitoring approach beyond the Landmarks⁵.

KEY FEATURES OF THE LANDMARK MONITORING PROCESS

Landmark monitoring by ESFRI has the following objectives:

- enabling regular exchange between ESFRI and Landmarks on their long-term development;
- assessing the quality of each individual Landmark;
- identification of possible problems and supporting the Landmarks to take appropriate actions;
- gathering information on the performance, outputs and impacts of the Landmarks.

¹ Conclusions of the Council of the European Union of 29 May 2018 on Accelerating knowledge circulation in the EU. Doc 9507/18
² Ad hoc Working Group on Monitoring, June 2018
³ Monitoring of Research Infrastructures Performance – ESFRI ad hoc Working Group Report, December 2019
⁴ All KPIs should be aligned with the objectives of RIs and fulfil RACER criteria: Relevant, Accepted, Credible, Easy to monitor, Robust. Each KPI should be accompanied by a reference sheet that provides a definition, data source(s), method of calculation, and other information concerning calculation or applicability – Recommendation 1, ibidem, pg. 4.
⁵ Proposal for the Implementation of the ESFRI Monitoring Approach, December 2021
Additionally, the outcomes of the Landmark monitoring exercise will provide insights into the functioning of the European RI ecosystem as a whole and will contribute to the identification of gaps in the European landscape and future opportunities for the RIs in Europe.

Each Landmark shall be monitored at regular intervals of about five years. Monitoring will be based on qualitative information gathered through a questionnaire and quantitative information represented by KPIs. In line with the two ESFRI monitoring reports mentioned in the previous chapter, RIs are invited to use the ESFRI KPIs, however, they may be replaced or complemented by other KPIs, which capture specific objectives of the Landmarks. The obtained information will be complemented by hearings (virtual) and site visits (if considered necessary by the Monitoring Panels), as relevant. The monitoring should be based as much as possible on the information already available, which Landmarks prepare for their governing bodies and the broader public.

Monitoring will cover Landmarks which have already started their operational phase and actively provide services. All eligible Landmarks will be monitored before the end of 2024, in three batches. Monitoring of the first batch will start in September 2022, after preparatory work starting from June 2022.

The Landmark monitoring process is coordinated by the ESFRI Monitoring Committee, while each Landmark will be analysed by a dedicated Monitoring Panel.

**ROLE OF THE MONITORING COMMITTEE**

The Monitoring Committee is responsible for the oversight of the monitoring process on behalf of ESFRI. It is composed of the Chairs of all SWGs, the Chair of the IG, selected EB Members and Delegates, as well as an EC representative. The Committee draws up the monitoring methodology, prepares general templates of the questionnaire and the monitoring report, proposes the timeline as well as coordinates its implementation.

**MONITORING PANELS**

The monitoring of individual Landmarks is carried out by dedicated Monitoring Panels. The Panels are established by the relevant SWGs and the IG.

The Panels are composed of 3-4 Members of the relevant SWGs (including at least one Member of SWG DIGIT to address the digital dimension of the RI), 1-2 Members of the IG. A representative of the European Commission may participate in the Panel as observer.

The Panels are advised by 2-3 external experts, at least one of which is identified by the involved SWGs and one by the IG. The external experts must have relevant experience and expertise in research infrastructures.

The Landmark will be informed about the names of the members of the Monitoring Panel and of the external experts.

The Panels should be established sufficiently in advance of the start of the monitoring of a particular Landmark. Each Panel should identify a Chair from among its members to organise and facilitate the work.
The Panels are responsible for engaging with the Landmarks throughout the monitoring process, discussing the KPIs used by the Landmark (checking what KPIs they use, to which extent they are consistent with ESFRI KPIs and the RACER criteria). If necessary, the Panels customise the questionnaires to be provided to each Landmark. The Panels are then responsible to analyse the gathered information, as well as to organise hearings (remotely) and site visits as relevant. The Panels draw up a monitoring report for each Landmark.

The collection of information through customised questionnaires and data feeding the KPIs is facilitated by the ESFRI MOS platform. The Landmark will electronically submit all the required data through the ESFRI MOS platform, using dedicated credentials provided.

PRINCIPLES, CONFLICT OF INTEREST (COI) AND CONFIDENTIALITY

Monitoring must comply with the following four principles:

- **Independence**, i.e. involved persons carry out the monitoring in a personal capacity and they represent neither their employer nor their country.

- **Impartiality**, i.e. involved persons must treat all Landmarks equally and assess them impartially on their merits, irrespective of their origin or the identity of the partners in the RI.

- **Objectivity**, i.e. involved persons carry out the monitoring based on the individual merit of each Landmark, refraining from any comparisons with other Landmarks.

- **Accuracy**, i.e. involved persons carry out the monitoring strictly in line with the agreed methodology and the relevant ESFRI documentation.

Each member of a Monitoring Panel must sign a declaration of the absence of conflict of interest (COI) and a confidentiality declaration.

The Monitoring Committee checks any potential COI of Panel members based on the self-declaration of the Panel members in advance of the exercise and confirms no COI exists in the Panels. A COI may arise, in particular, due to science competition, scientific and economic interests, political or national affinities, family or emotional ties, or any other relevant connection or shared interest.

Strict confidentiality rules apply. Any information obtained during the monitoring process beyond the agreed content of the Monitoring Reports must be kept confidential and may not be used for any other purpose. For each assessment, only the relevant persons will have access to a repository of all confidential documents.

IMPLEMENTATION OF THE MONITORING PROCESS

The first cycle of Landmarks monitoring will be implemented from September 2022 until December 2024. It will cover all the ESFRI Landmarks listed in the 2018 Roadmap, which have entered the operational phase. It will thus not cover the new Landmarks from the 2021 Roadmap. Including non-operational Landmarks may be considered in duly justified cases.

The monitoring process will consist of the following steps:
• Agreement on the overall schedule of the whole monitoring cycle, including periods when each Landmark will be monitored, based on the proposal from the ESFRI Working Groups and in consultation with the concerned Landmarks.
• Establishment of the monitoring panel for each Landmark, including external experts. The names will be communicated to Landmarks for information.
• Agreement with each Landmark on the list of additional documents the Landmark will submit (e.g. strategic plans and research agendas, annual reports, catalogues of services, etc.), the KPIs they will use as well as on the individual timeline.
• Opening of the ESFRI MOS system.
• Submission of the questionnaire, KPI data and other agreed documents by the Landmarks.
• Initial analysis of the documents and agreement on follow-up questions.
• Organisation of hearings and/or site visits.
• Preparation of a draft report containing an analysis of all the elements requested to each Landmark.
• Factual check of the draft report by the concerned Landmark.
• Preparation of the final monitoring report for each Landmark, for approval of the Forum.
• Preparation of the final report from the first Landmark monitoring cycle 2022-2024, for approval of the Forum.

The individual reports will indicate whether the RIs should retain their Landmark quality mark. In case of significant issues found for a particular Research Infrastructure that could impact its Landmark status, a follow-up review focusing on the implementation of the recommendations will be scheduled within two years, after which the Forum will take a final decision, taking into account the recommendations of the second review.

After the first batch, the Monitoring Committee will consider if any adjustments to the monitoring process are necessary. At the end of the first monitoring cycle, ESFRI will carry out an in-depth evaluation of the monitoring system and procedures.
## TIMELINE

Timeline for the monitoring of the first batch of the Landmarks.

<table>
<thead>
<tr>
<th>STEPS</th>
<th>DATE / DEADLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of Monitoring Panels</td>
<td>By 15 September 2022</td>
</tr>
<tr>
<td>Kick-off meeting with Landmarks</td>
<td>16 September 2022</td>
</tr>
<tr>
<td>Identification of external experts for each Landmark</td>
<td>October 2022</td>
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<tr>
<td>Agreement with Landmarks on the list of KPIs and on monitoring documents</td>
<td>October 2022</td>
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<tr>
<td>Opening of the MOS+ system for Landmarks</td>
<td>November 2022</td>
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<tr>
<td>Submission of documents by Landmarks</td>
<td>31 January 2023</td>
</tr>
<tr>
<td>External experts reports</td>
<td>28 February 2023</td>
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<tr>
<td>Initial analysis of the documents and agreement on follow-up questions</td>
<td>31 March 2023</td>
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<tr>
<td>Hearings / Site visits</td>
<td>1 - 30 April 2023</td>
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<tr>
<td>Draft Reports by Monitoring Panels</td>
<td>15 May 2023</td>
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<tr>
<td>Factual check by the Landmarks</td>
<td>22 May 2023</td>
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<tr>
<td>Draft Final reports by Monitoring Panels</td>
<td>31 May 2023</td>
</tr>
<tr>
<td>Review of the reports by the Monitoring Committee</td>
<td>10 June 2023</td>
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<tr>
<td>Final reports by Monitoring Panels for approval of the Forum</td>
<td>20 June 2023</td>
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<tr>
<td>Approval of the Forum</td>
<td>By 15 July 2023</td>
</tr>
<tr>
<td>Lessons learnt from the first batch and adapted monitoring procedure</td>
<td>15 September 2023</td>
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## ATTRIBUTION OF LANDMARKS TO MONITORING Batches

<table>
<thead>
<tr>
<th>Domain</th>
<th>Name</th>
<th>Full name</th>
<th>Roadmap (Y)</th>
<th>Landmark (Y)</th>
<th>Operation start (Y)</th>
<th>Monitoring Year</th>
</tr>
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<tbody>
<tr>
<td>SCI</td>
<td>ESS ERIC</td>
<td>European Social Survey</td>
<td>2006</td>
<td>2016</td>
<td>2013</td>
<td>2022</td>
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<td>SCI</td>
<td>CLARIN ERIC</td>
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<td>2016</td>
<td>2012</td>
<td>2022</td>
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<td>SCI</td>
<td>CESSDA ERIC</td>
<td>Consortium of European Social Science Data Archives</td>
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<td>2013</td>
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<td>SCI</td>
<td>DARIAH ERIC</td>
<td>Digital Research Infrastructure for the Arts and Humanities</td>
<td>2006</td>
<td>2016</td>
<td>2019</td>
<td>2023</td>
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<tr>
<td>ENV</td>
<td>ICOS ERIC</td>
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<td>2006</td>
<td>2016</td>
<td>2016</td>
<td>2022</td>
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<tr>
<td>ENV</td>
<td>EURO-ARGO ERIC</td>
<td>European contribution to the international Argo Programme</td>
<td>2006</td>
<td>2016</td>
<td>2014</td>
<td>2022</td>
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<tr>
<td>ENV</td>
<td>EPOS ERIC</td>
<td>European Plate Observing System</td>
<td>2008</td>
<td>2018</td>
<td>2023</td>
<td>2023</td>
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<td>ENV</td>
<td>EMSO ERIC</td>
<td>European Multidisciplinary Seafloor and water-column Observatory</td>
<td>2006</td>
<td>2016</td>
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<td>2023</td>
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<td>In-service Aircraft for a Global Observing System</td>
<td>2006</td>
<td>2016</td>
<td>2014</td>
<td>2023</td>
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<td>LifeWatch ERIC</td>
<td>e-Infrastructure for Biodiversity and Ecosystem Research</td>
<td>2006</td>
<td>2016</td>
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<td>2024</td>
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<td>ENV</td>
<td>EISCAT_3D</td>
<td>Next generation European Incoherent Scatter radar system</td>
<td>2008</td>
<td>2018</td>
<td>2023</td>
<td>2024</td>
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<tr>
<td>H&amp;F</td>
<td>BBMRI ERIC</td>
<td>Biobanking and BioMolecular Resources Research Infrastructure</td>
<td>2006</td>
<td>2016</td>
<td>2014</td>
<td>2022</td>
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<tr>
<td>H&amp;F</td>
<td>ECRIN ERIC</td>
<td>European Clinical Research Infrastructure Network</td>
<td>2006</td>
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<td>H&amp;F</td>
<td>EATRIS ERIC</td>
<td>European Advanced Translational Research Infrastructure in Medicine</td>
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<td>2016</td>
<td>2013</td>
<td>2022</td>
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<td>H&amp;F</td>
<td>ELIXIR</td>
<td>A distributed infrastructure for life-science information</td>
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<td>2014</td>
<td>2022</td>
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<td>INFRAFRONTIER</td>
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<td>INSTRUCT ERIC</td>
<td>Integrated Structural Biology Infrastructure</td>
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<td>European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences</td>
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<td>H&amp;F</td>
<td>EMBRC ERIC</td>
<td>European Marine Biological Resource Centre</td>
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<td>2018</td>
<td>2017</td>
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<tr>
<td>Domain</td>
<td>Name</td>
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<td>Roadmap (Y)</td>
<td>Landmark (Y)</td>
<td>Operation start (Y)</td>
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<td>ECCSEL ERIC</td>
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<td>DIGIT</td>
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<td>PSE</td>
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<td>European Synchrotron Radiation Facility Extremely Brilliant Source</td>
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<td>PSE</td>
<td>SPIRAL2</td>
<td>Système de Production d’Ions Radioactifs en Ligne de 2e génération</td>
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<td>2016</td>
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<tr>
<td>PSE</td>
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<td>Extreme Light Infrastructure</td>
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