Conservation Gap Analysis of Select Native

Asian Oaks


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Species profile: *Quercus hondae*

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CRITICALLY ENDANGERED

Quercus baniensis
Quercus baolamensis
Quercus bidoupensis
Quercus blaoensis
Quercus cambodiensis
Quercus camusiae
Quercus dankiaensis
Quercus dilacerata
Quercus donnaiensis
Quercus honbaensis
Quercus mangdenensis
Quercus ngochoaensis
Quercus pseudoverticillata
Quercus sontraensis
Quercus trungkhanhensis
Quercus xuanlienensis

ENDANGERED

Quercus arbutifolia
Quercus asymmetrica
Quercus bambusifolia
Quercus chrysotricha
Quercus disciformis
Quercus edithiae
Quercus kinabaluensis
Quercus kingiana
Quercus lenticellata
Quercus lodicosa
Quercus nivea
Quercus percoriacea
Quercus petelotii
Quercus ramsbottomii
Quercus rupestris
Quercus steenisii
Quercus xanthotricha

VULNERABLE

Quercus austrocochinchinensis
Quercus braianensis
Quercus gaharuensis
Quercus hondae
Quercus kerangasensis
Quercus merrillii
Quercus quangtriensis
Quercus treubiana

Quercus hondae Makino

IUCN Red List Category and Criteria: Vulnerable B1ab(iii,v)+2ab(iii,v)
Common Name: Hanagagashi (Japanese for "long-leaf oak")
Classification: Subgenus *Cerris*, Section *Cyclobalanopsis*

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DISTRIBUTION AND BIOLOGY

Quercus hondae is restricted to the islands of Kyushu (east coast) and Shikoku (south coast), Japan, where it occupies humid valley slopes and bottoms within warm-temperate evergreen broadleaved forests (Figure 1; Figure 2). It typically occurs at low elevations ranging from sea level to 400 meters (Ito et al., 2007). *Quercus hondae* is a large tree, frequently exceeding 20 meters in height with trunk diameters over 1 meter. It is characterized by thick, fissured, dark gray bark. Leaves are lanceolate to oblanceolate and leathery, up to 14 cm long, glossy bright green adaxially, with sharp teeth on the acuminate apical half. The short petiolate leaves are somewhat clustered at the apices of the branchlets. The ovoid-elliptic acorns require two years to ripen and are housed in fuzzy, hemispherical cupules. It is commonly found in association with *Q. gilva*, *Q. glauca*, and *Castanopsis cuspidata*.

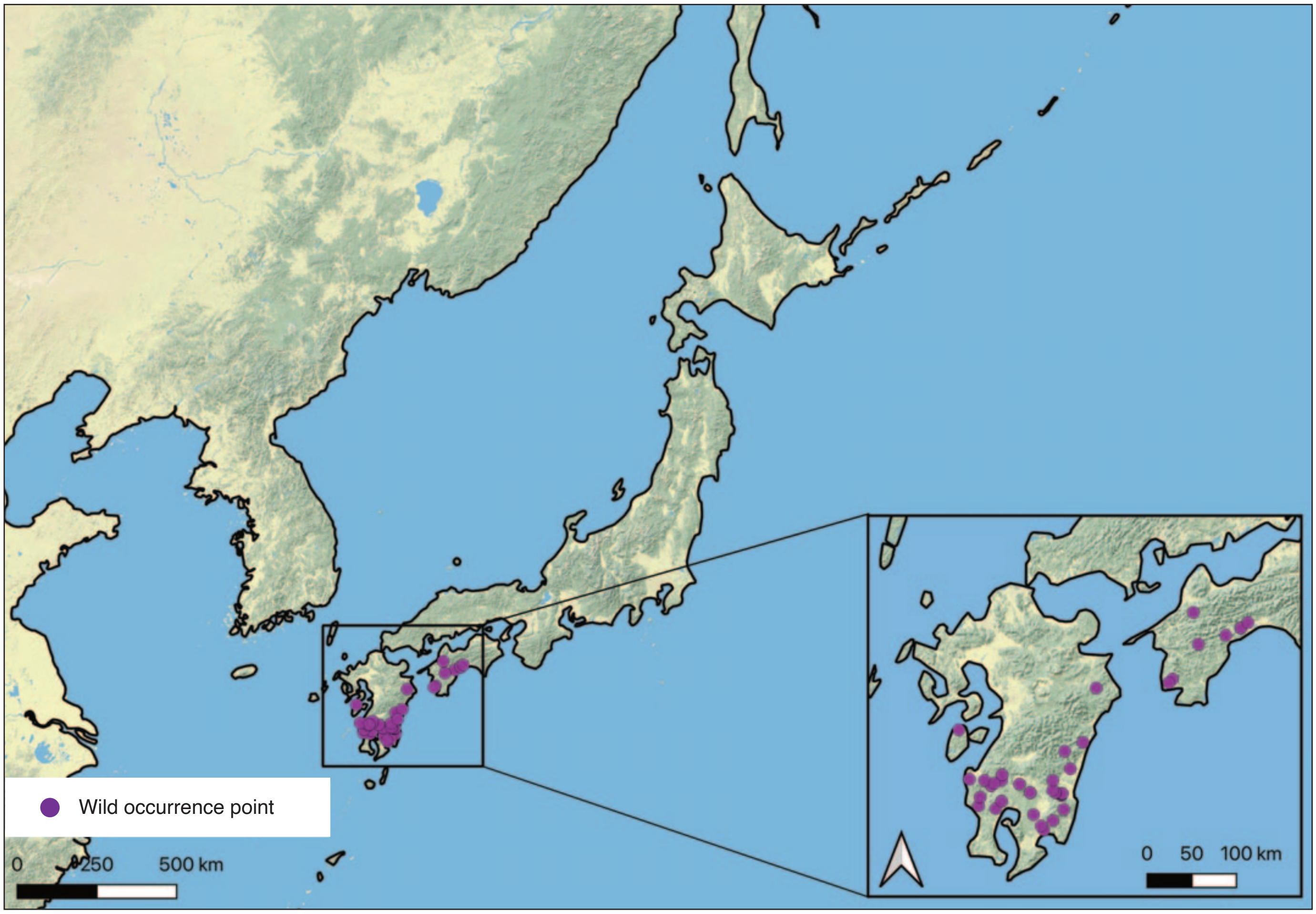

Figure 1. Wild (i.e., *in situ*) occurrence points for *Quercus hondae*.

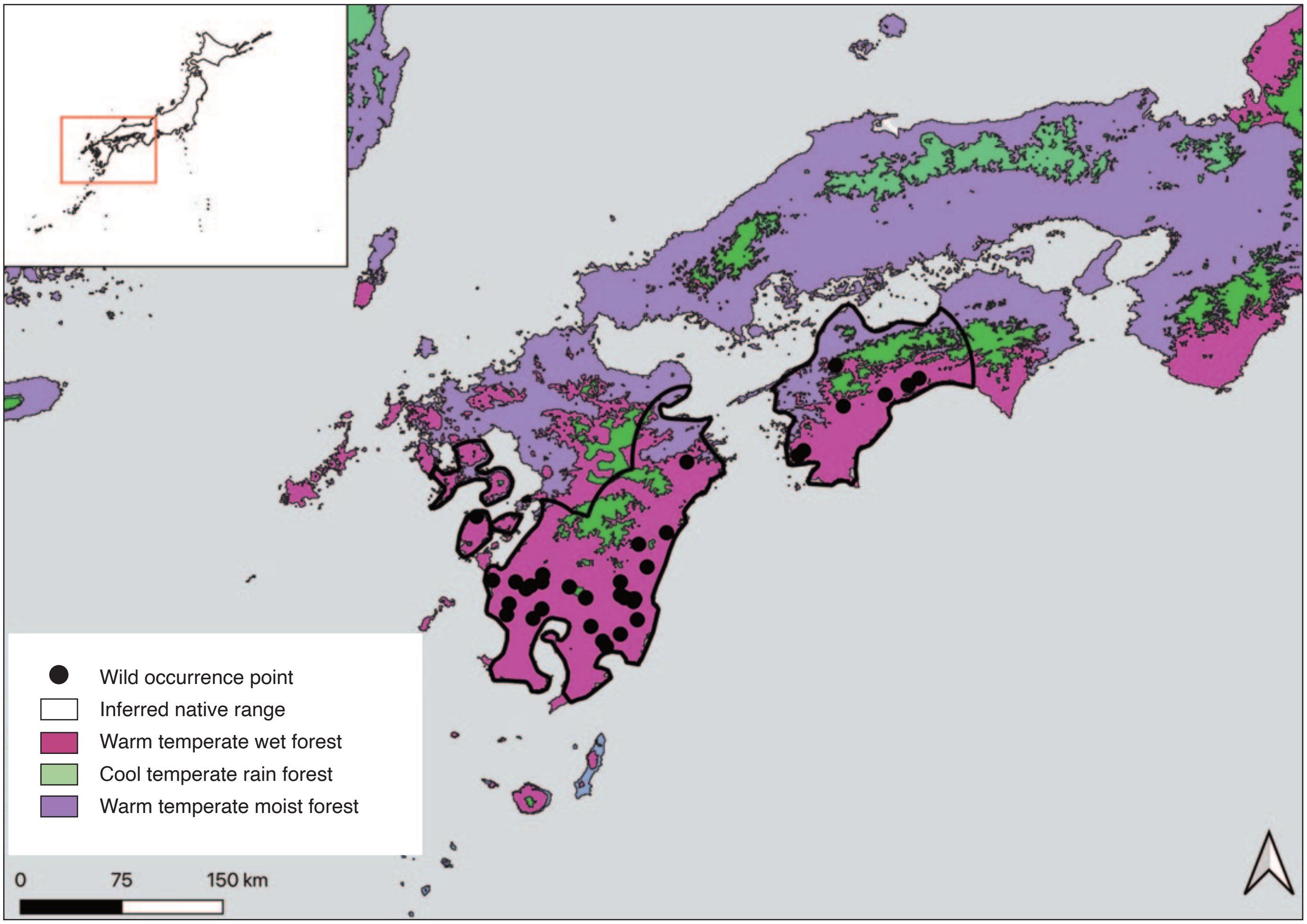

Figure 2. Holdridge life zones (HLZs) within the inferred native range of *Quercus hondae*. Map legend includes the HLZs with at least one occurrence point of *Q. hondae*. For a full map of HLZs within the study region, see Appendix B in Good et al. (2026).

THREATS TO WILD POPULATIONS

Biodiversity loss in Southeast and East Asia is primarily driven by habitat loss from rapid urbanization, industrialization, and agricultural expansion, resulting in some of the highest deforestation rates globally (Austin et al., 2017; Botterill-James et al., 2024; World Resources Institute, 2025). For oaks in Southeast and East Asia, agricultural expansion (including wood and pulp plantations) is the leading threat, followed by logging and wood harvesting (Good et al., 2026). While species-specific data remain limited, a literature review and consultation with species experts indicates that these broader pressures are applicable to *Q. hondae* and other terrestrial plant species.

Logging and wood harvesting: This is not currently considered a threat.

Agriculture, wood and pulp plantations: The primary driver of decline for *Q. hondae* is habitat loss, specifically the large-scale conversion of native broadleaved forests into *Cryptomeria* plantations. This has resulted in severe fragmentation, leaving the remaining populations small and isolated. Many extant stands survive only as "tutelary forests" or sacred groves surrounding Japanese shrines. Furthermore, the species suffers from regeneration failure; in several locations, such as the Asakura and Hachiman shrines, populations consist solely of mature relics with no observed seedling recruitment or juveniles.

Residential/commercial development, mining, roads: This is not currently considered a threat.

Tourism and recreation: This is not currently considered a threat.

Fire and fire suppression: This is not currently considered a threat.

Invasive species competition/disturbance: This is not currently considered a threat.

Climate change and severe weather: There are no studies on the direct impact of climate change on *Q. hondae*. However, Japan as a whole faces multiple threats from climate change, including heatwaves, changing precipitation patterns, fires, and increased storm intensity. In Kyushu, where *Q. hondae* is found, climate change is predicted to increase both the intensity and frequency of heavy rainfall (Tai et al., 2019). This increases the risk of landslides, which would impact forest habitat (Ministry of Education, Culture, Sports, Science and Technology, Japan Meteorological Agency, Ministry of the Environment, 2013).

Genetic material loss: Recent genetic research has highlighted a precarious conservation outlook for the species. Genetic diversity is significantly compromised, with heterozygosity levels 27% lower than its more common relative, *Q. glauca* (Kamiya et al., 2022). High genetic differentiation between populations suggests that genetic drift is currently outweighing gene flow, likely due to the extreme isolation of these small remnants. Certain sites, specifically the Miyazaki University Forest, Tsuruda, and Kamibun populations, have been identified as probable Pleistocene refugia harboring the highest levels of remaining genetic diversity.

Pests/pathogens: One of the most significant threats currently facing Fagaceous trees in Japan is Japanese Oak Wilt (JOW), a disease caused by the fungus *Raffaelea quercivora* and vectored by the ambrosia beetle *Platypus quercivorus*. Large-diameter trees, such as *Q. hondae*, are particularly susceptible to beetle attacks, posing a severe risk of rapid mortality upon infection. Given that JOW damage has already been reported within its distribution range in Kyushu and Shikoku, Japan, the potential loss of the few remaining mature individuals must be explicitly addressed in conservation management plans. Although evidence is currently limited to domestic conference proceedings, the infestation of *Q. hondae* by *P. quercivorus* has been documented in Miyazaki Prefecture. (Hirata et al., 2016)

Extremely small populations: There is little information on the population size of *Q. hondae*. In a study investigating the ecological distribution of seven evergreen *Quercus* species in Kyushu, Japan, Ito et al. (2007) noted that *Q. hondae* was the most infrequent *Quercus* species encountered. Similarly, Kamiya et al. (2022) describes *Q. hondae* as having small and isolated populations.

CONSERVATION ACTIVITIES

Once per year between 2021 and 2025, *Quercus* accessions data were requested from *ex situ* collections globally. A total of 45 institutions from 12 countries submitted data for Southeast and East Asian (SE-E Asian) oak species, including *Q. hondae*. We also included *ex situ* collections data in our analysis from the 267 institutions that responded to surveys conducted in 2017–2022 for previous gap analysis of oaks led by The Morton Arboretum, as these often included all *Quercus* level accession data at an institution and could have included one or more of our target species. Past, present, and planned conservation activities for SE-E Asian oak species of concern were also examined through literature review and expert consultation.

Two institutions reported *ex situ* collections of *Q. hondae* (Table 1), both of which are located in Europe. Provenance type was unknown or not reported for all individuals at both institutions. As a result, geographic and ecological coverage of *ex situ* collections for *Q. hondae* could not be calculated.

Using methods adapted from Khoury et al. (2020), we estimated the degree of representation of *Q. hondae* in protected areas in order to identify *in situ* conservation gaps. Wild occurrence points were mapped and overlaid with protected areas from the World Database on Protected Areas (Figure 3; UNEP-WCMC & IUCN, 2025). A fifty-kilometer buffer was placed around each occurrence point to represent the species inferred native range. Geographic coverage *in situ* was estimated by calculating the proportion of a species inferred native range that is covered by protected areas. Ecological coverage *in situ* was estimated by identifying the Holdridge life zones in the inferred native range as well as the Holdridge life zones in protected areas within the inferred native range and calculating the percentage of life zones that are conserved in protected areas. Species representativeness *in situ* was estimated by calculating the percentage of known occurrence points within the species inferred native range that fall inside protected areas. All three scores range from 0–100. A final conservation score *in situ* was calculated by taking an average of the three scores above. Final scores range from 0–100, with scores near 100 indicating comprehensive *in situ* conservation, and scores near 0 indicating poor *in situ* conservation (Table 2).

Table 1. Results of 2017–2022 *ex situ* surveys.

Number of *ex situ* collections reporting this species	2
Number of plants in *ex situ* collections	2
Average number of plants per institution	1
Percent of *ex situ* plants of wild origin	NA
Percent of wild origin plants with known locality	NA

Table 2. *In situ* conservation scores for *Quercus hondae* with all scores ranging from 0–100. A final score of 100 indicates comprehensive *in situ* conservation, and a score of 0 represents poor *in situ* conservation.

Geographic coverage *in situ*	17
Ecological coverage *in situ*	100
Species representation in *in situ* collections	12
Final *in situ* conservation score	43

The final conservation score *in situ* for *Q. hondae* is 43/100 (Table 2). As a reference, the threatened or Data Deficient SE-E Asian oaks with the highest *in situ* conservation scores are *Q. blaoensis* with a score of 77/100, and *Q. xuanlienensis* with a score of 79/100.

Land protection: Seventeen percent of the land area within the inferred native range of *Q. hondae* is within protected areas (Table 2). Small populations of *Q. hondae* are preserved in the traditional, protected “tutelary forests” of Japanese shrines.

Sustainable management of land: This is not a known conservation activity at the time of publication.

Population monitoring and/or occurrence surveys: In a 2022 study by Kamiya et al. on the genetic diversity of *Q. hondae*, the authors collected 202 individual samples from 12 localities of *Q. hondae* covering almost the entire distribution range of the species.

Wild collecting and/or *ex situ* curation: According to the results of our *ex situ* surveys, *Q. hondae* is currently held in two *ex situ* collections. The origin of the plants is unknown, or was not reported.

Propagation and/or breeding programs: This is not a known conservation activity at the time of publication.

Reintroduction, reinforcement, and/or translocation: This is not a known conservation activity at the time of publication.

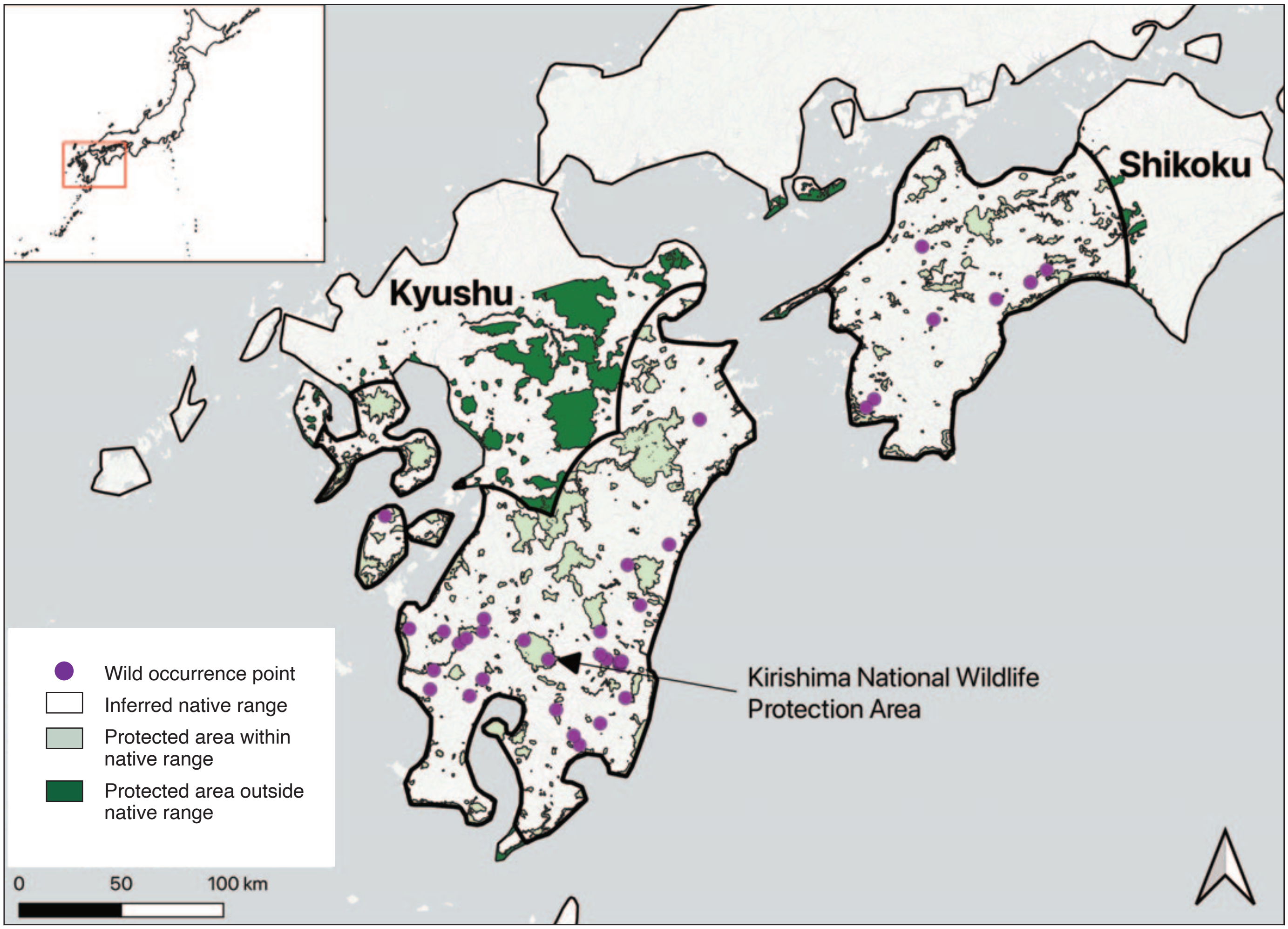

Figure 3. Wild occurrence points and inferred native range of *Quercus hondae* in relation to protected areas. Protected areas are from the World Database on Protected Areas (UNEP-WCMC & IUCN, 2025).

Research: Research on *Q. hondae* has primarily focused on the species' distribution, habitat conditions, and genetic diversity. Ito et al. (2020) investigated the ecological distribution of *Q. hondae* in Kyushu, Japan. They found that the occurrence of *Q. hondae* was mostly restricted to elevations less than 400 m, and mainly found on lower slopes. Yamashita et al. (2010) examined the habitat conditions of *Q. hondae* compared to the more widespread *Q. gilva* in Miyazaki Prefecture, Japan. They found that *Q. hondae* stands occur on thinner soil on steeper slopes with poor soil moisture compared to *Q. gilva*. Kamiya et al. (2022) evaluated the genetic diversity and phylogeographic structure of *Q. hondae* compared to *Q. gilva*. They found substantially lower heterozygosity at both the population and species level in *Q. hondae* relative to *Q. gilva*. Two subpopulations of *Q. hondae* (Miyazaki University Forest and Tsuruda) had the highest degree of genetic diversity among all subpopulations studied, and were identified as priorities for *in situ* conservation.

Education, outreach, and/or training: This is not a known conservation activity at the time of publication.

Species protection policies: This is not a known conservation activity at the time of publication.

PRIORITY CONSERVATION ACTIONS

To preserve the unique genetic structure of *Q. hondae*, *in situ* protection of the identified high-diversity refugia is the highest priority. Future efforts should focus on enhancing *ex situ* collections through vegetative propagation techniques, such as cuttings, to bolster the survival of populations currently failing to regenerate naturally. However, while vegetative propagation is theoretically possible for nearly all *Quercus* species, there is no specific documented evidence in available horticultural literature that *Q. hondae* has been successfully propagated through cuttings, and more research is needed.

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