

## Article

# Ex Ante Social Legitimacy and Institutional Stakeholder Approval of Protected Area Designation: Evidence from the Proposed Iblei National Park

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## Abstract

The designation of protected areas depends not only on ecological criteria but also on social acceptability. This study investigates the factors associated with ex ante support for the proposed Iblei National Park (Italy) through a survey of institutional stakeholders—public bodies, category associations, professional orders, and environmental associations—who are directly involved in or affected by the designation process. Focusing on environmental worldviews, place identity, and perceived economic benefits, the analysis combines parsimonious composite indices with exploratory ordinal regression models. Descriptive and associative results show that environmental attitudes and place identity are positively associated with stated support in baseline specifications, although neither association reaches conventional levels of statistical significance. When perceived economic benefits are added, they show the largest association with stated support among the variables considered, while the estimated associations of environmental values and place identity are attenuated to magnitudes indistinguishable from zero. The association of perceived economic benefits is stable in sign and magnitude across specifications, though its statistical strength varies with how the outcome is operationalised. These patterns, drawn from a small, near-complete population of institutional stakeholders, suggest that value- and identity-based orientations shape a general predisposition toward conservation, while explicit stakeholder endorsement is more closely associated with expectations of local economic benefits. We interpret these findings as exploratory evidence on distinct, and possibly complementary, channels of ex ante social legitimacy, to be corroborated by larger and mixed-method research designs.

**Keywords:** protected area designation; social acceptability; stakeholder support; place identity; environmental worldviews; perceived economic benefits; institutional stakeholders



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## 1. Introduction

The designation of protected areas is no longer understood as a purely technical exercise in ecological planning. Beyond their biophysical design and legal status, protected areas are institutions embedded in social contexts, where the perceptions, values, and expectations of local actors substantially influence implementation outcomes, compliance with management rules, and the emergence of conflict. Conservation planning has accordingly shifted from a predominantly biophysical perspective towards a socio-ecological understanding of protected areas, in which effectiveness, legitimacy, and long-term durability depend on social legitimacy as much as on ecological adequacy [1–5]. Where human

responses to protection are not anticipated, formally designated areas may deliver little effective protection—the well-documented problem of “paper parks”—even when ecological criteria are soundly defined [6].

This concern has acquired renewed urgency with the “30by30” commitments of the Kunming–Montreal Global Biodiversity Framework (2022) and the EU Biodiversity Strategy for 2030, which commit member states to legally protecting at least 30% of their land and sea area. Meeting such targets implies extending protection into territories that are inhabited, economically productive, and institutionally contested, where the social conditions of designation cannot be treated as a residual concern.

Two related but distinct constructs recur in this literature and are frequently conflated: social acceptability and stakeholder support. Following recent conceptual discussions of legitimacy in conservation governance, we define social acceptability as the extent to which stakeholders judge a protected area designation to be legitimate, tolerable, or compatible with local circumstances, and stakeholder support as the active, stated endorsement of a specific designation proposal [7,8]. A stakeholder may regard a designation as broadly acceptable while withholding explicit support, or may express support conditional on specific arrangements. The present study focuses specifically on *ex ante* stakeholder support, operationalized as stated approval of the proposed designation prior to its formal adoption; we use “support” and “approval” consistently to refer to this specific construct throughout, and reserve “acceptability” for the broader normative judgment discussed in Section 2.

Within this context, institutional stakeholders occupy a distinctive position. We define them here as the public bodies, category and trade associations, professional orders, and environmental associations formally involved in, or directly affected by, a protected area designation process, rather than a random sample of individual residents. Their positions are formed while boundaries, zoning schemes, and use restrictions are still negotiable, and they are therefore consequential for the trajectory that a designation process takes. Recent studies explicitly highlight the value of capturing stakeholder views at early planning stages in order to anticipate legitimacy challenges and potential sources of conflict [9], in both rural and urban settings [10], and show that the social factors underlying stated approval and active support may differ substantially [11].

The empirical setting of this study is the proposed Iblei National Park, in south-eastern Sicily (Italy). Its establishment was mandated by Law No. 222 of 29 November 2007 but has never been completed, and the proposal remains formally at a pre-designation stage. According to the most recent planning documents the park would cover approximately 146,849 ha across 27 municipalities, which would place it among the largest national parks in Italy. This scale amplifies both potential conservation benefits and perceived socio-economic trade-offs, making the Iblei case a particularly informative setting in which to examine *ex ante* support; Section 3.1 details the conservation, geographical, and cultural characteristics that motivate this choice.

This paper analyses institutional stakeholder support for protected area designation through a deliberately parsimonious framework that treats environmental worldviews, place identity, and perceived economic benefits as related but conceptually distinct sources of social legitimacy, combining theory-driven composite indices with exploratory ordinal regression models. The contribution is twofold. Substantively, the study describes how value-based, identity-based, and instrumental orientations relate jointly, and unequally, to stated approval at the planning stage. Methodologically, it proposes and documents a transparent measurement and modelling strategy for a situation that is common in applied conservation research but rarely discussed explicitly: one in which the relevant stakeholder

population is itself small and institutionally bounded, so that the inferential apparatus developed for large resident surveys does not apply.

The remainder of the paper is structured as follows. Section 2 reviews the literature on the social legitimacy of protected areas, on environmental worldviews, place-based identities, and perceived socio-economic impacts, and on ex ante assessment as a planning input, and closes by stating the research gap and the research questions addressed here. Section 3 describes the study area, the stakeholder population and identification procedure, the questionnaire, the operationalization of the variables, and the econometric specification adopted for ordinal outcomes. Section 4 presents the descriptive and econometric results, together with a sensitivity analysis and diagnostic checks. Section 5 discusses these results in relation to the reviewed literature. Section 6 concludes with implications for protected area planning and governance, explicit limitations, and directions for future research.

## 2. Literature Review

This section situates the present study within four strands of research and one methodological debate. It first frames social acceptance as a multidimensional property of protected area governance (Section 2.1), then reviews in turn the three families of explanation that the analysis brings together—environmental worldviews (Section 2.2), place-based identities (Section 2.3), and perceived socio-economic impacts (Section 2.4)—before turning to the specific role of ex ante assessment in planning (Section 2.5). Section 2.6 draws the resulting gap, states the research questions, and explains why the theoretical structure outlined here leads to a composite index-based, rather than a latent-variable, operationalization.

### 2.1. Social Acceptance and the Legitimacy of Protected Areas

A growing body of literature shows that stakeholder acceptance of protected areas is not a monolithic attitude but the outcome of multiple, partially overlapping mechanisms related to values, identities, and the perceived consequences of conservation policies [8,12–14]. Legitimacy, in this reading, is not conferred once by legal designation; it is produced and reproduced through the judgments of the actors who live with, administer, or represent interests in the protected territory.

Work on protected area governance has correspondingly moved from a focus on institutional design in the narrow sense towards attention to the quality of governance processes, including institutional trust, public engagement, and the procedural and distributive fairness of designation decisions [5,8,15,16]. Bennett and Satterfield [17] situate legitimacy alongside effectiveness, equity, responsiveness, and robustness as one of the constitutive objectives against which governance arrangements should be assessed, rather than as a by-product of them. This literature supplies an important boundary condition for the present study: stakeholder support is one input to conservation planning among several, to be weighed alongside ecological evidence, legal obligations, conservation urgency, and considerations of justice, rather than a criterion that overrides them.

Comparative and global evidence reinforces this framing in three respects. First, engagement is not self-validating: a review of 82 case studies and 31 meta-analyses finds that stakeholder engagement in biodiversity conservation is linked only weakly and inconsistently to conservation outcomes, with the design, quality, and timing of engagement mattering more than its mere occurrence [18]. Second, a recent global synthesis of governance and conservation effectiveness across protected areas and Indigenous and locally managed areas concludes that governance arrangements, rather than protection status alone, condition both ecological and social outcomes [19]. Third, on the perception side, a synthesis of local residents' perceptions across a large number of protected areas shows that benefits and problems are typically reported simultaneously rather than alternatively, so

that support cannot be read as a simple function of net perceived advantage [20]; evidence from coastal and marine settings likewise finds social acceptance to be contingent on how the designation process is conducted and on how expected impacts are distributed [21].

Within this broader frame, three families of explanation recur in empirical applications, and are reviewed in turn below. They operate at different conceptual levels—a general normative orientation, a symbolic and affective bond with a specific territory, and an instrumental appraisal of expected consequences—and this asymmetry, rather than being incidental, is central to the argument developed in Section 2.6.

## 2.2. *Environmental Worldviews and the New Ecological Paradigm*

A first strand of research highlights the role of environmental worldviews in shaping normative orientations towards nature protection and regulatory intervention. In this respect, the New Ecological Paradigm (NEP) has become one of the most widely used frameworks for capturing ecocentric versus anthropocentric orientations and their association with pro-environmental attitudes and policy support [22]. In value–belief–norm accounts, such general orientations sit upstream of more situated beliefs and appraisals, and influence a specific evaluative act only indirectly and jointly with them [1,2]. Empirical evidence consistently shows that stronger ecocentric worldviews are associated with higher acceptance of conservation measures, although their explanatory power is often contingent on contextual and institutional factors [1,14,22].

At the same time, the psychometric behaviour of the NEP scale is itself the subject of a substantial methodological literature. Although the revised scale was proposed as a unidimensional measure, applications across populations, languages, and cultural settings frequently recover multiple dimensions, and internal consistency estimates vary widely. The meta-analysis by Hawcroft and Milfont [23], covering 69 studies conducted in 36 countries and encompassing 139 samples, documents reliability estimates ranging from approximately 0.35 to 0.87 with a mean close to 0.68, and shows that scores vary systematically with the type of sample and with the number of items administered, environmentalist and white-collar samples differing appreciably from nationally or regionally representative ones. Reviewing three decades of use of the instrument, Dunlap [24] accordingly advises researchers to assess dimensionality empirically in each application rather than presuming it.

Two further strands qualify how reliability should be read. Amburgey and Thoman [25] find that the scale is better represented by a second-order structure with correlated first-order factors than by a single factor, and observe that computing a coefficient alpha on a multidimensional composite is inappropriate in principle, since alpha presupposes unidimensionality and is in any case unrelated to the internal structure of a set of items [26,27]. Most directly relevant to the present setting, Dorward et al. [28], working in protected area landscapes, report that exploratory factor analysis supported none of the scale's original factors in one of their two study countries, and that the resulting components correlated only weakly with support for protected area regulations; they conclude that considerable care is required when the instrument is transferred to new contexts and populations.

Two implications follow for the present study, and both bear directly on how the measurement properties reported in Section 4.1 should be interpreted. First, a low alpha on the full fifteen-item battery in a small and occupationally specialized population falls within the range documented across the literature and is not an anomaly of this dataset. Second, and more consequentially, alpha is not the appropriate criterion for a battery that is not unidimensional to begin with [25–27]. Recognizing this measurement debate at the review stage therefore matters, because it is what makes an index-based treatment of the

NEP items a theoretically motivated choice rather than a concession to sample size alone (Sections 2.6 and 3.5).

### 2.3. *Place Attachment and Place Identity*

A second, complementary strand emphasizes human–place relationships, particularly place attachment and place identity. These concepts capture the emotional, symbolic, and functional bonds that individuals and communities develop with specific landscapes through lived experience, social relations, and shared histories [29,30]. Place attachment is now widely recognized as a multidimensional construct encompassing personal identity, functional dependence, social bonding, and connections to the natural environment [31–33]. The present study focuses on place identity in the narrower, cognitive–symbolic sense of the term—the extent to which a territory is incorporated into the definition of the self [29]—and treats it as conceptually distinct from place dependence and nature bonding.

Crucially, the relationship between place-based bonds and conservation support is not monotonic. Strong attachment can foster support where protection resonates with locally valued landscapes and identities, but it can equally generate resistance where conservation is perceived as externally imposed or misaligned with local meanings, practices, and livelihoods [30,34–36]. Sense of place has also been shown to mediate human–environment relationships and governance outcomes more generally, particularly in multifunctional landscapes [37]. In the Italian context specifically, regional identity has been shown to predict support for the designation of protected areas positively [38], which establishes place-based identity as a central and empirically grounded component of social legitimacy in this setting rather than a secondary or “soft” consideration.

### 2.4. *Perceived Socio-Economic Impacts and Instrumental Considerations*

A third body of work focuses on instrumental considerations, highlighting stakeholders’ perceptions of the economic and social consequences associated with protected areas. Perceived benefits such as tourism development, employment opportunities, and local value creation have been shown to influence acceptance, particularly in multifunctional rural landscapes where conservation objectives intersect with productive activities [12,13,39]. Conversely, perceived costs and distributional concerns can undermine support even where conservation goals are endorsed in principle, and protected areas perceived as imposing constraints without compensating benefits are more likely to generate conflict, resistance, and weak compliance [5,8,13].

Evidence from rural and local contexts across several European countries indicates that attitudes towards protected areas are strongly shaped by expectations regarding economic opportunities, livelihood impacts, and broader socio-economic effects [40–42]. Using structural equation modelling on a large sample of local residents across ten European protected areas, Jones et al. [43] show that perceived social impacts, together with governance indicators such as institutional trust and public engagement, mediate the relationship between individuals’ social profile and their public support. McGinlay et al. [11] similarly find that the factors underlying stated and active support diverge. A meta-analysis of 305 environmental governance cases further underscores the importance of context-specific factors, including the scope and composition of the engaged stakeholder population, in shaping governance outcomes [44]. Taken together, this strand indicates that instrumental and governance-related perceptions, and not values alone, are central to explaining stated support.

### 2.5. *Ex Ante Assessment as an Input to Protected Area Planning*

From a planning perspective, the distinction between ex ante and ex post social acceptance is consequential. Whereas ex post assessments primarily inform adaptive man-

agement within already established protected areas, ex ante assessment bears directly on the design phase of conservation interventions, including decisions on spatial boundaries, zoning schemes, management objectives, and governance arrangements. In this sense it functions as an early decision-support and diagnostic tool, allowing planners to anticipate potential sources of resistance, legitimacy deficits, or conflict before institutional commitments become irreversible [7,45–48].

Recent ex ante evaluations show that incorporating social acceptance at the planning stage can improve the effectiveness and durability of protected areas by aligning ecological objectives with locally perceived priorities and constraints [46,49]. Such insights can inform the selection of protection categories, the calibration of use restrictions, the design of buffer and transition zones, and the sequencing of implementation measures. Ex ante social acceptability should not, however, be interpreted as a requirement for unanimity or as conferring veto power on any stakeholder category; it is one planning input among several, complementing ecological and legal criteria [5,8,15,16].

## 2.6. Research Gap and Research Questions

Two gaps emerge from the literature reviewed above. The first is substantive. Empirical studies typically examine environmental values, place-based identities, and economic expectations separately, or without integrating them within a single analytical framework, which limits insight into how these dimensions jointly shape ex ante support for designation. Yet, although the three operate at different conceptual levels (Section 2.1), they converge in a single evaluative act: the stakeholder's stated support for a specific proposal. This layered view is consistent with multi-level models of environmentally significant behaviour, in which values, beliefs, and situational appraisals jointly, but not equivalently, shape a single attitudinal outcome [1,2]. Treating the three dimensions together therefore reflects the structure of the outcome being explained, rather than an assumption that they are conceptually interchangeable.

The second gap is methodological, and it is the one that determines the operationalization adopted here. Many applications rely on confirmatory factor analysis (CFA) or structural equation modelling (SEM) to represent these dimensions as latent constructs. While informative in large samples, these methods require sample sizes well beyond what is typically available in stakeholder-focused analyses, and yield unstable estimates, inflated standard errors, and improper solutions when applied below those thresholds [50–53]. The constraint is not a matter of researcher preference: in many designation processes the population of formally organized actors with a direct stake is genuinely small and bounded by the nature of the decision-making process itself, so that no increase in sampling effort would enlarge it.

Methodological guidance in conservation social science makes the relevant distinction explicit. Non-probabilistic and complete-enumeration designs are appropriate for identifying and describing issues within a defined group, but not for producing estimates intended to generalize to a broader population; the two purposes carry different reporting obligations and should not be conflated [54]. Stakeholder analysis, correspondingly, is a purposive identification procedure with its own criteria of adequacy—completeness of the actor set, transparency of the identification rule, and defensible categorization—rather than a degraded approximation to probability sampling [55]. On the estimation side, the small-sample literature indicates that conventional events-per-variable rules of thumb rest on weaker foundations than is commonly assumed, and that the practical risks at low *N* are finite-sample bias in the coefficients and separation in particular covariate configurations, rather than a discrete threshold below which estimation becomes invalid [56]; where these risks materialize, penalized-likelihood estimation yields finite and less bi-

ased estimates [57,58]. Taken together, this literature supports a design that enumerates a bounded population, reports associations descriptively, and treats small-sample fragility as something to be diagnosed and disclosed rather than assumed away—the approach adopted in Sections 3.2 and 3.9.

Under these conditions, methodological parsimony and interpretability become substantive requirements rather than conveniences. The theoretical structure set out above supports a specific response: because the three dimensions are treated as related but conceptually distinct predictors of one evaluative act, and because the NEP items are known not to behave as a single latent factor across populations (Section 2.2), the analysis operationalizes each dimension through a transparent, theory-driven composite index rather than through a latent measurement model. This choice is developed and justified in detail in Sections 3.4 to 3.7, where its limitations are also stated explicitly.

Against this background, the general objective of this study is to describe the key correlates of institutional stakeholder support for protected area designation at the pre-designation stage. Three research questions follow:

**RQ1.** *To what extent are institutional stakeholders' environmental worldviews associated with their stated level of support for the proposed designation?*

**RQ2.** *Does place identity account for variation in stated support beyond that associated with environmental worldviews?*

**RQ3.** *How do perceived economic benefits relate to stated support, and do they attenuate the estimated associations of environmental worldviews and place identity—pointing to a possible instrumental channel through which ex ante social legitimacy is formed?*

Given the size and nature of the population studied, all three questions are addressed in a descriptive and exploratory register: the analysis reports associative patterns within a small, near-complete population of institutional stakeholders, not confirmatory or causal estimates.

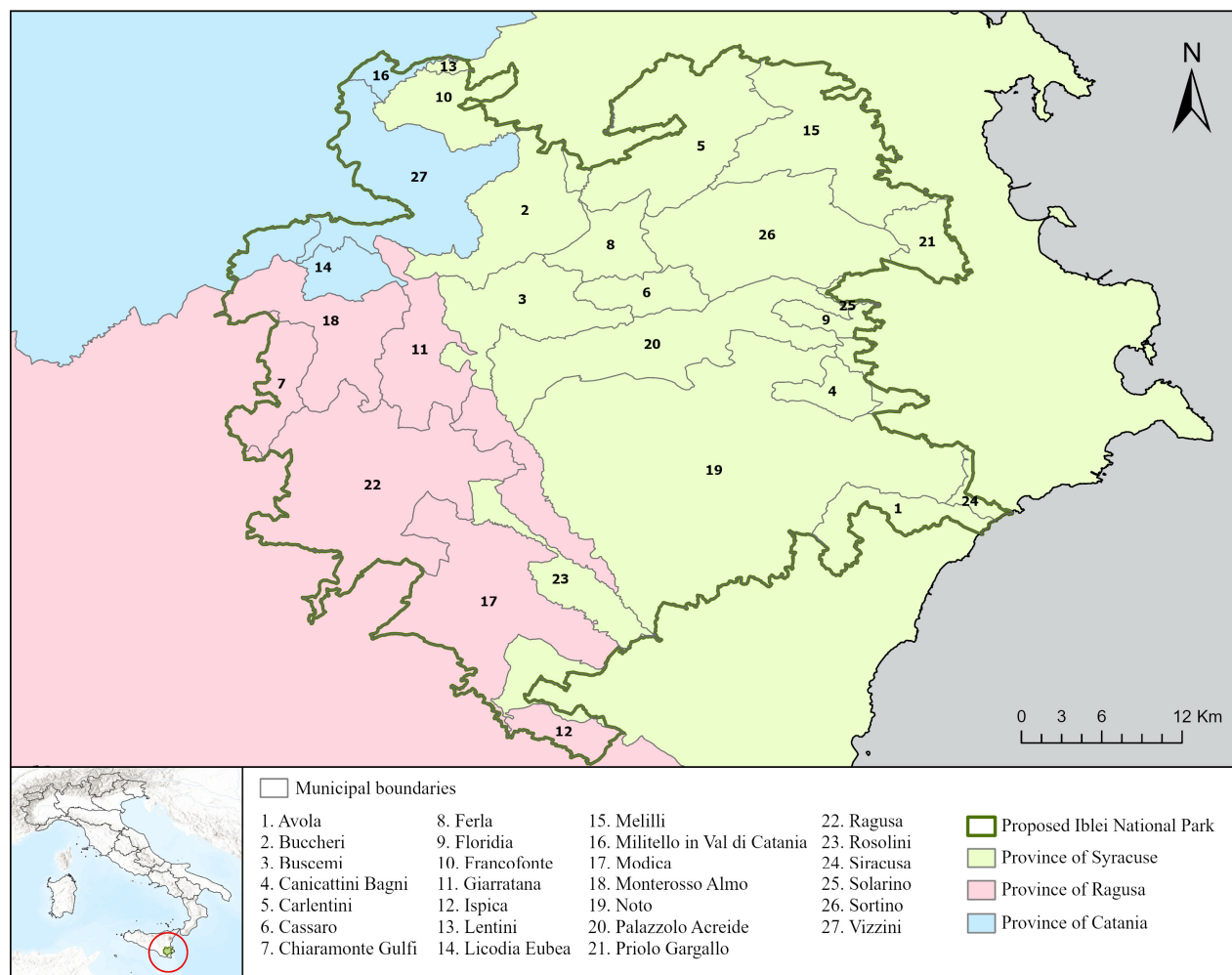
### 3. Materials and Methods

#### 3.1. Study Area

The study focuses on the proposed Iblei National Park in south-eastern Sicily (Italy) (Figure 1). The area encompasses the Iblei Plateau, a hilly and mountainous region extending approximately between 36°50'–37°15' N and 14°30'–15°20' E, mainly across the provinces of Syracuse and Ragusa with a marginal extension into the province of Catania. Its physical environment is dominated by a predominantly calcareous structure shaped by karst processes, which has generated plateaus, deep valleys and canyon systems, with elevation ranging from sea level along the coast to over 900 m a.s.l. inland. The hydrographic network consists of irregular-flow watercourses, including the Anapo, Cassibile and Irminio basins. The climate is Mediterranean, sub-humid at higher elevations and increasingly arid and thermo-xeric towards the coast. According to the most recent boundary proposals the park would cover approximately 146,849 ha across 27 municipalities, making it the largest protected natural area in Sicily and one of the most extensive at national level [59].

The territory hosts a rich mosaic of Mediterranean habitats—broad-leaved and coniferous forests, shrublands and garrigues, steppe grasslands, and fluvial and karst systems—which together support high levels of biodiversity. Its conservation value is already formally recognized: the area contains 15 Special Areas of Conservation designated under the EU Habitats Directive and 3 regional nature reserves, which jointly cover approximately 20% of the proposed park territory (29,639 ha net of spatial overlaps among sites) [59]. The

conservation objectives of the proposed park are therefore framed simultaneously by the EU Habitats (92/43/EEC) and Birds (2009/147/EC) Directives through this dense Natura 2000 network, by the national framework law on protected areas (Law No. 394/1991), by the designation envisaged in Law No. 222/2007, and by the EU Biodiversity Strategy for 2030.



**Figure 1.** Study area: the proposed Iblei National Park in south-eastern Sicily. The inset locates the study area within Italy. The dark green line delimits the proposed park perimeter ( $\approx 146,849$  ha), which extends across the provinces of Syracuse, Ragusa and—to a small extent—Catania, shown in different shades; municipal boundaries are shown, and the 27 municipalities concerned are numbered on the map and named in the key. Data sources: proposed park perimeter as elaborated by the technical working group established by the Ministry of the Environment and coordinated by the Regional Department of Territory and Environment of the Regione Siciliana; administrative boundaries from Istat, “Confini delle unità amministrative a fini statistici”, 2023 edition (shapefiles, WGS84), available under a Creative Commons Attribution licence. Map produced by the authors in ArcGIS Pro 3.7.

Alongside its biophysical characteristics, the Iblei territory carries a dense cultural and historical stratification. Long-standing land uses—cereal and tree-crop agriculture, grazing, and the dry-stone wall systems that structure the landscape—have shaped both the ecology of the plateau and the territorial identities of its communities. The area also includes archeological sites of international standing, most notably the Pantalica rock-cut necropolis complex, inscribed on the UNESCO World Heritage List. Cultural and natural values are thus not separable in this landscape, which is directly relevant to a study of

place-based identity: what stakeholders identify with is a jointly natural and anthropogenic landscape, not wilderness.

From an institutional perspective, the establishment of the Iblei National Park was mandated by Law No. 222 of 29 November 2007 but has not yet been completed. After a lengthy technical and consultative phase, the procedure stalled at the stage of the formal Ministry–Region agreement (*intesa*) required by the national framework law on protected areas (Law No. 394/1991). More recently, a ruling of the Regional Administrative Court (TAR) ordered the competent administrations to conclude the designation procedure within 180 days, appointing a *commissario ad acta* in the event of further delay. At the time of writing, the proposal therefore remains formally at a pre-designation stage, although this recent ruling has substantially accelerated its expected completion.

Although the Iblei designation predates the “30by30” target later popularized by the Kunming–Montreal Global Biodiversity Framework (2022) and the EU Biodiversity Strategy for 2030, its eventual completion would directly contribute to Italy’s progress toward this target. Italy’s protected area coverage of terrestrial and inland water area stood at approximately 21.5% in 2026 [60], still short of the 30% goal reaffirmed in Italy’s National Biodiversity Strategy 2030. This broader policy context provides renewed relevance to the Iblei case, even though the designation was not formally initiated as part of a 30by30 pipeline.

Three features make this an unusually informative setting in which to test the proposed research model. First, the designation is genuinely pending rather than hypothetical: as described above, the procedure has advanced through boundary delineation and consultation without being concluded, so stakeholders were asked about a proposal that is concrete, contested, and still open to modification—the exact condition under which *ex ante* support is decision-relevant. Second, the coexistence of high conservation value with productive agricultural systems means that conservation and local economic development are neither aligned by default nor necessarily opposed, so environmental worldviews, place-based identity and economic expectations can plausibly point in different directions rather than collapsing into a single pro- or anti-park stance. Third, the scale of the proposal—the largest in Sicily, across 27 municipalities and four categories of institutionally organized actors—amplifies both the potential conservation gains and the perceived socio-economic trade-offs, and generates a stakeholder population that is small enough to enumerate and large enough to exhibit real heterogeneity. A companion study of the same territory shows, moreover, that biodiversity and ecosystem-service priorities are spatially decoupled here, so that the areas supplying most of the services stakeholders associate with local benefit lie largely outside the ecological cores [59]; the socio-economic framing of the designation is therefore not incidental to its ecological design but structurally bound up with it. The two studies share the study area and the pre-designation framing but use entirely independent data.

### *3.2. Stakeholder Population and Identification Procedure*

Unlike household or resident surveys, which typically draw a probabilistic sample from a large population of individuals, this study targets the population of institutional stakeholders formally engaged in, or directly affected by, the designation process of the proposed Iblei National Park. Institutional stakeholders are here defined as public bodies, category and trade associations, professional orders, and environmental associations operating within the 27 municipalities covered by the proposed park, whose institutional mandate gives them a direct interest in land-use regulation, economic activity, or environmental protection in the area.

The population of relevant institutional stakeholders was identified through an ad hoc stakeholder mapping exercise conducted by the research team. The identification rule was institutional rather than discretionary: starting from the official registers and directories of public bodies, associations and professional orders present in the territory concerned by the proposed park, the research team retained every formally constituted organization whose statutory mandate covers land-use regulation, economic representation of a productive sector, professional regulation, or environmental protection within the park perimeter. Organizations without a formal constitution, those whose remit did not extend to the area concerned, and informal groupings were excluded. Following current guidance on stakeholder analysis in natural resource management [55], the objective of the exercise was completeness of the actor set and transparency of the identification criterion, rather than representativeness of a larger population—the two being different standards of adequacy.

The resulting population comprises 35 institutional stakeholders, organized into four categories, as summarized in Table 1.

**Table 1.** The population of institutional stakeholders, by category.

| Category                       | N  |
|--------------------------------|----|
| Public bodies and institutions | 12 |
| Category/trade associations    | 11 |
| Professional orders            | 5  |
| Environmental associations     | 7  |
| Total                          | 35 |

Notes: The population was identified through an ad hoc stakeholder mapping exercise (Section 3.2) rather than through probabilistic sampling, and is considered to cover the near-complete population of institutional stakeholders formally organized in relation to the area concerned by the proposed designation. Individual organizations are not named for confidentiality reasons.

For each of the 35 organizations, the questionnaire was administered face-to-face, by prior appointment, during September and October 2023, to the organization’s legal representative or the officer formally responsible for the relevant policy area. This procedure was adopted to ensure that responses reflected the organization’s institutional position rather than an individual, potentially unrepresentative, viewpoint, and to maximize response quality and completeness in a context where postal or online distribution would have been unlikely to reach an appropriate respondent within each organization. No organization that was contacted declined to participate, so the 35 organizations constitute simultaneously the identified population and the set of respondents, and the analysis is not exposed to non-response selection; the dataset contains no missing values on any item used in the analysis.

Because the unit of analysis is the stakeholder organization rather than the individual respondent, individual-level socio-demographic variables (e.g., age, gender, education) are not the primary source of analytically relevant heterogeneity in this design. The relevant source of heterogeneity is instead the stakeholder category to which each organization belongs (public body, category association, professional order, or environmental association), reported in Table 1 and considered, where informative, in the interpretation of results. This design differs from—and should not be read as directly comparable to—individual-level attitude surveys among residents, where socio-demographic profiling of individual respondents is the relevant source of heterogeneity.

This complete coverage of the identified population—small, bounded, and institutionally defined—has direct implications for how the empirical results should be interpreted. Rather than supporting probabilistic generalization to a wider population via sampling-

based inference, the analysis is better understood as a systematic, quantitatively supported description of associations within the identified population of relevant institutional actors. This is the purpose for which complete-enumeration and non-probabilistic designs are appropriate, and it is distinct from—and must not be conflated with—statistical generalization to a broader population [54], consistent with recent methodological discussions of small, bounded stakeholder populations in environmental governance research [5,44,47,48].

### 3.3. Questionnaire Design and Conceptual Framework

The questionnaire was specifically designed to investigate the determinants of ex ante social legitimacy and institutional stakeholder support for the proposed designation of the Iblei National Park. Its structure was grounded in the interdisciplinary literature on conservation governance, social acceptance of protected areas, and environmental attitudes, which consistently identifies environmental values, place-based relationships, and perceived socio-economic impacts as key correlates of support for conservation policies.

Accordingly, the questionnaire was organized into four main sections. The first section measured environmental worldviews using items derived from the New Ecological Paradigm (NEP), one of the most widely adopted instruments for capturing pro-ecological versus anthropocentric orientations [22]. In the context of conservation policy analysis, NEP-based measures are commonly used to proxy individuals' normative predispositions toward environmental protection and acceptance of regulatory constraints. The second section focused on human–place relationships, comprising a broader place-attachment battery on the Iblei territory [29,31] (adapted from Proshansky et al., 1983; and Williams and Vaske, 2003), of which only the place-identity sub-items are used in the present analysis (Section 3.7). The third section assessed perceived impacts of the proposed protected area, with particular emphasis on expected economic benefits for local communities, such as the valorization of typical agri-food products, the development of nature-based and cultural tourism, and the emergence of new tourism-related economic activities; these items were developed drawing on established constructs in the literature on perceived socio-economic impacts of protected areas [12,13,42]. The final section measured stakeholder support for park designation, using both attitudinal and behavioral indicators.

The perceived-economic-benefit items were drawn from question A35 of the 2023 questionnaire (an agreement–disagreement battery) and were developed by the authors, drawing on the literature on the perceived socio-economic impacts of protected areas cited above; the exact items and their questionnaire codes are reported in Appendix B (Table A3).

All attitudinal items in the questionnaire—including environmental worldviews, place identity, and perceived economic benefits—were measured on 5-point Likert-type scales (see Appendix B for the exact response anchors of each battery), with higher values indicating stronger endorsement of the underlying construct. For the New Ecological Paradigm (NEP) battery, items were retained as administered rather than reverse-coded: polarity is handled by construction, through the explicit contrast between the ecocentric and anthropocentric subsets that defines the net index (Section 3.6), so that higher values of that index reflect a more ecocentric environmental orientation. Table 2 summarizes the main constructs measured in the questionnaire and their operationalization in the empirical analysis.

The empirical analysis is based on questionnaire responses from the population of 35 institutional stakeholders described in Section 3.2, which also details the identification, selection, and administration procedures, and the rationale for treating this as a near-complete, bounded institutional population rather than a probabilistic sample of individuals.

**Table 2.** Overview of survey structure and key variables.

| Section of Questionnaire  | Construct                                | Number of Items | Scale       | Used in Analysis     |
|---------------------------|------------------------------------------|-----------------|-------------|----------------------|
| Environmental values      | New Ecological Paradigm (NEP)            | 15              | Likert 1–5  | Yes (index-based)    |
| Human–place relationships | Place identity                           | 3               | Likert 1–5  | Yes                  |
| Perceived impacts         | Economic benefits                        | 5               | Likert 1–5  | Yes                  |
| Support for designation   | Stakeholder support                      | 1               | Ordinal 1–5 | Yes                  |
| Background information    | Stakeholder/organization characteristics | Various         | Categorical | NO (see Section 3.2) |

Notes: The table summarizes the main constructs measured in the questionnaire and their operationalization in the empirical analysis. Only a subset of items was used to construct composite indices, in line with the parsimonious modelling strategy adopted for this small institutional population.

3.4. Preliminary Reliability and Diagnostic Analysis of NEP Items

Prior to index construction, a set of preliminary diagnostic analyses was conducted to assess the internal coherence of the NEP items in the present population [61]. These diagnostics were used to inform the choice of an appropriate operationalization strategy, rather than to validate the NEP scale as a psychometric instrument—a task for which, as discussed below, this sample size is not well suited. When computed on the final analytical dataset used for the regression analysis, the full 15-item NEP battery exhibited low internal consistency (Cronbach’s  $\alpha = 0.44$ ), indicating that the assumption of a single unidimensional latent construct is not maintained in this context. This result is consistent with the meta-analytic evidence reviewed in Section 2.2, which documents reliability estimates for this instrument ranging from approximately 0.35 to 0.87 across studies and shows that internal consistency varies systematically with sample type [23,24].

Item–test and item–rest correlations revealed a heterogeneous pattern. A subset of items displayed stronger correlations with the overall scale, corresponding to core NEP statements on environmental degradation, ecological limits, and the fragility of natural systems. In contrast, several items exhibited weak or near-zero item–rest correlations, reflecting conceptual heterogeneity rather than measurement error. Inter-item correlations were likewise characterized by generally low or negative values, with only limited clustering within item subsets. Reliability coefficients throughout this paper are computed with items taken as administered, without automatic reversal of items whose covariance with the remainder of the scale is negative, so that no item is silently re-scored inside the reliability computation.

Importantly, these diagnostics do not imply that the NEP items are invalid or inappropriate. Rather, they indicate that treating the full NEP battery as a single additive scale would be methodologically weak in the present context—and, as Section 2.2 makes clear, that coefficient alpha is not the appropriate criterion for a battery that is not unidimensional in the first place. Accordingly, and in line with both theoretical considerations and population-size constraints, environmental worldviews were operationalized using a parsimonious index-based strategy rather than a latent-variable approach.

3.5. Rationale for Index-Based Operationalization

In principle, confirmatory factor analysis (CFA) or structural equation modelling (SEM) could be used to explicitly model the latent structure of NEP items. As extensively discussed in the psychometric literature, however, exploratory and confirmatory factor analyses—and SEM more generally—require adequate sample sizes to yield stable and interpretable solutions [50–52].

We verified this directly rather than relying on general guidance. A four-factor confirmatory model over the twenty items composing the four constructs requires 46 free param-

ters from 35 observations; when estimated, it returns standard errors on the environmental-worldview loadings between 4 and 36—one to two orders of magnitude larger than the standardized loadings themselves—two loadings at the admissibility boundary, and unacceptable fit (CFI = 0.84, TLI = 0.81, RMSEA = 0.10). Treating the NEP items as a single latent factor performs worse still (CFI = 0.80, RMSEA = 0.11). The models converge; what is inadmissible is the precision of the solution. We therefore do not report a measurement model, and rely instead on the reliability diagnostics of Section 3.4 and the theory-driven index construction of Sections 3.6 and 3.7, whose limitations we state explicitly rather than resolve.

Moreover, the objective of this study is not to validate the psychometric properties of the NEP scale, but to use environmental orientation as an explanatory covariate in an exploratory model of institutional stakeholder support. Pursuing latent-variable modelling would therefore introduce unnecessary complexity and risk of overfitting without improving substantive inference. For these reasons, a transparent and parsimonious index-based approach was adopted, prioritizing interpretability and stability under severe data constraints.

### 3.6. Construction of a Net Environmental Orientation Index ( $NEP_{net}$ )

Accordingly, and consistent with the low internal consistency of the full NEP battery documented in Section 3.4, environmental worldviews were operationalized using a parsimonious, theory-driven index that captures the balance between ecocentric and anthropocentric orientations.

Specifically, a subset of six ecocentric items—referring to environmental degradation, ecological limits, and the fragility of natural systems—was averaged to obtain an ECO score. Similarly, a subset of six anthropocentric items—reflecting beliefs in human dominance over nature and technological optimism—was averaged to obtain an ANTRO score. The specific NEP items included in each subset are reported in Appendix A. Three items were not assigned to either subset, on two distinct grounds. Two of them—item A25.9 (human exemptionalism) and item A25.10 (the claim that the ecological crisis has been exaggerated)—show item–rest correlations at or below zero within the full battery (0.01 and  $-0.07$  respectively) and therefore contribute no coherent variance to either subset. The third, item A25.11 (“the Earth is like a spaceship with very limited room and resources”), was excluded on conceptual rather than empirical grounds: its metaphorical formulation does not map onto either pole of the ecocentric–anthropocentric contrast that the index is designed to capture. None of the three is regarded as invalid as a NEP item.

The net environmental orientation index is defined as

$$NEP_{net} = ECO_{score} - ANTRO_{score}$$

This formulation yields positive values for respondents with a predominantly ecocentric orientation and negative values for those with a predominantly anthropocentric worldview. To facilitate interpretation and improve numerical stability in regression models, the index was subsequently standardized:

$$NEP_{net,z} = (NEP_{net} - \text{mean}(NEP_{net}))/SD(NEP_{net})$$

Accordingly, regression coefficients associated with  $NEP_{net,z}$  can be interpreted as the estimated association of a one-standard-deviation increase in net pro-environmental orientation with the outcome.

This net-score approach is a pragmatic operationalization adopted under severe sample-size constraints, and should be understood as such: it addresses the low internal consistency of the full NEP battery in this population by combining conceptually opposite item subsets into a single contrast score, but it does not, by itself, resolve the underlying multidimensionality of the NEP construct documented in Section 3.4 and in the literature reviewed in Section 2.2. We report this limitation explicitly rather than treating the net index as a validated solution to the reliability problem.

### 3.7. Place Identity and Perceived Economic Benefits

In addition to environmental values, two further dimensions central to ex ante social legitimacy were included: place identity and perceived economic benefits.

Place identity was measured using a short composite index comprising three items that capture respondents' self-identification with the Iblei territory, including identification with the territory, perception of the territory as part of the self, and the identity-defining role of living in the area. These items closely align with the original conceptualization of place identity as a cognitive and symbolic component of the self [29,30], and are kept conceptually distinct from the broader construct of place attachment discussed in Section 2.3. The broader place-attachment dimensions captured by the same questionnaire battery (notably place dependence and nature bonding) are not used in the present analysis, which focuses specifically on the cognitive–symbolic identity component. The index was constructed as the mean of the selected items, with higher values indicating stronger place identity. The specific items used to construct the index are reported in Appendix B.

Perceived economic benefits were operationalized as the mean agreement with five statements capturing stakeholders' expectations regarding the economic impacts of the proposed protected area, including the valorization of typical agri-food products, nature-based and cultural tourism, and the emergence of new tourism-related economic activities, drawing on Mascia et al. [12], Bennett and Dearden [13], and Schneider et al. [42]. These items are reported in Appendix B.

### 3.8. Econometric Specification: Ordered Logit Model

Given the limited population size, variable selection followed strict principles of parsimony and conceptual distinctiveness. Including many correlated predictors would risk overfitting and undermine inference. A correlation matrix was therefore examined as a diagnostic tool to assess pairwise relationships among the constructed indices and to verify that the selected variables captured related but conceptually distinct dimensions.

Because stakeholder support for protected area designation is measured on an ordinal scale, the primary empirical strategy relies on an ordered logit model. Let  $Support^*_i$  denote an unobserved latent propensity to support the protected area. The observed ordinal outcome  $Support_i$  is generated by partitioning this latent variable through a set of increasing threshold (cutpoint) parameters [62,63]:

$$Support_i = j \text{ if } \kappa_{j-1} < Support^*_i \leq \kappa_j, \quad j = 1, \dots, J$$

where  $\kappa_j$  denotes the cutpoints to be estimated, with  $\kappa_0 = -\infty$  and  $\kappa_J = +\infty$ .

The baseline specification is given by:

$$Support^*_i = \beta_1 NEP_{net,z,i} + \beta_2 PlaceIdentity_i + \varepsilon_i$$

where  $NEP_{net,z,i}$  is the standardized net environmental orientation index,  $PlaceIdentity_i$  is the place identity index,  $\beta_1$  and  $\beta_2$  are parameters describing the estimated association

between the corresponding explanatory variables and the latent propensity to support protected area designation, and  $\varepsilon_i$  is an error term assumed to follow a logistic distribution.

To explore the role of instrumental considerations, an extended specification includes perceived economic benefits:

$$Support^*_i = \beta_1 NEP_{net,z,i} + \beta_2 PlaceIdentity_i + \beta_3 EconomicBenefits_i + \varepsilon_i$$

where *EconomicBenefits<sub>i</sub>* denotes the composite index of perceived economic benefits for stakeholder *i*, and  $\beta_3$  describes the estimated association between perceived economic benefits and the latent propensity to support protected area designation, conditional on environmental worldviews and place identity.

Model coefficients are interpreted as associative relationships between the explanatory variables and the likelihood of observing higher levels of stated support, rather than as causal effects. This interpretation is consistent with the cross-sectional nature of the data and the exploratory objective of describing candidate correlates of institutional stakeholder support. Given the population size ( $N = 35$ ), all reported associations should be read as exploratory and descriptive of this specific population of institutional stakeholders engaged in the Iblei designation process, rather than as confirmatory, causal, or generalizable estimates. Numerical convergence of the estimated models does not, by itself, guarantee stability of the estimates at this sample size.

For clarity, the baseline specification, including only environmental worldviews and place identity, is referred to as the parsimonious model, reflecting its focus on core normative and identity-based predictors under strict data constraints. The extended specification, including perceived economic benefits, is referred to as the mechanism model, as it allows exploration of a possible instrumental channel through which environmental values and place-based identities may relate to explicit support for protected area designation. The term “mechanism” is used here in a purely interpretive, labelling sense and does not imply a formally identified causal mediation structure; the exploratory, non-causal nature of this labelling is emphasized throughout the paper.

Average marginal effects (AME) are reported to facilitate the interpretation of substantive effect sizes.

All econometric models, including ordered and binary logit specifications, were estimated using Stata 19 [64], with robust standard errors. Average marginal effects were obtained through post-estimation procedures.

### 3.9. Sensitivity Analysis and Diagnostic Checks

With small populations, ordered logit estimates may become unstable if some response categories are sparsely populated. As a sensitivity check, the ordinal support variable was recoded into a binary indicator distinguishing favorable from non-favorable positions. Specifically, responses indicating support or strong support (values 4 and 5 on the original five-point scale) were coded as 1, while neutral or opposing responses (values 1–3) were coded as 0. This recoding focuses on explicit support for protected area designation and provides a simplified outcome definition for the sensitivity analysis.

The distribution of the original ordinal support variable shows that all five response categories are sufficiently populated, with no sparse cells (Section 4.1), justifying the use of an ordered logit model as the primary specification. The binary logit model is therefore used to assess how results change under an alternative and more parsimonious outcome definition, rather than as an independent confirmation of the robustness of the ordered logit estimates.

Consistent with the position taken in Section 2.6, we treat small-sample fragility as something to be diagnosed and disclosed rather than assumed away, and report four checks.

*Separation.* Complete or quasi-complete separation would render maximum-likelihood estimates unbounded. In the binary mechanism model the fitted probabilities span 0.022 to 0.822, with mean 0.600 and standard deviation 0.249, and no observation lies outside the interval [0.001, 0.999]. No observation was dropped in estimation. There is therefore no evidence of separation.

*Finite-sample bias.* Following the small-sample literature reviewed in Section 2.6, the binary mechanism model was re-estimated by Firth's penalized likelihood [57,58], which removes the first-order term of the finite-sample bias and yields finite estimates even under separation. The penalized estimates are reported in the notes to Section 4.5.

*Influence.* Because a sandwich variance estimator at this sample size can be sensitive to a small number of observations, the ordered mechanism model was re-estimated 35 times, omitting one organization in turn. The coefficient on perceived economic benefits remained positive in all 35 replications, ranging from 1.74 to 3.24, and significant at the 10% level throughout (median  $p = 0.056$ ). The association therefore does not depend on any individual respondent.

*Parallel odds.* The proportional-odds assumption underlying the ordered logit was tested by comparing the model with a fully generalized ordered logit. For the parsimonious specification, five tests—likelihood-ratio, score, Wald, Wolfe–Gould and Brant—all fail to reject the assumption ( $p$  between 0.23 and 0.41). Because the chi-squared reference distribution of these statistics is unreliable at this sample size, we also computed a bootstrap achieved significance level for the Brant test: 0.97 (95% Monte Carlo confidence interval 0.959–0.976; 1626 of 2000 replications usable). The assumption is therefore not rejected, and the asymptotic reference distribution is, in these data, biased towards rejection. For the mechanism specification the tests could not be computed: the unconstrained comparison model requires a separate coefficient vector for each of the four thresholds, and with three regressors and 35 observations its Hessian is not negative semidefinite, so no proper maximum is attained. As an indirect check we collapsed the outcome into three ordered categories, which reduces the comparison model sufficiently for the tests to run. On this reduced outcome the five tests diverge sharply: Brant ( $p = 0.26$ ), Wolfe–Gould ( $p = 0.14$ ) and the score test ( $p = 0.14$ ) do not reject, while the Wald test is marginal ( $p = 0.07$ ) and the likelihood-ratio test rejects ( $p = 0.001$ ). We read this as inconclusive rather than as a rejection, for two reasons: the Brant and Wolfe–Gould tests are those documented to control type I error better when the sample is small relative to the number of predictors, and the likelihood-ratio statistic is demonstrably inflated in these data—the same divergence appears in the model comparison, where a likelihood-ratio test of the added regressor yields  $\chi^2(1) = 19.36$  against a robust Wald statistic of 3.59. Since this check also concerns a different outcome specification from the one reported in Section 4.2, we treat it as indicative only. We therefore do not claim that the parallel-odds assumption is verified for the mechanism specification; the binary logit estimates reported in Section 4.5 provide a complementary specification that does not rest on it, and the consistency of the substantive pattern across the two provides the relevant reassurance.

Overall, the measurement strategy combines reliability diagnostics and theory-driven index construction, explicitly tailored to the constraints of a small, bounded, and institutionally defined stakeholder population (Section 3.2). This approach prioritizes transparency and interpretability over latent-variable complexity or inferential claims that this population size cannot support.

## 4. Results

This section reports descriptive statistics, reliability diagnostics and econometric estimates. In line with the structure of the paper, interpretation of the associations and their connection to the literature is deferred to Section 5.

### 4.1. Descriptive Statistics and Reliability Diagnostics

Table 3 summarizes descriptive statistics and reliability diagnostics for the constructed indices. Given the exploratory nature of alpha estimates at  $N = 35$ , all reliability coefficients reported here should be read as indicative rather than confirmatory. Coefficients are computed with items taken as administered (Section 3.4).

**Table 3.** Descriptive statistics and reliability of main variables.

| Variable                   | Description                                                       | Mean | SD   | Min   | Max  | Cronbach's $\alpha$ |
|----------------------------|-------------------------------------------------------------------|------|------|-------|------|---------------------|
| <i>Support</i>             | Stakeholder support for protected area designation (ordinal, 1–5) | 3.63 | 1.48 | 1.00  | 5.00 | —                   |
| <i>NEP (15 items)</i>      | Full New Ecological Paradigm scale                                | —    | —    | —     | —    | 0.44                |
| <i>ECO score</i>           | Ecocentric NEP subset (mean of 6 items)                           | 4.33 | 0.49 | 3.17  | 5.00 | 0.51                |
| <i>ANTRO score</i>         | Anthropocentric NEP subset (mean of 6 items)                      | 2.99 | 0.65 | 1.50  | 4.33 | 0.56                |
| <i>NEP<sub>net</sub></i>   | Net environmental orientation (ECO – ANTRO)                       | 1.34 | 0.83 | −0.33 | 3.17 | —                   |
| <i>NEP<sub>net,z</sub></i> | Net environmental orientation (standardized)                      | 0.00 | 1.00 | −2.01 | 2.20 | —                   |
| <i>Place identity</i>      | Place identity index (mean of 3 items)                            | 3.58 | 0.96 | 1.33  | 5.00 | 0.87                |
| <i>Economic benefits</i>   | Economic benefits index (mean of 5 items)                         | 4.13 | 1.09 | 1.00  | 5.00 | 0.96                |

Notes: Cronbach's alpha coefficients are reported for all multi-item constructs and should be read as exploratory given  $N = 35$  (Section 3.4). Alphas are computed with each item taken as administered, without automatic sign reversal. The full NEP battery and its ecocentric and anthropocentric subsets exhibit low internal consistency, motivating the net index-based operationalization (Section 3.6). All values are computed on the final analytical population ( $N = 35$ ).

Stakeholder support for the designation of the Iblei National Park exhibits substantial variation across respondents, with a mean value of 3.63 and the full range of the five-point ordinal scale observed (min = 1; max = 5). The distribution across the five categories is 4, 6, 4, 6 and 15 observations respectively (11.4%, 17.1%, 11.4%, 17.1% and 42.9%), so no category is sparsely populated. Under the binary recoding used in the sensitivity analysis, 21 of the 35 organizations (60%) express favorable support.

The net environmental orientation index,  $NEP_{net,z}$ , constructed as described in Section 3.6, is standardized by construction, with mean equal to zero and standard deviation equal to one. Its empirical range (approximately −2.01 to +2.20) indicates substantial variation in environmental worldviews among stakeholders, without evidence of extreme values.

Place identity varies widely across respondent organizations, with a mean of 3.58 and an observed range spanning almost the entire scale (min = 1.33; max = 5.00), so that the population includes both organizations reporting very weak identification with the Iblei territory and organizations reporting maximum identification. Perceived economic benefits display a higher mean (4.13) with comparable dispersion ( $SD = 1.09$ ) and also cover the full range of the scale.

Formal checks for outliers and distributional irregularities reveal no problematic observations. In particular, the standardized  $NEP_{net,z}$  index shows no values exceeding conventional thresholds for extreme observations ( $|z| > 3$ ), nor does it exhibit outliers according to the interquartile range criterion. This supports the use of the constructed indices as continuous explanatory variables in subsequent regression analysis without the need for trimming or transformation.

Table 3 also reports Cronbach's alpha coefficients for the main multi-item constructs. The full 15-item NEP scale exhibits low internal consistency ( $\alpha = 0.44$ ), and the ecocentric and anthropocentric subsets exhibit low to moderate values ( $\alpha = 0.51$  and  $\alpha = 0.56$  respectively), consistent with their intended use as components of a net orientation index rather than as standalone scales; they are not entered directly into the regression models. The two short indices used directly in the analysis show markedly different reliability properties: place identity displays high internal consistency ( $\alpha = 0.87$ ) and perceived economic benefits very high internal consistency ( $\alpha = 0.96$ ).

Pairwise correlations among the main explanatory variables are reported in Table 4. All coefficients are low in magnitude and none approaches conventional thresholds associated with problematic multicollinearity (e.g.,  $|r| \geq 0.7$ ). The net environmental orientation index is weakly and positively correlated with place identity ( $r = 0.14$ ,  $p = 0.41$ ) and with perceived economic benefits ( $r = 0.19$ ,  $p = 0.27$ ), while place identity and perceived economic benefits show a somewhat stronger positive association ( $r = 0.33$ ,  $p = 0.05$ ). Spearman rank correlations give the same picture (0.08, 0.20 and 0.32 respectively), so the pattern does not depend on the assumption of linearity. The three indices are therefore not redundant, although at this sample size the data establish little about their interrelations beyond that.

**Table 4.** Pairwise correlations among explanatory variables.

| Variable          | $NEP_{net,z}$ | Place Identity | Economic Benefits |
|-------------------|---------------|----------------|-------------------|
| $NEP_{net,z}$     | 1             | —              | —                 |
| Place identity    | 0.143         | 1              | —                 |
| Economic benefits | 0.193         | 0.333          | 1                 |

Notes: Pearson correlation coefficients ( $N = 35$ ). Two-sided  $p$ -values are 0.411 for  $NEP_{net,z}$ –Place identity, 0.268 for  $NEP_{net,z}$ –Economic benefits and 0.051 for Place identity–Economic benefits. All correlations are below conventional thresholds associated with problematic multicollinearity (e.g.,  $|r| \geq 0.7$ ).

#### 4.2. Ordered Logit Estimates: Parsimonious Model

Table 5 reports the ordered logit estimates of institutional stakeholder support for the proposed designation of the Iblei National Park. Column (1) presents the parsimonious specification, including net environmental orientation ( $NEP_{net,z}$ ) and place identity as explanatory variables.

Both coefficients in column (1) are positive. Neither reaches conventional levels of statistical significance ( $p = 0.247$  and  $p = 0.385$  respectively), and the model is not jointly significant (Wald  $\chi^2(2) = 1.98$ ,  $p = 0.371$ ). In the parsimonious model, a one-standard-deviation increase in  $NEP_{net,z}$  is associated with an average increase of approximately 10 percentage points in the predicted probability of expressing the maximum level of support ( $Y = 5$ ), and a one-unit increase in place identity with an increase of approximately 8 percentage points; neither marginal effect is statistically distinguishable from zero.

**Table 5.** Ordered logit estimates of institutional stakeholder support for protected area designation.

| Variables            | (1) Parsimonious Model—Coef. (SE) | (2) Mechanism Model—Coef. (SE) |
|----------------------|-----------------------------------|--------------------------------|
| $NEP_{net,z}$        | 0.457 (0.395)                     | 0.256 (0.368)                  |
| Place identity       | 0.358 (0.412)                     | −0.182 (0.479)                 |
| Economic benefits    | —                                 | 1.940 (1.024) *                |
| Cut 1 ( $\kappa_1$ ) | −0.899 (1.525)                    | 4.286 (3.297)                  |
| Cut 2 ( $\kappa_2$ ) | 0.261 (1.445)                     | 6.352 (3.906)                  |
| Cut 3 ( $\kappa_3$ ) | 0.784 (1.446)                     | 7.115 (4.133)                  |
| Cut 4 ( $\kappa_4$ ) | 1.541 (1.499)                     | 8.158 (4.160)                  |
| Wald $\chi^2$        | 1.98 ( $p = 0.371$ )              | 8.63 ( $p = 0.035$ )           |

Table 5. Cont.

| Variables                                   | (1) Parsimonious Model—Coef. (SE) | (2) Mechanism Model—Coef. (SE) |
|---------------------------------------------|-----------------------------------|--------------------------------|
| Pseudo R <sup>2</sup>                       | 0.032                             | 0.221                          |
| Log pseudolikelihood                        | −49.608                           | −39.929                        |
| N                                           | 35                                | 35                             |
| AME on P(Y = 5)— <i>NEP<sub>net,z</sub></i> | 0.104 (0.083)                     | 0.044 (0.067)                  |
| AME on P(Y = 5)— <i>Place identity</i>      | 0.081 (0.089)                     | −0.031 (0.080)                 |
| AME on P(Y = 5)— <i>Economic benefits</i>   | —                                 | 0.333 (0.119) ***              |

Notes: Coefficients are ordered logit estimates with robust standard errors in parentheses. \*  $p < 0.10$ ; \*\*\*  $p < 0.01$ . Cut parameters (Cut 1–Cut 4) represent estimated threshold values partitioning the latent propensity to support protected area designation into the observed ordinal response categories and are reported for completeness. Average marginal effects (AME), estimated using the delta method, report the change in predicted probability of expressing the highest level of support (Y = 5) associated with a one-unit increase in the explanatory variable.

The estimated cut parameters (Cut 1–Cut 4) are reported for completeness and define the thresholds separating the observed support categories on the latent scale. Although the estimated cutpoints exhibit relatively large standard errors due to the small population size, they are correctly ordered, which together with the response distribution reported above indicates that collapsing the ordinal scale is not warranted.

#### 4.3. Mechanism Model: The Role of Perceived Economic Benefits

Column (2) of Table 5 reports the mechanism model, which extends the parsimonious specification by including perceived economic benefits. The inclusion of this variable substantially alters the pattern of estimates.

Perceived economic benefits show the largest association with support for park designation among the variables considered. The estimated coefficient is positive and significant at the 10% level under robust standard errors ( $p = 0.058$ ), and the corresponding average marginal effect—an increase of approximately 33 percentage points in the predicted probability of expressing the highest level of support—is significant at the 1% level ( $p = 0.005$ ). We report both quantities, since at this sample size the coefficient and the marginal effect carry different amounts of information about the same association. A Wald test of the added regressor gives  $\chi^2(1) = 3.59$  ( $p = 0.058$ ), and the model as a whole becomes jointly significant (Wald  $\chi^2(3) = 8.63$ ,  $p = 0.035$ ), whereas the parsimonious specification is not.

At the same time, the coefficients on *NEP<sub>net,z</sub>* and place identity decrease sharply in magnitude, and their associated marginal effects become small and statistically indistinguishable from zero. The point estimate for place identity turns slightly negative, with a standard error several times its magnitude; the sign of that estimate is therefore not interpretable, and the association is reported here as attenuated to a magnitude indistinguishable from zero.

#### 4.4. Average Marginal Effects

Average marginal effects reported in Table 5 translate model coefficients into changes in predicted probabilities. Focusing on the probability of expressing the highest level of support (Y = 5) yields quantities on a directly interpretable scale.

In the parsimonious specification, the marginal effects of environmental orientation and place identity are 0.104 and 0.081 respectively, neither statistically distinguishable from zero. Once perceived economic benefits are introduced, these fall to 0.044 and −0.031, while the marginal effect of economic expectations is 0.333 and is significant at the 1% level. The relative ordering and magnitude of the three marginal effects are the same in both specifications.

#### 4.5. Sensitivity Analysis: Binary Logit Models

As a sensitivity check, the ordinal support measure was recoded into the binary favorable/non-favorable indicator defined in Section 3.9, and binary logit models were estimated using the same explanatory variables. The corresponding estimates are reported in Table 6.

**Table 6.** Binary logit estimates of favorable institutional stakeholder support (sensitivity check). Dependent variable: Favorable support (1 = support  $\geq 4$ ; 0 otherwise).

| Variables             | (1) Parsimonious Model—Coef. (SE) | (2) Mechanism Model—Coef. (SE) |
|-----------------------|-----------------------------------|--------------------------------|
| $NEP_{net,z}$         | 0.279 (0.416)                     | 0.116 (0.393)                  |
| Place identity        | 0.290 (0.375)                     | −0.121 (0.530)                 |
| Economic benefits     | —                                 | 1.291 (0.988)                  |
| Constant              | −0.615 (1.352)                    | −4.536 (3.901)                 |
| Wald $\chi^2$         | 1.13 ( $p = 0.570$ )              | 2.83 ( $p = 0.419$ )           |
| Pseudo $R^2$          | 0.029                             | 0.204                          |
| Log pseudolikelihood  | −22.862                           | −18.760                        |
| N                     | 35                                | 35                             |
| AME— $NEP_{net,z}$    | 0.064 (0.092)                     | 0.021 (0.072)                  |
| AME—Place identity    | 0.067 (0.083)                     | −0.022 (0.094)                 |
| AME—Economic benefits | —                                 | 0.232 (0.134) *                |

Notes: Binary logit estimates with robust standard errors in parentheses. \*  $p < 0.10$ . Average marginal effects (AME), estimated using the delta method, report changes in the predicted probability of favorable support ( $\geq 4$ ) associated with a one-unit increase in the explanatory variables. Firth's penalized-likelihood estimation of column (2), used as a small-sample robustness check (Section 3.9), yields coefficients of 0.102 (0.364) for  $NEP_{net,z}$ , −0.078 (0.431) for place identity and 1.015 (0.515) for perceived economic benefits, the last significant at the 5% level ( $p = 0.049$ ).

Column (1) of Table 6 presents the parsimonious binary logit specification. Both variables are positively associated with the probability of expressing favourable support, with marginal effects of approximately 6 and 7 percentage points, neither statistically significant.

Column (2) reports the mechanism model, which adds perceived economic benefits. Consistent with the ordered logit results, perceived economic benefits again show the largest association, of the same sign and comparable magnitude—an average marginal effect of approximately 23 percentage points—but the estimate does not reach conventional significance under the binary outcome definition (coefficient  $p = 0.191$ ; marginal effect  $p = 0.084$ ). Under Firth's penalized likelihood the same coefficient is 1.015 and significant at the 5% level ( $p = 0.049$ ). The estimated associations of environmental orientation and place identity are, as in the ordered specification, attenuated to magnitudes indistinguishable from zero.

The direction and relative ordering of the three associations are therefore unchanged across the two outcome definitions, while their statistical strength varies with how the outcome is operationalised. We report this openly rather than treating the ordered and binary results as mutually confirming, since a sensitivity check is informative precisely when the answer it returns is not identical.

#### 4.6. Summary of Estimates

Three patterns emerge from the estimates reported above. First, environmental world-views and place identity are positively associated with institutional stakeholder support in the parsimonious specifications, with marginal effects of the order of 6 to 10 percentage points, none of which is statistically distinguishable from zero.

Second, perceived economic benefits show the largest association with institutional stakeholder support in both the ordered and the binary specification, with marginal effects

of 33 and 23 percentage points, respectively. This association is stable in sign and magnitude across specifications and survives penalized-likelihood estimation and the leave-one-out check reported in Section 3.9, while its statistical strength varies with the outcome definition.

Third, including perceived economic benefits markedly attenuates the estimated associations between environmental worldviews and place identity in both specifications, to magnitudes indistinguishable from zero.

All patterns reported in this section describe associations within a small, complete population of 35 institutional stakeholders (Section 3.2). Their interpretation, and their relation to the literature reviewed in Section 2, are addressed in Section 5.

## 5. Discussion

The estimates reported in Section 4 point to distinct but interrelated associations of environmental values, place-based identities, and economic expectations with institutional stakeholder support for protected area designation.

Rather than pointing to a single dominant driver in a causal sense, the findings indicate that environmental worldviews and place-based identities are associated with a general predisposition towards conservation, while economic expectations show the largest association with strong and explicit approval in this population. This pattern suggests that *ex ante* social legitimacy may emerge from the interplay between normative orientations, territorial attachments, and anticipated material outcomes—an interpretation consistent with, though not confirmed by, the cross-sectional and exploratory nature of this study.

### 5.1. Environmental Worldviews and Support for Protected Areas

Environmental worldviews, measured through a parsimonious net NEP index that captures the balance between ecocentric and anthropocentric orientations, are positively associated with institutional stakeholder support in the parsimonious model, although the association is not statistically distinguishable from zero at this sample size.

The direction of the estimate—stakeholders with more ecocentric orientations tending to express higher support—is consistent with a large body of literature linking pro-environmental beliefs to acceptance of conservation policies, regulatory interventions, and biodiversity protection [1,14,22], even when such orientations are captured through parsimonious and internally heterogeneous measures. The magnitude of the associated marginal effect, of the order of ten percentage points on the probability of maximum support, is substantively non-trivial even though it cannot be distinguished from zero statistically; at  $N = 35$  the two statements are compatible, and we report both rather than treating non-significance as evidence of absence.

The attenuation of this association in the mechanism model indicates that environmental values alone do not account for institutional stakeholder support when expectations about economic outcomes are considered. This pattern does not undermine the relevance of environmental worldviews; rather, it suggests that their association with support is contingent on how conservation is perceived to affect local socio-economic conditions. In stakeholder contexts—where respondent organizations are directly affected by conservation decisions—general environmental concern appears to provide a normative foundation associated with legitimacy, but not, on its own, a sufficient basis for strong endorsement of specific policy proposals.

### 5.2. Place Identity and Support for Protected Areas

Place identity is also positively associated with support in the parsimonious specification, again without reaching statistical significance. The direction is consistent with theories of place attachment and place identity, which emphasize the role of emotional,

symbolic, and identity-based bonds in shaping attitudes towards landscape protection and long-term stewardship [29,30], and with prior Italian evidence linking regional identity to support for protected area designation [38]. The internal coherence of the place identity construct observed in the data ( $\alpha = 0.87$ ) supports the descriptive relevance of this measure, even when the association it enters is estimated imprecisely.

In the context of the Iblei Plateau, characterized by strong cultural, historical, and landscape identities, this result is of particular interest. Identification with the territory may be associated with a greater openness towards conservation initiatives perceived as protecting what is distinctive and locally valued. However, identification is far from uniform in this population: the place identity index spans almost the entire scale (Section 4.1), so the population includes organizations whose relation to the territory is, on this measure, weak.

As with environmental worldviews, the association of place identity with support is attenuated to a magnitude indistinguishable from zero once perceived economic benefits are included in the model. This suggests that strong territorial identification does not automatically translate into acceptance of protected area designation. Instead, as the broader place-attachment literature suggests, strong place-based identification may be associated with both approval and resistance, depending on how conservation is expected to affect local livelihoods, land-use practices, and development trajectories [30,34–36]. The results thus caution against assumptions that local identification invariably leads to conservation support and highlight the importance of considering the socio-economic framing of protected area proposals.

From a broader social–ecological perspective, place identity and sense of place play a key role in mediating human–environment relationships and governance outcomes, particularly in multifunctional landscapes [37]. These findings align with this perspective, showing that place-based identity is associated with an underlying predisposition towards conservation, while its translation into explicit support appears to depend on how conservation is framed in relation to local socio-economic expectations.

### 5.3. *Perceived Economic Benefits as the Largest Correlate of Stated Support*

The most salient finding concerns perceived economic benefits, measured through a highly internally consistent composite index ( $\alpha = 0.96$ ). Across both ordered and binary logit specifications, expectations regarding the valorization of typical local products, ecotourism and cultural tourism, and the emergence of new tourism-related economic activities emerge as the variable most strongly associated with institutional stakeholders' stated support.

The magnitude of the estimated average marginal effects is descriptively striking. A one-unit increase in perceived economic benefits is associated with an increase of approximately 33 percentage points in the predicted probability of expressing the highest level of support, and of approximately 23 percentage points in the probability of favourable support under the binary definition. This association is substantially larger than those associated with environmental orientation or place identity and remains stable in direction and relative magnitude across model specifications, under penalized-likelihood estimation, and when omitting any single respondent (Section 3.9). Its statistical strength, however, varies with the outcome definition, and we claim no more than the estimates support.

These results suggest that social legitimacy in protected area planning, at least within this population, is not grounded solely in normative agreement with conservation goals or emotional attachment to place. Rather, it appears related to stakeholders' expectations about the distribution of costs and benefits. Where conservation is perceived as compatible with local development and capable of generating tangible economic benefits, stated approval is markedly higher in this population.

This finding resonates with a growing literature on conservation governance and benefit-sharing, which emphasizes that protected areas perceived as imposing constraints without compensating benefits are more likely to generate conflict, resistance, and low compliance [5,8,13]. It is also consistent with Jones et al. [43], who find that perceived impacts and governance indicators—including trust and engagement—mediate public support for protected areas across a much larger sample of European residents, and with Newig et al. [44], whose meta-analysis of 305 environmental governance cases underscores the importance of context-specific factors, including the scope and composition of the engaged stakeholder population, in shaping governance outcomes. Conservation initiatives embedded in credible and locally meaningful development narratives appear more likely to be associated with durable social acceptance, though confirming this would require research designs beyond the scope of the present study.

#### *5.4. Interplay Between Values, Identity, and Instrumental Considerations*

Taken together, the results point to a layered structure of institutional stakeholder support. Environmental values and place identity appear to shape an underlying orientation towards conservation, reflecting normative and symbolic dimensions of legitimacy. Instrumental considerations related to economic outcomes, however, appear to play a larger role in whether this orientation translates into strong and explicit endorsement of protected area designation.

This interpretation may help reconcile different strands of the literature. While many studies document positive associations between environmental concern, place attachment, and conservation support, stakeholder-based analyses—including the present one and, at a different scale, McGinlay et al. [11] and Jones et al. [43]—often highlight economic considerations as particularly salient. The present findings suggest that these perspectives may be complementary rather than contradictory: values and identities appear to matter, but their association with expressed support seems to be conditioned by expectations about socio-economic consequences.

The attenuation of value- and identity-based associations in the mechanism model suggests that these dimensions may operate conditionally, rather than independently, in relation to expressed approval in this population. They may operate indirectly, shaping how stakeholders interpret information about economic impacts, assess the credibility of development promises, and evaluate trade-offs associated with conservation policies—an interpretation that future qualitative or mixed-method research (Section 6.2) could usefully examine directly.

#### *5.5. Implications for Protected Area Planning and Governance*

Read together, these results indicate that designing a protected area and building its social legitimacy are not separable tasks. The value- and identity-based dimensions appear to supply a normative and symbolic foundation, but in this population they were not, on their own, associated with strong stated support once economic expectations were considered. What follows for planning is therefore not a communication strategy but a design question: where in the territory, and through which instruments, the expected benefits are produced. This also delimits the role of an exercise of this kind. Ex ante stakeholder analysis describes the relative weight of the considerations in play before designation and is one planning input among several—to be read alongside ecological, legal, and distributive-justice criteria (Sections 2.1 and 2.5) rather than as the decisive basis for a decision. The two subsections that follow set out what the present evidence, combined with independent spatial evidence on the same territory, supports concretely.

More broadly, our findings resonate with recent economic arguments highlighting the need to integrate human responses into protected area planning from the outset. As emphasized by Albers and Kroetz [6], conservation designs that neglect how local actors anticipate costs and benefits risk generating ineffective or weakly enforced protected areas.

#### 5.5.1. Where the Instrumental Channel Is Located in Space

The finding that stated support is most strongly associated with expected local economic benefits acquires more specific planning content when read against the spatial structure of the same territory. A companion analysis of the proposed park partitions it into four zones on non-compensatory rules and finds a markedly asymmetric result: strict core conservation areas cover only 682 ha, about 0.5% of the park; a buffer zone covers 14,667 ha, about 10%; and transition and general matrix zones dominate, at 80,167 ha (54.7%) and 50,973 ha (34.8%) respectively [59]. Critically, all four ecosystem services examined there—carbon storage, pollination, flood regulation and recreation—concentrate 50–72% of their high-value area in the transition zone, while the existing protected-area network covers approximately 71% of the strict core but only 24% of that transition zone and 22% of the general matrix.

The two lines of evidence therefore converge on the same territory. The agri-food valorisation, nature-based and cultural tourism, and new tourism-related activities that stakeholders in this study associate with the designation are generated in the multifunctional transition landscape, not in the ecological cores—and it is precisely that landscape that current protection barely covers. This has a direct implication: a designation whose regulatory apparatus is concentrated on the cores would deliver ecological protection while leaving largely unaddressed the economic-benefit channel with which institutional support is most closely associated and would consequently be legitimate on paper and fragile in practice.

#### 5.5.2. Specific Proposals for the Iblei Designation

Four proposals follow, each attached to an existing instrument rather than to a new one.

First, the park plan should be differentiated by zone rather than treating the outer zones as residual. Under Law No. 394/1991 the park plan articulates the territory into zones of decreasing protection, and the outermost zone is in practice often left without positive prescriptions. The evidence above argues against that default here, because the outer zones hold most of the service-relevant area. Zone-specific and service-aware prescriptions are available [59]: in flood-regulation hotspots, protection of runoff-source and riparian areas, limits on soil sealing and channelization, and maintenance of vegetation cover upstream of vulnerable settlements; in pollination hotspots, retention of semi-natural elements—hedgerows, field margins, garrigue patches—and reduction in agrochemical pressure; in carbon hotspots, avoidance of land conversion and maintenance of soil organic carbon; in recreation hotspots, access management and preservation of landscape naturalness.

Second, the designation should complement the Natura 2000 management plans rather than duplicate them. The management plans of the 15 Special Areas of Conservation already cover the ecological cores well. What they do not cover is connectivity across the transition matrix. The designation adds value where it establishes corridors between cores and coordinates measures across the matrix, and adds least where it re-regulates what the site plans already regulate.

Third, agri-environmental instruments should be used as the operational vehicle for the benefit expectations documented here. The measures listed above for pollination and flood regulation are agri-environmental in nature and are deliverable through the

regional rural development framework: in Sicily, the Complemento di Programmazione Regionale per lo Sviluppo Rurale (CSR) within the national CAP Strategic Plan 2023–2027, approved by the Regional Government with Deliberazione della Giunta regionale No. 149 of 30 March 2023, whose SRA-type interventions and Natura 2000 compensatory payments are the existing channels for such measures. This matters for legitimacy specifically: our results indicate that support is associated with expected benefits, and expectations that are not attached to a funded instrument are the ones most likely to decay once restrictions become concrete.

Fourth, the park zoning should be aligned with the provincial landscape plans, which are already in force and binding. The Piano Paesaggistico of the regional Ambiti 15, 16 and 17 falling within the province of Ragusa was definitively approved by assessorial decree (D.A. No. 1346), and that of Ambiti 16 and 17 falling within the province of Syracuse by D.A. No. 5040 of 20 October 2017. Because the Italian Code of Cultural Heritage and Landscape requires other territorial and sectoral plans to be made coherent with an approved landscape plan, the constraints on soil sealing and land conversion in the identified flood-regulation and carbon hotspots are already partly available within existing competences. Coordinating the park zoning with those plans at the designation stage avoids the familiar situation in which a park plan and a landscape plan assign incompatible objectives to the same parcel.

These proposals do not follow from the associations reported in Section 4 taken alone. They follow from combining two things: the finding, in this population, that stated support is associated primarily with expected local economic benefits, and independent spatial evidence that the areas generating those benefits lie largely outside the ecological cores and outside current protection [59]. The stakeholder evidence identifies which channel matters for legitimacy; the spatial evidence identifies where that channel operates. Neither, on its own, would support prescriptions at this level of specificity, and both would need to be revisited if the boundary proposal changes materially.

## 6. Conclusions

This study provides exploratory descriptive evidence on how *ex ante* social legitimacy for protected area designation relates to environmental values, place-based identities, and institutional stakeholders' expectations regarding local economic outcomes, within the complete population of 35 institutional stakeholders engaged in the Iblei National Park designation process.

Three findings emerge, all specific to the population studied and offered as exploratory rather than confirmatory. First, environmental worldviews and place identity are positively associated with stated support in the parsimonious specifications, though neither association is statistically distinguishable from zero; they appear to provide a normative and symbolic foundation for conservation legitimacy at the pre-designation stage. Second, perceived economic benefits show the largest association with institutional stakeholder support in every specification estimated, with average marginal effects of 33 and 23 percentage points on the probability of maximum and of favourable support respectively; this association is stable in sign and magnitude, and survives penalized-likelihood estimation and the omission of any single respondent, while its statistical strength varies with how the outcome is defined. Third, the inclusion of perceived economic benefits attenuates the estimated associations of environmental values and place identity to magnitudes indistinguishable from zero, suggesting that these dimensions may not operate independently of expected socio-economic outcomes.

Conceptually, the study reinforces the view that social legitimacy is multidimensional and context-dependent, and that stated support cannot be inferred solely from environ-

mental concern or emotional attachment to place. Methodologically, it illustrates how a theoretically grounded, transparent and parsimonious measurement and modelling strategy can be applied—and honestly reported, including where diagnostic tests cannot be computed—in small, bounded, institutionally defined stakeholder populations, an increasingly common but methodologically under-discussed situation in applied conservation planning research.

### 6.1. Practical Implications for Conservation Planners

Three implications follow for those responsible for designating and planning protected areas in comparable settings.

Do not treat high environmental values or strong territorial attachment as sufficient conditions for institutional legitimacy. In this population they were not, on their own, associated with strong stated support once economic expectations were taken into account.

Attach expected benefits to funded instruments rather than to declarations. Because support is associated with expectations, and expectations decay when restrictions become concrete while benefits remain promissory, the agri-environmental and rural development instruments already available in the region are the operational route through which the economic-benefit channel can be made credible (Section 5.5.2).

Direct planning attention to the transition landscape, not only to the ecological cores. In this territory the areas generating the services stakeholders associate with local benefit lie largely outside the cores and outside current protection, so the outer zones of the park plan are where legitimacy and ecological function most need to be addressed together.

### 6.2. Limitations

Several limitations should be acknowledged, beyond those already discussed throughout the paper.

First, the findings are specific to a small and bounded population. Although the analysis covers the complete population of institutional stakeholders formally engaged in the Iblei designation process (Section 3.2), this population is itself small and specific to one designation process in one region. The findings should not be generalized to other protected area proposals, to other stakeholder populations (e.g., individual residents), or to other institutional contexts without further evidence.

Second, stated *ex ante* support was measured with a single ordinal item. While this item's response distribution shows meaningful variation across all five categories (mean = 3.63, SD = 1.48, range 1–5; Section 4.1), a single item cannot capture the multiple dimensions that support for designation may include—such as approval, acceptance of specific restrictions, perceived legitimacy of the process, willingness to cooperate, or willingness to bear costs. Future studies could usefully develop and validate a multi-item measure of institutional stakeholder support that disentangles these dimensions.

Third, *ex ante* preferences of the kind measured here are not necessarily stable: stakeholder positions may shift once boundaries, access restrictions, enforcement arrangements, compensation measures, or management responsibilities become concrete, as documented in other European experiences of protected area planning and implementation conflict [47,48]. The present findings should therefore be read as a baseline snapshot of *ex ante* positions rather than as a prediction of eventual acceptance.

Fourth, with  $N = 35$ , all reported associations—including reliability coefficients, correlation estimates, and regression coefficients—are best interpreted as exploratory and descriptive of this specific population rather than as confirmatory, causal, or generalizable estimates. The statistical strength of the central association varies with the outcome definition, and the proportional-odds assumption could not be tested for the mechanism

specification because the comparison model is not estimable at this sample size (Section 3.9). We report these limits rather than resolving them.

Finally, the net environmental orientation index (Section 3.6) is a pragmatic response to the low reliability of the full NEP battery, not a validated psychometric solution to that reliability problem; this limitation is inherent to the approach and is not resolved by the net-score construction.

Nevertheless, the consistency of the estimated pattern across ordered and binary specifications, its stability under penalized-likelihood estimation and under the omission of any single respondent, and the complete coverage of the relevant institutional population lend some descriptive confidence to the patterns reported here.

### 6.3. Future Research

Future research could extend this work in several directions. Larger and more heterogeneous stakeholder populations—including individual residents alongside institutional actors—could be used to examine whether the relative importance of environmental values, place identity, and economic expectations varies across stakeholder types or territorial contexts. Longitudinal designs could shed light on how stated support evolves as protected area designation moves from proposal to implementation, directly addressing the preference-stability concerns noted above.

Given the small, bounded, and categorical nature of the institutional stakeholder population studied here, qualitative comparative analysis [65] (QCA) represents a particularly promising complementary strategy: QCA is explicitly designed for small- and medium-N research and could identify configurations of conditions (e.g., stakeholder category, perceived economic benefit, place identity) associated with support, provided that conditions and calibration thresholds are theoretically justified and that limited diversity and contradictory configurations are explicitly addressed. Combined with semi-structured interviews exploring why stakeholders support, oppose, or conditionally accept the designation, such a mixed-method design could reveal concerns and reasoning not captured by Likert-scale items alone, and would directly respond to the concern that a questionnaire-plus-regression design may not be the most informative approach for a small, specialized stakeholder population of this kind.

In conclusion, this study offers exploratory evidence that the social legitimacy of protected areas, within the population of institutional stakeholders studied here, is not given *ex ante* but appears to be actively constructed. Environmental values and territorial identities provide a normative and symbolic foundation associated with a general predisposition toward conservation, while stronger and more explicit stated support appears more closely linked to whether conservation is perceived as compatible with, and contributory to, the socio-economic future of local territories. Corroborating and extending these exploratory patterns through larger, comparative, and mixed-method research designs is an important direction for future work on the planning and governance of protected areas.

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and interviewed exclusively in their capacity as legal representatives, or as designated officers, of the institutional stakeholders listed in Table 1, and the questionnaire elicited the position of the organization on a public planning proposal rather than personal information about the individual respondent. Responses are attributed to organizations rather than to individuals, and results are reported only at the level of stakeholder categories, so that no individual respondent is identifiable in the reported findings.

**Informed Consent Statement:** Informed consent was obtained from all participants involved in the study. Participation was voluntary. Before each interview, respondents were informed of the purpose and academic nature of the research, of the institutional character of the questions, of the intended use of the responses for scientific publication in aggregate form, and of their right to decline to answer any question or to withdraw at any point.

**Data Availability Statement:** The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to ethical and confidentiality considerations.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## Appendix A. Classification of NEP Items and Construction of the Net Environmental Orientation Index

This appendix reports the classification of the New Ecological Paradigm (NEP) items used to construct the ecocentric (ECO) and anthropocentric (ANTRO) components of the net environmental orientation index. Twelve of the fifteen NEP items were used (six per subset); the remaining three did not load consistently and were excluded (Section 3.6). The rightmost column reports the corresponding questionnaire variable code. The classification follows a theory-driven approach consistent with the original NEP framework [22] and is intended to ensure transparency and replicability of the index construction.

**Table A1.** Classification of NEP items into ecocentric and anthropocentric subsets.

| NEP Item—Italian Original/English Translation                                                                                                                                                                                | Code   | Subset |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| «Stiamo raggiungendo il numero massimo di esseri umani che il pianeta Terra può sostenere»/“We are approaching the maximum number of people the Earth can support”                                                           | A25.1  | ECO    |
| «Quando gli esseri umani interferiscono con la natura spesso provocano conseguenze disastrose»/“When humans interfere with nature it often produces disastrous consequences”                                                 | A25.3  | ECO    |
| «Gli esseri umani stanno abusando dell’ambiente»/“Humans are severely abusing the environment”                                                                                                                               | A25.5  | ECO    |
| «Le piante e gli animali hanno gli stessi diritti a vivere degli esseri umani»/“Plants and animals have as much right as humans to exist”                                                                                    | A25.7  | ECO    |
| «L’equilibrio della natura è molto delicato e facilmente deteriorabile»/“The balance of nature is very delicate and easily upset”                                                                                            | A25.13 | ECO    |
| «Se le nostre relazioni con la natura continueranno come adesso, sperimenteremo presto una grande catastrofe ecologica»/“If things continue on their present course, we will soon experience a major ecological catastrophe” | A25.15 | ECO    |
| «Gli esseri umani hanno il diritto di modificare l’ambiente naturale per soddisfare i loro bisogni»/“Humans have the right to modify the natural environment to suit their needs”                                            | A25.2  | ANTRO  |
| «Gli esseri umani hanno le capacità per non rendere la Terra un pianeta invivibile»/“Human ingenuity will ensure that we do not make the Earth unlivable”                                                                    | A25.4  | ANTRO  |
| «Il pianeta Terra ha risorse sufficienti per tutti se impariamo a sfruttarle al meglio»/“The Earth has plenty of natural resources if we just learn how to develop them”                                                     | A25.6  | ANTRO  |
| «L’equilibrio della natura è abbastanza forte da far fronte agli impatti dei paesi industrializzati»/“The balance of nature is strong enough to cope with the impacts of modern industrial nations”                          | A25.8  | ANTRO  |

Table A1. *Cont.*

| NEP Item—Italian Original/English Translation                                                                                                                                          | Code   | Subset |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| «Gli esseri umani devono governare la natura»/“Humans were meant to rule over the rest of nature”                                                                                      | A25.12 | ANTRO  |
| «Gli esseri umani impareranno come funziona la natura e saranno in grado di saperla controllare»/“Humans will eventually learn enough about how nature works to be able to control it” | A25.14 | ANTRO  |

Notes: Composite ECO and ANTRO scores were computed as the arithmetic mean of the items in each subset.

## Appendix B. Measurement Items for Place Identity, Perceived Economic Benefits, and Stated Support

This appendix reports the specific questionnaire items used to construct the composite indices for place identity and perceived economic benefits employed in the empirical analysis, and the single item used to measure stated support for designation.

Table A2. Items used to construct the place identity index.

| Item Code   | Item Wording (Italian Original/English Translation)                                                                   | Construct      |
|-------------|-----------------------------------------------------------------------------------------------------------------------|----------------|
| PI1 (A13.4) | “Mi identifico fortemente con il territorio ibleo”/“I strongly identify with the Iblei territory”                     | Place identity |
| PI2 (A13.6) | “Sento che il territorio ibleo faccia parte di me stesso”/“I feel that the Iblei territory is part of myself”         | Place identity |
| PI3 (A13.5) | “Vivere nel territorio ibleo dice tanto su quello che sono”/“Living in the Iblei territory says a lot about who I am” | Place identity |

Notes: Items measured on a 5-point Likert-type importance scale (1 = per niente importante/not at all important, 5 = estremamente importante/extremely important; item battery no. 13 in the questionnaire). Index computed as the arithmetic mean of the three items. Adapted from Proshansky et al. [29] and Lewicka [30]; place identity is treated as conceptually distinct from the broader construct of place attachment. English wordings are faithful translations of the original Italian items administered in 2023.

The place-identity index is the mean of the three cognitive–symbolic identity items A13.4, A13.5 and A13.6 of the questionnaire’s human–place battery (question 13); the remaining items of that battery, which capture place dependence and nature bonding, were not used in the present analysis.

Table A3. Items used to construct the perceived economic benefits index.

| Item Code    | Item Wording (Italian Original/English Translation)                                                                                                                                                                                                                                         | Construct         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| EB1 (A35.7)  | «Col parco nazionale degli Iblei valorizziamo di più i prodotti agro-alimentari tipici del nostro territorio»/“With the Iblei National Park we would better valorize the typical agri-food products of our territory”                                                                       | Economic benefits |
| EB2 (A35.8)  | «Il parco nazionale degli Iblei attrarrebbe ecoturisti da ogni dove»/“The Iblei National Park would attract ecotourists from everywhere”                                                                                                                                                    | Economic benefits |
| EB3 (A35.9)  | «Col parco nazionale degli Iblei si aiuterebbe anche lo sviluppo del turismo culturale»/“The Iblei National Park would also foster the development of cultural tourism”                                                                                                                     | Economic benefits |
| EB4 (A35.10) | «Col parco nazionale degli Iblei si favorirebbe la nascita e lo sviluppo di nuove attività economiche legate al turismo naturale e culturale»/“The Iblei National Park would encourage the creation and development of new economic activities linked to nature-based and cultural tourism” | Economic benefits |

Table A3. Cont.

| Item Code    | Item Wording (Italian Original/English Translation)                                                                                                                                                                                                                                                                          | Construct         |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| EB5 (A35.11) | «Il parco nazionale degli Iblei favorirebbe la nascita e lo sviluppo di nuove attività economiche (produttive e commerciali) ragusane legate all’ecoturismo»/“The Iblei National Park would encourage the creation and development of new Ragusa-based economic activities (productive and commercial) linked to ecotourism” | Economic benefits |

Notes: Items measured on 5-point Likert-type scales (1–5). Index computed as the arithmetic mean of the five items. Developed drawing on Mascia et al. [12], Bennett and Dearden [13], and Schneider et al. [42].

The perceived-economic-benefits index is the mean of five items from question A35 of the 2023 questionnaire (agreement–disagreement scale): items A35.7 to A35.11, reported below with their original Italian wording and English translation.

Table A4. Item used to measure stated support for designation.

| Item Code | Item Wording (Italian Original/English Translation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Response Scale                                                                                                                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUP       | “Fermo restando che l’attuale proposta di perimetrazione del parco non sia quella definitiva in quanto potrà subire adeguati aggiustamenti per venire incontro alle varie esigenze espresse dalle istituzioni locali e da altre associazioni di categoria, in quale misura lei è d’accordo o in disaccordo in linea di principio con la designazione del Parco nazionale degli Iblei?”/“Bearing in mind that the current park boundary proposal is not the final one, as it may undergo appropriate adjustments to accommodate the various needs expressed by local institutions and other category associations, to what extent do you agree or disagree, in principle, with the designation of the Iblei National Park?” | 1 = Completamente in disaccordo (strongly disagree); 2 = Lievemente in disaccordo (slightly disagree); 3 = Neutrale (neutral); 4 = Lievemente in accordo (slightly agree); 5 = Completamente in accordo (strongly agree) |

Notes: Single-item ordinal measure of stated ex ante support (question 36 of the questionnaire administered in 2023). In the analyzed population the item shows meaningful variation across all five categories (mean = 3.63, SD = 1.48; full range 1–5 observed; Section 4.1). The English wording is a faithful translation of the original Italian item.

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