

## 6. INSTITUTIONAL GUIDING PRINCIPLES ON THE SELECTION, OPERATION AND USE OF UNIVERSITY OF CALIFORNIA NATURAL RESERVE SYSTEM SITES

The University of California Natural Reserve System (NRS) is a unique assemblage of protected wildland sites throughout California. Its reserves encompass nearly all of the state's major ecosystems, preserved in as undisturbed a condition as possible to support University-level research and teaching programs.

Throughout the life of the NRS, certain fundamental guiding principles have governed the selection, operation, and use of NRS reserves. These guiding principles, first set forth in the system's founding documents, have been reiterated in subsequent formal documents, including the NRS twenty-year review and recently adopted reserve use guidelines. As well, many individuals important in the development of the NRS have given voice to these principles throughout the history of the system. As the NRS has grown and matured, these guiding principles have remained remarkably constant.

### In the Beginning

From its very inception, a fundamental tenet of the NRS has been to ensure that the natural resources available in this system of outdoor laboratories are conserved for future generations of university research and instruction. The Regents first established this guiding principle in the original charter, calling for:

...the preservation of a natural environment in as undisturbed a condition as possible so that present and future faculty members and students may do research and make observations on a variety of natural environments...<sup>1</sup>

Early on, the founder of the NRS, Kenneth S. Norris, recognized the need to balance the goal of preserving these natural resources with the goal of performing scientific experimental manipulation on the reserves:

Simple observation, untempered by the experimental check, often gives equivocal or misleading results. Hence, to be useful for our scientists, some degree of manipulation of

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<sup>1</sup> Regents Committee on Educational Policy recommendation, approved and adopted by The Board of Regents on January 22, 1965.

either the biota or of physical conditions can usually be expected to be necessary for studies done within the reserves.<sup>2</sup>

In order to allow for some degree of manipulative research, while at the same time protecting natural resources, it was recommended that a system of zoning be established within each reserve, allowing limited manipulations in only part of the reserve, and leaving the remainder undisturbed:

Each reserve should be zoned so that the majority is kept inviolate, while a smaller section, but one which contains within it a sampling of the entire or at least the majority of variability of the reserve as a whole, is set aside for manipulation. Then, manipulations should be controlled in the following fashion. Each proposed case should be examined in detail and should, in the view of ecologists regulating the reserve, be of such a minor nature that best judgment predicts that no permanent or even long-term transitory change in the natural environment will result from them. Restitution should predictably occur within, say, a period of five years.<sup>3</sup>

Although the door was opened to manipulative research, the long-term goal of preserving the NRS's natural resources has remained paramount. According to Ken Norris, researchers proposing manipulative research that would cause alterations of the environment should be directed to other field stations outside of the NRS:

Many activities of environmental scientists which involve alterations of environments can profitably be carried on outside of reserves, as for example, most collections of experimental organisms, most terminal experiments where members of the natural biota are killed, or experiments involving large scale changes in the physical environment. These should be routed to non-reserve lands wherever possible, even if they can be expected to cause little or no permanent change in the reserve itself.... If these guide lines

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<sup>2</sup> Kenneth S. Norris, "The Use of Natural Land and Water Reserves Land," February 11, 1966, p. 1.

<sup>3</sup> *Ibid.*, 1-2. The restitution period does not imply that the total length of the study is limited to five years, but rather that upon the completion of the study, restitution of the study site should be brought about within a five-year period. The use of the NRS for long-term studies was recognized from the inception. *See*, for example, the NLWRS Systemwide Academic Plan, which states: "...NLWRS reserves increasingly become places where careful work may be done over long periods, and where disruption [of the study] is controlled to the maximum extent possible." (University of California Natural Land and Water Reserves System, Systemwide Academic Plan, November 14, 1978, p. 2.) *See also* the report of the NRS twenty-year review: "As the pace of development accelerated and the pressure on wild areas increased, the University realized it would need natural areas managed specifically for academic uses, where teachers and researchers could undertake long-term projects with the confidence that their study sites would never be disturbed. The UC Natural Reserve System grew out of this need." (Natural Reserve System/The First Twenty Years, University of California, 1985, p. 5.)

are followed we can expect the habitat reserves within the system to yield important scientific dividends and yet to remain useful and natural indefinitely. <sup>4</sup>

In 1978, the Systemwide Advisory Committee reasserted these viewpoints in the Systemwide Academic Plan, stating:

The basic use criterion is that no use may be allowed that will degrade the habitat of any reserve for any appreciable period of time. Of course, some portion of each reserve is relegated to amenities such as roads and reserve headquarters, and the above constraint does not apply to these areas. Some uses, such as minor collections, which impact habitats but which are rapidly restored by the natural ecological processes of the land may be permitted upon advice of the management advisory committee. The kinds of uses permitted on given reserves may also be regulated within reserves by zoning plans.

Submitted projects may come from a wide variety of disciplines, and are judged by the faculty manager with the advice of the management advisory committee on the basis of the following criteria: (1) the validity of the work proposed, (2) the need for reserve use in its pursuance, including the use of unique reserve values and the need for protection from vandalism or accidental interference, (3) the availability of land and facilities necessary for its pursuit, and (4) priorities as determined in consultation with the management advisory committee. No limits of a disciplinary sort are normally imposed. The use of reserves for photography by University classes, or the composition of outdoor writing, may be as valid as a natural science project. <sup>5</sup>

#### Acquisition Guidelines for Reserves

In calling for the long-term protection of natural resources on NRS sites, the founders understood that, unavoidably, many sites may come with a history of human disturbance. The NRS Acquisition Guidelines acknowledge this inevitability:

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<sup>4</sup> *Ibid*, 2.

<sup>5</sup> University of California Natural Land and Water Reserves System, Systemwide Academic Plan, November 14, 1978, p. 4.

Ecosystems totally free of man's influence are no longer to be found, and in reality, units of a system of natural reserves will fall within a spectrum with undisturbed ecosystems on the one hand and ecosystems heavily influenced by man on the other hand.<sup>6</sup>

Even if not "pristine," a site may qualify as an NRS reserve if it meets certain criteria, including:

- 1) Viable ecosystem: Ecosystem viability is a prime requisite in establishing a natural reserve. The natural relationships should be essentially intact...and the reserves should be of sufficient size so that the natural balance of the community may be maintained with the survival of the plant and animal elements assured....
- 2) Habitat significance: Reserves should possess exceptional value in illustrating, interpreting, and protecting examples of the major habitat types of California.<sup>7</sup>

Furthermore, a reserve has "added value" if it also possesses special features, such as:

- important variations of the common habitat types, such as different successional stages (including important man-induced successional stages) or variations in soil parent material.
- significant gene pools, such as isolated populations or populations at extreme limits of the range of a species or habitat type.
- "type localities," for example, the location where a species, soil type, geological type, etc. [is] first described.
- transition zones (ecotones) and interfaces between adjacent habitat types.
- the presence of a rare or an endangered habitat type or the presence of a rare or endangered species.
- the presence of a feature of geological, archaeological, or paleontological importance.<sup>8</sup>

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<sup>6</sup> University of California Natural Reserve System, NRS Acquisition Guidelines, June 1984, p. 1. *See also* University of California Natural Land and Water Reserves System, NLWRS Acquisition Guidelines, March 1975.

<sup>7</sup> *Ibid*, 1.

<sup>8</sup> *Ibid*, 2.

The long-term protection of a reserve's natural resources must therefore take into consideration the particular features that the reserve was created to protect. Collectively, the distinct attributes of each NRS site serve to form a systemwide catalog of the state's diverse natural resources.

### The First Twenty Years

The "archival" values of these NRS sites have been emphasized throughout the life of the system. In 1985, the NRS conducted a twenty-year review that affirmed these values. As stated in the final published report:

An essential component of the University of California, the reserves are as important to field scientists as chemistry labs are to medical researchers. Though a laboratory can always be rebuilt, a natural ecosystem, once gone, can never be replaced. The habitats it supported are lost forever, the value of its species will never be realized. In this context, the NRS also serves as a library—an irreplaceable storehouse of living ecosystems, each millions of years in the making.<sup>9</sup>

In the same report, Ken Norris echoed this theme as he addressed the future of the system:

The specific educational value of the NRS will always be unpredictable. Experience teaches us that scholars of many kinds will use the reserves. There will be botanists, geologists, entomologists, naturalists, and scientists from many other disciplines as well; writers, photographers, and poets should also feel free to apply.

These people are going to uncover new stories of the animals and plants and the geology and soils of natural systems. We can't know now what scientific questions might arise, but we can make sure that the resources to answer those questions are available. What we are doing is opening the doors and providing the opportunities for those who follow in our footsteps.<sup>10</sup>

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<sup>9</sup> Natural Reserve System/The First Twenty Years, University of California, 1985, p. 12.

<sup>10</sup> *Ibid*, 24.

The report of the twenty-year review concludes with the observation that these archival values have not changed: “As the NRS grows, its original dream remains intact: protecting undisturbed samples of California’s diverse natural habitats for education will always be its highest goal.”<sup>11</sup>

Following on the heels of the twenty-year review, the 1991 Steering Committee on Long-Range Planning recast these values in the context of the NRS’s responsibilities as a Trustee Agency under the California Environmental Quality Act:

As a Trustee Agency under the California Environmental Quality Act, the University manages the resources of the Natural Reserve System in the Public Trust. Setting aside land is simply the first step in fulfilling that trust. Reserves require *active*, scientifically sound management to ensure their continued viability as natural systems, as well as their long-term availability for teaching and research. This truly fulfills our responsibilities as Trustee.<sup>12</sup>

Indeed, the NRS’s Trustee Agency status is one characteristic that distinguishes NRS reserves from the University’s agricultural field stations. Unlike the latter,

“...the reserves have the added Public Trust responsibility to manage and preserve samples of California’s diverse ecosystems.”<sup>13</sup>

### Present-Day NRS

Views expressed by present-day users of the NRS reaffirm these intentions. For example, Carla D’Antonio, Associate Professor of Integrative Biology at UC Berkeley writes in a letter distributed to the NRS Systemwide Advisory Committee:

I feel strongly that one of the roles of the NRS is to preserve the biological diversity, from the population genetic level to the landscape, that is part of the natural heritage of California....

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<sup>11</sup> *Ibid.*

<sup>12</sup> Final Report of the Natural Reserve System Steering Committee on Long-Range Planning, University of California, June 1991, p. 16.

<sup>13</sup> *Ibid.*, 20.

I feel very proud to be part of a University that supports this large system of natural reserves in a day and age when California's natural heritage is rapidly disappearing. Because the reserves are part of a largely human-dominated landscape, they are already under threat from species invasions, pollution and other unanticipated disturbances or stresses. It is therefore important that users of these reserves not add to the threats that already exist.<sup>14</sup>

In addition, the recent report of the committee to evaluate introduction of exotic genotypes into UC reserves reflects a broad concern with protecting the natural values of these reserves.<sup>15</sup> Similar views were expressed by members of a panel on the same subject at the November 2000 NRS management workshop at Palm Desert.<sup>16</sup>

### Reserve Use Guidelines

The Reserve Use Guidelines have standardized these founding principles and values of the NRS. Under the guidelines:

Activities that will or are highly likely to irrevocably harm the natural values, ecosystem functions and native biodiversity of the reserve, or preclude its possible future use for University-level research or instruction, will not be allowed.<sup>17</sup>

In evaluating applications for reserve use, reserve managers may consider, among other things, the impacts on natural systems and long-term use. Evaluation criteria include:

- (a) Impacts on Natural Systems. Potential positive and negative impacts on natural systems (e.g., significant new research, extensive collections, significant habitat alterations, introductions of species or genes);

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<sup>14</sup> Letter from Carla D'Antonio to NRS Director Alexander Glazer, distributed November 16, 2000.

<sup>15</sup> Committee members: John Endler (chair), Susan Mazer, Mike Williams, Cristina Sandoval, Wayne Ferren. Report distributed and discussed at the May 19, 2000 meeting of the Universitywide NRS Advisory Committee. See Notes, Universitywide Natural Reserve System Advisory Committee, May 19, 2000.

<sup>16</sup> Report presented by Allan Muth at the November 16, 2000 meeting of the Universitywide NRS Advisory Committee. See Notes, Universitywide Natural Reserve System Advisory Committee, November 16, 2000.

<sup>17</sup> University of California Natural Reserve System, Reserve Use Guidelines, April 1999, p. 1.

(b) Impacts on Present or Long-term Use. Potential positive and negative impacts on present or future long-term use of the reserve for research or instructional purposes....<sup>18</sup>

Consistent with Ken Norris' early recommendations, the use guidelines allow for zoning in the reserves. Reserve management plans may zone certain areas that contain fragile resources "off-limits" to most users. Furthermore, reserve managers are given the latitude to direct highly manipulative research to field stations outside the NRS:

For highly manipulative research that may irrevocably harm the natural values of the reserve or preclude its future use for University-level research or instruction, the prospective researcher may be directed to areas outside the reserve if such areas are available, or the application may be denied.<sup>19</sup>

### Conclusion

Throughout the history of the Natural Reserve System, there has been an implicit agreement on the fundamental guiding principles and values that govern the selection, operation, and use of NRS reserves. From the founders of the system to present-day users, the NRS charter to the Reserve Use Guidelines, these guiding principles have remained constant in the life of the NRS. As the future brings to bear competing pressures on the operations and uses of NRS sites, these guiding principles are a beacon that will ensure the long-term value of the Natural Reserve System for generations to come.

Compiled by Alexander Glazer and Chen Yin Noah.  
Reviewed and accepted at the May 16, 2001 meeting of the Universitywide NRS Advisory Committee.

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<sup>18</sup> *Ibid*, 3.

<sup>19</sup> *Ibid*, 4.