



601 FW 3

Biological Integrity, Diversity, and Environmental Health

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3.1 What is the purpose of this chapter? This chapter provides policy for maintaining and restoring, where appropriate, the biological integrity, diversity, and environmental health of the National Wildlife Refuge System.

3.2 What is the scope of this policy? This policy applies to all units of the System.

3.3 What is the biological integrity, diversity, and environmental health policy? The policy is an additional directive for refuge managers to follow while achieving refuge purpose(s) and System mission. It provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. Further, it provides refuge managers with an evaluation process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate and in concert with refuge purposes and System mission, restore lost or severely degraded components.

3.4 What are the objectives of this policy?

A. Describe the relationships among refuge purposes, System mission, and maintaining biological integrity, diversity, and environmental health.

B. Provide guidelines for determining what conditions constitute biological integrity, diversity, and environmental health.

C. Provide guidelines for maintaining existing levels of biological integrity, diversity, and environmental health.

D. Provide guidelines for determining how and when it is appropriate to restore lost elements of biological integrity, diversity, and environmental health.

E. Provide guidelines to follow in dealing with external threats to biological integrity, diversity, and environmental health.

3.5 What are the authorities for this policy? National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee (Refuge Administration Act). Section 4(a)(4)(B) of this law states that "In administering the System, the Secretary shall . . . ensure that the biological integrity, diversity, and environmental health of the System

are maintained for the benefit of present and future generations of Americans" This is one of 14 directives to the Secretary contained within the Refuge Administration Act.

3.6 What do these terms mean?

A. Biological Diversity. The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur.

B. Biological Integrity. Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

C. Environmental Health. Composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

D. Historic Conditions. Composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human related changes to the landscape.

E. Native. With respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

3.7 What are the principles underlying this policy?

A. Wildlife First. The Refuge Administration Act, as amended, clearly establishes that wildlife conservation is the singular National Wildlife Refuge System mission. House Report 105-106 accompanying the National Wildlife Refuge System Improvement Act of 1997 states ". . . the fundamental mission of our System is wildlife conservation: wildlife and wildlife conservation must come first." Biological integrity, diversity, and environmental health are critical components of wildlife conservation.

B. Accomplishing refuge purposes and maintaining biological integrity, diversity, environmental health of the System. The Refuge Administration Act states that each refuge will be managed to fulfill refuge purpose(s) as well as to help fulfill the System mission, and we will accomplish these purpose(s) and our mission by ensuring that the biological integrity, diversity, and environmental health of each refuge are maintained, and where appropriate, restored. We base our decisions on sound professional judgment.

C. Biological integrity, diversity, and environmental health in a landscape context. Biological integrity, diversity, and environmental health can be described at various landscape scales from refuge to ecosystem, national, and international. Each landscape scale has a measure of biological integrity, diversity, and environmental health dependent on how the existing habitats, ecosystem processes, and wildlife populations have been altered in comparison to historic conditions. Levels of biological integrity, diversity, and

environmental health vary among refuges, and often within refuges over time. Individual refuges contribute to biological integrity, diversity, and environmental health at larger landscape scales, especially when they support populations and habitats that have been lost at an ecosystem, national, or even international scale. In pursuit of refuge purposes, individual refuges may at times compromise elements of biological integrity, diversity, and environmental health at the refuge scale in support of those components at larger landscape scales. When evaluating the appropriate management direction for refuges, refuge managers will consider their refuges' contribution to biological integrity, diversity, and environmental health at multiple landscape scales.

D. Maintenance and restoration of biological integrity, diversity, and environmental health. We will, first and foremost, maintain existing levels of biological integrity, diversity, and environmental health at the refuge scale. Secondarily, we will restore lost or severely degraded elements of integrity, diversity, environmental health at the refuge scale and other appropriate landscape scales where it is feasible and supports achievement of refuge purpose(s) and System mission.

E. Wildlife and Habitat Management. Management, ranging from preservation to active manipulation of habitats and populations, is necessary to maintain biological integrity, diversity, and environmental health. We favor management that restores or mimics natural ecosystem processes or functions to achieve refuge purpose(s). Some refuges may differ from the frequency and timing of natural processes in order to meet refuge purpose(s) or address biological integrity, diversity, and environmental health at larger landscape scales.

F. Sound Professional Judgment. Refuge managers will use sound professional judgment when implementing this policy primarily during the comprehensive conservation planning process to determine: the relationship between refuge purpose(s) and biological integrity, diversity, and environmental health; what conditions constitute biological integrity, diversity, and environmental health; how to maintain existing levels of all three; and, how and when to appropriately restore lost elements of all three. These determinations are inherently complex. Sound professional judgment incorporates field experience, knowledge of refuge resources, refuge role within an ecosystem, applicable laws, and best available science including consultation with others both inside and outside the Service.

G. Public Use. The priority wildlife-dependent public uses, established by the National Wildlife Refuge System Improvement Act of 1997, are not in conflict with this policy when determined to be compatible. The directives of this policy do not generally entail exclusion of visitors or elimination of public use structures; e.g., boardwalks and observation towers. However, maintenance and/or restoration of biological integrity, diversity, and environmental health may require spatial or temporal zoning of public use programs and associated infrastructures. General success in maintaining or restoring biological integrity, diversity, and environmental health will produce higher quality opportunities for wildlife-dependent public use.

3.8 What are our responsibilities?

A. Director.

- (1) Provides national policy, goals and objectives for maintaining and restoring the biological integrity, diversity, and environmental health of the System.
- (2) Ensures that national plans and partnerships support maintaining and restoring the biological integrity, diversity, and environmental health of the System.
- (3) Ensures that the national land acquisition strategy for the System is designed to enhance the biological integrity, diversity, and environmental health of the System at all landscape scales.

B. Regional Director.

- (1) Provides regional policy, goals and objectives for maintaining and restoring the biological integrity, diversity, and environmental health of the System, including guidance to resolve any conflicts with biological integrity, diversity, and environmental health at an individual refuge versus at the larger landscape scales.
- (2) Ensures that regional and ecosystem plans, and regional partnerships support maintaining and restoring the biological integrity, diversity, and environmental health of the System.
- (3) Resolves conflicts that arise between maintaining biological integrity, diversity, and environmental health at the refuge level landscape scale versus at larger landscape scales.

C. Regional Chief.

- (1) Ensures that individual refuge comprehensive conservation plans support maintaining and restoring the biological integrity, diversity, and environmental health of the System.
- (2) Reviews and ensures those refuge management programs that occur on many refuges (e.g., fire management) are consistent with this policy.

D. Refuge Manager.

- (1) Follows the procedure outlined in paragraph [3.9](#).
- (2) Incorporate the principles of this policy into all refuge management plans and actions.

3.9 How do we implement this policy? The Director, Regional Directors, Regional Chiefs, and Refuge Managers will carry out their responsibilities specified in paragraph [3.8](#). In addition, refuge managers will carry out the following tasks:

- A.** Identify the refuge purpose(s), legislative responsibilities, refuge role within the ecosystem, and System mission.
- B.** Assess the current status of biological integrity, diversity, and environmental health through baseline vegetation, population surveys and studies, and any other necessary environmental studies.
- C.** Assess historic conditions and compare them to current conditions. This will provide a benchmark of comparison for the relative intactness of ecosystems' functions and processes. This assessment should include the opportunities and limitations to maintaining and restoring biological integrity, diversity, and environmental health.
- D.** Consider the refuge's importance to refuge, ecosystem, national, and international landscape scales of biological integrity, diversity, and environmental health. Also, identify the refuge's roles and responsibilities within the Regional and System administrative levels.
- E.** Consider the relationships among refuge purpose(s) and biological integrity, diversity and environmental health, and resolve conflicts among them.
- G.** Through the comprehensive conservation planning process, interim management planning, or compatibility reviews, determine the appropriate management direction to maintain and, where appropriate, restore, biological integrity, diversity, and environmental health, while achieving refuge purpose(s).
- H.** Evaluate the effectiveness of our management by comparing results to desired outcomes. If the results of our management strategies are unsatisfactory, assess the causes of failure and adapt our strategies accordingly.

3.10 What factors do we consider when maintaining and restoring biological integrity, diversity, and environmental health? We plan for the maintenance and restoration of biological integrity, diversity, and environmental health while considering all three in an integrated and holistic manner. The highest measure of biological integrity, diversity, and environmental health is viewed as those intact and self-sustaining habitats and wildlife populations that existed during historic conditions.

A. Biological Integrity.

(1) We evaluate biological integrity by examining the extent to which biological composition, structure, and function has been altered from historic conditions. Biological composition refers to biological components such as genes, populations, species, and communities. Biological structure refers to the organization of biological components, such as gene frequencies, social structures of populations, food webs of species, and niche partitioning within communities. Biological function refers to the processes undergone by biological components, such as genetic recombination, population

migration, the evolution of species, and community succession [see [602 FW 3.4C\(1\)\(e\)](#), Planning Area and Data Needs].

(2) Biological integrity lies along a continuum from a biological system extensively altered by significant human impacts to the landscape to a completely natural system. No landscape retains absolute biological integrity, diversity, and environmental health. However, we strive to prevent the further loss of natural biological features and processes; i.e., biological integrity.

(3) Maintaining or restoring biological integrity is not the same as maximizing biological diversity. Maintaining biological integrity may entail managing for a single species or community at some refuges and combinations of species or communities at other refuges. For example, a refuge may contain critical habitats for an endangered species. Maintaining that habitat (and, therefore, that species), even though it may reduce biological diversity at the refuge scale, helps maintain biological integrity and diversity at the ecosystem or national landscape scale.

(4) In deciding which management activities to conduct to accomplish refuge purpose(s) while maintaining biological integrity, we start by considering how the ecosystem functioned under historic conditions. For example, we consider the natural frequency and timing of processes such as flooding, fires, and grazing. Where it is not appropriate to restore ecosystem function, our refuge management will mimic these natural processes including natural frequencies and timing to the extent this can be accomplished.

(5) We may find it necessary to modify the frequency and timing of natural processes at the refuge scale to fulfill refuge purpose(s) or to contribute to biological integrity at larger landscape scales. For example, under historic conditions, an area may have flooded only a few times per decade. Migratory birds dependent upon wetlands may have used the area in some years, and used other areas that flooded in other years. However, many wetlands have been converted to agriculture or other land uses, the remaining wetlands must produce more habitat, more consistently, to support wetland-dependent migratory birds. Therefore, to conserve these migratory bird populations at larger landscape scales, we may flood areas more frequently and for longer periods of time than they were flooded historically.

B. Biological Diversity.

(1) We evaluate biological diversity at various taxonomic levels, including class, order, family, genus, species, subspecies, and--for purposes of Endangered Species Act implementation--distinct population segment. These evaluations of biological diversity begin with population surveys and studies of flora and fauna. The System's focus is on native species and natural communities such as those found under historic conditions [see [602 FW 3.4C\(1\)\(e\)](#)]. The Natural Heritage Network databases for respective States should prove a valuable tool for this initial evaluation.

(2) We also evaluate biological diversity at various landscape scales, including refuge, ecosystem, national, and international. On refuges, we typically focus our evaluations of biological diversity at the refuge scale; however, these refuge evaluations can contribute to assessments at larger landscape scales.

(3) We strive to maintain populations of breeding individuals that are genetically viable and functional. We provide for the breeding, migrating, and wintering needs of migratory species. We also strive to maximize the size of habitat blocks and maintain connectivity between blocks of habitats, unless such connectivity causes adverse effects on wildlife or habitat (e.g., by facilitating the spread of invasive species).

(4) At the community level, the most reliable indicator of biological diversity is plant community composition. We use the National Vegetation Classification System to identify biological diversity at this level.

C. Environmental Health.

(1) We evaluate environmental health by examining the extent to which environmental composition, structure, and function have been altered from historic conditions. Environmental composition refers to abiotic components such as air, water, and soils, all of which are generally interwoven with biotic components (e.g., decomposers live in soils). Environmental structure refers to the organization of abiotic components, such as atmospheric layering, aquifer structure, and topography. Environmental function refers to the processes undergone by abiotic components, such as wind, tidal regimes, evaporation, and erosion. A diversity of abiotic composition, structure, and function tends to support a diversity of biological composition, structure, and function [see [602 FW 3.4C\(1\)\(e\)](#), Planning Area and Data Needs].

(2) We are especially concerned with environmental features as they affect all living organisms. For example, at the genetic level, we manage for environmental health by preventing chemical contamination of air, water, and soils that may interfere with reproductive physiology or stimulate high rates of mutation. Such contamination includes carcinogens and other toxic substances that are released within or outside of refuges.

(3) At the population and community levels, we consider the habitat components of food, water, cover, and space. Food and water may become contaminated with chemicals that are not naturally present. Activities such as logging and mining or structures such as buildings and fences may modify security or thermal cover. Unnatural noise and light pollution may also compromise migration and reproduction patterns. Unnatural physical structures, including buildings, communication towers, reservoirs, and other infrastructure, may displace space or may be obstacles to wildlife migration. Refuge facility construction and maintenance projects necessary to accomplish refuge purpose(s) should be designed to minimize their impacts on the environmental health of the refuge.

3.11 How do we apply our management strategies to maintain and restore biological integrity, diversity, and environmental health?

A. We strive to manage in a holistic manner the combination of biological integrity, diversity, and environmental health. We balance all three by considering refuge purpose(s), System mission, and landscape scales. Considered independently, management strategies to maintain and restore biological integrity, diversity, and environmental health may conflict.

B. For example, physical structures and chemical applications are often necessary to maintain biological integrity and to fulfill refuge purpose(s). We may use dikes and water control structures to maintain and restore natural hydrological cycles, or use rotenone to eliminate invasive carp from a pond. These unnatural physical alterations and chemical applications would compromise environmental health if considered in isolation, but they may be appropriate management actions for maintaining biological integrity and accomplishing refuge purpose(s).

C. We may remove physical structures to promote endangered species recovery in some areas, or we may remove plants or animals to protect structures, depending upon refuge purpose(s). Unless we determine that a species was present in the area of a refuge under historic conditions, we will not introduce or maintain the presence of that species for the purpose of biological diversity. We may make exceptions where areas are essential for the conservation of a threatened or endangered species and suitable habitats are not available elsewhere. In such cases, we strive to minimize unnatural effects and to restore or maintain natural processes and ecosystem components to the extent practicable without jeopardizing refuge purpose(s).

3.12 How do we incorporate information from historic conditions into our management decisions?

A. Maintaining biological integrity, diversity, and environmental health requires an ecological frame of reference. A frame of reference allows us to contrast current conditions of our resources with historic conditions. The reference guides us in two ways. It provides information on how the landscape looked prior to changes in land use that destroyed and fragmented habitats and resulted in diminished wildlife populations and the extirpation or extinction of species. It also allows us to examine how natural ecosystems function and maintain themselves. We use these conditions as a frame of reference in which to develop goals and objectives.

B. We use historical conditions as the frame of reference to identify composition, structure, and functional processes that naturally shaped ecosystems. We especially seek to identify keystone species, indicator species, and types of communities that occurred during the frame of reference. We also seek to ascertain basic information on natural ecosystem structure such as predator/prey relationships and distribution of plant communities. Finally, we seek to identify the scale and frequency of processes that accompanied these components and structures, such as fire regimes, flooding events, and plant community succession. Where appropriate and feasible, we also pursue biological integrity, diversity, and environmental health by eliminating unnatural biotic and abiotic features and processes not necessary to accomplish refuge purpose(s).

C. We do not expect, however, to reconstruct a complete inventory of components, structures, and functions for any successional stage occurring during the frame of reference. Rather, we use sound professional judgment to fit the pieces to create a conceptual picture of our resources under historic conditions.

D. We ensure that our management activities result in the establishment of a community that fits within what we reasonably believe to have been the natural successional series, unless doing so conflicts with accomplishing refuge purpose(s). We may choose to maintain nonclimax communities pursuant to refuge purpose(s) or for maintaining biological integrity, diversity, and environmental health at the regional, national, or international landscape scale. We favor techniques such as fire or flooding that mimic or result in natural processes to maintain these nonclimax communities. However, where it will support fulfillment of refuge purpose(s), we allow or, if necessary, encourage natural succession to proceed.

3.13 Where do we get information on historic conditions?

A. Information on historic conditions may be historical, archeological, or other. Historical information includes the written and, in some cases, the pictographic accounts of Native Americans, explorers, surveyors, traders, and early settlers. Archeological information comes from collections of cultural artifacts maintained by scientific institutions. We may obtain other data from a range of sources, including research, soil sediments, and tree rings.

B. We obtain information on historic conditions from our investigations and from partners in academia, conservation organizations, and other Federal, State, Tribal, and local government agencies. In many cases, we use historical vegetation maps to provide data. Such historical maps are usually drawn at relatively coarse scales, perhaps to the level of vegetation alliance. Generally a comprehensive historical list of plant and animal species is not available or necessary. We will base the determination of natural species and ecosystem composition on sound professional judgment. We periodically update our information on historic conditions with results from ongoing historical, archeological, and other studies.

3.14 How do we manage populations to maintain and restore biological integrity, diversity, and environmental health?

A. We encourage cooperation and coordination with State fish and wildlife management agencies in setting refuge population goals and objectives. To the extent practicable, our regulations pertaining to fishing or hunting of resident wildlife within the System are consistent with State fish and wildlife laws, regulations, and management plans.

B. We maintain, or contribute to the maintenance of, populations of native species. We design our wildlife population management strategies to support accomplishing refuge purpose(s) while maintaining or restoring biological integrity, diversity, and environmental health. We formulate refuge goals and objectives for population

management by considering natural densities, social structures, and population dynamics at the refuge level, and population objectives set by national plans and programs-- such as the North American Waterfowl Management Plan--in which the System is a partner.

C. Natural densities are relatively stable for some species and variable for others. We manage populations for natural densities and levels of variation, while assuring that densities of endangered or otherwise rare species are sufficient for maintaining viable populations. We consider population parameters such as sex ratios and age class distributions when managing populations to maintain and restore where appropriate biological integrity, diversity, and environmental health.

D. On some refuges, including many of those having the purpose of migratory bird conservation, we establish goals and objectives to maintain densities higher than those that would naturally occur at the refuge level because of the loss of surrounding habitats. We more closely approximate natural levels at larger landscape scales, such as flyways, by maintaining higher densities at the refuge level.

E. We do not, however, allow densities to reach excessive levels that result in adverse effects on wildlife and habitat. The effects of producing densities that are too high may include disease, excessive nutrient accumulation, and the competitive exclusion of other species. We use planning and sound professional judgment to determine prudent limits to densities.

F. Where practical, we support the reintroduction of extirpated native species. We consider such reintroduction in the context of surrounding landscapes. We do not introduce species on refuges outside their historic range or introduce species if we determine that they were naturally extirpated, unless such introduction is essential for the survival of a species and prescribed in an endangered species recovery plan, or is essential for the control of an invasive species and prescribed in an integrated pest management plan.

3.15 How do we manage habitats to maintain and restore biological integrity, diversity, environmental health?

A. We will, first and foremost, maintain existing levels of biological integrity, diversity, and environmental health at the refuge scale. Following that, we will restore lost or degraded elements of biological integrity, diversity, and environmental health at all landscape scales where it is feasible and supports fulfillment of refuge purposes.

B. Our habitat management plans call for the appropriate management strategies that mimic historic conditions while still accomplishing refuge objectives. For example, prescribed burning can simulate natural fire regimes or water level management can mimic natural hydrological cycles. Farming, haying, logging, livestock grazing, and other extractive activities are permissible habitat management practices only when prescribed in plans to meet wildlife or habitat management objectives, and only when more natural

methods, such as fire or grazing by native herbivores, cannot meet refuge goals and objectives.

Amendment 1, 07/31/2006, amends Section 3.15C below.

C. We do not allow refuge uses or management practices that result in the maintenance of non-native plant communities unless we determine there is no feasible alternative for accomplishing refuge purpose(s). For example, where we do not require farming to accomplish refuge purpose(s), we cease farming and strive to restore natural habitats. Where feasible and consistent with refuge purpose(s), we restore degraded or modified habitats in the pursuit of biological integrity, diversity, and environmental health. We use native seed sources in ecological restoration. We do not use genetically modified organisms in refuge management unless we determine their use is essential to accomplishing refuge purpose(s) and the Director approves the use.

3.16 How do we manage non-native species to maintain and restore biological integrity, diversity, and environmental health?

A. We prevent the introduction of invasive species, detect and control populations of invasive species, and provide for restoration of native species and habitat conditions in invaded ecosystems. We develop integrated pest management strategies that incorporate the most effective combination of mechanical, chemical, biological, and cultural controls while considering the effects on environmental health.

B. We require no action to reduce or eradicate self-sustaining populations of non-native, noninvasive species (e.g., pheasants) unless those species interfere with accomplishing refuge purpose(s). We do not, however, manage habitats to increase populations of these species unless such habitat management supports accomplishing refuge purpose(s).

3.17 How does this policy affect the acquisition of lands for the System?

A. We consider the mission, goals, and objectives of the System in planning for its strategic growth. We will take a proactive approach to identifying lands that are critical for maintaining or restoring the biological integrity, diversity, and environmental health of the System at all landscape scales. We will integrate this approach into all Service strategies and initiatives related to the strategic growth of the System. We incorporate the directives of this policy when evaluating an area's potential contribution to the conservation of the ecosystems of the United States.

B. We use the Land Acquisition Priority System to rank potential acquisitions once the Director approves significant expansions or new refuges. Our Land Acquisition Priority System includes components that gauge the contributions of refuges to maintaining and restoring biological integrity, diversity, and environmental health.

3.18 What is the relationship between biological integrity, diversity, and environmental health and compatibility? When completing compatibility

determinations, refuge managers use sound professional judgment to determine if a refuge use will materially interfere with or detract from the fulfillment of the System mission or the refuge purpose(s). Inherent in fulfilling the System mission is protection of the biological integrity, diversity, and environmental health of the System. Specific policy for compatibility is found in [603 FW 2](#).

3.19 What is the relationship between biological integrity, diversity, and environmental health and comprehensive conservation planning?

A. We integrate the principles of this policy into all aspects of comprehensive conservation planning, including pre-planning guidance (see [602 FW 3.4C\(1\)\(e\)](#)) as we complete plans to direct long-range refuge management and identify desired future conditions for proposed refuges (see [602 FW 1.7D](#)).

B. Refuge purpose(s) and the System mission serve as the basis for goals and objectives at all levels of the System (e.g., System, Regional, ecosystem, and refuge level). When we develop refuge goals and objectives during the Comprehensive Conservation Plan process we include goals and objectives for maintaining and restoring the biological integrity, diversity, and environmental health of the refuge.

C. While developing Comprehensive Conservation Plans, we make management decisions based on sound professional judgment. We subsequently evaluate the effectiveness of these decisions by comparing results to desired outcomes. If the results are unsatisfactory, we assess the causes of failure and adapt our management decisions accordingly. In part, we base management decisions on natural resource-related research that has been conducted on refuges. This type of research adds to the general body of information related to natural resource management and aids us in continually adapting our management decisions. We generally encourage natural resource-related research on refuges.

3.20 How do we protect biological integrity, diversity, and environmental health from actions outside of refuges? Events occurring off refuge lands or waters may injure or destroy the biological integrity, diversity, and environmental health of a refuge. Given their responsibility to the public resources with which they have been entrusted, refuge managers should address these problems. It is critical that they pursue resolution fully cognizant and respectful of legitimate private property rights, seeking a balance between such rights and the refuge manager's own responsibility to the public trust. While each situation will be different, the following is a suggested procedure which emphasizes our desire for cooperative resolutions. The time and effort expended, and the rate at which a refuge manager escalates the process, will depend on the severity of threat and the resources at risk.

A. We first seek resolution by directly contacting the landowner(s), corporation, agency or other entity from which the problem originates.

B. Where direct discussions fail, managers might seek resolution through collaborative discussions with State or local authorities or other organizations that can help in cooperative resolution of the problem.

C. An appropriate next step might be to pursue resolution at the local level through planning and zoning boards or other regulatory agencies at the city and county level. Failing that, the manager may seek avenues through State administrative and regulatory agencies. Regulatory solutions are a serious step, and a manager should take this route only after careful consideration and in close consultation with the Regional Offices.

D. If the above efforts fail, we may take action within the legal authorities available to the Service and with full respect to private property rights. In such cases, refuge managers will consult with the Office of the Solicitor for assistance in identifying appropriate remedies and obtain concurrence from the Regional Director.

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