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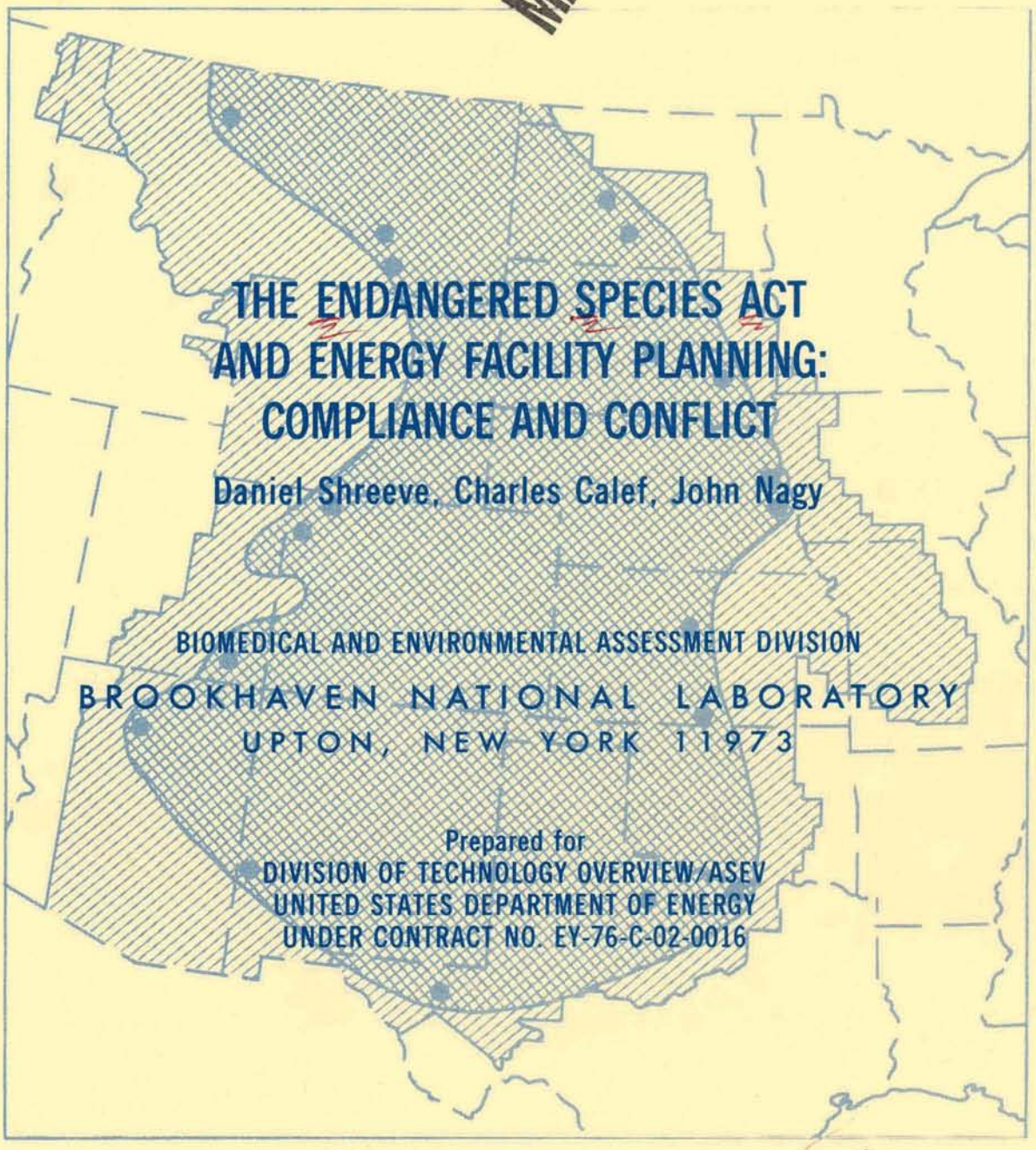

THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT

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BIOMEDICAL AND ENVIRONMENTAL ASSESSMENT DIVISION

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MAY 1978

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Abstract

New energy facilities such as coal mines, gasification plants, refineries, and power plants because of their severe environmental impacts may, if they are sited haphazardly, jeopardize endangered species. By law, conflicts between energy facility siting and endangered species occurrence must be minimized. To assess the likelihood of such conflicts arising, we have used data from the Fish and Wildlife Service, Endangered Species Office, that describe species' ranges by county. We have matched this data set with county level occurrences of imminent energy developments to find counties of overlap and hence potential conflict. An index has been developed to measure the likelihood of actual conflict occuring in such counties. Factors determining the index are: numbers of endangered species inhabiting the county, number of energy-related developments and to what degree the county remains in a wild or undeveloped state. Maps have been prepared showing (1) geographic ranges of endangered species by taxonomic groups (mammals, fish, etc.) and (2) counties of conflict.

I. THE ACT

Planners who must propose sites for power plants, coal mines, and other energy facilities face a complex responsibility for estimating both the health and ecological effects of their proposals. In comparing two or more different site choices, they consider both environmental and economic factors, hoping to maximize benefits and minimize impacts. Because of the many factors which contribute to environmental effects alone, it is rarely possible to make a quantitative decision acceptable to all.

The Endangered Species Act of 1973[1] effectively constrains development plans to those areas where the well-being of endangered species will not be jeopardized. The Act charges all Federal agencies with the responsibility to aid in the protection of the species listed as endangered in the United States (currently about 200). In addition to prohibiting actions against endangered species by private citizens, the Act prohibits federal agencies from funding or authorizing a project which jeopardizes any one of the species. This includes entering into a cooperative agreement such as an agreement to supplemet a project of private industry or local government with federal funds. It authorizes funds for research on U.S. endangered species and describes a procedure for adding species to the list (Figure 1). It mandates that all federal agencies shall cooperate with state agencies in programs that benefit endangered species, including those for the identification of critical habitats. The Act does not void state laws designed to protect wildlife. For example, states may draw up endangered species lists more inclusive than the federal list, or may define criteria for the "taking" of endangered species more stringent than those in the Federal Act.

As explained in a recent New York Times article,[2] the Act can halt any project in which federal dollars or permits are involved, "from dams on Big Darby Creek to highways in Mississippi and coal mines in Montana." All species on the list have equal legal status, the most lowly mollusk on a par with the spectacular bald eagle.

Some planners might suggest that if a complex siting decision conflicted with the Act the law might be changed, at least regarding the particular nuisance species. This is contradicted so far by the historical record. The arduous process of listing or removing a species (Figure 1) invites "bureaucratic entanglement" at many stages. At least 10 distinct hurdles must be overcome before a species' status can be changed, and even a single step may require the agreement of many officials: "Step 6, for example, requires that after a staff scientist has drafted proposed rules and usually an assessment of the environmental impact of protecting the particular species, his report must carry no fewer than 12 signatures from department head and managers within the Department of the Interior. The entire process takes a minimum of 36 work days ... and several of the steps provide for waiting periods of up to 90 days before the next step can begin."[2]

As the Act now reads, the removal of a species from protected status would follow the same procedure. A special amendment to the Act might be passed by Congress to exclude a particular species, or even a group of species, but this is unlikely. Another tactic that growth proponents might exploit would be to encourage an amendment to Section 7 that would exempt a particular plan, perhaps a plan for damming a river system. Just such a threat to the Act's integrity may emerge in this session of Congress. Senator Howard Baker (R-Tennessee) is expected to submit an amendment to exempt specific public

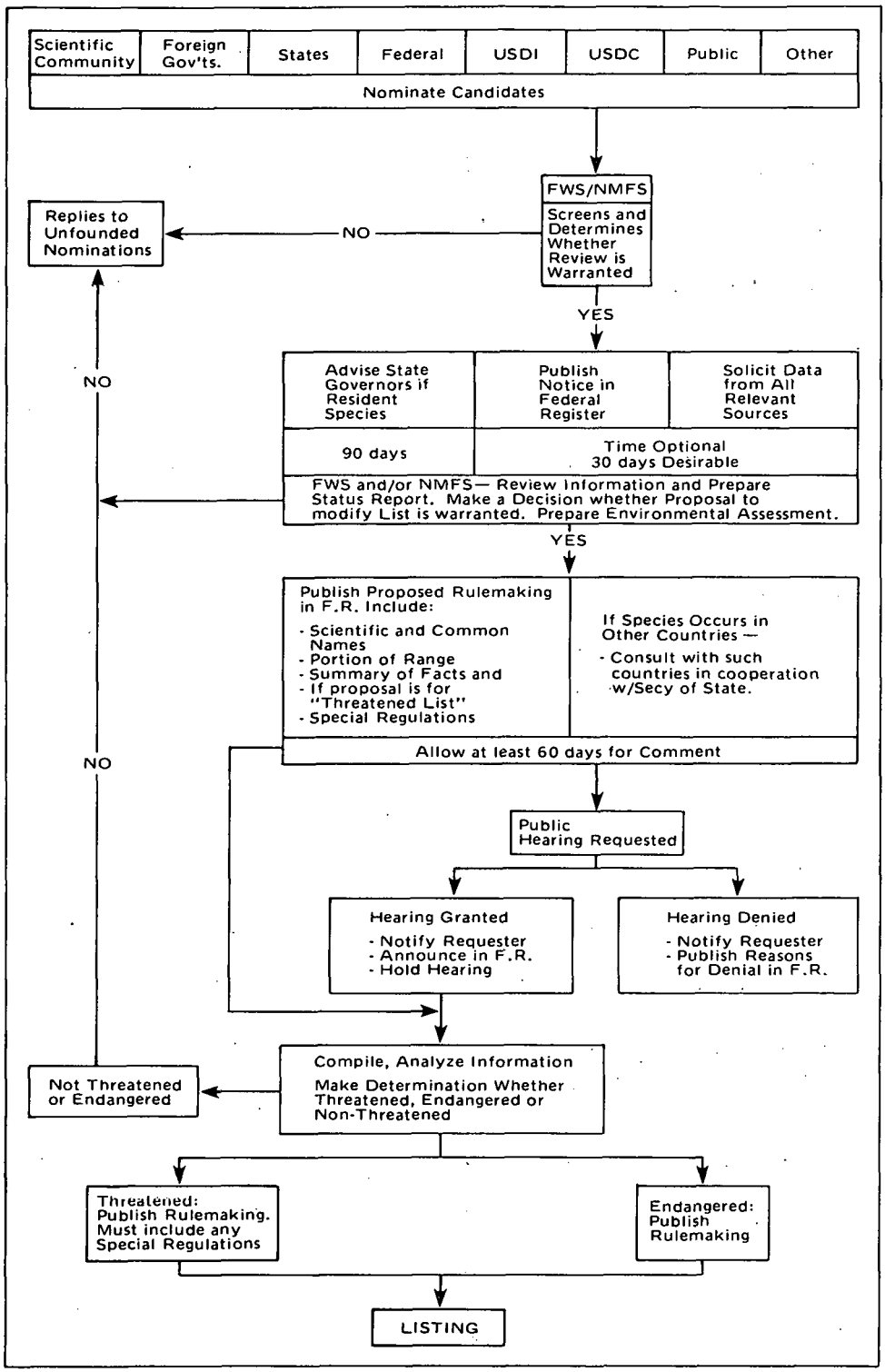


Figure 1. Procedure for modifying lists of threatened or endangered species. Note basic three step process: notice, proposed rulemaking, final rule making. F.R. = *Federal Register;* FWS = U. S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; USDC = U.S. Dept. of Commerce; USDI = U.S. Dept. of the Interior.
Figure courtesy Bruce MacBryde. From, "Plant Conservation in the United States Fish and Wildlife Service," in, *Extinction is Forever,* New York Botanical Garden, 1977.

works projects (such as the Telleco Dam in his home state) from compliance with Section 7 of the Act.[3]

It seems unlikely that a conflict between a growth plan and protection of an endangered species would be resolved by changing the law. Because of this reality, the many steps required to add new species to the list invite political opposition at many stages. This is germane, since important cases now approaching the courts involve species that are proposed for protection rather than already listed. One can well imagine the intense political opposition to listing species that are already in conflict with growth plans.

The efforts of conservationists are international in scale. Ten years were required to design and convene an internation conference for the protection of endangered species, and during that time 6% of all mammal extinctions in history occurred.[4] The long-term effort to agree on international measures for endangered species conservation can be expected to endow the agreement with strong resistance to change.

In considering the importance of the Act to energy planners, it is relevant whether the original impetus of the Act has grown or declined during a period when the U.S. is increasing the exploitation of domestic energy resources. The history of court challenges based on endangered species is still a short one,[5] but there is evidence that the Act will become increasingly important to planners; it is certain that the list of species will be greatly lengthened. Section 12 of the Act enjoined the Smithsonian Institution to review the status of the U.S. flora and propose candidates for the endangered species list. The Institution proposed ∿3000 species of plants to the Endangered Species Office, and the Office proposed about 1850 of these for recognition as endangered species. The species are being considered in batches of 12 to 14; the first four species, living on San Clemente Island in California, were added to the official list in late 1977.

II. CONFLICTS BETWEEN GROWTH PLANS AND THE ACT

One of the most controversial conflicts involves the Telleco Dam project in Tennessee. Because the snail darter (Percina tanasi), an endangered fish, would be destroyed by the dam, the $80 to $100-million project was halted when three-fourths completed. A candidate for the list, Anthony's river snail (Athearnia anthonyi), is also found at the site.

Rejecting arguments that the Telleco Dam project should be exempted from compliance with Section 7 of the Act, the Sixth Circuit Court of Appeals ruled "that the extinction of a species was too severe a consequence to warrant exempting a substantially completed activity solely on the basis of dollars already spent ... . The degree of completion of a project was irrelevant."[6]

The Environmental Defense Fund has lately opposed the Army Corps of Engineers, objecting to the latter's plan to reverse the flow of a portion of the Little Tennessee River by building a parallel stream. This plan, like the Telleco Dam, could affect local races of the snail darter. The impact statement for this plan is short and simply mentions the species found at the site which are included on federal and state endangered species lists.

A proposal for two dams near Columbus, Ohio, sponsored jointly by the city of Columbus and the Army Corps of Engineers, may fail to be implemented because of the presence of an endangered mollusk, the tan riffle shell (Epioblasma walkeri), which might prevent Federal funding or authorization.

A rare snapdragon in a remote area of northern Maine could thwart construction of the $600-million Dickey Lincoln hydroelectric project. The furbish lousewort, believed extinct, has been found at the site by an Army Corps of Engineers botanist. It has been proposed as a candidate for the endangered species list and will very likely be included.

A strong provision of the Act is its power to designate critical habitat. "'Critical habitat' means any air, land, or water area ... the loss of which would appreciably decrease the likelihood of the survival and recovery of a listed species or a distinct segment of its population."[6] An example of the Act's power in this regard is the recent proposal of critical habitat for the grizzly bear (Ursus arctos horribilis) in the northern Rocky Mountain states. The U.S. Fish and Wildlife Service (USFWS) has proposed 13 million acres as critical habitat, causing local citizens to fear that private enterprise in the area will be inhibited; in fact, the effect of the proposal is not precisely known. According to the U.S. Forest Service, activities that might be affected include "timber management, livestock grazing, recreation (including wilderness use), oil and gas leasing, water diversion, and road and trail construction."[7]

III. LEGAL PRECEDENTS

Two cases, National Wildlife Federation versus Coleman and Sierra Club versus Froehlke, serve as examples of how the Act may be interpreted when federal plans are alleged to threaten an endangered species. In the former case, the plaintiff invoked the Act in an attempt to stop progress of Highway 110 which would have crossed habitat of the Mississippi sandhill crane (Grus canadensis pulla), probably affecting about 40 members of this species. The plaintiff was successful and obtained an injunction that prevents the Federal Highway Administration from continuing construction.

In Sierra Club versus Froehlke, in contrast, the plaintiff failed legally to prevent the construction of the Merramac Pass Lake Dam near St. Louis, in spite of a claim that such construction would threaten the Indiana bat (Myotis sodalis) by usurping its cave roosts. The plans for the dam received a setback early in 1977 when President Carter impounded the construction funds

(effectively halting the projects), pending further studies, for 19 water development actions including this one. The endangered species controversy has already figured in recent renewed public hearings on the dam; two oficially endangered species, the gray bat (Myotis grisescens) and Higgins' eye pearly mussel (Lampsilis higginsi), have been found at the site.

The differences between these early court cases constitute the principal evidence for judging how the Act will be enforced. The cases demonstrate that the wording of the Act is imprecise; interpretation will depend on precedents set by each controversy or on clarification of ambiguities by new rulings by the USFWS published in the Federal Register.

In the case of National Wildlife Federation versus Coleman, the USFWS armed the batteries of the plaintiff by declaring 10,000 acres as critical habitat of the crane, including the area to be traversed by the proposed highway. This agency declared that "construction activities, incidental intrusions, and subsequent related commercial and residential development of the area all constitute a significant threat to the well-being of the crane." The plaintiffs presented expert testimony by wildlife biologists to prove that the highway would in fact threaten the crane, and the district court judge further remarked that the Federal Highway Administration in an impact statement had acknowledged the inevitable development contingent on such construction.[5]

In the case of Sierra Club versus Froehlke, the Sierra Club amended its original complaint against the Merramac Pass Lake Dam to include the impact on the Indiana bat almost two years after initiating the suit. The Sierra Club did not prove that the area of the impact was critical habitat of the Indiana bat; and the area was not declared as critical habitat by the USFWS although it was under consideration. The USFWS instead urged a moratorium on the project, pending further study. The plaintiff was not successful.[5]

The outcome of the two cases depended also on interpretations by the court of certain vaguely worded passages in the Act. According to the court, the Act requires any federal agency planning a project that could threaten an endangered species to consult with the Department of the Interior regarding possible consequences of the plan, and the consultations should be "meaningful" even though the Department of the Interior should not be regarded as having absolute "veto power." In National Wildlife Federation versus Coleman, the highway project was effectively blocked in part because the defendants simply failed to consult at all with the USFWS (within the Department of the Interior). At the time of the case, the authority of the USFWS was undetermined, but strict procedures and requirements for consultation have recently been formulated.

The USFWS, in an important rule making[6] affirmed that interagency consultations are mandatory when an agency judges its activities may jeopardize a particular species. Each federal agency must initiate consultations--but only if it decides that a program may conflict with the Act. "The Secretary of the Interior is not empowered to veto the final actions of such agencies even when he is convinced, after the requisite consultation has ensued, that they violate the Act." It appears that court challenges on a case-by-case basis will be the only way to resolve conflicts between endangered species and development; no definitive administrative procedure seems to exist.

Another vague part of the Act is the requirement that a federal agency planning a potentially hazardous project not only should be cognizant of the Department of Interior recommendations but also should actively promulgate policies that aid in the preservation of listed species. This implies that such agencies are required to explore to some unspecified extent, the effects of their plans on endangered species. According to the court's interpretation in National

Wildlife Federation versus Coleman, the Federal Highway Administration "failed to fulfill its mandatory duty to take the necessary steps 'to insure' that the highway will not jeopardize the crane or modify its critical habitat."[5]

IV. METHODS OF PLANNING THE LOCATIONS OF ENERGY FACILITIES

Knowledge of the distribution and habits of endangered species is vital in planning the locations of electric power plants, gasification plants, mining operations, and other energy-related activities. In the formulation of an impact statement for a particular site, the value of the habitat that will suffer a change must be considered. If the Act is interpreted precisely, the value of habitat occupied by an endangered species is absolute.

The siting of power plants by private industry serves as an example of the procedure for locating energy facilities in general. Historically, it has been common for companies to choose a site purely for its economic advantages, acquire it without public announcement, and begin construction. Such a procedure preempts the property of interest before speculators can purchase it in order to sell it at a profit to the utility or to accompanying industry. This procedure is now no longer common because an environmental impact statement must be filed, which must be made public for review, and because the general trend toward careful planning has forced utilities to put more thought into site selection. The obstacles to any plan may be monumental, and the procedure for approval is so complex that some local governments virtually direct the location of plants by simply buying up the preferable sites for eventual sale to the power company.[8]

Because of the many opportunities provided by alleged adverse environmental effects for federal, state, and private opposition to a siting plan, Schuster[9] states, "Someplace else is getting to be a mighty hard place to find ... . The clamor against siting new power generating plants is hurting the utility industry's

ears, and fouling up system growth plans." Schuster suggests that groups with the power to thwart a plan have a duty to propose alternatives. He expounds a policy of "one-stop" site approval, i.e. that a single agency should have the authority to accept or reject a plan.

An early description of the environmental values of a prosposed site may expedite the approval procedure by avoiding the wasted energy of defending plans rejected on environmental grounds. Modern planners are therefore increasingly inclined to consider environmental interests simultaneously with economic advantages. A group at Argonne National Laboratory has proposed[10] that maps of environmental resources be compared with maps of economic assets in the consideration of potential sites. "Candidate regions for siting can ... be determined by simply holding up mechanical overlays of transparencies of these maps and 'looking for the holes' in a computer-aided analog to the methodology of McHarg ... . When this technique was employed in the examination of optimum sites for nuclear power plants in the Commonwealth Edison service area in northern Illinois, it predicted quite well the problems or lack thereof that would characterize the plants then built or under construction."

Calvert and Heilman[8] suggest that first the economical areas for construction should be defined and then progressive subsets of these should be selected on the basis of such criteria as topography, water supply, site accessability, geology and soils, and pollution effects. After an initial selection involving some "intuitive screening" candidate sites would be ranked according to environmental effects, development costs, and public acceptance factors. After a consideration of possible conflicts with other land uses, the development costs would be weighed against the environmental effects to reach a single quantitative rating assigned to each candidate. The most favorable sites would then be investigated in detail.

This method is not truly quantitative since it relies on some "intuitive screening." Furthermore, Calvert and Heilman fail to note that the order of screening affects the weighting of each factor: the factors considered earlier affect the final decision more than do those considered later. That a screening process is intuitive does not necessarily imply that it is faulty or inefficient. The quantification of environmental impacts depends on simultaneous comparison of many factors, each of which must be identified precisely. Although a perfect siting methodology may be a distant goal, geographic data on environmental resources and advantages are obviously helpful during site selection and in realistic comparison of alternative plans. Siting methodology is probably the most advanced for electric power plants. In comparison, the siting of new coal mines, for example, is capricious and is negligent of environmental factors.

V. PURPOSE OF PRESENT RESEARCH

The presence of endangered species is a necessary part of the characterization of a site's environment. Unlike most other aspects of the characterization, however, it has value already assigned. Since this value in any impact statement is very high, it is vital to know the national distribution of endangered species and to pinpoint areas where their presence may conflict with energy developments. (The purpose of our work is aptly symbolized by the Department of Energy seal on the cover of this report: the head of an endangered species, the bald eagle, juxtaposed with symbols of energy engineering technology.)

Here we identify counties with potential conflicts by mapping distributions of endangered species and proposed energy developments. The analysis will alert planners to the need for detailed research when an energy facility is planned in a county with many endangered species. Even in such a county an endangered

species may inhabit or require only a local part, which may go untouched by development. The present analysis is limited to certain energy-related threats to endangered species already listed. Other energy-related threats (pipelines, oil wells, etc.) are considered to be less severe than those dealt with. A host of particularly serious threats (highways, urbanization, industrialization, etc.) are not included because they are related only loosely to the energy system.

VI. DATA

Data from the Endangered Species Office, USFWS, were used to obtain the distribution of endangered species on a county scale. While some data were already recorded on the county level, distributions of most species were given in terms of Aggregated Subareas (i.e., small river basins) of the Water Resource Council. The latter were converted by using a map that delineates Aggregated Subareas by their contained counties. Our rearrangement of the data resulted in two files: (1) the number of endangered species in each U.S. county for each taxonomic group (mammals, birds, reptiles, amphibians, fishes, insects, mollusks, and plants), and (2) a listing of the species found in each county. A version of the latter file is reproduced in Appendix A.

The Endangered Species Office distribution data can be grouped into four classes of reliability with gradations between them.

1. The distributions of some groups of organisms, for example mollusks and plants, are very exactly known. Any county for which a given species is listed is known to include that species.

2. The distribution of the American alligator (Alligator mississippiensis), which is fairly common and has a wide range, illustrates another level of certainty. The alligator, being a transient species, is not always found in all the counties for which it is listed but is highly mobile and may recolonize

them at any time, so that any of the counties might harbor alligators within a span of several years.

3. A third level of accuracy applies to the data for species that are rare but widespread. The black-footed ferret (Mustella nigripes) has not actually been witnessed over the last 50 years in all the counties in which its presence is listed, but the range of the few sightings is very extensive. It appears to be very rare, yet widely distributed. On the basis of the similarity of habitats throughout the range shown (Figure 2), each of the counties may potentially harbor the ferret, but how many of them actually do so at any given time is not known.

Figure 2 also illustrates how Aggregated Subareas only approximate the range of species. Whether by intent or mistake, the Endangered Species Office included as part of the black-footed ferret's range and Aggregated Subarea extending well into Missouri. As far as we can determine, the ferret has never been observed in Missouri and is not on a list of rare and endangered species published by that state.

4. The Endangered Species Office excluded from their distribution data a number of bird species which, "because of their vast distribution and/or rarity or unknown status, cannot be precisely assigned to aggregated subareas."[11] These include the familiar bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus anatum), and ivory-billed woodpecker (Campephilus principalis). Such birds are not included in our study but are listed in Table 3 with an explanatory footnote. The data on certain other species are no more reliable than the data on the excluded birds, and yet the Endangered Species Office has assigned these species to Aggregated Subareas. The eastern cougar (Felis concolor cougar) has been indicated to have a range covering most of the eastern U.S. although, like the excluded birds, it has a vast distribution and a rare or uncertain status. Clearly the cougar's range as listed is historical

DISTRIBUTION OF BLACK FOOTED FERRET
IN UNITED STATES

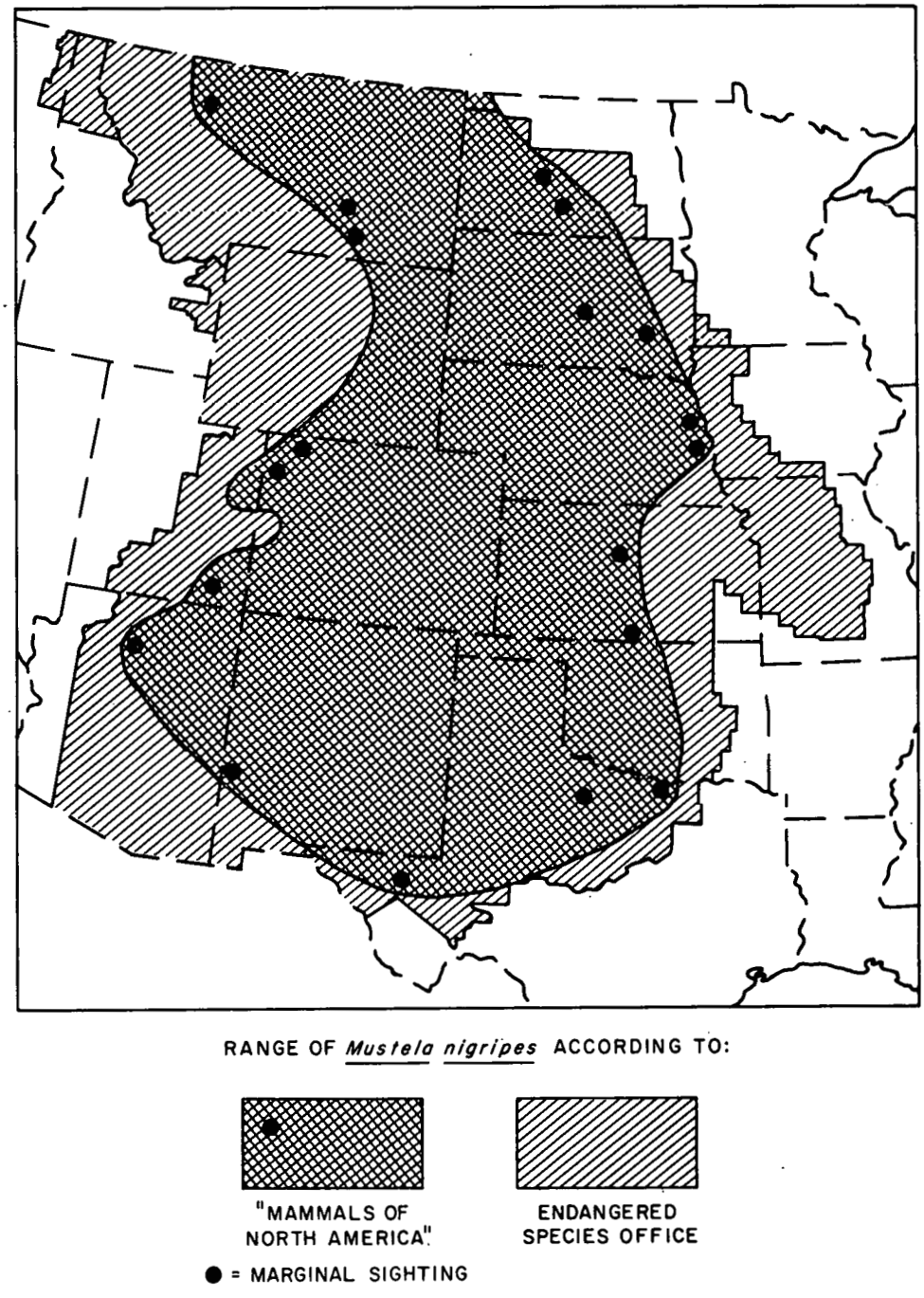


Figure 2. Range of black-footed ferret *(Mustela nigripes)* according to *Mammals of North America*, by Hall and Kelson (12), and U.S. Fish and Wildlife Service, Endangered Species Office. Endangered Species Office approximates range using aggregated subareas of Water Resource Council. Marginal sightings, some dating from early twentieth century, used by Hall and Kelson to define range.

and its inclusion by the Endangered Species Office is inconsistent. The grizzly bear, a rare but well-known species, is listed as occurring throughout certain Aggregated Subareas in northeastern Montana. This again is an approximated or historical range and its use for such a well studied and located species is inappropriate. In spite of these inconsistencies, the Endangered Species Office data have been used without alteration in our work.

In interpreting the reality of a potential conflict between an energy facility and an endangered species, the reliability of distribution data must be a factor. A coal mine opening in a county harboring an endangered bivalve or fish carries a greater conflict potential than does a new mine in a county within the "range" of the eastern cougar. Workers doing further studies on conflicts between endangered species and development would do well to refine the distribution data, perhaps in conjunction with the Endangered Species Office or state and local experts.

VII. SPECIES INCLUDED FOR STUDY

As of December 31, 1977, the USFWS had listed 201 species as endangered or threatened whose ranges, in part or in whole, came under the jurisdiction of the United States. The list is not static: since the beginning of 1978 species have been added (e.g., the leopard darter), populations of the species from other geographic areas included (e.g., the bald eagle), the status of some populations has changed, and subspecies have been aggregated (e.g. the gray wolves). For this study we use the list as it existed at the beginning of the year and plan to update the report every year. In addition, the future inclusion of proposed species and of species listed by individual states will increase the usefulness of the study.

Of the 201 U.S. species, we excluded 31 species with ranges entirely outside the 50 states and 15 species with ranges definitely or possibly

Table 1

Summary of Status and County Range Mapping: U.S. Species as of 31 Dec 1977

	Endangered	Threatened	Range mapped	Range not defined	Outside 50 states	Total
Mammals	36	2	22	7	9	38
Birds	68	2	45	8	17	70
Reptiles*	9	3	8	0	4	12
Amphibians	5	2	6	0	1	7
Fish	30	9	39	0	0	39
Snails	0	0	0	0	0	0
Clams	23	0	23	0	0	23
Crustaceans	0	0	0	0	0	0
Insects	6	2	8	0	0	8
Plants	4	0	4	0	0	4
Total	181	20	155	15	31	201

*American alligator counted as threatened.

overlapping the 50 states but not defined by the USFWS.[11] The remaining 155 species are included in the range and conflict maps. The quality of the range data, as discussed above, varies from precise to more or less questionable, to unreliable.

Table 1 summarizes the status and location of the U.S. species by taxonomic group. Tables 2 through 9 list each species by common name, scientific name, and family; indicate its status; and note species excluded from the study because their range is outside the 50 states, they have an undefined range, or they may be extinct.

Table 2

Mammals (Status of Bear and Otter is Threatened; all others are Endangered)

Common name	Scientific name	Family
Bat, gray	Myotis grisescens	Vespertilionidae
Bat, hoary, Hawaiian	Lasiurus cinereus semotus	Vespertilionidae
Bat, Indiana	Myotis sodalis	Vespertilionidae
Bear, grizzly	Ursus arctos horribilis	Ursidae
Cougar, eastern	Felis concolor cougar	Felidae
Deer, key	Odocoileus (Dama) virginianus clavium	Cervidae
Deer, white-tailed, Columbian	Odocoileus virginianus leucurus	Cervidae
Dugong*	Dugong dugon	Dugongidae
Ferret, black-footed	Mustella nigripes	Mustelidae
Fox, kit, northern**	Vulpes velox hebes	Canidae
Fox, kit, San Joaquin	Vulpes macrotis mutica	Canidae
Jaguar**	Panthera onca	Felidae
Jaguarundi, cacomitl**	Felis yagouaroundi cacomitli	Felidae
Jaguarundi, tolteca**	Felis yagouaroundi tolteca	Felidae
Manatee, West Indian (Florida)	Trichechus manatus	Trichechidae
Margay**	Felis wiedii	Felidae
Mouse, harvest, salt marsh	Reithrodontomys raviventris	Cricetidae
Ocelot**	Felis pardalis	Felidae
Otter, sea, southern	Enhydra lutris nereis	Mustelidae
Panther, Florida	Felis concolor coryi	Felidae
Prairie dog, Utah	Cynomys parvidens	Sciuridae
Pronghorn, Sonoran	Antilocapra americana sonoriensis	Antilocapridae
Rat, kangaroo, Morro Bay	Dipodomys heermanni morroensis	Heteromyidae
Seal, monk, Hawaiian	Monachus schauinslandi	Phocidae
Squirrel, fox, Delmarva Peninsula	Sciurus niger cinereus	Sciuridae
Whale, blue*	Balaenoptera musculus	Balaenopteridae
Whale, bowhead*	Balaena mysticetus	Balaenidae
Whale, finback*	Balaenoptera physalus	Balaenopteridae
Whale, gray*	Eschrichtius gibbosus	Eschrichtidae
Whale, humpback*	Megaptera novaeangliae	Balaenopteridae
Whale, right*	Eubalaena spp.	Balaenidae
Whale, sei*	Balaenoptera borealis	Balaenopteridae
Whale, sperm*	Physeter catodon	Physeteridae
Wolf, gray (Texas)**	Canis lupus monstrabilis	Canidae
Wolf, Mexican	Canis lupus baileyi	Canidae
Wolf, northern Rocky Mountain	Canis lupus irremotus	Canidae
Wolf, red	Canis rufus	Canidae
Wolf, timber, eastern	Canis lupus lycaon	Canidae

*Range of species does not include the 50 states.

**Range of species not well defined or species possibly extinct. These species not included in county range maps.

Table 3

Birds (Status of Shearwater and Sage sparrow is Threatened; all others are Endangered)

Common name	Scientific name	Family
Akepa, Hawaii	Loxops coccinea coccinea	Drepanididae
Akepa, Maui	Loxops coccinea ochracea	Drepanididae
Akialoa, Kauai	Hemignathus procerus	Drepanididae
Akiapolaau	Hemignathus wilsoni	Drepanididae
Albatross, short-tailed**	Diomedea albatrus	Diomedeidae
Blackbird, yellow-shouldered**	Agelaius xanthomus	Icteridae
Bobwhite, masked (quail)	Colinus virginianus ridgwayi	Phasianidae
Condor, California	Gymnogyps californianus	Cathartidae
Coot, Hawaiian	Fulica americana alai	Rallidae
Crane, sandhill, Mississippi	Grus canadensis pulla	Gruidae
Crane, whooping	Grus americana	Gruidae
Creeper, Hawaii	Loxops maculata mana	Drepanididae
Creeper, Molokai (kakawahie)	Loxops maculata flammea	Drepanididae
Creeper, Oahu (alauwahio)	Loxops maculata maculata	Drepanididae
Crow, Hawaiian (alala)	Corvus tropicus	Corvidae
Curlew, eskimo*	Numenius borealis	Scolopacidae
Dove, ground, Palau**	Gallicolumba canifrons	Columbidae
Duck (teal), Laysan**	Anas laysanensis	Anatidae
Duck, Hawaiian (koloa)	Anas wyvilliana	Anatidae
Duck, Mexican	Anas diazi	Anatidae
Eagle, bald, southern*	Haliaeetus leucocephalus leucocephalus	Accipitridae
Falcon, peregrine, American*	Falco peregrinus anatum	Falconidae
Falcon, peregrine, arctic*	Falco peregrinus tundrius	Falconidae
Finch, Laysan and Nihoa**	Psittirostra cantans	Drepanididae
Flycatcher, fantail, Palau**	Rhipidura lepida	Muscicapidae
Flycatcher, monarch, Tinian Island**	Monarcha takatsukasae	Muscicapidae
Gallinule, Hawaiian	Gallinula chloropus sandvicensis	Rallidae
Goose, Canada, Aleutian	Branta canadensis leucopareia	Anatidae
Goose, Hawaiian (nene)	Branta sandvicensis	Anatidae
Hawk, Hawaiian (io)	Buteo solitarius	Accipitridae
Honeycreeper, crested (akohekohe)	Palmeria dolei	Drepanididae
Kite, Florida Everglade (snail hawk)	Rostrhamus sociabilis plumbeus	Accipitridae
Mallard, Marianas**	Anas oustaleti	Anatidae
Megapode, La Perouse's**	Megapodius laperouse	Megapodiidae
Millerbird, Nihoa**	Acrocephalus kingi	Sylviidae
Nukupuu, Maui and Kauai	Hemignathus lucidus	Drepanididae

Table 3
(Continued)

Common name	Scientific name	Family
Oo, Kauai (oo aa) (honeyeater)	Moho braccatus	Meliphagidae
Ou	Psittirostra psittacea	Drepanididae
Owl, Palau**	Otus podarginus	Strigidae
Palila	Psittirostra bailleui	Drepanididae
Parrot (amazon), Puerto Rican**	Amazona vittata	Psittacidae
Parrot, thick-billed	Rhynchopsitta pachyrhyncha	Psittacidae
Parrotbill, Maui	Pseudonestor xanthophrys	Drepanididae
Pelican, brown*	Pelecanus occidentalis	Pelecanidae
Petrel, Hawaiian, dark-rumped	Pterodroma phaeopygia sandwichensis	Procellariidae
Pigeon, plain, Puerto Rican**	Columba inornata wetmorei	Columbidae
Poo-uli	Melamprosops phaeosoma	Drepanididae
Prairie chicken, greater, Attwater's	Tympanuchus cupido attwateri	Tetraonidae
Rail, clapper, California	Rallus longirostris obsoletus	Rallidae
Rail, clapper, light-footed	Rallus longirostris levipes	Rallidae
Rail, clapper, Yuma	Rallus longirostris yumanensis	Rallidae
Shearwater, Manx, Newell's	Puffinus puffinus newelli	Procellariidae
Shrike, loggerhead, San Clemente	Lanius ludovicianus mearnsi	Laniidae
Sparrow, Cape Sable	Ammospiza maritima mirabilis	Fringillidae
Sparrow, sage, San Clemente	Amphispiza belli clementae	Fringillidae
Sparrow, seaside, dusky	Ammospiza maritima nigrescens	Fringillidae
Sparrow, song, Santa Barbara	Melospiza melodia graminea	Fringillidae
Starling, mountain, Ponape**	Aplonis pelzelni	Sturnidae
Stilt, Hawaiian (black-winged)	Himantopus himantopus knudseni	Recurvirostridae
Tern, least, California	Sterna albifrons browni	Laridae
Thrush, Kauai, large	Phaeornis obscurus myadestina	Turdidae
Thrush, Kauai, small	Phaeornis palmeri	Turdidae
Thrush, Molokai	Phaeornis obscurus rutha	Turdidae
Warbler, (wood), Bachman's*	Vermivora bachmanii	Parulidae
Warbler, (wood), Kirtland's	Dendroica kirtlandii	Parulidae
Warbler, reed**	Acrocephalus luscinia	Sylviidae
Whip-poor-will, Puerto Rican**	Caprimulgus noctitherus	Caprimulgidae
White-eye, great, Ponape**	Rukia sanfordi	Zosteropidae
Woodpecker, ivory-billed*	Campephilus principalis	Picidae
Woodpecker, red-cockaded*	Picoides (Dendrocopus) borealis	Picidae

*Range of species not well defined or species possibly extinct. These species not included in county range maps or conflict estimates.
**Range of species does not include the 50 states.

Table 4

Reptiles

Common name (status)	Scientific name	Family
Alligator, American (E,T)	Alligator mississippiensis	Alligatoridae
Anole, giant* (E)	Anolis roosevelti	Iguanidae
Boa, Puerto Rican* (E)	Epicrates inornatus	Boidae
Crocodile, American (E)	Crocodylus acutus	Crocodylidae
Lizard, ground, St. Croix* (E)	Amciva polops	Teiidae
Lizard, leopard, blunt-nosed (E)	Crotaphytus silus	Iguanidae
Lizard, night, island (T)	Klauberina riversiania	Xantusiidae
Snake, garter, San Francisco (E)	Thamnophis sirtalis tetrataenia	Colubridae
Turtle, sea, hawksbill* (E)	Eretmochelys imbricata	Cheloniidae
Turtle, sea, leatherback (E)	Dermochelys coriacea	Dermochelyidae
Turtle, sea, Ridley, Atlantic (E)	Lepidochelys kempii	Cheloniidae
Watersnake, salt marsh, Atlantic (T)	Nerodia (Natrix) fasciata taeniata	Colubridae

*Range of species does not include the 50 states.

Table 5

Amphibians (Red Hills salamander & Coqui Threatened; others Endangered)

Common name	Scientific name	Family
Coqui, golden*	Eleutherodactylus jasperi	Leptodactylidae
Salamander, blind, Texas	Typhlomolge rathbuni	Plethodontidae
Salamander, desert slender	Batrachoseps aridus	Plethodontidae
Salamander, long-toed, Santa Cruz	Ambystoma macrodactylum croceum	Ambystomatidae
Salamander, Red Hills	Phaeognathus hubrichti	Plethodontidae
Toad, Houston	Bufo houstonensis	Bufonidae
Treefrog, Pine Barrens	Hyla andersonii	Hylidae

*Range of species does not include the 50 states.

Table 6

Fish

Common name (status)	Scientific name	Family
Bonytail, Pahranagat (E)	Gila robusta jordoni	Cyprinidae
Cavefish, Alabama (T)	Speoplatyrhinus poulsoni	Amblyopsidae
Chub, humpback (E)	Gila cypha	Cyprinidae
Chub, Mohave (E)	Gila (Siphateles) mohavensis	Cyprinidae
Chub, slender (T)	Hybopsis cahni	Cyprinidae
Chub, spotfin (T)	Hybopsis monacha	Cyprinidae
Cisco, longjaw (E)	Coregonus alpenae	Salmonidae
Cui-ui (E)	Chasmistes cujus	Catostomidae
Dace, Moapa (E)	Moapa coriacea	Cyprinidae
Dace, warm springs, Kendall (E)	Rhinichthys osculus thermalis	Cyprinidae
Darter, bayou (T)	Etheostoma rubrum	Percidae
Darter, fountain (E)	Etheostoma fonticola	Percidae
Darter, Maryland (E)	Etheostoma sellare	Percidae
Darter, Okaloosa (E)	Etheostoma okaloosae	Percidae
Darter, slackwater (T)	Etheostoma boschungi	Percidae
Darter, snail (E)	Percina tanasi	Percidae
Darter, watercress (E)	Etheostoma nuchale	Percidae
Gambusia, Big Bend (E)	Gambusia gaigei	Poeciliidae
Gambusia, Clear Creek (E)	Gambusia heterochir	Poeciliidae
Gambusia, Pecos (E)	Gambusia nobilis	Poeciliidae
Killifish, Pahrump (E)	Empetrichthys latos	Cyprinodontidae
Madtom, Scioto (E)	Noturus trautmani	Ictaluridae
Madtom, yellowfin (T)	Noturus flavipinnis	Ictaluridae
Pike, blue (E)	Stizostedion vitreum glaucum	Percidae
Pupfish, Comanche Springs (E)	Cyprinodon elegans	Cyprinodontidae
Pupfish, Devil's Hole (E)	Cyprinodon diabolis	Cyprinodontidae
Pupfish, Owens River (E)	Cyprinodon radiosus	Cyprinodontidae
Pupfish, Tecopa (E)	Cyprinodon nevadensis calidae	Cyprinodontidae
Pupfish, warm springs (E)	Cyprinodon nevadensis pectoralis	Cyprinodontidae
Squawfish, Colorado River (E)	Ptychocheilus lucius	Cyprinidae
Stickleback, threespine, unarmored (E)	Gasterosterus aculeatus williamsoni	Gasterosteidae
Sturgeon, shortnose (E)	Acipenser brevirostrum	Acipenseridae
Topminnow, Gila (E)	Poeciliopsis occidentalis	Poeciliidae
Trout, Arizona (T)	Salmo apache	Salmonidae
Trout, cutthroat, greenback (E)	Salmo clarki stomias	Salmonidae
Trout, cutthroat, Lahontan (T)	Salmo clarki henshawi	Salmonidae
Trout, cutthroat, Paiute (T)	Salmo clarki seleniris	Salmonidae
Trout, Gila (E)	Salmo gilae	Salmonidae
Woundfin (E)	Plagopterus argentissimus	Cyprinidae

Table 7

Clams (All are of family Unionidae; all are Endangered)

Common name	Scientific name
Mussel, pearly, bean, Cumberland	Villosa (Micromya) trabilis
Mussel, pearly, birdwing	Conradilla caelata
Mussel, pearly, Curtis	Epioblasma (Dysnomia) florentina curtisi
Mussel, pearly, dromedary	Dromus dromas
Mussel, pearly, fat pocketbook	Potamilus (Proptera) capax
Mussel, pearly, green-blossom	Epioblasma (Dysnomia) torulosa gubernaculum
Mussel, pearly, Higgins' eye	Lampsilis higginsi
Mussel, pearly, lamp, Alabama	Lampsilis virescens
Mussel, pearly, monkeyface, Appalachian	Quadrula sparsa
Mussel, pearly, monkeyface, Cumberland	Quadrula intermedia
Mussel, pearly, pale lilliput	Toxolasma (Carunculina) cylindrella
Mussel, pearly, pigtoe, fine-rayed	Fusconaia cuneolus
Mussel, pearly, pigtoe, rough	Pleurobema plenum
Mussel, pearly, pigtoe, shiny	Fusconaia edgariana
Mussel, pearly, pink mucket	Lampsilis orbiculata orbiculata
Mussel, pearly, Sampson's	Epioblasma (Dysnomia) sampsoni
Mussel, pearly, tuberculed-blossom	Epioblasma (Dysnomia) torulosa torulosa
Mussel, pearly, turgid-blossom	Epioblasma (Dysnomia) turgidula
Mussel, pearly, white cat's paw	Epioblasma sulcata delicata + perobliqua
Mussel, pearly, white warty-back	Plethobasis cicatricosus
Mussel, pearly, yellow-blossom	Epioblasma (Dysnomia) florentina florentina
Pimpleback, orange-footed	Plethobasis cooperianus
Riffle shell, tan	Epioblasma (Dysnomia) walkeri

Table 8

Insects (Swallowtail butterflies are Threatened; others are Endangered)

Common name	Scientific name	Family
Butterfly, blue, El Segundo	Shijimiaeoides battoides allyni	Lycaenidae
Butterfly, blue, lotis	Lycaeides argyrognomon lotis	Lycaenidae
Butterfly, blue, mission	Icaricia icarioides missionensis	Lycaenidae
Butterfly, blue, Smith's	Shijimiaeoides enoptes smithi	Lycaenidae
Butterfly, elfin, San Bruno	Callophrys mossii bayensis	Lycaenidae
Butterfly, metalmark, Lange's	Apodemia mormo langei	Riodinidae
Butterfly, swallowtail, Bahama	Papilio andraemon bonhotei	Papilionidae
Butterfly, swallowtail, Schaus	Papilio aristodemus ponceanus	Papilionidae

Table 9

Plants (All are Endangered)

Common name	Scientific name	Family
Broom, San Clemente	Lotus scoparius traskiae	Fabaceae
Bushmallow, San Clemente Island	Malacothamnus clementinus	Malvaceae
Indian paintbrush, San Clemente Island	Castilleja grisea	Scrophulariaceae
Larkspur, San Clemente Island	Delphinium kinkiense	Ranunculaceae

VII. ENERGY-RELATED THREATS TO ENDANGERED SPECIES

Our objective was to determine how the ranges of endangered species overlap with counties bearing one or more of the following characteristics.

1. Planned electric generating stations, including hydroelectric.[13]
2. Planned sites for coal gasification plants.[14,15]
3. Coal production in excess of 1 million tons in 1972.[16]
4. Rapidly increasing coal production, defined as more than 1 million tons production per year to be added between 1975 and 1980.[15,17]
5. Population increase greater than 50% between 1960 and 1970.[18]
6. Sites of new or expanding oil refineries or natural gas processing plants.[14,15]

IX. CONFLICT INDEX

A single index was worked out which shows for each county, the likelihood of conflicts between endangered species and the energy related characteristics listed above:

$$I = S \cdot A \cdot N$$

where,

S is the number of endangered species in the county,

A indicates the presence of from 1 to 6 of the characteristics listed above, and

N is a factor having integer values from 1 to 5 that measures to what degree a county has already been developed, i.e., how far it has departed from a natural state.

The factor N adds realism to the measure of conflict between energy plans and endangered species because (1) an already heavily populated, industrialized, and polluted county stands a lower chance of actually harboring endangered species than a pristine county even though it may be a potential habitat,

and (2) an increment of development in an already developed county should have less impact than the first encroachment in a pristine county.

Six factors were used to measure the level of development of a county (i.e., its degree of unnaturalness):

1. Value added in manufacturing, a measure of industrialization.
2. Value of mineral shipments, a measure of disturbance due to mining.
3. Value of farm products sold, a measure of another form of preemption of land, habitat destruction, and water pollution.
4. Total retail sales, a measure of business activity.
5. Total fuel consumed, a measure of total human activity and air pollution.
6. Population density.

For each of the six values, all counties were ranked and given a score of 1 to 10 according to whether they were in the first, second, ... , tenth decile of all counties for that particular parameter. To obtain an overall naturalness index for a county, its six scores were summed. Thus, the highest possible score, 60, would mean that a county was in the highest decile (top 10%) of all counties in each of the six categories. Because a scale of 6 to 60 is too broad and implies more detail than is justifiable, the scale was compressed to 1 to 5 with 5 indicating the most natural conditions and 1 the most heavily developed. The naturalness factor is given in Table 10 for the most critical of the endangered species counties.

To illustrate the calculation of the conflict index, the following data on Suffolk County, New York, can be used. Two endangered species, the shortnose sturgeon (Acipenser brevirostrum) and the Indiana bat (Myotis sodalis) may inhabit this eastern Long Island county. They are threatened by two of the developments being considered, planned electric power plants and a rapidly increasing population. However, because Suffolk is among the most densely populated

industrialized, and polluted counties, and is in the top 10% in farm and retail sales and only slightly lower in mineral industries, its index of naturalness is 59 out 60, or class 1, the lowest category. Therefore its conflict index is

$$I = 2 \cdot 2 \cdot 1 = 4 \ .$$

X. RESULTS

Maps

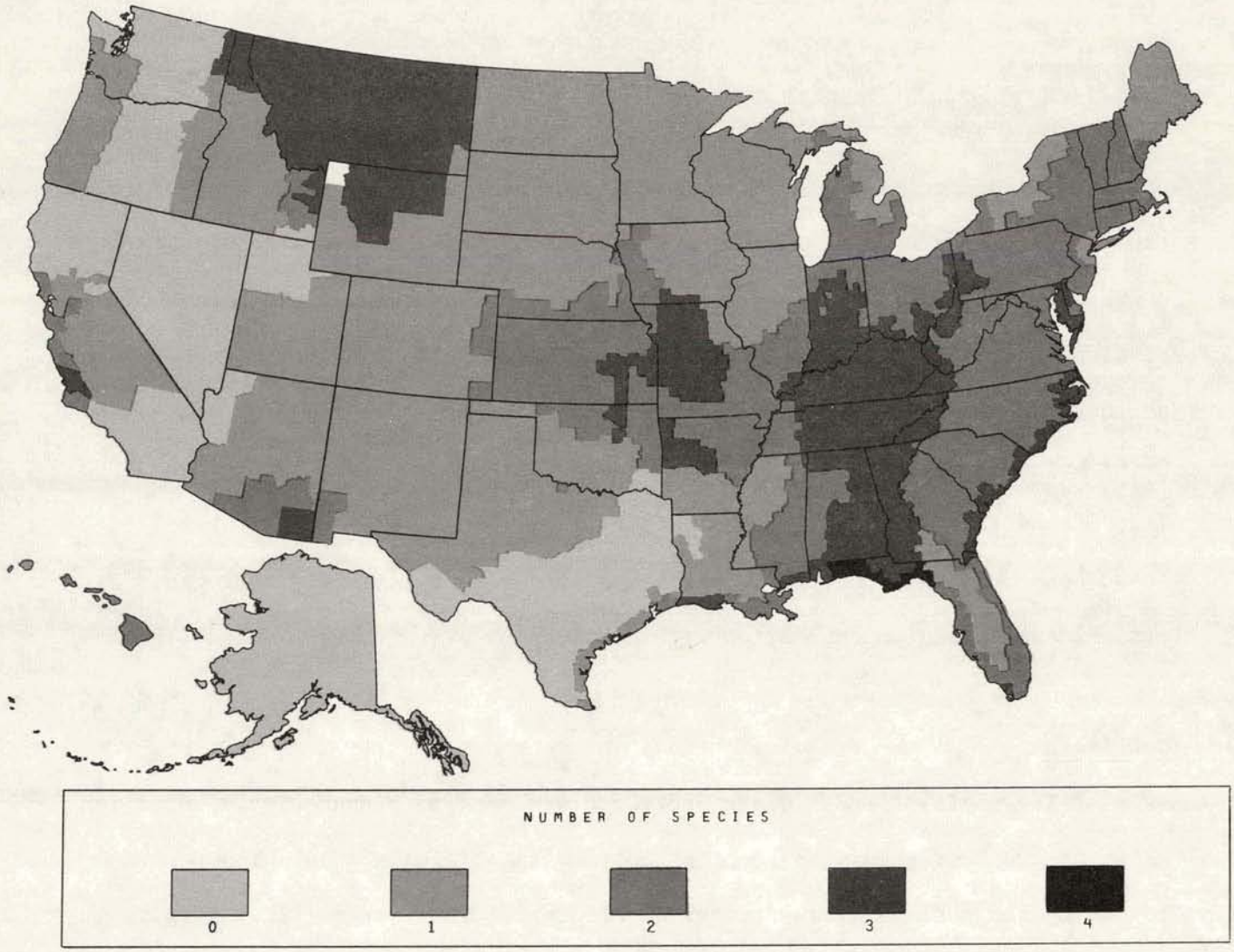
Maps were prepared (with the provisos of Section VII) showing the ranges of endangered species included in this study, by taxonomic groups (Maps 1 to 7). Map 8 indicates roughly for each county the amount of human disturbance, or conversely, the degree of natural (factor N described above). The most heavily developed counties (index 1) occur in a belt across the northern midwest through southern New England, and the least developed (index 5) in the high plains and intermontane west. A map (Map 9) showing total species times naturalness (two of the three factors in the conflict index, $I = S \cdot A \cdot N$) may be useful to those concerned with endangered species distributions (as modified by the naturalness index) in connection with development plans not considered in this report.

Conflicts

The conflict index described above was used to prepare Table 10, which shows the rank order of the counties most critical (index $\geq$ 10) with regard to endangered species versus energy development. The most critical area is the southern Appalachians (including western Kentucky), where 24 of the top 37 conflict counties are found. The main reason for this is the presence of many endangered species; this region is the highest ranking not only in conflict but also in richness of endangered species. Most of the species richness is due to the many kinds of endangered freshwater bivalves. Other areas of the country do not have such a variety of endangered species and therefore do not rate as

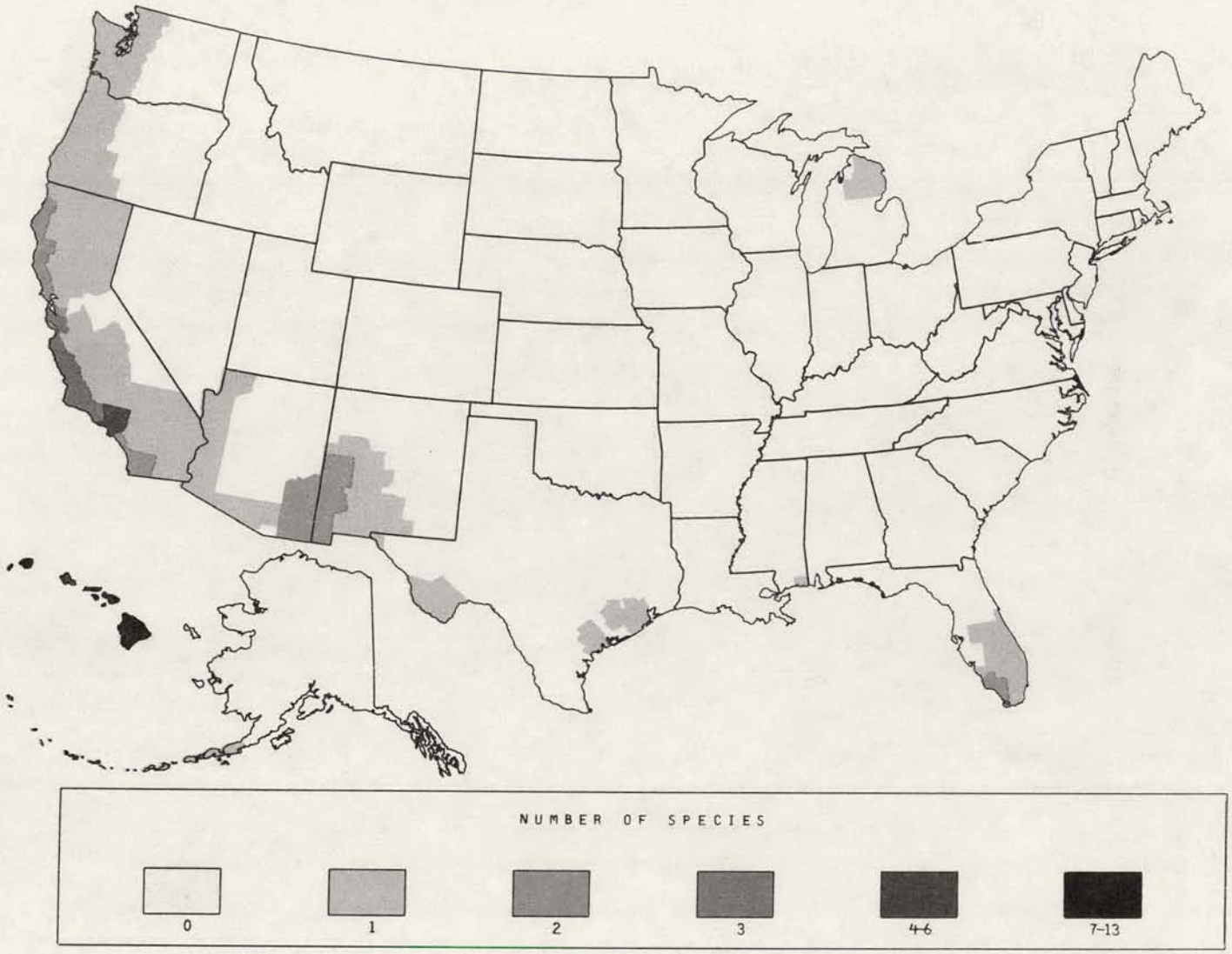
MAP 1

ENDANGERED MAMMALS BY COUNTY



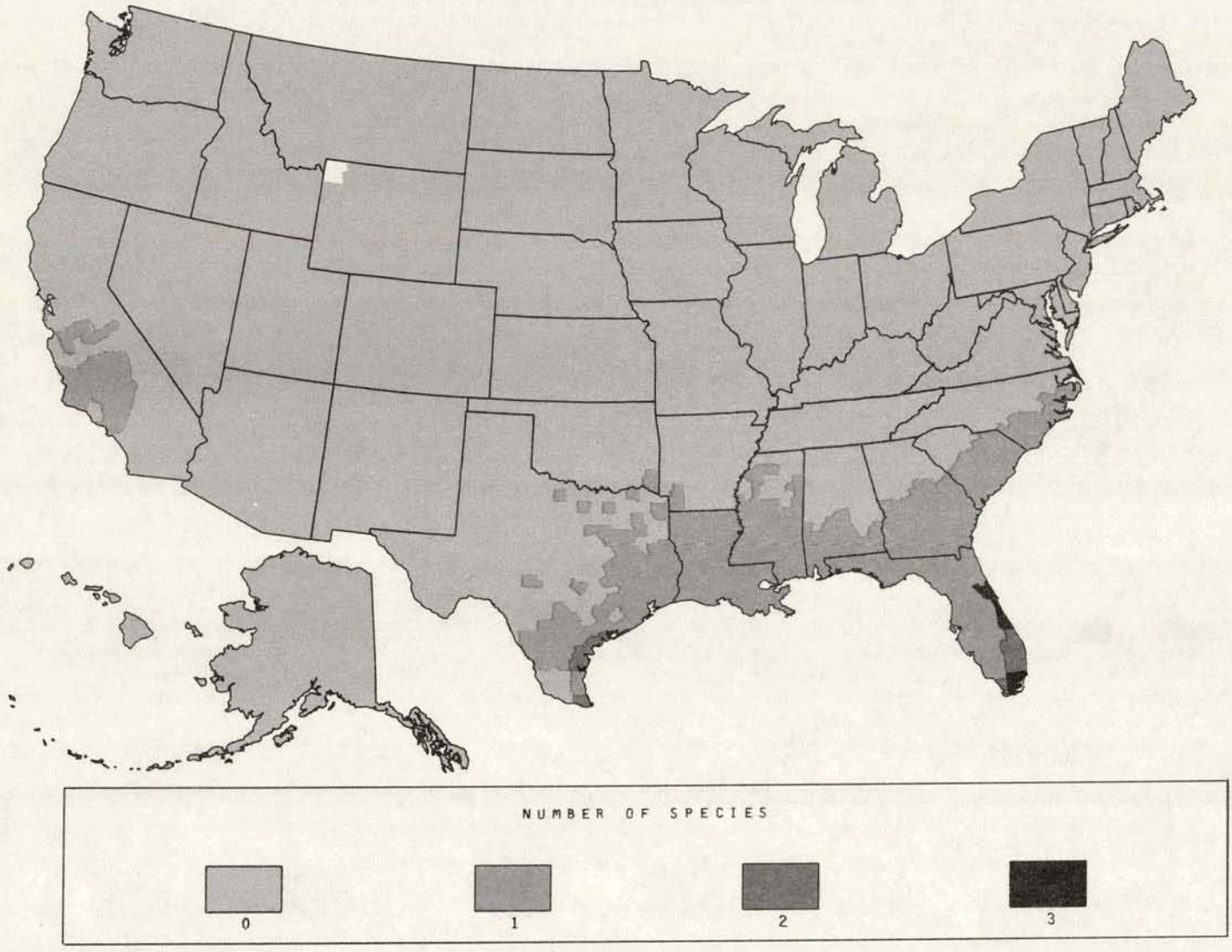
MAP 2

ENDANGERED BIRDS BY COUNTY



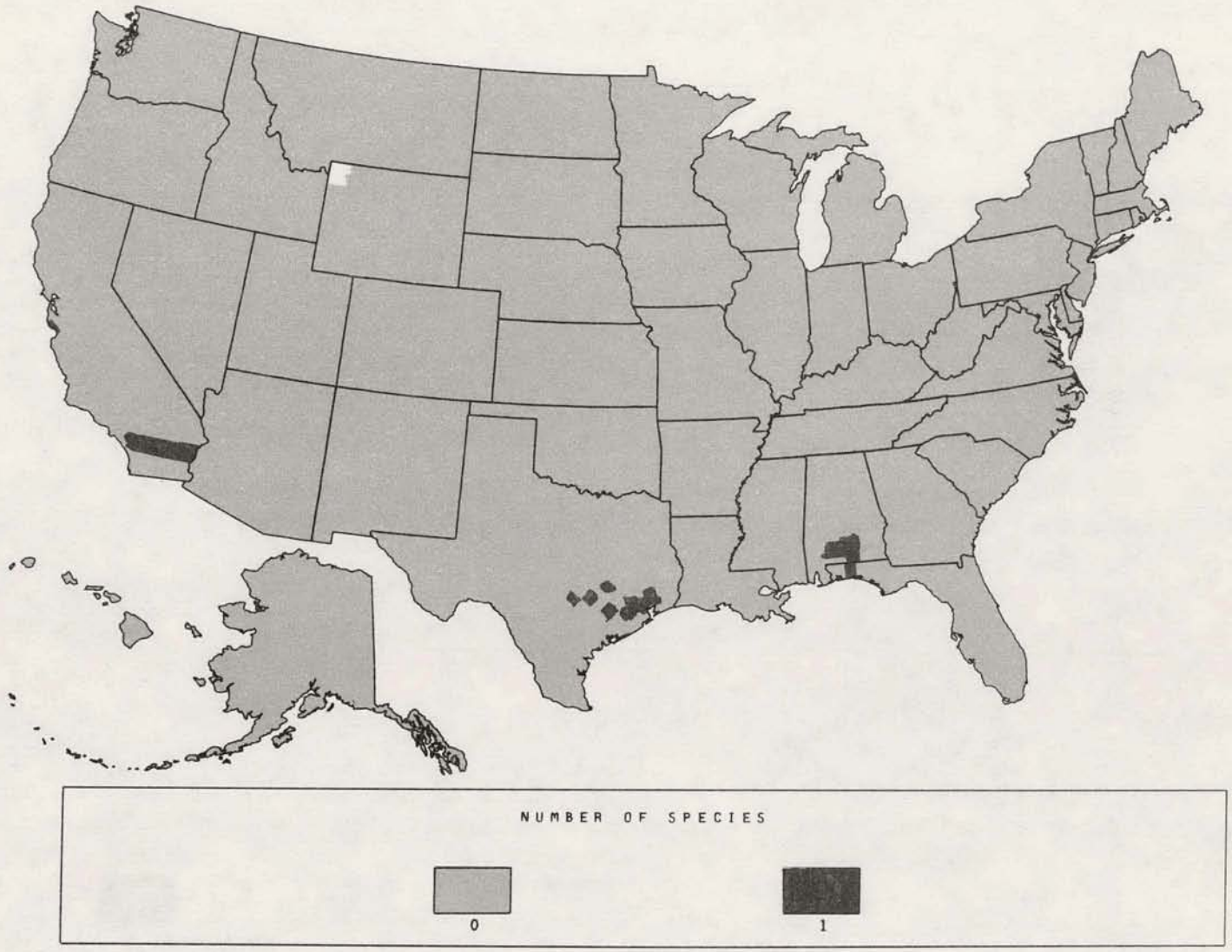
MAP 3

ENDANGERED REPTILES BY COUNTY



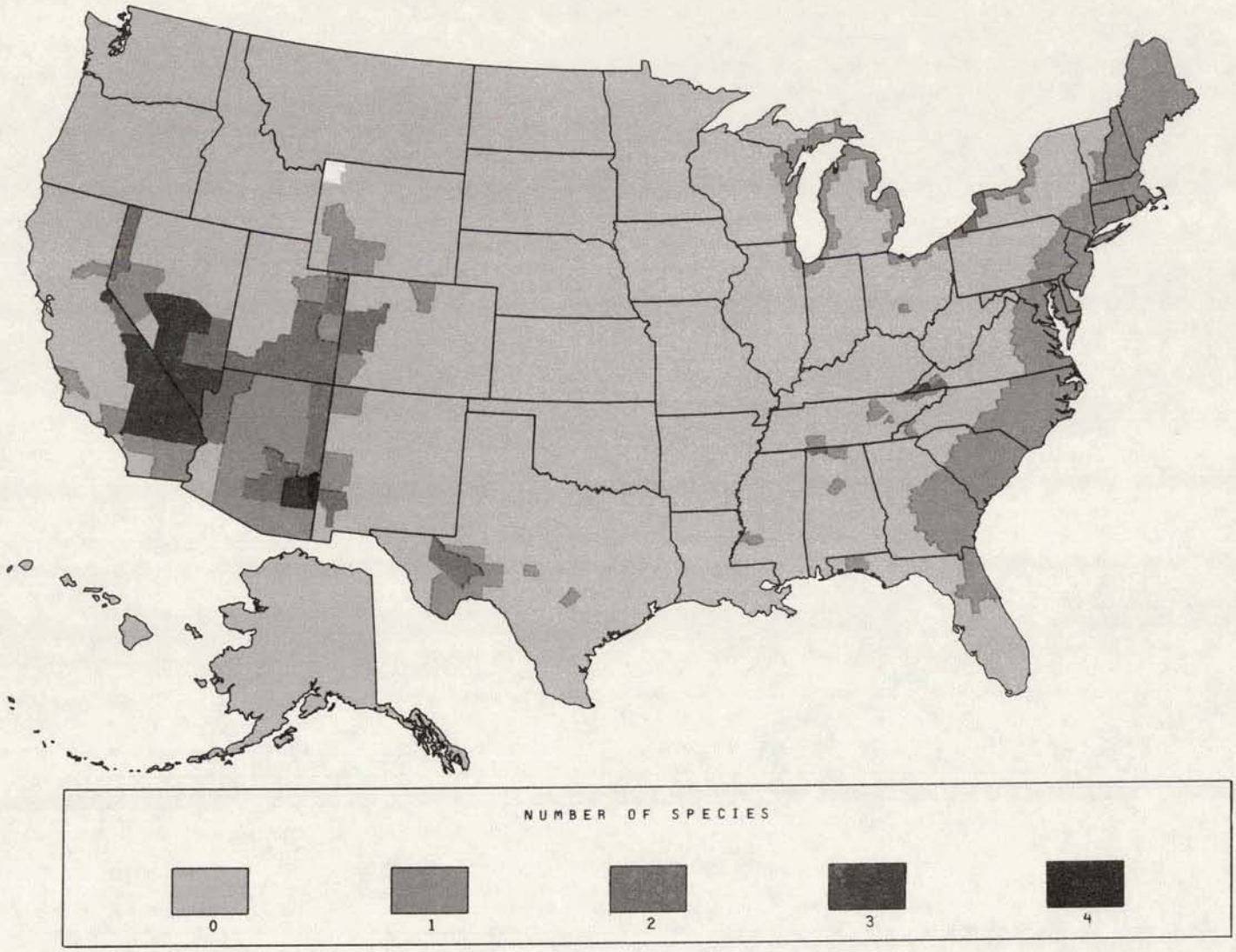
MAP 4

ENDANGERED AMPHIBIANS BY COUNTY



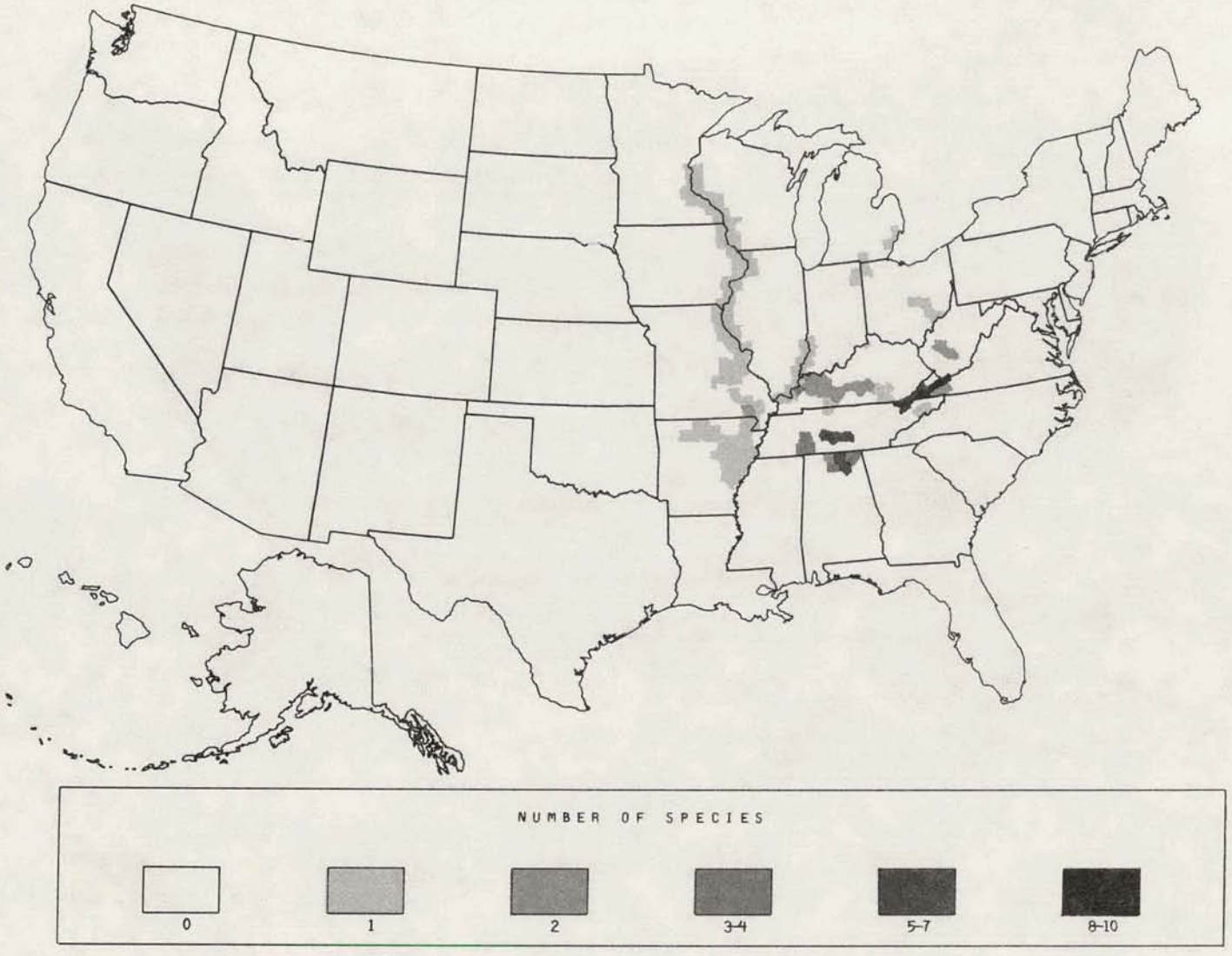
MAP 5

ENDANGERED FISHES BY COUNTY



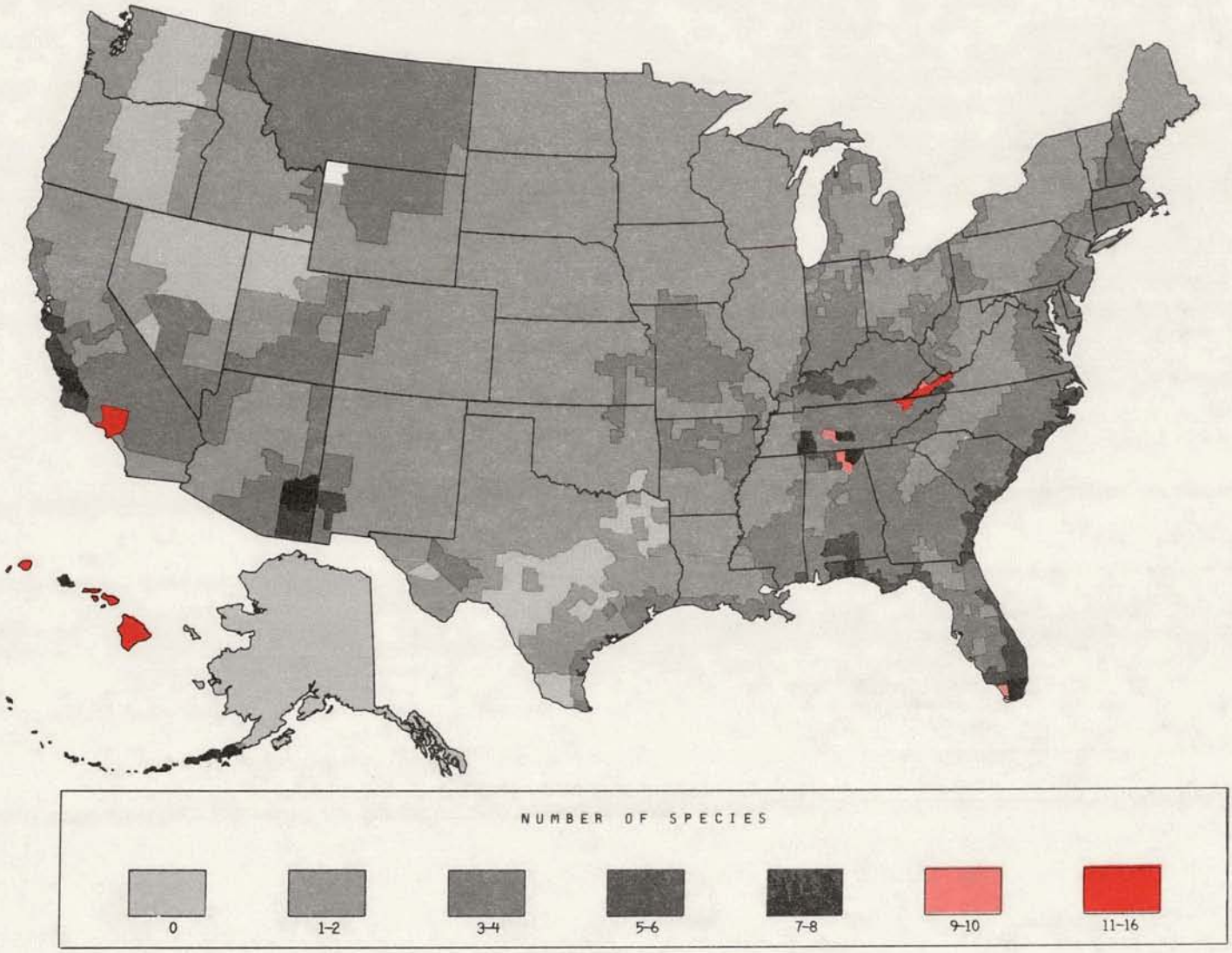
MAP 6

ENDANGERED CLAMS BY COUNTY



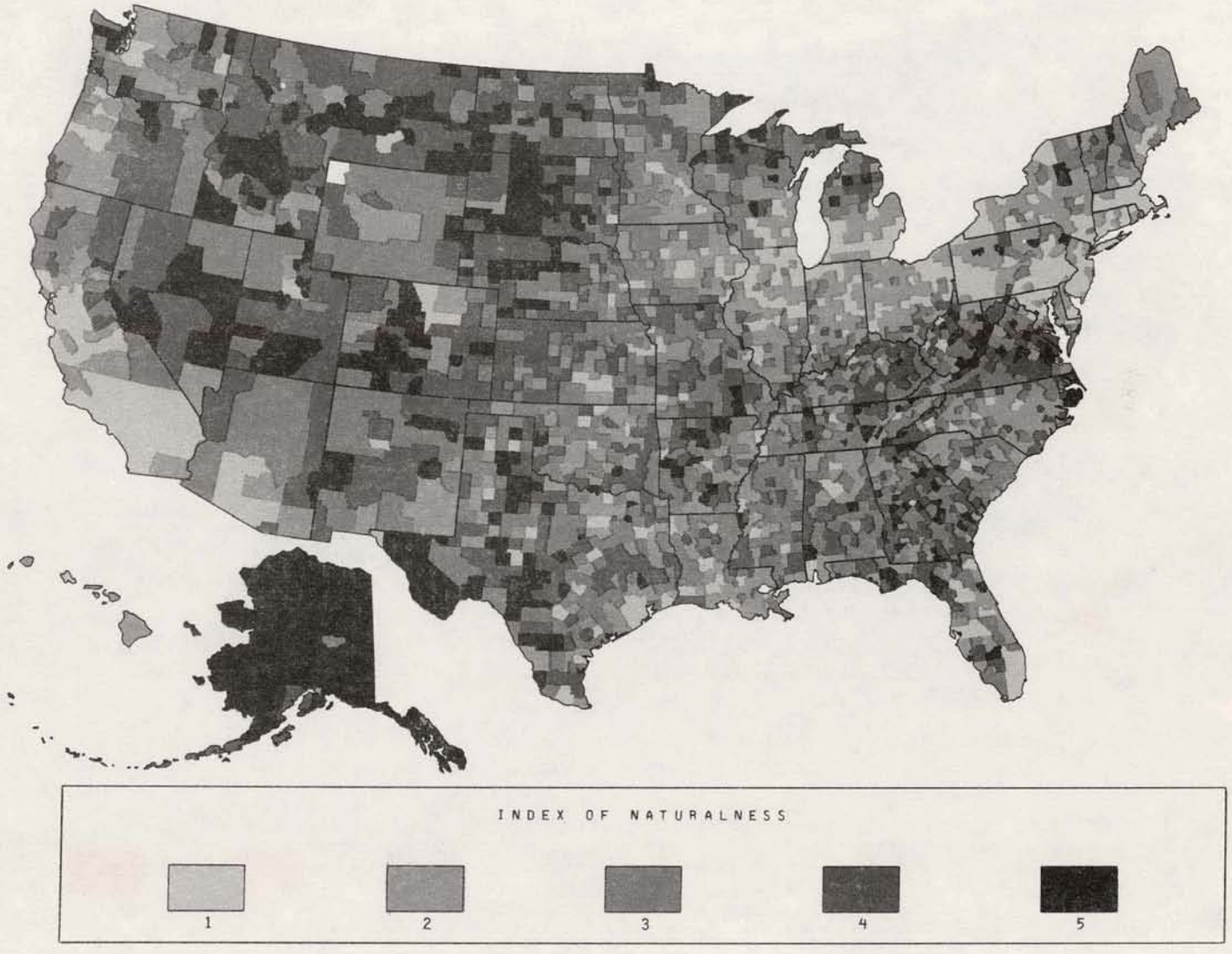
MAP 7

TOTAL ENDANGERED SPECIES BY COUNTY



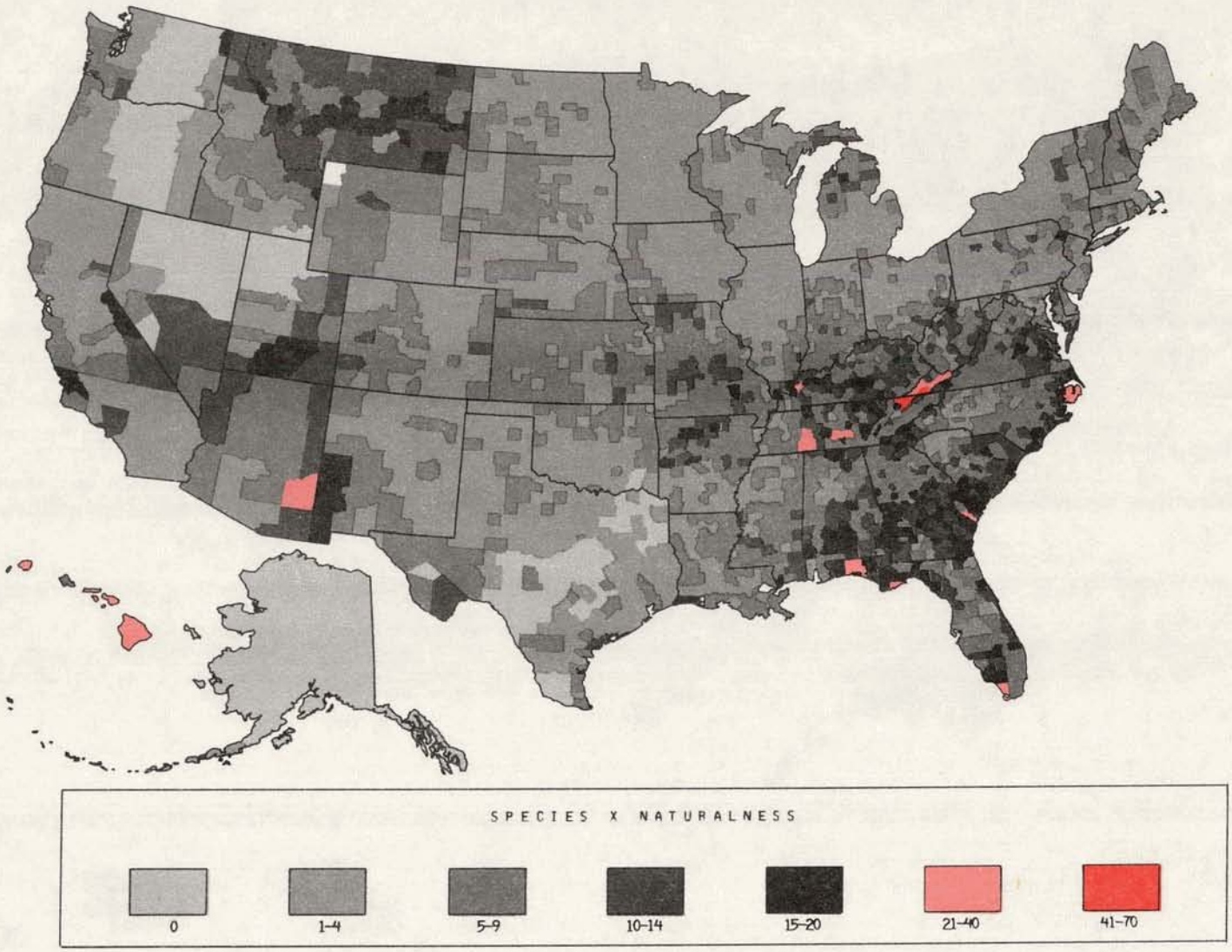
MAP 8

HABITAT PREEMPTION BY MAN'S ACTIVITIES



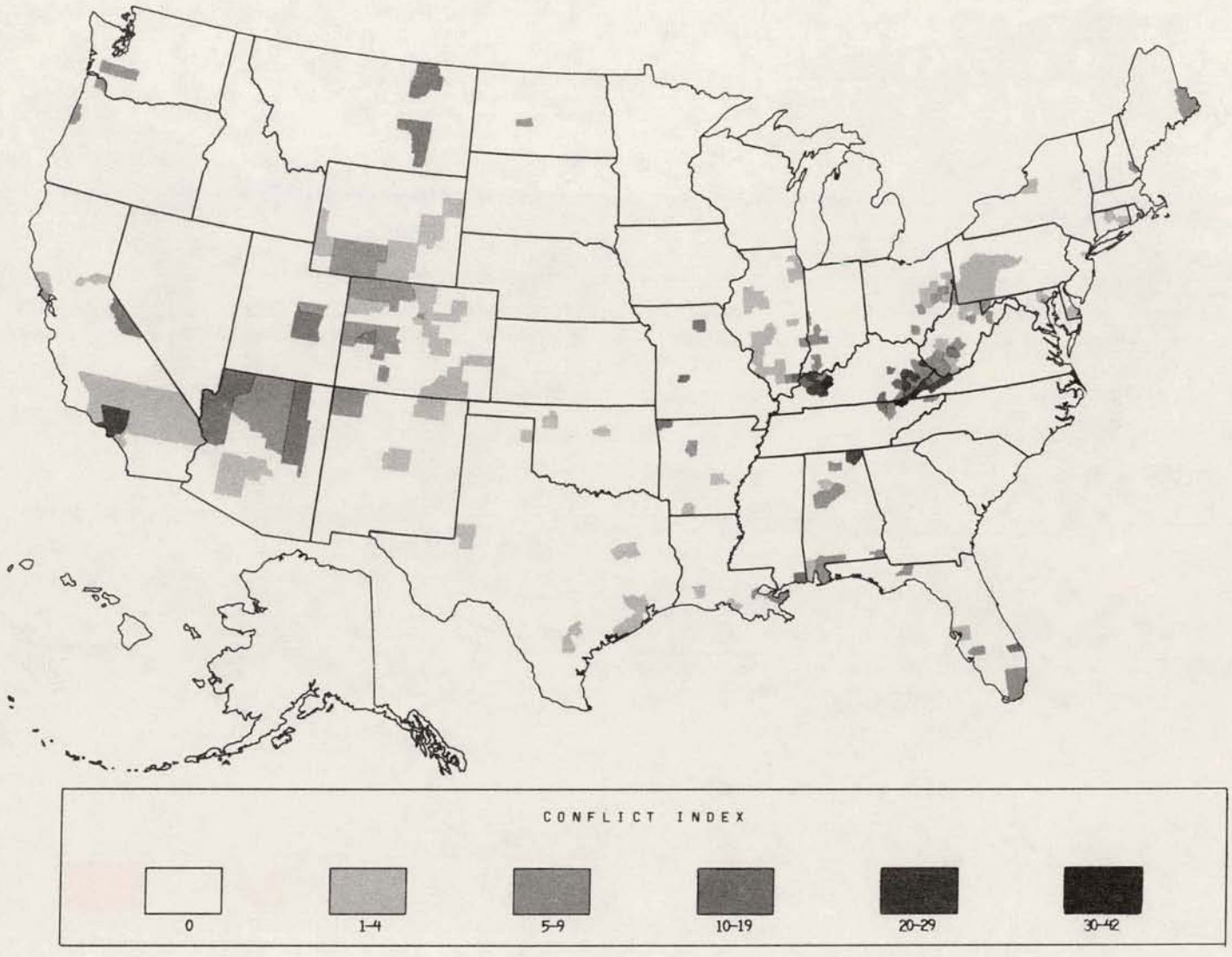
MAP 9

TOTAL SPECIES TIMES NATURALNESS



MAP 10

ENDANGERED SPECIES - ENERGY DEVELOPMENT CONFLICTS



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high in conflict potential. Hawaii has many endangered species, but the threats to their continued existence, although real, are not among the particular developments being considered here. The southern Appalachians are known to be a coal mining area, and planned future expansion of coal output is the major threat to the endangered species there. The inclusion of coal mining as one of the technologies considered in this work resulted in Appalachia's dominating the conflict table.

Some of the counties listed in Table 10 as having high conflict indices actually deserve lower rankings that those obtained by our procedure (these are indicated by asterisks). These counties are thought to be overrated because of the unlikelihood of their actually harboring the endangered species associated with them. For example, the eastern cougar, Indiana bat, and gray bat have such uncertain ranges and are so rare that they are unlikely to cause strong conflicts with coal mining activities in, say, Martin County, Kentucky. Since such conflicts are, nevertheless, possible, especially considering the undeveloped nature of these counties, the listings have been retained in the table. While the liklihood of conflicts arising in counties with $I < 10$ is generally low, a number of such counties may have higher potential than their index shows due to the certain presence in them of sensitive species and destructive developments. These selected counties have also been included in Table 10.

A more complete picture of potential conflict may be gotten from Map 10 which shows how the index varies over the entire country.

Because the data on endangered species ranges can be used to assess potential conflicts with energy technologies or threats other than those considered here, a listing of all counties with their resident endangered species is given in Appendix A. This shows endangered species concentrations apart from estimates of naturalness and conflict. Total endangered species for all counties may be read from Map 7.

Table 10

County & State	Confl. index	Natural-ness	Endangered species involved (see key)	Developments (see key)
Claiborne TN	42	3	1, 2, 3, 20, 21, 22, 23, 27, 31, 32, 33, 34, 38, 39	CA
Lee VA	33	3	1, 2, 3, 20, 22, 23, 31, 32, 34, 38, 39	CA
Ohio KY	30	3	1, 2, 3, 18, 27	CP, CA
Russell VA	28	2	1, 2, 3, 20, 21, 22, 23, 28, 31, 32, 33, 34, 39, 41	CA
Jackson AL	28	2	2, 3, 5, 22, 23, 24, 28	CA
Wise VA	27	3	1, 2, 3, 20, 22, 23, 31, 33, 34	CA
Tazewell VA	24	2	1, 2, 3, 21, 22, 23, 27, 31 32, 33, 34	CA
Breathit KY	24	4	1, 2, 3	CP, CA
Martin KY	24	4	1, 2, 3	CP, CA
Leslie KY	24	4	1, 2, 3	CP, CA
Knott KY	24	4	1, 2, 3	CP, CA
McLean KY	20	4	1, 2, 3, 18, 27	CA
Muhlenburg KY	20	2	1, 2, 3, 18, 27	CP, CA
Hopkins KY	20	2	1, 2, 3, 18, 27	CP, CA
Henderson KY	20	2	1, 2, 3, 18, 27	CP, GS
Harlan KY	18	3	1, 2, 3	CP, CA
Navajo AZ	18	3	10, 12	CP, CA, PP
McCreary KY	16	4	1, 2, 3, 29	CA
Webster KY	15	3	1, 2, 3, 18, 27	CA
Martin FL	15	3	4, 5, 6, 37, 40	PP
Mono CA	15	5	15, 16, 17	MI
Estill KY	12	4	1, 2, 3	CP
Clay KY	12	4	1, 2, 3	CP
Gallatin IL	12	3	1, 2, 3, 19	CA
Union KY	12	3	1, 2, 3, 19	CA
Scott TN	12	4	1, 2, 3	CA
Dickenson VA	12	4	1, 2, 3	CA
Hickory MO	12	4	2, 3, 10	CA
Macon MO	12	4	2, 3, 10	CA
Valley MT	12	4	8, 9, 10	GS
Rosebud MT	12	4	8, 9, 10	CA
Fayette WV	12	3	1, 3, 18, 19	CA
Emery UT	12	4	10, 11, 12	CA
Delta CO	12	4	10, 11, 12	CP
Mohave AZ	12	4	11, 13, 14	MI
Benton AR	12	2	2, 3, 5	PP, MI
Jackson MI	10	2	3, 4, 5, 7, 37	RF
Carbon UT	9	3	10, 11, 12	CA
Jefferson AL	9	1	3, 5, 42	CA, GS, PP
Baldwin AL	8	2	3, 4, 5, 37	RF
Sullivan TN	8	2	1, 2, 3, 38	RF
Marin CA	8	2	43, 44, 45, 46	RF
Dade FL	8	1	4, 5, 6, 37, 40, 47, 48, 49	PP
St. Bernard LA	6	2	4, 5, 37	RF
Mesa CO	6	2	10, 11, 12	CP
San Juan NM	6	3	10. 12	CA

Table 10 (Continued)

County & State	Confl. index	Natural-ness	Endangered species involved (see key)	Developments (see key)
Sweetwater WY	6	3	10, 11	RF
Daviess KY	5	1	1, 2, 3, 18, 27	CA
Broward FL	5	1	4, 5, 6, 37, 40	MI
Mobile AL	4	1	3, 4, 5, 37	RF
Sonoma CA	4	1	43, 44, 45, 46	PP
Kanawha WV	4	1	1, 3, 18, 19	CA
Matagorda TX	4	2	4, 37	RF
Oswego NY	4	2	1, 50	RF
San Bernardino CA	4	1	12, 14, 51, 52	PP
St. Mary LA	3	1	4, 5, 37	RF
Hillsborough FL	3	1	4, 5, 37	PP
Pinellas FL	3	1	4, 5, 37	PP
Orleans LA	3	1	4, 5, 37	RF
Brazoria TX	3	1	4, 37, 53	RF
Harris TX	3	1	4, 53, 54	RF
Maricopa AZ	2	1	10, 12	PP

Key to Species

1. Eastern cougar
2. Gray bat
3. Indiana bat
4. American alligator
5. Florida panther
6. Florida everglade kite
7. Mississippi sandhill crane
8. Grizzly bear
9. Northern Rocky Mountain wolf
10. Black-footed ferret
11. Humpback chub
12. Colorado River squawfish
13. Woundfin
14. Yuma clapper rail
15. San Joaquin kit fox
16. Paiute-cutthroat trout
17. Owens River pupfish
18. Pink mucket pearly mussel
19. Tuberculed blossom pearly mussel
20. Birdwing pearly mussel
21. Turgid-blossom pearly mussel
22. Fine rayed pigtoe pearly mussel
23. Shiny pigtoe pearly mussel
24. Alabama lamp pearly mussel
25. White warty back pearly mussel
26. Orange footed pimple back
27. Rough pigtoe pearly mussel
28. Pale lilliput pearly mussel
29. Cumberland bean pearly mussel
30. Sampson's pearly mussel
31. Dromedary pearly mussel
32. Green-blossom pearly mussel
33. Cumberland monkeyface pearly mussel
34. Appalachian monkeyface pearly mussel
35. Yellow-blossom pearly mussel
36. Bahama swallowtail
37. West Indian manatee
38. Slender chub
39. Yellowfin madtom
40. Leatherback sea turtle
41. Tan riffle shell
42. Watercress darter
43. Aleutian Canada goose
44. California clapper rail
45. Salt marsh harvest mouse
46. Southern sea otter
47. American crocodile
48. Bahama swallowtail
49. Schaus swallowtail
50. Blue pike
51. Unarmored three spine stickleback
52. Mohave chub
53. Attwater's greater prairie chicken
54. Houston toad

Key to Developments

CA = Coal mine Additions 10^6 tons/yr by 1980
GS = coal GaSification site planned
MI = in-MIgration > 50% 1960 - 1970
CP = 1972 Coal Production > 10^6 tons
PP = planned Power Plant
RF = planned ReFinery

XI. CONCLUSIONS

Conflicts between the Endangered Species Act and "development," be it energy-related or not, are likely to increase markedly in the near future in the absence of careful planning; the importance of the Act in preventing unwise development in sensitive areas cannot be overemphasized. We draw this conclusion after considering the following:

1. Endangered species are very widely distributed across the country. It is almost impossible to say a priori that any particular area slated for development does not contain an endangered species population. Detailed surveys for endangered species at the site are required to be sure even if the site is merely within the species' potential range.

2. There are many endangered species hot spots--undeveloped counties with many species--particularly in the southern Appalachian region. Some of the counties in this region are already planning million-ton per year expansions in their coal output and/or power plants, dams, and pumped storage. The region as a whole is undergoing rapid growth in population and industrialization, a phenomenon found throughout the "sun belt" in the South and West. The Blue Ridge has proved to be prime territory for vacation home development, right up to the borders of Smokey Mountain National Park. It is an area of recreational retreat from sultry southern cities.

3. Historical endangered species conflicts involving litigation have occurred in "unexpected" places judging from the numbers of species potentially at risk in other places. For example, the Mississippi sandhill crane battle was fought in Jackson County, Mississippi, a county with (at the time) 4 endangered species and a naturalness value of 2 (i.e., a relatively developed county) giving a conflict index of 8. Since 68 counties have indices ≥ 8, many conflicts can be expected to materialize. It is of some interest that Jackson County reappears as a likely "conflict" county in Table 10. Since the Mississippi

sandhill crane controversy, the West Indian manatee, a coastal marine mammal, has been added to the list of endangered species probably inhabiting this county. Fuel Desulfurization, Inc., has announced plans for a new 200,000 barrel per day refinery to be built on the Jackson County coast. The counties having high indices, e.g. those over 20, have as yet been untouched by controversy. When their endangered species resources are "discovered," future developments if they have adverse effects on the species, are certain to result in numerous court challenges.

4. The potential addition of 1800 plant species to the official endangered species list can only augment the chances for conflicts.

Our data are probably conservative, underestimating the potential for conflicts in several ways. First, the ranges of certain endangered species may in fact be broader than indicated, and some species have not even been considered here. Various species designated as endangered by states are not included in our data. A group of endangered, widely distributed birds were also left out (including the bald eagle, a specimen of which was recently illegally shot in Suffolk County, New York). Recent studies at the Merramac Dam site in Missouri have shown the presence of the Higgins' eye pearly mussel which was not known at the time of the original suit involving only the Indiana bat. Second, experience has shown that endangered species conflicts can occur even in developed counties. For example, a population of the Houston toad (Bufo houstonensis) living in a park in the city of Houston is potentially threatened by oil drilling proposed for the park. Our methods are biased against the probability of conflicts in such counties resulting in a conservative estimate of conflict.

XII. REFERENCES

1. Endangered Species Act of 1973, P.L. 93-205, 87 Stat. 884, 16 U.S.C. 1531 et seq.

2. Hopson, J.L., A plea for a mundane mollusc, The New York Times Magazine, pp. 58-76 (Nov. 14, 1976).

3. U.S. Congress, Environmental Study Conference, Weekly Bulletin, pp. 33-4 (Jan. 16, 1978).

4. Morton, R. G., World Wildlife Conference, Dept. of State Publ. 8729, General Foreign Policy Series 279, Office of Media Services, Bureau of Public Affairs, Washington, DC, 1973.

5. Environmental Law Institute, Implementing Section 7 of the Endangered Species Act of 1973: First notices from the courts, Environmental Law Reporter, 6, 10120-3 (1976).

6. Federal Register, 43, No. 2, 870-876 (January 4, 1978)

7. Grizzly critical habitat: What will be excluded?, High Country News 8, 23 (Nov. 19, 1976).

8. Calvert, J. D. and Heilman, W. L., A new approach to power plant siting, Presented at Am. Soc. Civil Engineering Annu Convention and Nat. Environmental Engineering Meet., St. Louis, 1971.

9. Schuster, R., Power plant siting, Power Eng. 74, 12, 29-35 (Dec. 1970)

10. Frigerio, N.A., Habegger, L.J., King, R.F., Hoover, L.H., Clark, N.A., and Cobian, J.M., A Methodology for Assessment of Energy Facility Siting Patterns, Argonne National Laboratory, Regional Studies Program.

11. Distribution compendium of listed endangered and threatened species, Data sheets from the Office of Endangered Species, Washington, DC, 1976.

12. Hall, E.R. and Kelson, K.R., The Mammals of North America, Vol. 2, The Ronald Press, New York, 1959.

13. New Generating Plants, the May 1976 summary of electric utility construction plans, Power Eng.

14. Projects to expand fuel sources in eastern states, U.S. Bur. Mines Inf. Circ. 8725, 1976.

15. Projects to expand fuel sources in western states, U.S. Bur. Mines Inf. Circ. 8719, 1976.

16. Minerals Yearbook 1973, Vol. 1: Metals, Minerals and Fuels, U.S. Bur. Mines, GPO, Washington, DC, 1975.

17. Campbell, J.M., New Coal Production Planned in Appalachia, 1975-1985, Appalachian Regional Commission, Washington, DC, 1976.

18. County and City Data Book 1972, U.S. Bur. of the Census, GPO, Washington, DC 1973.

19. Drysdale, F.R. and Calef, C.E., The Energetics of the United States of America: An Atlas, BNL 50501-R, 1977.

KEY TO SPECIES CODES
LISTED IN APPENDIX A

1	STURGEON, SHORTNOSE	FISH
2	COUGAR, EASTERN	MAMMAL
3	BAT, GRAY	MAMMAL
4	BAT, INDIANA	MAMMAL
5	SQUIRREL, FOX, DELMARVA PENINSULA	MAMMAL
6	DARTER, MARYLAND	FISH
7	ALLIGATOR, AMERICAN	REPTILE
8	PANTHER, FLORIDA	MAMMAL
11	SPARROW, SEASIDE, DUSKY	BIRD
12	KITE, FLORIDA EVERGLADE (SNAIL HAWK)	BIRD
13	SPARROW, CAPE SABLE	BIRD
14	*DEER, KEY*	MAMMAL
16	DARTER, OKALOOSA	FISH
17	DARTER, WATERCRESS	FISH
18	CRANE, SANDHILL, MISSISSIPPI	BIRD
19	CISCO, LONGJAW	FISH
20	WOLF, TIMBER, EASTERN	MAMMAL
21	WARBLER, (WOOD), KIRTLAND'S	BIRD
22	PIKE, BLUE	FISH
23	WOLF, RED	MAMMAL
24	BEAR, (BROWN), GRIZZLY	MAMMAL
25	WOLF, NORTHERN ROCKY MOUNTAIN	MAMMAL
26	FERRET, BLACK-FOOTED	MAMMAL
27	TROUT, CUTTHROAT, GREENBACK	FISH
28	TOAD, HOUSTON	AMPHIBIAN
29	PRAIRIE CHICKEN, GREATER, ATTWATER'S	BIRD
30	GAMBUSIA, CLEAR CREEK	FISH
31	DARTER, FOUNTAIN	FISH
32	SALAMANDER, BLIND, TEXAS	AMPHIBIAN
33	CRANE, WHOOPING	BIRD
34	DUCK, MEXICAN	BIRD
35	GAMBUSIA, BIG BEND	FISH
36	GAMBUSIA, PECOS	FISH
37	PUPFISH, COMANCHE SPRINGS	FISH
38	CHUB, HUMPBACK	FISH
39	DACE, WARM SPRINGS, KENDALL	FISH
40	SQUAWFISH, COLORADO RIVER	FISH
41	TROUT, ARIZONA	FISH
42	BONYTAIL, PAHRANAGAT	FISH
43	DACE, MOAPA	FISH
44	WOUNDFIN	FISH
45	RAIL, CLAPPER, YUMA	BIRD
46	*PRAIRIE DOG, UTAH*	MAMMAL
47	PRONGHORN, SONORAN	MAMMAL
48	TROUT, GILA	FISH
49	TOPMINNOW, GILA	FISH
50	BOBWHITE, MASKED (QUAIL)	BIRD
51	KILLIFISH, PAHRUMP	FISH
52	PUPFISH, DEVIL'S HOLE	FISH
53	PUPFISH, WARM SPRINGS	FISH
54	TROUT, CUTTHROAT, LAHONTAN	FISH
55	CUI-UI	FISH
56	GOOSE, CANADA, ALEUTIAN	BIRD
57	DEER, WHITE-TAILED, COLUMBIAN	MAMMAL
58	RAIL, CLAPPER, CALIFORNIA	BIRD
59	MOUSE, HARVEST, SALT MARSH	MAMMAL
60	LIZARD, LEOPARD, BLUNT-NOSED	REPTILE
61	CONDOR, CALIFORNIA	BIRD
62	FOX, KIT, SAN JOAQUIN	MAMMAL
63	SNAKE, GARTER, SAN FRANCISCO	REPTILE
64	TERN, LEAST, CALIFORNIA	BIRD
65	STICKLEBACK, THREESPINE, UNARMORED	FISH
66	SALAMANDER, LONG-TOED, SANTA CRUZ	AMPHIBIAN
67	RAIL, CLAPPER, LIGHT-FOOTED	BIRD
68	CHUB, MOHAVE	FISH
69	SALAMANDER, DESERT SLENDER	AMPHIBIAN
70	SPARROW, SONG, SANTA BARBARA	BIRD
71	TROUT, CUTTHROAT, PAIUTE	FISH
72	PUPFISH, OWENS RIVER	FISH
73	PUPFISH, TECOPA	FISH
74	BAT, HOARY, HAWAIIAN	MAMMAL
75	OU (HONEYCREEPER)	BIRD
76	PALILA (HONEYCREEPER)	BIRD
78	THRUSH, KAUAI, LARGE	BIRD
79	THRUSH, KAUAI, SMALL	BIRD
81	PARROTBILL, MAUI (HONEYCREEPER)	BIRD
82	CREEPER, MOLOKAI (KAKAWAHIE) (HONEYCREEPER)	BIRD
84	AKIALOA, KAUAI (HONEYCREEPER)	BIRD
85	OO, KAUAI (OO AA) (HONEYEATER)	BIRD
86	GOOSE, HAWAIIAN (NENE)	BIRD
87	PETREL, HAWAIIAN, DARK-RUMPED	BIRD
88	AKEPA, MAUI (HONEYCREEPER)	BIRD
89	NUKUPUU, MAUI + KAUAI (HONEYCREEPER)	BIRD
90	HONEYCREEPER, CRESTED (AKOHEKOHE)	BIRD
91	*THRUSH, MOLOKAI*	BIRD
92	GALLINULE, HAWAIIAN	BIRD
93	AKEPA, HAWAII (HONEYCREEPER)	BIRD
95	AKIAPOLAAU (HONEYCREEPER)	BIRD
96	CROW, HAWAIIAN (ALALA)	BIRD
97	STILT, HAWAIIAN (BLACK-WINGED)	BIRD
98	COOT, HAWAIIAN	BIRD
99	HAWK, HAWAIIAN (IO)	BIRD
100	DUCK, HAWAIIAN (KOLOA)	BIRD
101	CREEPER, OAHU (ALAUWAHIO) (HONEYCREEPER)	BIRD
149	MUSSEL, PEARLY, HIGGINS'S EYE	CLAM
150	MUSSEL, PEARLY, CURTIS'	CLAM
151	MUSSEL, PEARLY, PAT POCKETBOOK	CLAM
152	MUSSEL, PEARLY, WHITE CAT'S PAW	CLAM
153	MUSSEL, PEARLY, PINK MUCKET	CLAM
154	MUSSEL, PEARLY, TUBERCULED-BLOSSOM	CLAM
155	MUSSEL, PEARLY, BIRDWING	CLAM
156	MUSSEL, PEARLY, TURGID-BLOSSOM	CLAM
157	MUSSEL, PEARLY, PIGTOE, FINE-RAYED	CLAM
158	MUSSEL, PEARLY, PIGTOE, SHINY	CLAM
159	MUSSEL, PEARLY, LAMP, ALABAMA	CLAM
160	MUSSEL, PEARLY, WHITE WARTY-BACK	CLAM
161	PIMPLEBACK, ORANGE FOOTED	CLAM
162	MUSSEL, PEARLY, PIGTOE, ROUGH	CLAM
163	MUSSEL, PEARLY, PALE LILLIPUT	CLAM
164	MUSSEL, PEARLY, BEAN, CUMBERLAND	CLAM
165	MUSSEL, PEARLY, SAMPSON'S	CLAM
166	MUSSEL, PEARLY, DROMEDARY	CLAM
167	MUSSEL, PEARLY, GREEN-BLOSSOM	CLAM
168	MUSSEL, PEARLY, MONKEYFACE, CUMBERLAND	CLAM
169	MUSSEL, PEARLY, MONKEYFACE, APPALACHIAN	CLAM
170	MUSSEL, PEARLY, YELLOW-BLOSSOM	CLAM
171	BUTTERFLY, SWALLOWTAIL, BAHAMA	INSECT
172	BUTTERFLY, SWALLOWTAIL, SCHAUS	INSECT
173	DARTER, SNAIL	FISH
174	MADTOM, SCIOTO	FISH
175	CROCODILE, AMERICAN	REPTILE
176	MANATEE, WEST INDIAN (FLORIDA)	MAMMAL
177	RAT, KANGAROO, MORRO BAY	MAMMAL
178	WATERSNAKE, SALT MARSH, ATLANTIC	REPTILE
179	TREEFROG, PINE BARRENS	AMPHIBIAN
180	CAVEFISH, ALABAMA	FISH
181	CHUB, SLENDER	FISH
182	CHUB, SPOTFIN	FISH
183	DARTER, BAYOU	FISH
184	DARTER, SLACKWATER	FISH
185	MADTOM, YELLOWFIN	FISH
186	SALAMANDER, RED HILLS	AMPHIBIAN
187	LIZARD, NIGHT, ISLAND	REPTILE
188	TURTLE, SEA, RIDLEY, ATLANTIC	REPTILE
190	TURTLE, SEA, LEATHERBACK	REPTILE
191	SEAL, MONK, HAWAIIAN	MAMMAL
193	*WOLF, MEXICAN*	MAMMAL
194	OTTER, SEA, SOUTHERN	MAMMAL
195	CREEPER, HAWAII (HONEYCREEPER)	BIRD
196	PARROT, THICK-BILLED	BIRD
197	POO-ULI	BIRD
198	SHRIKE, LOGGERHEAD, SAN CLEMENTE	BIRD
199	SHEARWATER, MANX, NEWELL'S	BIRD
200	SPARROW, SAGE, SAN CLEMENTE	BIRD
201	RIFFLE SHELL, TAN (MUSSEL, PEARLY, BROWN-BLOSSO	CLAM
202	BUTTERFLY, BLUE, EL SEGUNDO	INSECT
203	BUTTERFLY, BLUE, LOTIS	INSECT
204	BUTTERFLY, BLUE, MISSION	INSECT
205	BUTTERFLY, BLUE, SMITH"S	INSECT
206	BUTTERFLY, ELFIN, SAN BRUNO	INSECT
207	BUTTERFLY, METALMARK, LANGE'S	INSECT
208	INDIAN PAINTBRUSH, SAN CLEMENTE ISLAND	PLANT
209	BROOM, SAN CLEMENTE	PLANT
210	LARKSPUR, SAN CLEMENTE ISLAND	PLANT
211	BUSHMALLOW, SAN CLEMENTE ISLAND	PLANT

APPENDIX A
TABLE OF ENDANGERED SPECIES BY COUNTY

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BUTLER 3 4 7 8 186
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CHAMBERS 3 4 8
CHEROKEE 3 4 8
CHILTON 3 4 8
CHOCTAW 4 7 8
CLARKE 4 7 8
CLAY 3 4 8
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COFFEE 3 4 7 8
COLBERT 3 4 8
CONECUH 3 4 7 8 186
COOSA 3 4 8
COVINGTON 3 4 7 8 186
CRENSHAW 3 4 7 8 186
CULLMAN 4 8
DALE 3 4 7 8
DALLAS 3 4 7 8
DE KALB 3 4 8
ELMORE 3 4 8
ESCAMBIA 3 4 7 8
ETOWAH 3 4 8
FAYETTE 4 8
FRANKLIN 3 4 8
GENEVA 3 4 7 8
GREENE 4 8
HALE 4 8
HENRY 3 4 7 8
HOUSTON 3 4 7 8
JACKSON 3 4 8 157 158 159
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JEFFERSON 4 8 17
LAMAR 4 8
LAUDERDALE 3 4 8 180 184
LAWRENCE 3 4 8
LEE 3 4 8
LIMESTONE 3 4 8 160 161 184
LOWNDES 3 4 7 8
MACON 3 4 8
MADISON 3 4 8 153 158 159
160 161 163 184
MARENGO 4 8
MARION 4 8
MARSHALL 3 4 8 153 157 158
159 160 161 163
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MONROE 3 4 7 8 186
MONTGOMERY 3 4 8
MORGAN 3 4 8 153 160 161
PERRY 3 4 8
PICKENS 4 8
PIKE 3 4 8
RANDOLPH 3 4 8
RUSSELL 3 4 8
ST CLAIR 3 4 8
SHELBY 4 8
SUMTER 4 8
TALLADEGA 3 4 8
TALLAPOOSA 3 4 8
TUSCALOOSA 4 8
WALKER 4 8
WASHINGTON 4 7 8
WILCOX 3 4 7 8
WINSTON 4 8

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ANCHORAGE
ANGOON
BARROW
BETHEL
BRISTOL BA
BRISTOL BA
CORDOVA-MC
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HAINES
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KETCHIKAN
KOBUK
KODIAK
KUSKOKWIM
MATANUSKA-
NOME
OUTER KETC
PRINCE OF
SEWARD
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GILA 26 40 41
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PULASKI 3 4 8
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ST FRANCIS 3 4 151
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SCOTT 3 4 8
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SEBASTIAN 3 4 8
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DELTA 26 38 40
DENVER 26
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DOUGLAS 26
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ELBERT 26
EL PASO 26
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GARFIELD 26 38 40
GILPIN 26
GRAND 26
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HINSDALE 26
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LAS ANIMAS 26
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SEDGWICK 26
SUMMIT 26
TELLER 26
WASHINGTON 26
WELD 26
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HARTFORD 1 2 4
LITCHFIELD 1 2 4
MIDDLESEX 1 2 4
NEW HAVEN 1 2 4
NEW LONDON 1 2 4
TOLLAND 1 2 4
WINDHAM 1 2 4

DE KENT 1 2 4 5
NEW CASTLE 1 2 4 5
SUSSEX 1 2 4

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BEN HILL 1 4 7 8
BERRIEN 1 7 8
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BLECKLEY 1 4 7 8
BRANTLEY 1 4 7 8

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	CALHOUN	3	4	7	8
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	CANDLER	1	4	7	8
	CARROLL	3	4	8	
	CATOOSA	2	3	4	
	CHARLTON	1	4	7	8
	CHATHAM	1	4	7	8 176
	CHATTAHOOC	3	4	7	8
	CHATTOOGA	3	4	8	
	CHEROKEE	3	4	8	
	CLARKE	4	8		
	CLAY	3	4	7	8
	CLAYTON	3	4	8	
	CLINCH	1	7	8	
	COBB	3	4	8	
	COFFEE	1	4	7	8
	COLQUITT	7	8		
	COLUMBIA	1	4	8	
	COOK	7	8		
	COWETA	3	4	8	
	CRAWFORD	3	4	7	8
	CRISP	3	4	7	8
	DADE	2	3	4	
	DAWSON	3	4	8	
	DECATUR	3	4	7	8
	DE KALB	3	4	8	
	DODGE	1	4	7	8
	DOOLY	3	4	7	8
	DOUGHERTY	3	4	7	8
	DOUGLAS	3	4	8	
	EARLY	3	4	7	8
	ECHOLS	7	8		
	EFFINGHAM	1	4	7	8
	ELBERT	4	8		
	EMANUEL	1	4	7	8
	EVANS	1	4	7	8
	FANNIN	2	3	4	
	FAYETTE	3	4	8	
	FLOYD	3	4	8	
	FORSYTH	3	4	8	
	FRANKLIN	4	8		
	FULTON	3	4	8	
	GILMER	3	4	8	
	GLASCOCK	1	4	8	
	GLYNN	1	4	7	8 176
	GORDON	3	4	8	
	GRADY	3	4	7	8
	GREENE	4	8		
	GWINNETT	3	4	8	
	HABERSHAM	3	4	8	
	HALL	3	4	8	
	HANCOCK	1	4	7	8
	HARALSON	3	4	8	
	HARRIS	3	4	7	8
	HART	4	8		
	HEARD	3	4	8	
	HENRY	4	8		
	HOUSTON	1	4	7	8
	IRWIN	1	7	8	
	JACKSON	4	8		
	JASPER	4	8		
	JEFF DAVIS	1	4	7	8
	JEFFERSON	1	4	7	8
	JENKINS	1	4	7	8
	JOHNSON	1	4	7	8
	JONES	1	4	7	8
	LAMAR	4	8		
	LANIER	7	8		
	LAURENS	1	4	7	8
	LEE	3	4	7	8
	LIBERTY	1	4	7	8 176
	LINCOLN	4	8		
	LONG	1	4	7	8
	LOWNDES	7	8		
	LUMPKIN	3	4	8	
	MC DUFFIE	1	4	8	
	MC INTOSH	1	4	7	8 176
	MACON	3	4	7	8
	MADISON	4	8		
GA	MARION	3	4	7	8
	MERIWETHER	3	4	8	
	MILLER	3	4	7	8
	MITCHELL	3	4	7	8
	MONROE	4	8		
	MONTGOMERY	1	4	7	8
	MORGAN	4	8		
	MURRAY	3	4	8	
	MUSCOGEE	3	4	7	8
	NEWTON	4	8		
	OCONEE	4	8		
	OGLETHORPE	4	8		
	PAULDING	3	4	8	
	PEACH	1	4	7	8
	PICKENS	3	4	8	
	PIERCE	1	4	7	8
	PIKE	3	4	8	
	POLK	3	4	8	
	PULASKI	1	4	7	8
	PUTNAM	4	7	8	
	QUITMAN	3	4	7	8
	RABUN	4	8		
	RANDOLPH	3	4	7	8
	RICHMOND	1	4	7	8
	ROCKDALE	4	8		
	SCHLEY	3	4	7	8
	SCREVEN	1	4	7	8
	SEMINOLE	3	4	7	8
	SPALDING	3	4	8	
	STEPHENS	4	8		
	STEWART	3	4	7	8
	SUMTER	3	4	7	8
	TALBOT	3	4	7	8
	TALIAFERRO	4	8		
	TATTNALL	1	4	7	8
	TAYLOR	3	4	7	8
	TELFAIR	1	4	7	8
	TERRELL	3	4	7	8
	THOMAS	3	4	7	8
	TIFT	7	8		
	TOOMBS	1	4	7	8
	TOWNS	2	3	4	
	TREUTLEN	1	4	7	8
	TROUP	3	4	8	
	TURNER	1	7	8	
	TWIGGS	1	4	7	8
	UNION	2	3	4	
	UPSON	3	4	8	
	WALKER	2	3	4	
	WALTON	4	8		
	WARE	1	4	7	8
	WARREN	1	4	8	
	WASHINGTON	1	4	7	8
	WAYNE	1	4	7	8
	WEBSTER	3	4	7	8
	WHEELER	1	4	7	8
	WHITE	3	4	8	
	WHITFIELD	3	4	8	
	WILCOX	1	4	7	8
	WILKES	4	8		
	WILKINSON	1	4	7	8
	WORTH	3	4	7	8
HI	HAWAII	74	75	76	86 87 89
		93	95	96	97 98 99
		100	191	195	
	HONOLULU	74	92	97	98 100 101
		191			
	KAUAI	74	75	78	79 84 85
		92	97	98	100 191 199
	MAUI	74	81	82	86 87 88
		89	90	91	92 97 98
		191	197		
ID	ADA	25			
	ADAMS	25			
	BANNOCK	24	25		
	BEAR LAKE				
	BENEWAH	24	25	26	
	BINGHAM	24	25		
	BLAINE	25			
	BOISE	25			
	BONNER	24	25	26	
	BONNEVILLE	24	25	26	
ID	BOUNDARY	24	25	26	
	BUTTE	25			
	CAMAS	25			
	CANYON	25			
	CARIBOU	24	25		
	CASSIA	25			
	CLARK	24	25		
	CLEARWATER	25			
	CUSTER	25			
	ELMORE	25			
	FRANKLIN				
	FREMONT	24	25	26	
	GEM	25			
	GOODING	25			
	IDAHO	25			
	JEFFERSON	24	25		
	JEROME	25			
	KOOTENAI	24	25	26	
	LATAH	25			
	LEMHI	25			
	LEWIS	25			
	LINCOLN	25			
	MADISON	24	25		
	MINIDOKA	25			
	NEZ PERCE	25			
	ONEIDA				
	OWYHEE	25			
	PAYETTE	25			
	POWER	25			
	SHOSHONE	24	25	26	
	TETON	24	25	26	
	TWIN FALLS	25			
	VALLEY	25			
	WASHINGTON	25			
IL	ADAMS	4	149		
	ALEXANDER	3	4		
	BOND	3	4		
	BOONE	4			
	BROWN	4			
	BUREAU	4			
	CALHOUN	4	149		
	CARROLL	4	149		
	CASS	4			
	CHAMPAIGN	3	4		
	CHRISTIAN	4			
	CLARK	3	4		
	CLAY	3	4		
	CLINTON	3	4		
	COLES	3	4		
	COOK	4	19		
	CRAWFORD	3	4	165	
	CUMBERLAND	3	4		
	DE KALB	4			
	DE WITT	4			
	DOUGLAS	3	4		
	DU PAGE	4			
	EDGAR	3	4		
	EDWARDS	3	4	165	
	EFFINGHAM	3	4		
	FAYETTE	3	4		
	FORD	4			
	FRANKLIN	3	4		
	FULTON	4			
	GALLATIN	2	3	4	154
	GREENE	4			
	GRUNDY	4			
	HAMILTON	3	4		
	HANCOCK	4	149		
	HARDIN	2	3	4	154
	HENDERSON	4	149		
	HENRY	4			
	IROQUOIS	4			
	JACKSON	3	4		
	JASPER	3	4		
	JEFFERSON	3	4		
	JERSEY	4	149		
	JO DAVIESS	4	149		
	JOHNSON	2	3	4	
	KANE	4			
	KANKAKEE	4			
	KENDALL	4			
	KNOX	4			
	LAKE	4	19		
IL	LA SALLE	4			
	LAWRENCE	3	4	165	
	LEE	4			
	LIVINGSTON	4			
	LOGAN	4			
	MC DONOUGH	4			
	MC HENRY	4			
	MC LEAN	4			
	MACON	4			
	MACOUPIN	4			
	MADISON	3	4		
	MARION	3	4		
	MARSHALL	4			
	MASON	4			
	MASSAC	2	3	4	154
	MENARD	4			
	MERCER	4	149		
	MONROE	3	4		
	MONTGOMERY	3	4		
	MORGAN	4			
	MOULTRIE	3	4		
	OGLE	4			
	PEORIA	4			
	PERRY	3	4		
	PIATT	4			
	PIKE	4	149		
	POPE	2	3	4	154
	PULASKI	2	3	4	154
	PUTNAM	4			
	RANDOLPH	3	4		
	RICHLAND	3	4		
	ROCK ISLAN	4	149		
	ST CLAIR	3	4		
	SALINE	2	3	4	
	SANGAMON	4			
	SCHUYLER	4			
	SCOTT	4			
	SHELBY	3	4		
	STARK	4			
	STEPHENSON	4			
	TAZEWELL	4			
	UNION	3	4		
	VERMILION	3	4		
	WABASH	3	4	165	
	WARREN	4			
	WASHINGTON	3	4		
	WAYNE	3	4		
	WHITE	3	4	165	
	WHITESIDE	4	149		
	WILL	4			
	WILLIAMSON	3	4		
	WINNEBAGO	4			
	WOODFORD	4			
IN	ADAMS	2	4		
	ALLEN	2	4	152	
	BARTHOLOME	2	3	4	
	BENTON	2	3	4	
	BLACKFORD	2	3	4	
	BOONE	2	3	4	
	BROWN	2	3	4	
	CARROLL	3	4		
	CASS	2	3	4	
	CLARK	2	3	4	
	CLAY	2	3	4	
	CLINTON	2	3	4	
	CRAWFORD	2	3	4	
	DAVIESS	2	3	4	
	DEARBORN	2	3	4	
	DECATUR	2	3	4	
	DE KALB	2	4	152	
	DELAWARE	2	3	4	
	DUBOIS	2	3	4	
	ELKHART	2	4		
	FAYETTE	2	4		
	FLOYD	2	3	4	
	FOUNTAIN	2	3	4	
	FRANKLIN	2	4		
	FULTON	2	3	4	
	GIBSON	2	3	4	165
	GRANT	2	3	4	
	GREENE	2	3	4	
	HAMILTON	2	3	4	
	HANCOCK	2	3	4	
IN	HARRISON	2	3	4	
	HENDRICKS	2	3	4	
	HENRY	2	3	4	
	HOWARD	2	3	4	
	HUNTINGTON	3	4		
	JACKSON	2	3	4	
	JASPER	2	4		
	JAY	2	3	4	
	JEFFERSON	2	3	4	
	JENNINGS	2	3	4	
	JOHNSON	2	3	4	
	KNOX	2	3	4	165
	KOSCIUSKO	2	3	4	
	LAGRANGE	2	4		
	LAKE	2	4	19	
	LA PORTE	2	4	19	
	LAWRENCE	2	3	4	
	MADISON	2	3	4	
	MARION	2	3	4	
	MARSHALL	2	4		
	MARTIN	2	3	4	
	MIAMI	2	3	4	
	MONROE	2	3	4	
	MONTGOMERY	3	4		
	MORGAN	2	3	4	
	NEWTON	2	4		
	NOBLE	2	4		
	OHIO	2	3	4	
	ORANGE	2	3	4	
	OWEN	2	3	4	
	PARKE	2	3	4	
	PERRY	2	3	4	
	PIKE	2	3	4	
	PORTER	2	4	19	
	POSEY	2	3	4	165
	PULASKI	2	3	4	
	PUTNAM	2	3	4	
	RANDOLPH	2	3	4	
	RIPLEY	2	3	4	
	RUSH	2	3	4	
	ST JOSEPH	2	4		
	SCOTT	2	3	4	
	SHELBY	2	3	4	
	SPENCER	2	3	4	
	STARKE	2	4		
	STEUBEN	2	4		
	SULLIVAN	2	3	4	165
	SWITZERLAN	2	3	4	
	TIPPECANOE	2	3	4	
	TIPTON	2	3	4	
	UNION	2	4		
	VANDERBURG	2	3	4	
	VERMILLION	2	3	4	
	VIGO	2	3	4	
	WABASH	2	3	4	
	WARREN	2	3	4	
	WARRICK	2	3	4	
	WASHINGTON	2	3	4	
	WAYNE	2	4		
	WELLS	2	3	4	
	WHITE	2	3	4	
	WHITLEY	3	4		
IA	ADAIR	4	26		
	ADAMS	4	26		
	ALLAMAKEE	4	149		
	APPANOOSE	3	4	26	
	AUDUBON	4	26		
	BENTON	4			
	BLACK HAWK	4			
	BOONE	4			
	BREMER	4			
	BUCHANAN	4			
	BUENA VIST	4			
	BUTLER	4			
	CALHOUN	4			
	CARROLL	4			
	CASS	4	26		
	CEDAR	4			
	CERRO GORD	4			
	CHEROKEE	4	26		
	CHICKASAW	4			
	CLARKE	4			
	CLAY	4	26		

APPENDIX A (CONT.)

IA	CLAYTON	4	149	
	CLINTON	4	149	
	CRAWFORD	4	26	
	DALLAS	4		
	DAVIS	4		
	DECATUR	3	4	26
	DELAWARE	4		
	DES MOINES	4	149	
	DICKINSON	4	26	
	DUBUQUE	4	149	
	EMMET	4		
	FAYETTE	4		
	FLOYD	4		
	FRANKLIN	4		
	FREMONT	4	26	
	GREENE	4		
	GRUNDY	4		
	GUTHRIE	4		
	HAMILTON	4		
	HANCOCK	4		
	HARDIN	4		
	HARRISON	4	26	
	HENRY	4		
	HOWARD	4		
	HUMBOLDT	4		
	IDA	4	26	
	IOWA	4		
	JACKSON	4	149	
	JASPER	4		
	JEFFERSON	4		
	JOHNSON	4		
	JONES	4		
	KEOKUK	4		
	KOSSUTH	4		
	LEE	4	149	
	LINN	4		
	LOUISA	4	149	
	LUCAS	4		
	LYON	26		
	MADISON	4		
	MAHASKA	4		
	MARION	4		
	MARSHALL	4		
	MILLS	4	26	
	MITCHELL	4		
	MONONA	4	26	
	MONROE	4		
	MONTGOMERY	4	26	
	MUSCATINE	4	149	
	O'BRIEN	4	26	
	OSCEOLA	4	26	
	PAGE	4	26	
	PALO ALTO	20		
	PLYMOUTH	4	26	
	POCAHONTAS	4		
	POLK	4		
	POTTAWATTA	4	26	
	POWESHIEK	4		
	RINGGOLD	3	4	26
	SAC	4		
	SCOTT	4	149	
	SHELBY	4	26	
	SIOUX	26		
	STORY	4		
	TAMA	4		
	TAYLOR	4	26	
	UNION	3	4	26
	VAN BUREN	4		
	WAPELLO	4		
	WARREN	4		
	WASHINGTON	4		
	WAYNE	3	4	26
	WEBSTER	4		
	WINNEBAGO	4		
	WINNESHIEK	4		
	WOODBURY	4	26	
	WORTH	4		
	WRIGHT	4		
KS	ALLEN	3	4	
	ANDERSON	3	4	26
	ATCHISON	4	26	
	BARBER	4	26	
	BARTON	4	26	
KS	BOURBON	3	4	26
	BROWN	4	26	
	BUTLER	4	26	
	CHASE	3	4	26
	CHAUTAUQUA	3	4	26
	CHEROKEE	3	4	
	CHEYENNE	4	26	
	CLARK	4	26	
	CLAY	4	26	
	CLOUD	4	26	
	COFFEY	3	4	
	COMANCHE	4	26	
	COWLEY	4	26	
	CRAWFORD	3	4	
	DECATUR	4	26	
	DICKINSON	4	26	
	DONIPHAN	4	26	
	DOUGLAS	4	26	
	EDWARDS	4	26	
	ELK	3	4	26
	ELLIS	4	26	
	ELLSWORTH	4	26	
	FINNEY	4	26	
	FORD	4	26	
	FRANKLIN	3	4	26
	GEARY	4	26	
	GOVE	4	26	
	GRAHAM	4	26	
	GRANT	4	26	
	GRAY	4	26	
	GREELEY	4	26	
	GREENWOOD	3	4	26
	HAMILTON	4	26	
	HARPER	4	26	
	HARVEY	4	26	
	HASKELL	4	26	
	HODGEMAN	4	26	
	JACKSON	4	26	
	JEFFERSON	4	26	
	JEWELL	4	26	
	JOHNSON	3	4	26
	KEARNY	4	26	
	KINGMAN	4	26	
	KIOWA	4	26	
	LABETTE	3	4	
	LANE	4	26	
	LEAVENWORT	4	26	
	LINCOLN	4	26	
	LINN	3	4	26
	LOGAN	4	26	
	LYON	3	4	26
	MC PHERSON	4	26	
	MARION	3	4	26
	MARSHALL	4	26	
	MEADE	4	26	
	MIAMI	3	4	26
	MITCHELL	4	26	
	MONTGOMERY	3	4	
	MORRIS	3	4	26
	MORTON	4	26	
	NEMAHA	4	26	
	NEOSHO	3	4	
	NESS	4	26	
	NORTON	4	26	
	OSAGE	3	4	26
	OSBORNE	4	26	
	OTTAWA	4	26	
	PAWNEE	4	26	
	PHILLIPS	4	26	
	POTTAWATOM	4	26	
	PRATT	4	26	
	RAWLINS	4	26	
	RENO	4	26	
	REPUBLIC	4	26	
	RICE	4	26	
	RILEY	4	26	
	ROOKS	4	26	
	RUSH	4	26	
	RUSSELL	4	26	
	SALINE	4	26	
	SCOTT	4	26	
	SEDGWICK	4	26	
	SEWARD	4	26	
	SHAWNEE	4	26	
KS	SHERIDAN	4	26	
	SHERMAN	4	26	
	SMITH	4	26	
	STAFFORD	4	26	
	STANTON	4	26	
	STEVENS	4	26	
	SUMNER	4	26	
	THOMAS	4	26	
	TREGO	4	26	
	WABAUNSEE	4	26	
	WALLACE	4	26	
	WASHINGTON	4	26	
	WICHITA	4	26	
	WILSON	3	4	
	WOODSON	3	4	
	WYANDOTTE	3	4	26
KY	ADAIR	2	3	4 153 162
	ALLEN	2	3	4
	ANDERSON	2	3	4
	BALLARD	2	3	4 154
	BARREN	2	3	4
	BATH	2	3	4
	BELL	2	3	4
	BOONE	2	3	4
	BOURBON	2	3	4
	BOYD	2	3	4
	BOYLE	2	3	4
	BRACKEN	2	3	4
	BREATHITT	2	3	4
	BRECKINRID	2	3	4
	BULLITT	2	3	4
	BUTLER	2	3	4 153 162
	CALDWELL	2	3	4
	CALLOWAY	3	4	8
	CAMPBELL	2	3	4
	CARLISLE	3	4	
	CARROLL	2	3	4
	CARTER	2	3	4
	CASEY	2	3	4 153 162
	CHRISTIAN	2	3	4
	CLARK	2	3	4
	CLAY	2	3	4
	CLINTON	2	3	4
	CRITTENDEN	2	3	4 153 154 162
	CUMBERLAND	2	3	4
	DAVIESS	2	3	4 153 162
	EDMONSON	2	3	4 153 162
	ELLIOTT	2	3	4
	ESTILL	2	3	4
	FAYETTE	2	3	4
	FLEMING	2	3	4
	FLOYD	2	3	4
	FRANKLIN	2	3	4
	FULTON	3	4	
	GALLATIN	2	3	4 165
	GARRARD	2	3	4
	GRANT	2	3	4
	GRAVES	3	4	
	GRAYSON	2	3	4
	GREEN	2	3	4 153 162
	GREENUP	2	3	4
	HANCOCK	2	3	4
	HARDIN	2	3	4
	HARLAN	2	3	4
	HARRISON	2	3	4
	HART	2	3	4 153 162
	HENDERSON	2	3	4 153 162
	HENRY	2	3	4
	HICKMAN	3	4	
	HOPKINS	2	3	4 153 162
	JACKSON	2	3	4
	JEFFERSON	2	3	4
	JESSAMINE	2	3	4
	JOHNSON	2	3	4
	KENTON	2	3	4
	KNOTT	2	3	4
	KNOX	2	3	4
	LARUE	2	3	4
	LAUREL	2	3	4 164
	LAWRENCE	2	3	4
	LEE	2	3	4
	LESLIE	2	3	4
	LETCHER	2	3	4
KY	LEWIS	2	3	4
	LINCOLN	2	3	4
	LIVINGSTON	2	3	4 154
	LOGAN	2	3	4 201
	LYON	2	3	4
	MC CRACKEN	2	3	4 154
	MC CREARY	2	3	4 164
	MC LEAN	2	3	4 153 162
	MADISON	2	3	4
	MAGOFFIN	2	3	4
	MARION	2	3	4
	MARSHALL	3	4	8
	MARTIN	2	3	4
	MASON	2	3	4
	MEADE	2	3	4
	MENIFEE	2	3	4
	MERCER	2	3	4
	METCALFE	2	3	4
	MONROE	2	3	4
	MONTGOMERY	2	3	4
	MORGAN	2	3	4
	MUHLENBERG	2	3	4 153 162
	NELSON	2	3	4
	NICHOLAS	2	3	4
	OHIO	2	3	4 153 162
	OLDHAM	2	3	4
	OWEN	2	3	4
	OWSLEY	2	3	4
	PENDLETON	2	3	4
	PERRY	2	3	4
	PIKE	2	3	4
	POWELL	2	3	4
	PULASKI	2	3	4 164
	ROBERTSON	2	3	4
	ROCKCASTLE	2	3	4
	ROWAN	2	3	4
	RUSSELL	2	3	4
	SCOTT	2	3	4
	SHELBY	2	3	4
	SIMPSON	2	3	4 201
	SPENCER	2	3	4
	TAYLOR	2	3	4 153 162
	TODD	2	3	4
	TRIGG	2	3	4
	TRIMBLE	2	3	4
	UNION	2	3	4 154
	WARREN	2	3	4 153 162
	WASHINGTON	2	3	4
	WAYNE	2	3	4
	WEBSTER	2	3	4 153 162
	WHITLEY	2	3	4 164
	WOLFE	2	3	4
	WOODFORD	2	3	4
LA	ACADIA	7	8	
	ALLEN	7	8	
	ASCENSION	7	8	
	ASSUMPTION	7	8	
	AVOYELLES	4	7	
	BEAUREGARD	7	8	
	BIENVILLE	7		
	BOSSIER	7		
	CADDO	7		
	CALCASIEU	7	8	
	CALDWELL	4	7	
	CAMERON	7	8	23 176
	CATAHOULA	4	7	
	CLAIBORNE	4	7	
	CONCORDIA	4	7	
	DE SOTO	7	8	
	EAST BATON	7	8	
	EAST CARRO	4	7	
	EAST FELIC	7	8	
	EVANGELINE	7	8	
	FRANKLIN	4	7	
	GRANT	4	7	
	IBERIA	7	8	176
	IBERVILLE	7	8	
	JACKSON	4	7	
	JEFFERSON	7	8	176
	JEFFERSON	7	8	
	LAFAYETTE	7	8	
	LAFOURCHE	7	8	176
	LA SALLE	4	7	
LA	LINCOLN	4	7	
	LIVINGSTON	7	8	
	MADISON	4	7	
	MOREHOUSE	4	7	
	NATCHITOCH	7		
	ORLEANS	7	8	176
	OUACHITA	4	7	
	PLAQUEMINE	7	8	176
	POINTE COU	7	8	
	RAPIDES	4	7	
	RED RIVER	7		
	RICHLAND	4	7	
	SABINE	7	8	
	ST BERNARD	7	8	176
	ST CHARLES	7	8	
	ST HELENA	7	8	
	ST JAMES	7	8	
	ST JOHN TH	7	8	
	ST LANDRY	7	8	
	ST MARTIN	7	8	
	ST MARY	7	8	176
	ST TAMMANY	7	8	176
	TANGIPAHOA	7	8	
	TENSAS	4	7	
	TERREBONNE	7	8	176
	UNION	4	7	
	VERMILION	7	8	23 176
	VERNON	7	8	
	WASHINGTON	4	7	8
	WEBSTER	7		
	WEST BATON	7	8	
	WEST CARRO	4	7	
	WEST FELIC	7	8	
	WINN	4	7	
ME	ANDROSCOGG	1	2	
	AROOSTOOK	1	2	
	CUMBERLAND	1	2	4
	FRANKLIN	1	2	
	HANCOCK	1	2	
	KENNEBEC	1	2	
	KNOX	1	2	
	LINCOLN	1	2	
	OXFORD	1	2	
	PENOBSCOT	1	2	
	PISCATAQUI	1	2	
	SAGADAHOC	1	2	
	SOMERSET	1	2	
	WALDO	1	2	
	WASHINGTON	1	2	
	YORK	1	2	4
MD	ALLEGANY	2	4	
	ANNE ARUND	1	2	4
	BALTIMORE	1	2	4
	BALTIMORE	1	2	4
	CALVERT	1	2	4
	CAROLINE	1	2	4 5
	CARROLL	1	2	4
	CECIL	1	2	4 5
	CHARLES	1	2	4
	DORCHESTER	1	2	4 5
	FREDERICK	1	2	4
	GARRETT	2	4	
	HARFORD	1	2	4 6
	HOWARD	1	2	4
	KENT	1	2	4 5
	MONTGOMERY	1	2	4
	PRINCE GEO	1	2	4
	QUEEN ANNE	1	2	4 5
	ST MARYS	1	2	4
	SOMERSET	1	2	4 5
	TALBOT	1	2	4 5
	WASHINGTON	2	4	
	WICOMICO	1	2	4 5
	WORCESTER	1	2	4 5
MA	BARNSTABLE	1	2	4
	BERKSHIRE	1	2	4
	BRISTOL	1	2	4
	DUKES	1	2	4
	ESSEX	1	2	4
	FRANKLIN	1	2	4
	HAMPDEN	1	2	4

APPENDIX A (CONT.)

MA	HAMPSHIRE	1	2	4	
	MIDDLESEX	1	2	4	
	NANTUCKET	1	2	4	
	NORFOLK	1	2	4	
	PLYMOUTH	1	2	4	
	SUFFOLK	1	2	4	
	WORCESTER	1	2	4	
MI	ALCONA	2	19	21	
	ALGER	20			
	ALLEGAN	2	4	19	
	ALPENA	2	19	21	
	ANTRIM	2	4	19	
	ARENAC	2	19		
	BARAGA	20			
	BARRY	2	4		
	BAY	2	19		
	BENZIE	2	4	19	
	BERRIEN	2	4	19	
	BRANCH	2	4		
	CALHOUN	2	4		
	CASS	2	4		
	CHARLEVOIX	2	4	19	
	CHEBOYGAN	2	19	21	
	CHIPPEWA	2	19		
	CLARE	2			
	CLINTON	2	4		
	CRAWFORD	2	21		
	DELTA	19	20		
	DICKINSON	20			
	EATON	2	4		
	EMMET	2	4	19	
	GENESEE	2			
	GLADWIN	2			
	GOGEBIC	20			
	GRAND TRAV	2	4	19	
	GRATIOT	2			
	HILLSDALE	2	4	152	
	HOUGHTON	20			
	HURON	2	19		
	INGHAM	2	4		
	IONIA	2	4		
	IOSCO	2	19	21	
	IRON	20			
	ISABELLA	2			
	JACKSON	2	4		
	KALAMAZOO	2	4		
	KALKASKA	2	4	21	
	KENT	2	4		
	KEWEENAW	20			
	LAKE	2	4		
	LAPEER	2			
	LEELANAU	2	4	19	
	LENAWEE	2	4		
	LIVINGSTON	2	4		
	LUCE	2			
	MACKINAC	2	4	19	
	MACOMB	2	4	19	152
	MANISTEE	2	4	19	
	MARQUETTE	20			
	MASON	2	4	19	
	MECOSTA	2	4		
	MENOMINEE	19	20		
	MIDLAND	2			
	MISSAUKEE	2	4	21	
	MONROE	2	4		
	MONTCALM	2	4		
	MONTMORENC	2	21		
	MUSKEGON	2	4	19	
	NEWAYGO	2	4		
	OAKLAND	2	4		
	OCEANA	2	4	19	
	OGEMAW	2	21		
	ONTONAGON	20			
	OSCEOLA	2	4		
	OSCODA	2	21		
	OTSEGO	2	21		
	OTTAWA	2	4	19	
	PRESQUE IS	2	19	21	
	ROSCOMMON	2	4	21	
	SAGINAW	2			
	ST CLAIR	2	4	19	
	ST JOSEPH	2	4		
	SANILAC	2	4	19	
MI	SCHOOLCRAF	2	4	19	
	SHIAWASSEE	2	4		
	TUSCOLA	2	19		
	VAN BUREN	2	4	19	
	WASHTENAW	2	4		
	WAYNE	2	4	19	152
	WEXFORD	2	4		
MN	AITKIN	20			
	ANOKA	20			
	BECKER	20			
	BELTRAMI	20			
	BENTON	20			
	BIG STONE	20			
	BLUE EARTH	20			
	BROWN	20			
	CARLTON	20			
	CARVER	20			
	CASS	20			
	CHIPPEWA	20			
	CHISAGO	20	149		
	CLAY	20			
	CLEARWATER	20			
	COOK	20			
	COTTONWOOD	20			
	CROW WING	20			
	DAKOTA	20	149		
	DODGE	20			
	DOUGLAS	20			
	FARIBAULT	20			
	FILLMORE	20			
	FREEBORN	4			
	GOODHUE	20	149		
	GRANT	20			
	HENNEPIN	20			
	HOUSTON	20	149		
	HUBBARD	20			
	ISANTI	20			
	ITASCA	20			
	JACKSON	20			
	KANABEC	20			
	KANDIYOHI	20			
	KITTSON	20			
	KOOCHICHIN	20			
	LAC QUI PA	20			
	LAKE	20			
	LAKE OF TH	20			
	LE SUEUR	20			
	LINCOLN	20			
	LYON	20			
	MC LEOD	20			
	MAHNOMEN	20			
	MARSHALL	20			
	MARTIN	20			
	MEEKER	20			
	MILLE LACS	20			
	MORRISON	20			
	MOWER	4			
	MURRAY	20			
	NICOLLET	20			
	NOBLES	26			
	NORMAN	20			
	OLMSTED	20			
	OTTER TAIL	20			
	PENNINGTON	20			
	PINE	20			
	PIPESTONE	26			
	POLK	20			
	POPE	20			
	RAMSEY	20			
	RED LAKE	20			
	REDWOOD	20			
	RENVILLE	20			
	RICE	20			
	ROCK	26			
	ROSEAU	20			
	ST LOUIS	20			
	SCOTT	20			
	SHERBURNE	20			
	SIBLEY	20			
	STEARNS	20			
	STEELE	20			
	STEVENS	20			
	SWIFT	20			
MN	TODD	20			
	TRAVERSE	20			
	WABASHA	20	149		
	WADENA	20			
	WASECA	20			
	WASHINGTON	20	149		
	WATONWAN	20			
	WILKIN	20			
	WINONA	20	149		
	WRIGHT	20			
	YELLOW MED	20			
MS	ADAMS	4	7		
	ALCORN	3	4		
	AMITE	7	8		
	ATTALA	4	7		
	BENTON	4			
	BOLIVAR	4			
	CALHOUN	4			
	CARROLL	4			
	CHICKASAW	4	8		
	CHOCTAW	4			
	CLAIBORNE	4	7	183	
	CLARKE	4	7	8	
	CLAY	4	7	8	
	COAHOMA	4	7		
	COPIAH	4	7	8	183
	COVINGTON	4	7	8	
	DE SOTO	4			
	FORREST	4	7	8	
	FRANKLIN	4	7		
	GEORGE	4	7	8	
	GREENE	4	7	8	
	GRENADA	4			
	HANCOCK	4	7	8	176
	HARRISON	4	7	8	176
	HINDS	4	7	8	
	HOLMES	4	7		
	HUMPHREYS	4	7		
	ISSAQUENA	4	7		
	ITAWAMBA	4	8		
	JACKSON	4	7	8	18 176
	JASPER	4	7	8	
	JEFFERSON	4	7		
	JEFFERSON	4	7	8	
	JONES	4	7	8	
	KEMPER	4	7	8	
	LAFAYETTE	4	7		
	LAMAR	4	7	8	
	LAUDERDALE	4	7	8	
	LAWRENCE	4	7	8	
	LEAKE	4	7	8	
	LEE	4	8		
	LEFLORE	4	7		
	LINCOLN	4	7	8	
	LOWNDES	4	7	8	
	MADISON	4	7		
	MARION	4	7	8	
	MARSHALL	4			
	MONROE	4	7	8	
	MONTGOMERY	4			
	NESHOBA	4	7	8	
	NEWTON	4	7	8	
	NOXUBEE	4	7	8	
	OKTIBBEHA	4	8		
	PANOLA	4	7		
	PEARL RIVE	4	7	8	
	PERRY	4	7	8	
	PIKE	4	7	8	
	PONTOTOC	4			
	PRENTISS	4	8		
	QUITMAN	4	7		
	RANKIN	4	7	8	
	SCOTT	4	7	8	
	SHARKEY	4	7		
	SIMPSON	4	7	8	
	SMITH	4	7	8	
	STONE	4	7	8	
	SUNFLOWER	4			
	TALLAHATCH	4	7		
	TATE	4			
	TIPPAH	3	4		
	TISHOMINGO	3	4	8	
	TUNICA	4			
MS	UNION	4			
	WALTHALL	4	7	8	
	WARREN	4	7		
	WASHINGTON	4	7		
	WAYNE	4	7	8	
	WEBSTER	4			
	WILKINSON	4	7		
	WINSTON	4	8		
	YALOBUSHA	4			
	YAZOO	4	7		
MO	ADAIR	3	4	26	
	ANDREW	4	26		
	ATCHISON	4	26		
	AUDRAIN	4			
	BARRY	3	4		
	BARTON	3	4		
	BATES	3	4	26	
	BENTON	3	4	26	
	BOLLINGER	3	4		
	BOONE	3	4	26	
	BUCHANAN	4	26		
	BUTLER	3	4	150	151
	CALDWELL	3	4	26	
	CALLAWAY	3	4	26	
	CAMDEN	3	4	26	
	CAPE GIRAR	3	4		
	CARROLL	3	4	26	
	CARTER	3	4		
	CASS	3	4	26	
	CEDAR	3	4	26	
	CHARITON	3	4	26	
	CHRISTIAN	3	4		
	CLARK	4	149		
	CLAY	3	4	26	
	CLINTON	3	4	26	
	COLE	3	4	26	
	COOPER	3	4	26	
	CRAWFORD	3	4	149	
	DADE	3	4	26	
	DALLAS	3	4	26	
	DAVIESS	3	4	26	
	DE KALB	3	4	26	
	DENT	3	4		
	DOUGLAS	3	4		
	DUNKLIN	3	4	151	
	FRANKLIN	3	4	149	
	GASCONADE	3	4	26	149
	GENTRY	3	4	26	
	GREENE	3	4	26	
	GRUNDY	3	4	26	
	HARRISON	3	4	26	
	HENRY	3	4	26	
	HICKORY	3	4	26	
	HOLT	4	26		
	HOWARD	3	4	26	
	HOWELL	3	4		
	IRON	3	4		
	JACKSON	3	4	26	
	JASPER	3	4		
	JEFFERSON	3	4	149	
	JOHNSON	3	4	26	
	KNOX	4			
	LACLEDE	3	4	26	
	LAFAYETTE	3	4	26	
	LAWRENCE	3	4		
	LEWIS	4	149		
	LINCOLN	4	149		
	LINN	3	4	26	
	LIVINGSTON	3	4	26	
	MC DONALD	3	4		
	MACON	3	4	26	
	MADISON	3	4		
	MARIES	3	4	26	
	MARION	4	149		
	MERCER	3	4	26	
	MILLER	3	4	26	
	MISSISSIPP	3	4		
	MONITEAU	3	4	26	
	MONROE	4			
	MONTGOMERY	3	4		
	MORGAN	3	4	26	
	NEW MADRID	3	4		
	NEWTON	3	4		
MO	NODAWAY	4	26		
	OREGON	3	4		
	OSAGE	3	4	26	
	OZARK	3	4		
	PEMISCOT	3	4		
	PERRY	3	4		
	PETTIS	3	4	26	
	PHELPS	3	4	26	149
	PIKE	4	149		
	PLATTE	3	4	26	
	POLK	3	4	26	
	PULASKI	3	4	26	
	PUTNAM	3	4	26	
	RALLS	4	149		
	RANDOLPH	3	4	26	
	RAY	3	4	26	
	REYNOLDS	3	4	150	
	RIPLEY	3	4		
	ST CHARLES	3	4	149	
	ST CLAIR	3	4	26	
	ST FRANCOI	3	4		
	ST LOUIS	3	4	149	
	ST LOUIS C	3	4		
	STE GENEVI	3	4		
	SALINE	3	4	26	
	SCHUYLER	4			
	SCOTLAND	4			
	SCOTT	3	4		
	SHANNON	3	4		
	SHELBY	4			
	STODDARD	3	4	151	
	STONE	3	4		
	SULLIVAN	3	4	26	
	TANEY	3	4		
	TEXAS	3	4	26	
	VERNON	3	4	26	
	WARREN	3	4		
	WASHINGTON	3	4	149	
	WAYNE	3	4	150	
	WEBSTER	3	4	26	
	WORTH	3	4	26	
	WRIGHT	3	4	26	
MT	BEAVERHEAD	24	25	26	
	BIG HORN	24	25	26	
	BLAINE	24	25	26	
	BROADWATER	24	25	26	
	CARBON	24	25	26	
	CARTER	24			
	CASCADE	24	25	26	
	CHOUTEAU	24	25	26	
	CUSTER	24	25	26	
	DANIELS	24	25	26	
	DAWSON	24	25	26	
	DEER LODGE	24	25	26	
	FALLON	24	25	26	
	FERGUS	24	25	26	
	FLATHEAD	24	25	26	
	GALLATIN	24	25	26	
	GARFIELD	24	25	26	
	GLACIER	24	25	26	
	GOLDEN VAL	24	25	26	
	GRANITE	24	25	26	
	HILL	24	25	26	
	JEFFERSON	24	25	26	
	JUDITH BAS	24	25	26	
	LAKE	24	25	26	
	LEWIS AND	24	25	26	
	LIBERTY	24	25	26	
	LINCOLN	24	25	26	
	MC CONE	24	25	26	
	MADISON	24	25	26	
	MEAGHER	24	25	26	
	MINERAL	24	25	26	
	MISSOULA	24	25	26	
	MUSSELSHEL	24	25	26	
	PARK	24	25	26	
	PETROLEUM	24	25	26	
	PHILLIPS	24	25	26	
	PONDERA	24	25	26	
	POWDER RIV	24	25	26	
	POWELL	24	25	26	
	PRAIRIE	24	25	26	
	RAVALLI	24	25	26	

APPENDIX A (CONT.)

MT	RICHLAND	24	25	26
	ROOSEVELT	24	25	26
	ROSEBUD	24	25	26
	SANDERS	24	25	26
	SHERIDAN	24	25	26
	SILVER BOW	24	25	26
	STILLWATER	24	25	26
	SWEET GRAS	24	25	26
	TETON	24	25	26
	TOOLE	24	25	26
	TREASURE	24	25	26
	VALLEY	24	25	26
	WHEATLAND	24	25	26
	WIBAUX	24	25	26
	YELLOWSTON	24	25	26
	YELLOWSTON	24	25	26
NE	ADAMS	4	26	
	ANTELOPE	26		
	ARTHUR	26		
	BANNER	26		
	BLAINE	26		
	BOONE	26		
	BOX BUTTE	26		
	BOYD	26		
	BROWN	26		
	BUFFALO	26		
	BURT	26		
	BUTLER	4	26	
	CASS	4	26	
	CEDAR	26		
	CHASE	4	26	
	CHERRY	26		
	CHEYENNE	26		
	CLAY	4	26	
	COLFAX	26		
	CUMING	26		
	CUSTER	26		
	DAKOTA	4	26	
	DAWES	26		
	DAWSON	26		
	DEUEL	26		
	DIXON	26		
	DODGE	26		
	DOUGLAS	4	26	
	DUNDY	4	26	
	FILLMORE	4	26	
	FRANKLIN	4	26	
	FRONTIER	4	26	
	FURNAS	4	26	
	GAGE	4	26	
	GARDEN	26		
	GARFIELD	26		
	GOSPER	4	26	
	GRANT	26		
	GREELEY	26		
	HALL	26		
	HAMILTON	4	26	
	HARLAN	4	26	
	HAYES	4	26	
	HITCHCOCK	4	26	
	HOLT	26		
	HOOKER	26		
	HOWARD	26		
	JEFFERSON	4	26	
	JOHNSON	4	26	
	KEARNEY	26		
	KEITH	26		
	KEYA PAHA	26		
	KIMBALL	26		
	KNOX	26		
	LANCASTER	26		
	LINCOLN	26		
	LOGAN	26		
	LOUP	26		
	MC PHERSON	26		
	MADISON	26		
	MERRICK	26		
	MORRILL	26		
	NANCE	26		
	NEMAHA	4	26	
	NUCKOLLS	4	26	
	OTOE	4	26	
	PAWNEE	4	26	

NE	PERKINS	4	26	
	PHELPS	26		
	PIERCE	26		
	PLATTE	26		
	POLK	4	26	
	RED WILLOW	4	26	
	RICHARDSON	4	26	
	ROCK	26		
	SALINE	4	26	
	SARPY	4	26	
	SAUNDERS	26		
	SCOTTS BLU	26		
	SEWARD	4	26	
	SHERIDAN	26		
	SHERMAN	26		
	SIOUX	26		
	STANTON	26		
	THAYER	4	26	
	THOMAS	26		
	THURSTON	4	26	
	VALLEY	26		
	WASHINGTON	4	26	
	WAYNE	26		
	WEBSTER	4	26	
	WHEELER	26		
	YORK	4	26	
NV	CARSON CIT	54		
	CHURCHILL	54		
	CLARK	38	43	44
	DOUGLAS	54		
	ELKO			
	ESMERALDA			
	EUREKA			
	HUMBOLDT			
	LANDER			
	LINCOLN	42	44	
	LYON	54		
	MINERAL	54		
	NYE	51	52	53
	PERSHING			
	STOREY	54		
	WASHOE	54	55	
	WHITE PINE			
NH	BELKNAP	1	2	4
	CARROLL	1	2	4
	CHESHIRE	1	2	4
	COOS	1	2	4
	GRAFTON	1	2	4
	HILLSBOROU	1	2	4
	MERRIMACK	1	2	4
	ROCKINGHAM	1	2	4
	STRAFFORD	1	2	4
	SULLIVAN	1	2	4
NJ	ATLANTIC	1	2	4
	BERGEN	1	4	
	BURLINGTON	1	2	4
	CAMDEN	1	2	4
	CAPE MAY	1	2	4
	CUMBERLAND	1	2	4
	ESSEX	1	4	
	GLOUCESTER	1	2	4
	HUDSON	1	4	
	HUNTERDON	1	2	4
	MERCER	1	2	4
	MIDDLESEX	1	4	
	MONMOUTH	1	4	
	MORRIS	1	4	
	OCEAN	1	2	4
	PASSAIC	1	4	
	SALEM	1	2	4
	SOMERSET	1	4	
	SUSSEX	1	2	4
	UNION	1	4	
	WARREN	1	2	4
NM	BERNALILLO	26		
	CATRON	26	34	48 196
	CHAVES	26		
	COLFAX	26		
	CURRY	26		
	DE BACA	26		

NM	DONA ANA	26	34				
	EDDY	26					
	GRANT	26	34	48	48	193	196
	GUADALUPE	26					
	HARDING	26					
	HIDALGO	26	34	193	196		
	LEA	26					
	LINCOLN	26					
	LOS ALAMOS	26					
	LUNA	26	34				
	MC KINLEY	26					
	MORA	26					
	OTERO	26	34				
	QUAY	26					
	RIO ARRIBA	26					
	ROOSEVELT	26					
	SANDOVAL	26					
	SAN JUAN	26	48				
	SAN MIGUEL	26					
	SANTA FE	26					
	SIERRA	26	34				
	SOCORRO	26	34				
	TAOS	26					
	TORRANCE	26					
	UNION	26					
	VALENCIA	26	34				
NY	ALBANY	2	4				
	ALLEGANY	2					
	BRONX	1	4				
	BROOME	2	4				
	CATTARAUGU	2	4				
	CAYUGA	2	22				
	CHAUTAUQUA	2	4	19	22		
	CHEMUNG	2	4				
	CHENANGO	2	4				
	CLINTON	2	4				
	COLUMBIA	1	2	4			
	CORTLAND	2	4				
	DELAWARE	2	4				
	DUTCHESS	1	2	4			
	ERIE	2	4	19	22		
	ESSEX	2	4				
	FRANKLIN	2					
	FULTON	2	4				
	GENESEE	2					
	GREENE	2	4				
	HAMILTON	2	4				
	HERKIMER	2	4				
	JEFFERSON	2	22				
	KINGS	1	4				
	LEWIS	2					
	LIVINGSTON	2					
	MADISON	2					
	MONROE	2	22				
	MONTGOMERY	2	4				
	NASSAU	1	4				
	NEW YORK	1	4				
	NIAGARA	2	4	19	22		
	ONEIDA	2	4				
	ONONDAGA	2					
	ONTARIO	2					
	ORANGE	1	2	4			
	ORLEANS	2	22				
	OSWEGO	2	22				
	OTSEGO	2	4				
	PUTNAM	1	2	4			
	QUEENS	1	4				
	RENSSELAER	2	4				
	RICHMOND	1	4				
	ROCKLAND	1	4				
	ST LAWRENC	2					
	SARATOGA	2	4				
	SCHENECTAD	2	4				
	SCHOHARIE	2	4				
	SCHUYLER	2					
	SENECA	2					
	STEUBEN	2	4				
	SUFFOLK	1	4				
	SULLIVAN	1	2	4			
	TIOGA	2	4				
	TOMPKINS	2					
	ULSTER	1	2	4			
	WARREN	2	4				

NY	WASHINGTON	2	4				
	WAYNE	2	22				
	WESTCHESTE	1	4				
	WYOMING	2					
	YATES	2					
NC	ALAMANCE	2	4				
	ALEXANDER	2	4				
	ALLEGHANY	2	4				
	ANSON	1	2	4			
	ASHE	2	4				
	AVERY	2	3	4			
	BEAUFORT	1	2	4	7	176	
	BERTIE	1	2	4	176		
	BLADEN	1	2	4	7		
	BRUNSWICK	1	2	4	7	176	
	BUNCOMBE	2	3	4			
	BURKE	2	4				
	CABARRUS	2	4				
	CALDWELL	2	4				
	CAMDEN	1	2	4	176		
	CARTERET	1	2	4	7	176	
	CASWELL	2	4				
	CATAWBA	2	4				
	CHATHAM	1	2	4			
	CHEROKEE	2	3	4			
	CHOWAN	1	2	4	176		
	CLAY	2	3	4			
	CLEVELAND	2	4				
	COLUMBUS	1	2	4	7		
	CRAVEN	1	2	4	7		
	CUMBERLAND	1	2	4	7		
	CURRITUCK	1	2	4	176		
	DARE	1	2	4	7	176	
	DAVIDSON	2	4				
	DAVIE	2	4				
	DUPLIN	1	2	4	7		
	DURHAM	1	2	4			
	EDGECOMBE	1	2	4			
	FORSYTH	2	4				
	FRANKLIN	1	2	4			
	GASTON	2	4				
	GATES	1	2	4			
	GRAHAM	2	3	4			
	GRANVILLE	1	2	4			
	GREENE	1	2	4			
	GUILFORD	2	4				
	HALIFAX	1	2	4			
	HARNETT	1	2	4			
	HAYWOOD	2	3	4			
	HENDERSON	2	3	4			
	HERTFORD	1	2	4			
	HOKE	1	2	4			
	HYDE	1	2	4	7	176	
	IREDELL	2	4				
	JACKSON	2	3	4			
	JOHNSTON	1	2	4			
	JONES	1	2	4	7		
	LEE	1	2	4			
	LENOIR	1	2	4			
	LINCOLN	2	4				
	MC DOWELL	2	4				
	MACON	2	3	4	182		
	MADISON	2	3	4			
	MARTIN	1	2	4			
	MECKLENBUR	2	4				
	MITCHELL	2	3	4			
	MONTGOMERY	1	2	4			
	MOORE	1	2	4			
	NASH	1	2	4			
	NEW HANOVE	1	2	4	7	176	
	NORTHAMPTO	1	2	4			
	ONSLOW	1	2	4	7	176	
	ORANGE	1	2	4			
	PAMLICO	1	2	4	7	176	
	PASQUOTANK	1	2	4	176		
	PENDER	1	2	4	7	176	
	PERQUIMANS	1	2	4	176		
	PERSON	2	4				
	PITT	1	2	4	7		
	POLK	2	4				
	RANDOLPH	2	4				
	RICHMOND	1	2	4			
	ROBESON	1	2	4	7		

NC	ROCKINGHAM	2	4			
	ROWAN	2	4			
	RUTHERFORD	2	4			
	SAMPSON	1	2	4	7	
	SCOTLAND	1	2	4	7	
	STANLY	1	2	4		
	STOKES	2	4			
	SURRY	2	4			
	SWAIN	2	3	4	182	
	TRANSYLVAN	2	3	4		
	TYRRELL	1	2	4	7	176
	UNION	1	2	4		
	VANCE	1	2	4		
	WAKE	1	2	4		
	WARREN	1	2	4		
	WASHINGTON	1	2	4	7	176
	WATAUGA	2	4			
	WAYNE	1	2	4		
	WILKES	2	4			
	WILSON	1	2	4		
	YADKIN	2	4			
	YANCEY	2	3	4		
ND	ADAMS	26				
	BARNES	20				
	BENSON	20				
	BILLINGS	26				
	BOTTINEAU	20				
	BOWMAN	26				
	BURKE	20				
	BURLEIGH	26				
	CASS	20				
	CAVALIER	20				
	DICKEY	26				
	DIVIDE	20				
	DUNN	26				
	EDDY	26				
	EMMONS	26				
	FOSTER	26				
	GOLDEN VAL	26				
	GRAND FORK	20				
	GRANT	26				
	GRIGGS	20				
	HETTINGER	26				
	KIDDER	26				
	LA MOURE	26				
	LOGAN	26				
	MC HENRY	20				
	MC INTOSH	26				
	MC KENZIE	26				
	MC LEAN	26				
	MERCER	26				
	MORTON	26				
	MOUNTRAIL	26				
	NELSON	20				
	OLIVER	26				
	PEMBINA	20				
	PIERCE	20				
	RAMSEY	20				
	RANSOM	20				
	RENVILLE	20				
	RICHLAND	20				
	ROLETTE	20				
	SARGENT	20				
	SHERIDAN	26				
	SIOUX	26				
	SLOPE	26				
	STARK	26				
	STEELE	20				
	STUTSMAN	26				
	TOWNER	20				
	TRAILL	20				
	WALSH	20				
	WARD	20				
	WELLS	26				
	WILLIAMS	26				
OH	ADAMS	2	3	4		
	ALLEN	2	4			
	ASHLAND	2	4			
	ASHTABULA	2	4	22		
	ATHENS	2	3	4		
	AUGLAIZE	2	4			
	BELMONT	2	3	4		

APPENDIX A (CONT.)

OH	BROWN	2	3	4
	BUTLER	2	4	
	CARROLL	2	4	
	CHAMPAIGN	2	4	
	CLARK	2	4	
	CLERMONT	2	3	4
	CLINTON	2	3	4
	COLUMBIANA	2	3	4
	COSHOCTON	2	4	
	CRAWFORD	2	4	
	CUYAHOGA	2	4	22
	DARKE	2	4	
	DEFIANCE	2	4	152
	DELAWARE	2	4	
	ERIE	2	4	22
	FAIRFIELD	2	3	4
	FAYETTE	2	4	
	FRANKLIN	2	4	
	FULTON	2	4	
	GALLIA	2	3	4
	GEAUGA	2	4	
	GREENE	2	4	
	GUERNSEY	2	4	
	HAMILTON	2	3	4
	HANCOCK	2	4	
	HARDIN	2	4	
	HARRISON	2	4	
	HENRY	2	4	
	HIGHLAND	2	4	
	HOCKING	2	3	4
	HOLMES	2	4	
	HURON	2	4	
	JACKSON	2	3	4
	JEFFERSON	2	3	4
	KNOX	2	4	
	LAKE	2	4	22
	LAWRENCE	2	3	4
	LICKING	2	4	153
	LOGAN	2	4	
	LORAIN	2	4	22
	LUCAS	2	4	
	MADISON	2	4	
	MAHONING	2	3	4
	MARION	2	4	
	MEDINA	2	4	
	MEIGS	2	3	4
	MERCER	2	4	
	MIAMI	2	4	
	MONROE	2	3	4
	MONTGOMERY	2	4	
	MORGAN	2	4	153
	MORROW	2	4	
	MUSKINGUM	2	4	153
	NOBLE	2	3	4
	OTTAWA	2	4	22
	PAULDING	2	4	
	PERRY	2	4	
	PICKAWAY	2	4	174
	PIKE	2	4	
	PORTAGE	2	4	
	PREBLE	2	4	
	PUTNAM	2	4	
	RICHLAND	2	4	
	ROSS	2	4	
	SANDUSKY	2	4	22
	SCIOTO	2	4	
	SENECA	2	4	
	SHELBY	2	4	
	STARK	2	4	
	SUMMIT	2	4	
	TRUMBULL	2	3	4
	TUSCARAWAS	2	4	
	UNION	2	4	
	VAN WERT	2	4	
	VINTON	2	3	4
	WARREN	2	3	4
	WASHINGTON	2	4	153
	WAYNE	2	4	
	WILLIAMS	2	4	152
	WOOD	2	4	
	WYANDOT	2	4	
OK	ADAIR	3	4	
	ALFALFA	4	26	
	ATOKA	26		
	BEAVER	26		
	BECKHAM	26		
	BLAINE	26		
	BRYAN	26		
	CADDO	26		
	CANADIAN	26		
	CARTER	26		
	CHEROKEE	3	4	
	CHOCTAW			
	CIMARRON	26		
	CLEVELAND	26		
	COAL	26		
	COMANCHE	26		
	COTTON	26		
	CRAIG	3	4	
	CREEK	3	4	26
	CUSTER	26		
	DELAWARE	3	4	
	DEWEY	26		
	ELLIS	26		
	GARFIELD	4	26	
	GARVIN	26		
	GRADY	26		
	GRANT	4	26	
	GREER	26		
	HARMON	26		
	HARPER	4	26	
	HASKELL	3	4	
	HUGHES	26		
	JACKSON	26		
	JEFFERSON	26		
	JOHNSTON	26		
	KAY	4	26	
	KINGFISHER	4	26	
	KIOWA	26		
	LATIMER	3	4	
	LE FLORE	3	4	
	LINCOLN	26		
	LOGAN	4	26	
	LOVE	26		
	MC CLAIN	26		
	MC CURTAIN	7		
	MC INTOSH	26		
	MAJOR	4	26	
	MARSHALL	26		
	MAYES	3	4	
	MURRAY	26		
	MUSKOGEE	3	4	
	NOBLE	4	26	
	NOWATA	3	4	
	OKFUSKEE	26		
	OKLAHOMA	26		
	OKMULGEE	26		
	OSAGE	3	4	26
	OTTAWA	3	4	
	PAWNEE	4	26	
	PAYNE	4	26	
	PITTSBURG	26		
	PONTOTOC	26		
	POTTAWATOM	26		
	PUSHMATAHA			
	ROGER MILL	26		
	ROGERS	3	4	
	SEMINOLE	26		
	SEQUOYAH	3	4	
	STEPHENS	26		
	TEXAS	26		
	TILLMAN	26		
	TULSA	3	4	
	WAGONER	3	4	
	WASHINGTON	3	4	
	WASHITA	26		
	WOODS	4	26	
	WOODWARD	26		
OR	BAKER	25		
	BENTON	56	57	
	CLACKAMAS	56	57	
	CLATSOP	56	57	
	COLUMBIA	56	57	
	COOS	56	57	
	CROOK			
	CURRY	56	57	
	DESCHUTES			
	DOUGLAS	56	57	
	GILLIAM			
	GRANT			
	HARNEY			
	HOOD RIVER			
	JACKSON	56	57	
	JEFFERSON			
	JOSEPHINE	56	57	
	KLAMATH	56		
	LAKE			
	LANE	56	57	
	LINCOLN	56	57	
	LINN	56	57	
	MALHEUR	25		
	MARION	56	57	
	MORROW			
	MULTNOMAH	56	57	
	POLK	56	57	
	SHERMAN			
	TILLAMOOK	56	57	
	UMATILLA			
	UNION	25		
	WALLOWA	25		
	WASCO			
	WASHINGTON	56	57	
	WHEELER			
	YAMHILL	56	57	
PA	ADAMS	2	4	
	ALLEGHENY	2	3	4
	ARMSTRONG	2	4	
	BEAVER	2	3	4
	BEDFORD	2	4	
	BERKS	1	2	4
	BLAIR	2	4	
	BRADFORD	2	4	
	BUCKS	1	2	4
	BUTLER	2	3	4
	CAMBRIA	2	4	
	CAMERON	2	4	
	CARBON	1	2	4
	CENTRE	2	4	
	CHESTER	1	2	4
	CLARION	2	4	
	CLEARFIELD	2	4	
	CLINTON	2	4	
	COLUMBIA	2	4	
	CRAWFORD	2	4	
	CUMBERLAND	2	4	
	DAUPHIN	2	4	
	DELAWARE	1	2	4
	ELK	2	4	
	ERIE	2	4	19 22
	FAYETTE	2	4	
	FOREST	2	4	
	FRANKLIN	2	4	
	FULTON	2	4	
	GREENE	2	4	
	HUNTINGDON	2	4	
	INDIANA	2	4	
	JEFFERSON	2	4	
	JUNIATA	2	4	
	LACKAWANNA	2	4	
	LANCASTER	1	2	4
	LAWRENCE	2	3	4
	LEBANON	1	2	4
	LEHIGH	1	2	4
	LUZERNE	2	4	
	LYCOMING	2	4	
	MC KEAN	2	4	
	MERCER	2	3	4
	MIFFLIN	2	4	
	MONROE	1	2	4
	MONTGOMERY	1	2	4
	MONTOUR	2	4	
	NORTHAMPTO	1	2	4
	NORTHUMBER	2	4	
	PERRY	2	4	
	PHILADELPH	2	4	
	PIKE	1	2	4
	POTTER	2	4	
	SCHUYLKILL	1	2	4
	SNYDER	2	4	
	SOMERSET	2	4	
	SULLIVAN	2	4	
	SUSQUEHANN	2	4	
	TIOGA	2	4	
	UNION	2	4	
	VENANGO	2	4	
	WARREN	2	4	
	WASHINGTON	2	3	4
	WAYNE	2	4	
	WESTMORELA	2	3	4
	WYOMING	2	4	
	YORK	1	2	4
RI	BRISTOL	1	2	4
	KENT	1	2	4
	NEWPORT	1	2	4
	PROVIDENCE	1	2	4
	WASHINGTON	1	2	4
SC	ABBEVILLE	4	8	
	AIKEN	1	4	7 8
	ALLENDALE	1	2	4 7
	ANDERSON	4	8	
	BAMBERG	1	2	4 7
	BARNWELL	1	2	4 7
	BEAUFORT	1	2	4 7 176
	BERKELEY	1	2	4 7
	CALHOUN	1	2	4 7
	CHARLESTON	1	2	4 7 176
	CHEROKEE	2	4	
	CHESTER	1	2	4
	CHESTERFIE	1	2	4 7
	CLARENDON	1	2	4 7
	COLLETON	1	2	4 7 176
	DARLINGTON	1	2	4 7
	DILLON	1	2	4 7
	DORCHESTER	1	2	4 7
	EDGEFIELD	1	4	8
	FAIRFIELD	1	2	4
	FLORENCE	1	2	4 7
	GEORGETOWN	1	2	4 7 176
	GREENVILLE	2	4	
	GREENWOOD	2	4	
	HAMPTON	1	2	4 7
	HORRY	1	2	4 7 176
	JASPER	1	2	4 7 176
	KERSHAW	1	2	4 7
	LANCASTER	1	2	4
	LAURENS	2	4	
	LEE	1	2	4 7
	LEXINGTON	1	2	4 7
	MC CORMICK	4	8	
	MARION	1	2	4 7
	MARLBORO	1	2	4 7
	NEWBERRY	1	2	4
	OCONEE	4	8	
	ORANGEBURG	1	2	4 7
	PICKENS	2	4	
	RICHLAND	1	2	4 7
	SALUDA	1	2	4
	SPARTANBUR	2	4	
	SUMTER	1	2	4 7
	UNION	2	4	
	WILLIAMSBU	1	2	4 7
	YORK	2	4	
SD	AURORA	26		
	BEADLE	26		
	BENNETT	26		
	BON HOMME	26		
	BROOKINGS	26		
	BROWN	26		
	BRULE	26		
	BUFFALO	26		
	BUTTE	26		
	CAMPBELL	26		
	CHARLES MI	26		
	CLARK	26		
	CLAY	26		
	CODINGTON	26		
	CORSON	26		
	CUSTER	26		
	DAVISON	26		
	DAY	26		
	DEUEL	26		
	DEWEY	26		
	DOUGLAS	26		
	EDMUNDS	26		
	FALL RIVER	26		
	FAULK	26		
	GRANT	26		
	GREGORY	26		
	HAAKON	26		
	HAMLIN	26		
	HAND	26		
	HANSON	26		
	HARDUNG	26		
	HUGHES	26		
	HUTCHINSON	26		
	HYDE	26		
	JACKSON	26		
	JERAULD	26		
	JONES	26		
	KINGSBURY	26		
	LAKE	26		
	LAWRENCE	26		
	LINCOLN	26		
	LYMAN	26		
	MC COOK	26		
	MC PHERSON	26		
	MARSHALL	26		
	MEADE	26		
	MELLETTE	26		
	MINER	26		
	MINNEHAHA	26		
	MOODY	26		
	PENNINGTON	26		
	PERKINS	26		
	POTTER	26		
	ROBERTS	26		
	SANBORN	26		
	SHANNON	26		
	SPINK	26		
	STANLEY	26		
	SULLY	26		
	TODD	26		
	TRIPP	26		
	TURNER	26		
	UNION	26		
	WALWORTH	26		
	WASHABAUGH	26		
	YANKTON	26		
	ZIEBACH	26		
TN	ANDERSON	2	3	4
	BEDFORD	3	4	8 155 156 163
		168	170	
	BENTON	3	4	8
	BLEDSOE	2	3	4
	BLOUNT	2	3	4
	BRADLEY	2	3	4
	CAMPBELL	2	3	4
	CANNON	2	3	4
	CARROLL	3	4	
	CARTER	2	3	4
	CHEATHAM	2	3	4
	CHESTER	3	4	
	CLAIBORNE	2	3	4 155 156 157
		158	162	166 167 168 169
		181	185	
	CLAY	2	3	4
	COCKE	2	3	4
	COFFEE	3	4	8 155 156 163
		168	170	
	CROCKETT	3	4	
	CUMBERLAND	2	3	4 182
	DAVIDSON	2	3	4
	DECATUR	3	4	8 153 160 161
		162		
	DE KALB	2	3	4
	DICKSON	2	3	4
	DYER	3	4	
	FAYETTE	3	4	
	FENTRESS	2	3	4 182
	FRANKLIN	3	4	8
	GIBSON	3	4	
	GILES	3	4	8
	GRAINGER	2	3	4 155 156 157
		158	162	166 167 168 169

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	GREENE	2	3	4	154			
	GRUNDY	2	3	4				
	HAMBLEN	2	3	4				
	HAMILTON	2	3	4				
	HANCOCK	2	3	4	155	156	157	
		158	162	166	167	168	169	
		181	185					
	HARDEMAN	3	4					
	HARDIN	3	4	8	153	160	161	
		162						
	HAWKINS	2	3	4	181			
	HAYWOOD	3	4					
	HENDERSON	3	4	8				
	HENRY	3	4	8				
	HICKMAN	3	4	8				
	HOUSTON	2	3	4				
	HUMPHREYS	3	4	8				
	JACKSON	2	3	4				
	JEFFERSON	2	3	4				
	JOHNSON	2	3	4				
	KNOX	2	3	4				
	LAKE	3	4					
	LAUDERDALE	3	4					
	LAWRENCE	3	4	8	184			
	LEWIS	3	4	8				
	LINCOLN	3	4	8				
	LOUDON	2	3	4	173			
	MC MINN	2	3	4				
	MC NAIRY	3	4					
	MACON	2	3	4				
	MADISON	3	4					
	MARION	2	3	4				
	MARSHALL	3	4	8	155	156	163	
		168	170	201				
	MAURY	3	4	8	155	156	163	
		168	170	201				
	MEIGS	2	3	4				
	MONROE	2	3	4				
	MONTGOMERY	2	3	4				
	MOORE	3	4	8				
	MORGAN	2	3	4	182			
	OBION	3	4					
	OVERTON	2	3	4				
	PERRY	3	4	8	153	160	161	
		162						
	PICKETT	2	3	4				
	POLK	2	3	4				
	PUTNAM	2	3	4				
	RHEA	2	3	4				
	ROANE	2	3	4				
	ROBERTSON	2	3	4	201			
	RUTHERFORD	2	3	4				
	SCOTT	2	3	4				
	SEQUATCHIE	2	3	4				
	SEVIER	2	3	4				
	SHELBY	3	4					
	SMITH	2	3	4				
	STEWART	2	3	4				
	SULLIVAN	2	3	4	181			
	SUMNER	2	3	4				
	TIPTON	3	4					
	TROUSDALE	2	3	4				
	UNICOI	2	3	4	154			
	UNION	2	3	4				
	VAN BUREN	2	3	4				
	WARREN	2	3	4				
	WASHINGTON	2	3	4	154			
	WAYNE	3	4	8	153	160	161	
		162	164					
	WEAKLEY	3	4					
	WHITE	2	3	4				
	WILLIAMSON	2	3	4				
	WILSON	2	3	4				
TX	ANDERSON	7						
	ANDREWS	26						
	ANGELINA	7						
	ARANSAS	7	33	176	188			
	ARCHER	7	26					
	ARMSTRONG	26						
	ATASCOSA	7						
	AUSTIN	7	29					
	BAILEY	26						
TX	BANDERA							
	BASTROP	28						
	BAYLOR	26						
	BEE	7						
	BELL							
	BEXAR	7						
	BLANCO							
	BORDEN	26						
	BOSQUE							
	BOWIE							
	BRAZORIA	7	29	176				
	BRAZOS	7						
	BREWSTER	34	35					
	BRISCOE	26						
	BROOKS							
	BROWN	26						
	BURLESON	7	28					
	BURNET							
	CALDWELL							
	CALHOUN		33	176	188			
	CALLAHAN	26						
	CAMERON	7	176	188				
	CAMP							
	CARSON	26						
	CASS	7						
	CASTRO	26						
	CHAMBERS	7	23	176				
	CHEROKEE							
	CHILDRESS	26						
	CLAY	26						
	COCHRAN	26						
	COKE	26						
	COLEMAN	26						
	COLLIN	7	26					
	COLLINGSWO	26						
	COLORADO	7	28	29				
	COMAL	31						
	COMANCHE	26						
	CONCHO							
	COOKE	26						
	CORYELL							
	COTTLE	26						
	CRANE	26	36					
	CROCKETT	36						
	CROSBY	26						
	CULBERSON	26						
	DALLAM	26						
	DALLAS							
	DAWSON	26						
	DEAF SMITH	26						
	DELTA							
	DENTON	26						
	DE WITT	29						
	DICKENS	26						
	DIMMIT	7						
	DONLEY	26						
	DUVAL	7						
	EASTLAND	26						
	ECTOR	26						
	EDWARDS							
	ELLIS	7						
	EL PASO	26	34					
	ERATH	26						
	FALLS							
	FANNIN							
	FAYETTE							
	FISHER	26						
	FLOYD	26						
	FOARD	26						
	FORT BEND	7	28	29				
	FRANKLIN							
	FREESTONE	7						
	FRIO	7						
	GAINES	26						
	GALVESTON	7	29	176				
	GARZA	26						
	GILLESPIE							
	GLASSCOCK	26						
	GOLIAD	7	29					
	GONZALES							
	GRAY	26						
	GRAYSON	26						
	GREGG							
	GRIMES	7						
TX	GUADALUPE							
	HALE	26						
	HALL	26						
	HAMILTON							
	HANSFORD	26						
	HARDEMAN	26						
	HARDIN	7						
	HARRIS	7	28	29				
	HARRISON							
	HARTLEY	26						
	HASKELL	26						
	HAYS	31	32					
	HEMPHILL	26						
	HENDERSON	7						
	HIDALGO							
	HILL							
	HOCKLEY	26						
	HOOD	26						
	HOPKINS							
	HOUSTON	7						
	HOWARD	26						
	HUDSPETH	26						
	HUNT							
	HUTCHINSON	26						
	IRION							
	JACK	26						
	JACKSON	7						
	JASPER	7						
	JEFF DAVIS							
	JEFFERSON	7	23	176				
	JIM HOGG							
	JIM WELLS	7						
	JOHNSON	7	26					
	JONES	26						
	KARNES	7						
	KAUFMAN							
	KENDALL							
	KENEDY	176	188					
	KENT	26						
	KERR							
	KIMBLE	7						
	KING	26						
	KINNEY							
	KLEBERG	7	176	188				
	KNOX	26						
	LAMAR	7						
	LAMB	26						
	LAMPASAS							
	LA SALLE	7						
	LAVACA	7						
	LEE							
	LEON	7						
	LIBERTY	7	23	28				
	LIMESTONE							
	LIPSCOMB	26						
	LIVE OAK	7						
	LLANO							
	LOVING	26						
	LUBBOCK	26						
	LYNN	26						
	MC CULLOCH							
	MC LENNAN							
	MC MULLEN	7						
	MADISON	7						
	MARION	7						
	MARTIN	26						
	MASON							
	MATAGORDA	7	176					
	MAVERICK							
	MEDINA							
	MENARD	30						
	MIDLAND	26						
	MILAM							
	MILLS							
	MITCHELL	26						
	MONTAGUE	26						
	MONTGOMERY	7						
	MOORE	26						
	MORRIS	7						
	MOTLEY	26						
	NACOGDOCHE	7						
	NAVARRO	7						
	NEWTON	7						
	NOLAN	26						
TX	NUECES	7	176	188				
	OCHILTREE	26						
	OLDHAM	26						
	ORANGE	7	23					
	PALO PINTO	26						
	PANOLA							
	PARKER	26						
	PARMER	26						
	PECOS	26	36	37				
	POLK	7						
	POTTER	26						
	PRESIDIO	34						
	RAINS							
	RANDALL	26						
	REAGAN	26						
	REAL							
	RED RIVER							
	REEVES	26	36	37				
	REFUGIO	7	29	176	188			
	ROBERTS	26						
	ROBERTSON	7						
	ROCKWALL							
	RUNNELS	26						
	RUSK							
	SABINE	7						
	SAN AUGUST	7						
	SAN JACINT	7						
	SAN PATRIC	7	176	188				
	SAN SABA							
	SCHLEICHER							
	SCURRY	26						
	SHACKELFOR	26						
	SHELBY	7						
	SHERMAN	26						
	SMITH	7						
	SOMERVELL	26						
	STARR							
	STEPHENS	26						
	STERLING	26						
	STONEWALL	26						
	SUTTON							
	SWISHER	26						
	TARRANT	26						
	TAYLOR	26						
	TERRELL	36						
	TERRY	26						
	THROCKMORT	26						
	TITUS							
	TOM GREEN							
	TRAVIS	7						
	TRINITY	7						
	TYLER	7						
	UPSHUR							
	UPTON	26	36					
	UVALDE							
	VAL VERDE							
	VAN ZANDT							
	VICTORIA	7	29					
	WALKER	7						
	WALLER	7						
	WARD	26	36					
	WASHINGTON							
	WEBB	7						
	WHARTON	29						
	WHEELER	26						
	WICHITA	26	176					
	WILBARGER	26						
	WILLACY	188						
	WILLIAMSON							
	WILSON	7						
	WINKLER	26						
	WISE	7	26					
	WOOD	7						
	YOAKUM	26						
	YOUNG	26						
	ZAPATA							
	ZAVALA							
UT	BEAVER	46						
	BOX ELDER							
	CACHE							
	CARBON	26	38	40				
	DAGGETT	26	38					
	DAVIS							
UT	DUCHESNE	26	38					
	EMERY	26	38	40				
	GARFIELD	26	38	40				
	GRAND	26	40					
	IRON	46						
	JUAB	46						
	KANE	26	38	40				
	MILLARD	46						
	MORGAN							
	PIUTE	46						
	RICH							
	SALT LAKE							
	SAN JUAN	26	38	40				
	SANPETE	46						
	SEVIER	46						
	SUMMIT							
	TOOELE							
	UINTAH	26	38	40				
	UTAH							
	WASATCH	38						
	WASHINGTON	38	44	46				
	WAYNE	26	38	40				
	WEBER							
VT	ADDISON	2	4					
	BENNINGTON	2	4					
	CALEDONIA	2	4					
	CHITTENDEN	2	4					
	ESSEX	2	4					
	FRANKLIN	2	4					
	GRAND ISLE	2	4					
	LAMOILLE	2	4					
	ORANGE	2	4					
	ORLEANS	2	4					
	RUTLAND	2	4					
	WASHINGTON	2	4					
	WINDHAM	1	2	4				
	WINDSOR	1	2	4				
VA	ACCOMACK	1	2	4	5			
	ALBEMARLE	2	4					
	ALLEGHANY	2	4					
	AMELIA	1	2	4				
	AMHERST	2	4					
	APPOMATTOX	2	4					
	ARLINGTON	1	2	4				
	AUGUSTA	2	4					
	BATH	2	4					
	BEDFORD	2	4					
	BLAND	2	4					
	BOTETOURT	2	4					
	BRUNSWICK	1	2	4				
	BUCHANAN	2	3	4				
	BUCKINGHAM	2	4					
	CAMPBELL	2	4					
	CAROLINE	1	2	4				
	CARROLL	2	4					
	CHARLES CI	1	2	4				
	CHARLOTTE	2	4					
	CHESTERFIE	1	2	4				
	CLARKE	2	4					
	CRAIG	2	4					
	CULPEPER	1	2	4				
	CUMBERLAND	1	2	4				
	DICKENSON	2	3	4				
	DINWIDDIE	1	2	4				
	ESSEX	1	2	4				
	FAIRFAX	1	2	4				
	FAUQUIER	1	2	4				
	FLOYD	2	4					
	FLUVANNA	1	2	4				
	FRANKLIN	2	4					
	FREDERICK	2	4					
	GILES	2	4					
	GLOUCESTER	1	2	4				
	GOOCHLAND	1	2	4				
	GRAYSON	2	4					
	GREENE	2	4					
	GREENSVILL	1	2	4				
	HALIFAX	2	4					
	HANOVER	1	2	4				
	HENRICO	1	2	4				
	HENRY	2	4					
	HIGHLAND	2	4					

APPENDIX A (CONT.)

VA	ISLE OF WI	1	2	4			
	JAMES CITY	1	2	4			
	KING AND Q	1	2	4			
	KING GEORG	1	2	4			
	KING WILLI	1	2	4			
	LANCASTER	1	2	4			
	LEE	2	3	4	155	157	158
		166	168	169	181	185	
	LOUDOUN	1	2	4			
	LOUISA	1	2	4			
	LUNENBERG	2	4				
	MADISON	2	4				
	MATHEWS	1	2	4			
	MECKLENBUR	2	4				
	MIDDLESEX	1	2	4			
	MONTGOMERY	2	4				
	NANSEMOND	1	2	4			
	NELSON	2	4				
	NEW KENT	1	2	4			
	NORTHAMPTO	1	2	4	5		
	NORTHUMBER	1	2	4			
	NOTTOWAY	1	2	4			
	ORANGE	1	2	4			
	PAGE	2	4				
	PATRICK	2	4				
	PITTSYLVAN	2	4				
	POWHATAN	1	2	4			
	PRINCE EDW	2	4				
	PRINCE GEO	1	2	4			
	PRINCE WIL	1	2	4			
	PULASKI	2	4				
	RAPPAHANNO	2	4				
	RICHMOND	1	2	4			
	ROANOKE	2	4				
	ROCKBRIDGE	2	4				
	ROCKINGHAM	2	4				
	RUSSELL	2	3	4	155	156	157
		158	162	166	167	168	169
		185	201				
	SCOTT	2	3	4	155	156	157
		158	162	166	167	168	169
		181	182	185	201		
	SHENANDOAH	2	4				
	SMYTH	2	3	4	158	201	
	SOUTHAMPTO	1	2	4			
	SPOTSYLVAN	1	2	4			
	STAFFORD	1	2	4			
	SURRY	1	2	4			
	SUSSEX	1	2	4			
	TAZEWELL	2	3	4	155	156	157
		158	162	166	167	168	169
	WARREN	2	4				
	WASHINGTON	2	3	4	158	181	182
		201					
	WESTMORELA	1	2	4			
	WISE	2	3	4	155	157	158
		166	168	169			
	WYTHE	2	4				
	YORK	1	2	4			
	ALEXANDRIA	2	4				
	BEDFORD CI	2	4				
	BRISTOL CI	2	3	4			
	BUENA VIST	2	4				
	CHARLOTTES	2	4				
	CHESAPEAKE	1	2	4			
	CLIFTON FO	2	4				
	COLONIAL H	2	4				
	COVINGTON	2	4				
	DANVILLE C	2	4				
	EMPORIA CI	2	4				
	FAIRFAX CI	2	4				
	FALLS CHUR	2	4				
	FRANKLIN C	2	4				
	FREDERICKS	2	4				
	GALAX CITY	2	4				
	HAMPTON CI	1	2	4			
	HARRISONBU	2	4				
	HOPEWELL C	2	4				
	LEXINGTON	2	4				
	LYNCHBURG	2	4				
	MARTINSVIL	2	4				
	NEWPORT NE	1	2	4			
	NORFOLK CI	2	4				
	NORTON CIT	2	3	4			
VA	PETERSBURG	2	4				
	PORTSMOUTH	2	4				
	RADFORD CI	2	4				
	RICHMOND C	2	4				
	ROANOKE CI	2	4				
	SALEM CITY	2	4				
	SOUTH BOST	2	4				
	STAUNTON C	2	4				
	SUFFOLK CI	2	4				
	VIRGINIA B	1	2	4			
	WAYNESBORO	2	4				
	WILLIAMSBU	2	4				
	WINCHESTER	2	4				
WA	ADAMS						
	ASOTIN	25					
	BENTON						
	CHELAN						
	CLALLAM	56					
	CLARK	56	57				
	COLUMBIA						
	COWLITZ	56	57				
	DOUGLAS						
	FERRY						
	FRANKLIN						
	GARFIELD	25					
	GRANT						
	GRAYS HARB	56	57				
	ISLAND	56					
	JEFFERSON	56					
	KING	56					
	KITSAP	56					
	KITTITAS						
	KLICKITAT						
	LEWIS	56	57				
	LINCOLN						
	MASON	56					
	OKANOGAN						
	PACIFIC	56	57				
	PEND OREIL	24	25	26			
	PIERCE	56	57				
	SAN JUAN	56					
	SKAGIT	56					
	SKAMANIA	56	57				
	SNOHOMISH	56					
	SPOKANE	24	25	26			
	STEVENS						
	THURSTON	56	57				
	WAHKIAKUM	56	57				
	WALLA WALL						
	WHATCOM	56					
	WHITMAN	25					
	YAKIMA						
WV	BARBOUR	2	4				
	BERKELEY	2	4				
	BOONE	2	4				
	BRAXTON	2	4				
	BROOKE	2	3	4			
	CABELL	2	3	4			
	CALHOUN	2	3	4			
	CLAY	2	4				
	DODDRIDGE	2	3	4			
	FAYETTE	2	4	153	154		
	GILMER	2	3	4			
	GRANT	2	4				
	GREENBRIER	2	4				
	HAMPSHIRE	2	4				
	HANCOCK	2	3	4			
	HARDY	2	4				
	HARRISON	2	4				
	JACKSON	2	3	4			
	JEFFERSON	2	4				
	KANAWHA	2	4	153	154		
	LEWIS	2	4				
	LINCOLN	2	3	4			
	LOGAN	2	3	4			
	MC DOWELL	2	3	4			
	MARION	2	4				
	MARSHALL	2	3	4			
	MASON	2	4				
	MERCER	2	4				
	MINERAL	2	4				
	MINGO	2	3	4			
WV	MONONGALIA	2	4				
	MONROE	2	4				
	MORGAN	2	4				
	NICHOLAS	2	4				
	OHIO	2	3	4			
	PENDLETON	2	4				
	PLEASANTS	2	3	4			
	POCAHONTAS	2	4				
	PRESTON	2	4				
	PUTNAM	2	4				
	RALEIGH	2	4				
	RANDOLPH	2	4				
	RITCHIE	2	3	4			
	ROANE	2	3	4			
	SUMMERS	2	4				
	TAYLOR	2	4				
	TUCKER	2	4				
	TYLER	2	3	4			
	UPSHUR	2	4				
	WAYNE	2	3	4			
	WEBSTER	2	4				
	WETZEL	2	3	4			
	WIRT	2	3	4			
	WOOD	2	3	4			
	WYOMING	2	3	4			
WI	ADAMS	20					
	ASHLAND	20					
	BARRON	20					
	BAYFIELD	20					
	BROWN	19	20				
	BUFFALO	20	149				
	BURNETT	20					
	CALUMET	20					
	CHIPPEWA	20					
	CLARK	20					
	COLUMBIA	20					
	CRAWFORD	20	149				
	DANE	4					
	DODGE	4					
	DOOR	19	20				
	DOUGLAS	20					
	DUNN	20					
	EAU CLAIRE	20					
	FLORENCE	20					
	FOND DU LA	20					
	FOREST	20					
	GRANT	4	149				
	GREEN	4					
	GREEN LAKE	20					
	IOWA	4					
	IRON	20					
	JACKSON	20					
	JEFFERSON	4					
	JUNEAU	20					
	KENOSHA	4	19				
	KEWAUNEE	19	20				
	LA CROSSE	20	149				
	LAFAYETTE	4					
	LANGLADE	20					
	LINCOLN	20					
	MANITOWOC	19	20				
	MARATHON	20					
	MARINETTE	19	20				
	MARQUETTE	20					
	MENOMINEE	20					
	MILWAUKEE	4	19				
	MONROE	20					
	OCONTO	19	20				
	ONEIDA	20					
	OUTAGAMIE	20					
	OZAUKEE	4	19				
	PEPIN	20	149				
	PIERCE	20	149				
	POLK	20	149				
	PORTAGE	20					
	PRICE	20					
	RACINE	4	19				
	RICHLAND	20					
	ROCK	4					
	RUSK	20					
	ST CROIX	20	149				
	SAUK	20					
	SAWYER	20					
WI	SHAWANO	20					
	SHEBOYGAN	19	20				
	TAYLOR	20					
	TREMPEALEA	20	149				
	VERNON	20	149				
	VILAS	20					
	WALWORTH	4					
	WASHBURN	20					
	WASHINGTON	4					
	WAUKESHA	4					
	WAUPACA	20					
	WAUSHARA	20					
	WINNEBAGO	20					
	WOOD	20					
WY	ALBANY	26					
	BIG HORN	24	25	26			
	CAMPBELL	24	25	26			
	CARBON	26					
	CONVERSE	26					
	CROOK	26					
	FREMONT	24	25	26			
	GOSHEN	26					
	HOT SPRING	24	25	26			
	JOHNSON	24	25	26			
	LARAMIE	26					
	LINCOLN	26					
	NATRONA	26					
	NIOBRARA	26					
	PARK	24	25	26			
	PLATTE	26					
	SHERIDAN	24	25	26			
	SUBLETTE	26	39				
	SWEETWATER	26	38				
	TETON	25					
	UINTA	26					
	WASHAKIE	24	25	26			
	WESTON	26					

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