

Using Partnerships to Address Human Black Bear Conflicts in Central Florida

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Abstract: Conflicts between humans and bears have escalated in central Florida over the past 5 years. The scope and magnitude of these conflicts extend beyond the responsibilities and capabilities of any 1 agency; therefore, handling these problems requires cooperation among multiple agencies and organizations. We used partnerships to accomplish the following large-scale efforts: 1) a study of movements, habitat use, and population dynamics of bears relative to a highway; 2) creation and implementation of an annual bear festival; 3) creation and distribution of, and training for, an educator's curriculum guide; 4) establishment of a specialty license tag; 5) formation and execution of a broad educational campaign, and 6) support of educational efforts of individual organizations in the partnerships. These examples highlight benefits of collaborative efforts by agencies, nongovernmental organizations, and local communities to resolve large-scale problems between people and bears. Our experiences demonstrate that only through partnerships were we able to generate the funding, public awareness, and human resources needed to effectively address the current situation.

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Resolving escalating human/bear conflicts is central to conservation of the Florida black bear (*Ursus americanus floridanus*). The Florida black bear, a subspecies of the American black bear (*U. a. americanus*) is listed by the State of Florida as threatened. Although the Florida black bear once ranged throughout most of the state, its distribution now is relegated to 8 disjunct populations with the Ocala National Forest (ONF) bear population comprising a major population unit that exhibits the greatest reported densities documented for the subspecies (McCown and Eason 2001). The region around the ONF also is one of the most rapidly developing human population areas in the nation (Campbell 1996, U.S. Census Bur. 2002), with commuter communities expanding outward from the burgeoning cities of Orlando, Ocala, and Daytona Beach. Human population growth in central Florida has created a development boom in rural areas surrounding public lands in Marion, Lake, Semi-

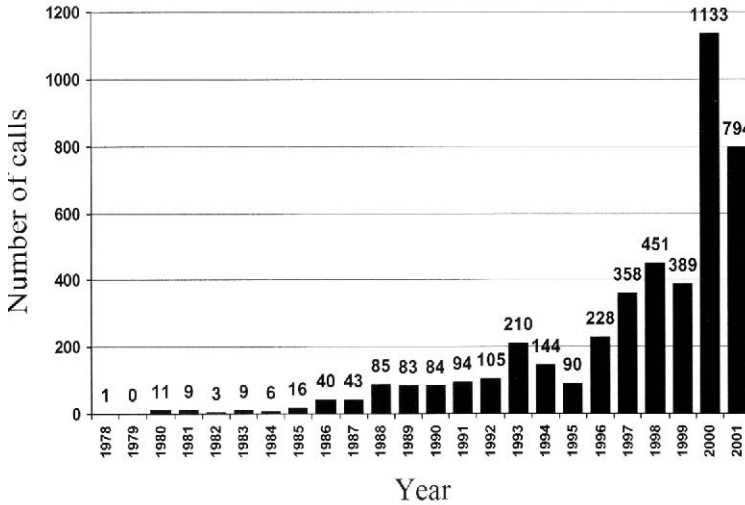


Figure 1. Number of phone calls concerning black bears received by the Florida Fish and Wildlife Conservation Commission, 1978–2001.

nole, Orange, and Volusia counties. Rural lands in these counties formerly were used predominantly for timber, ranching, and citrus production and served as a buffer between natural areas and urban developments. They are now being transformed into residential communities and ranchettes abutting wildlife movement corridors, core habitat areas, and large tracts of federal and state-owned lands. This change in land use has created expansive areas of wildland/urban interface, resulting in significant overlap in core habitat areas and travel corridors by bears and humans. These changes have led to increased vehicle/bear collisions and human/bear conflicts. Conflicts between humans and bears extend beyond the jurisdiction or responsibility of any single agency, and require extensive partnering and collaboration among organizations if conservation of bears is to be successful in Florida.

Human/Bear Conflicts in Central Florida

Some negative encounters between humans and bears are to be expected as human populations, especially those with urban experiences and expectations, expand into the range of the ONF bear population. However, phone calls to the Florida Fish and Wildlife Conservation Commission (FWC) concerning bears statewide have increased from an average of 26 calls per year from 1978–1995 to an average of 559 calls per year from 1996–2001, an increase of 2,050% (FWC, unpubl. data; Fig. 1). About 45% of these calls pertained to destructive behavior of bears, with most stemming from bears getting into people's garbage. Other less common complaints about

bears included bears damaging beeyards, threatening or killing pets or livestock, getting into wildlife or livestock feeders, and damaging buildings and property. A large proportion of calls to the FWC (41%) stemmed from the perception that bears are dangerous and was from people calling to report a bear seen near human dwellings. Only a small percentage of calls concerned a neutral or helpful attitude toward bears, with about 8% of the callers reporting a dead bear and 6% reporting a sick or injured bear. Of all 8 black bear populations in Florida, most calls (60%) to FWC concerning bears came from people living among the ONF bear population. During the 6-month period from July–December 2000, FWC staff from the Division of Wildlife expended >300 man-days responding to bear-related calls; approximately 190 of these man-days pertained to the ONF bear population. Such expenditures of time and resources have continued to grow as human/bear conflicts intensify, particularly in central Florida around the ONF bear population.

Further contributing to incidences of human/bear encounters is increased recreational pressure on public lands. The recreation situation on the ONF also complicated the U.S. Department of Agriculture Forest Service (USFS) and FWC's abilities to curtail negative encounters between humans and bears. The ONF, with thousands of miles of roads and trails networking across the landscape (USFS, unpubl. data), is fully accessible to the public during all hours and days throughout the year. Dispersed camping is allowed throughout ONF outside of the general-gun hunting season for antlered deer (*Odocoileus virginianus*) and wild hog (*Sus scrofa*). This situation creates difficulties in preventing human/bear conflicts by educating recreationists about bears, preventing intentional feeding, managing garbage, and enforcing regulations. Recreational pressure on ONF is estimated to be around 2.2 million visitors per year (USFS, unpubl. data) and is increasing at a rate of approximately 5% per year (J. G. Nobles, pers. commun.). In 2001, ONF staff began receiving reports of bears destroying campsites, raiding dumpsters, and bluff-charging picnickers. These encounters were probably the result of intentional and unintentional feeding of bears in developed recreation areas and dispersed campsites on ONF and by residents within and near the forest area.

Negative encounters between humans and bears include vehicle-bear collisions which can be fatal or injurious to both bears and humans. Approximately 72.7 million tourists visited Florida in 2000, 40.2% of whom visited the central and east central regions of the state (Visit Fla., Inc., unpubl. data). Florida was expected to experience a 46.2% increase in its 1995 resident population of 14.5 million by the year 2025 (Campbell 1996). This expectation was supported by the 2000 census, which documented over 16 million residents in Florida—an 11% increase in 5 years. Rapid human population growth in Florida and high visitation by tourists has created increased use of and demands for highways, resulting in increasing incidence of bears killed on roadways (Gilbert and Wooding, 1996). Numbers of bears killed on Florida highways averaged 23.3 per year from 1976–1995 and increased 272% to an average of 86.7 per year from 1996–2001 (FWC, unpubl. data; Fig. 2). Highway mortality of bears throughout the state is greater in the ONF bear population than in other bear populations, and mortality there accounts for 43% of bears killed on Florida roads

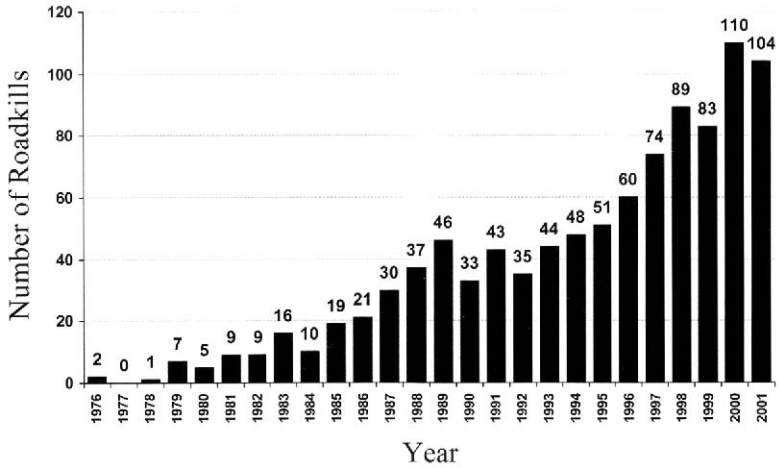


Figure 2. Number of documented transportation related bear deaths (roadkills) in Florida, 1976–2001.

(McCown and Eason 2001). Eight of the 15 zones in Florida identified by Gilbert et al, (2001) as “chronic roadkill problem areas” impact the ONF bear population. Five highways—State Road 46, State Road 40, State Road 19, State Road 44, and County Road 42—cross public lands that provide high quality bear habitat for the ONF population and are receiving increased traffic volumes from areas transforming from rural communities to commuter communities.

Using Partnerships to Achieve Common Goals

As human/bear conflicts escalated from 1996 to 2001, it became evident that the responsibility for addressing these conflicts would fall to more than 1 agency. Further, nongovernmental organizations concerned with wildlife and wildlife habitat became increasingly involved with issues related to black bear roadkills, habitat management, habitat loss, habitat fragmentation and human/bear conflicts. Defenders of Wildlife (DOW) and the Florida Chapter of the Sierra Club jointly sponsor the Habitat for Bears Campaign; a statewide campaign intended to address threats to conservation of the Florida black bear by building public awareness and encouraging citizen participation in government decisions affecting bears. It became apparent that primarily 4 organizations had overlapping, vested interests directly related to human/bear interactions (Fig. 3): FWC, Florida Department of Transportation (FDOT), USFS, and DOW. A core component of all parties’ priorities was education, both of the general public and of targeted audiences involved with human/bear conflicts. We present the following projects to illustrate the use of partnerships in addressing complex conflicts between humans and wildlife.

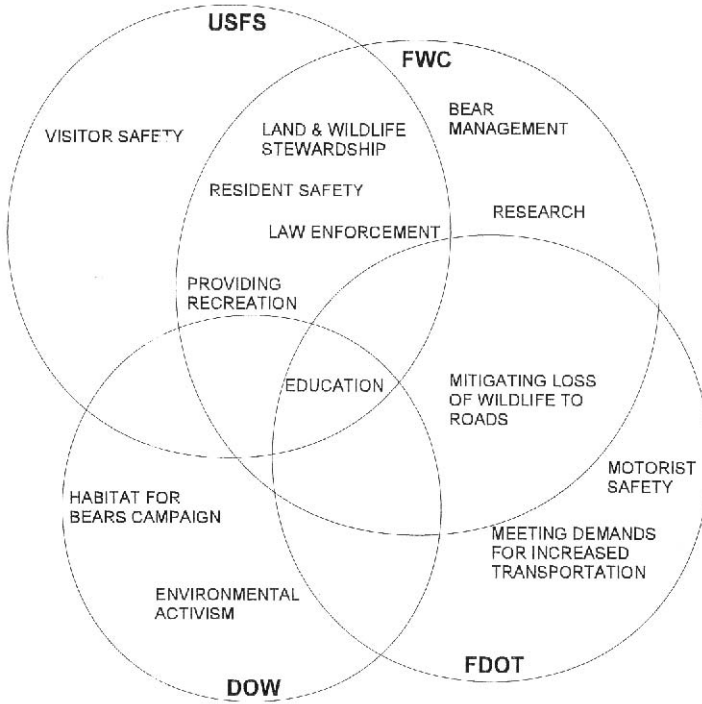


Figure 3. Responsibilities of the U.S. Forest Service (USFS), Florida Fish and Wildlife Conservation Commission (FWCC), Defenders of Wildlife (DOW), and Florida Department of Transportation (FDOT) as they pertain to human/bear conflicts.

State Road 40 Research Project

State Road 40, a 2-lane highway that divides the ONF, is a major source of mortality for the ONF bear population (Gilbert et al. 2001, McCown and Eason, 2001). Local governments in the ONF area have recommended that FDOT evaluate widening State Road 40 to a 4-lane, high-speed connector between I-75 and I-95. USFS, FWC, and the U.S. Fish and Wildlife Service shared their concerns with FDOT regarding adverse impacts to ONF wildlife populations and ecosystems and whether traffic levels justified the request for additional lanes. DOW was a participant in the early 1990s Technical Advisory Committee to FDOT on the feasibility study to widen SR 40 and presented to FDOT the body of scientific information on roads and bears. A major concern of DOW was the potential fragmentation and resulting impact to long term viability of the ONF bear population.

Critical to assessing the proposed road project is accurate, site-specific, biological information on impacts of roads on bears. In 1999, the FDOT funded a FWC study to evaluate movements, habitat use, and population dynamics of bears in the

ONF relative to State Road 40. The USFS provided supplemental funding, access to the study area, assistance with logistics, pertinent forest data, and technical assistance as needed. The Wildlife Foundation of Florida contributed additional funding to develop and implement population estimates of the bear population in the study area using genetic analysis of black bear hair samples. In addition to analyzing bear crossing patterns along State Road 40, the project produced new insights into home range dynamics, population density, use of forest ecosystems, causes of death, and physical health. The FDOT has offered further funding to extend this project through 2003. The scope and significance of the findings from this research project are not discussed in depth in this manuscript because the focus herein is the partnerships that made the project possible. McCown and Eason (2001) presented the findings of the first 2 years of the project, and results of the extended project will be detailed in other forthcoming scientific publications.

Florida Black Bear Festival

DOW first proposed the idea of the Florida Black Bear Festival to the City of Umatilla, a town of 2,400 residents located on State Road 19, a major access road to the Ocala National Forest, in 1998. The intent of the festival was to build public appreciation for the Florida black bear and its habitats in central Florida and awareness of threats undermining its conservation, as part of DOW's Habitat for Bears Campaign. As a result, DOW, the City of Umatilla, Umatilla Chamber of Commerce, USFS, FWC, Florida Chapter of the Sierra Club, Wildlife Foundation of Florida, and WalkAbout Adventures, Inc., partnered to create the Annual Florida Black Bear Festival. Each partner has a representative who serves on the festival executive committee, which is responsible for planning the activities and logistics of the festival, securing funding, attracting and approving vendors, and promoting the festival and its objectives. The partners provide oversight of the festival through their representatives, and all planning decisions are made through joint approval.

The first festival was held in 1999, and the festival has continued annually since that time. The USFS and FWC received full support from all partners when they asked to expand objectives of the 2001 festival to include educating the public on recreating and living safely among bears. The partners provide funding and manpower for the festival and use the partnerships to leverage grants to support educational activities at the festival. Local businesses and corporations contribute funding and advertising, provide underwriting so that educational Black Bear Activity Guides can be provided to attendees free of charge, and sponsor select festival activities. Involvement from the local community is essential to long-term success of the festival and its educational goals because a shift to the local community partners taking the lead role in implementing the festival will allow DOW, FWC, and USFS to expand their capabilities to provide public education on bears and address conservation and management issues. Local school clubs, civic groups, and individual volunteers are essential to festival logistics and operations because the workload involved in conducting the festival exceeds human resources that partners can provide. However, gaining participation of such groups requires an active recruiting effort from the part-

ners that are part of the Umatilla community. The Umatilla Chamber of Commerce has recruited area businesses, several of which have provided their staffs to conduct specific functions at the festival that take advantage of their professional skills.

The objectives of the festival would be difficult to attain if all partners were not committed to insuring that the festival focuses on conservation education activities. The festival has seminars, field trips, stage shows, and activities that increase participant understanding of bear biology, ecology, human/bear conflicts, and other conservation issues. A family activities pavilion, staffed by environmental educators, offers hands-on games and crafts that teach about bears and conservation. A Teacher's Resource Center provides educational materials to educators and parents. Other educational activities include a maze depicting the life of a bear, a paleontology "bone dig," a scent identification activity, an ABC's of Bears scavenger hunt, and an author's corner. Exhibits on living-in-bear-country and camping-in-bear-country, and "Ask a Bear Biologist" booth, the Florida Forests Forever show van, field trips to the ONF, and seminars, capitalize on the knowledge of natural resources professionals and share it with the public. Presentations on live animals native to Florida are delivered by the regional zoo, and are hosted by renowned naturalists. Starting in 2001, a "school day" was added to the festival, providing bear-oriented educational activities for the 4th-grade classes of 2 elementary schools whose attendees live among the ONF bear population.

The festival attracts 6,000–10,000 participants annually. Businesses in the local community have reported economic benefits (FWC, unpubl. data), thus achieving the executive board's goal for the festival to foster long-term local support. Results from participant surveys show that attendees are generally well-educated with above-average incomes (FWC, unpubl. data). Perhaps most beneficial to the community is that most participants spend the entire day at the festival, which may translate into more money being spent at the festival and in the community and greater exposure to the festival's educational messages. We believe that the diversity of activities offered for all ages during different times of the day encourage attendees to stay. The festival further benefits the host community, Umatilla, by highlighting the town and the services it can provide to people traveling to the ONF. The festival also serves as a valuable means of promoting Umatilla's slogan, "Gateway to the Forest." Partners recognize that educating local children on living with bears is an important step to reduce area human/bear conflicts and are working to gain greater involvement from area schools.

Florida Black Bear Curriculum Guide

The Florida Black Bear Curriculum Guide, developed in 1998 through a partnership between DOW and FWC, targets school children in 3rd to 8th grades. Ten lessons address reading, language arts, history, math, geography, social studies, arts, and science. Among the topics are how bears are different from the Florida panther (*Felis concolor coryi*), how the Florida black bear differs from other bears, what people know and think about bears, what bears need to survive, and how human activities affect bears. The guide is available through teacher-training workshops, facilitated by the FWC and DOW.

Wildlife Conservation Tag

The “Conserve Wildlife” license plate is the result of partnerships among FWC, DOW, and the Wildlife Foundation of Florida, Inc. The DOW initiated the effort to establish a new specialty license plate in Florida and secured the application fee and petition list needed to bring the tag proposal before the Florida Legislature. This license tag, featuring the image of the Florida black bear, generated revenues to support wildlife programs in Florida through grants from the Wildlife Foundation of Florida, Inc. News releases from the Wildlife Foundation of Florida state that the license plate is raising an average of \$350,000 per year for wildlife education, research, habitat protection, and law enforcement. In the first 3 years since the inception of the Conserve Wildlife tag in 1999, \$721,597 in grants have been awarded (Wildl. Found. Fla., unpubl. data). Grants, some exceeding \$100,000, have been awarded to the FWC for black bear conservation, management, and research, and human/bear conflict education.

Be Bear Aware Campaign and Other Education Efforts

The rapid escalation of human/bear conflicts in recent years involving the ONF bear population has necessitated increased coordination and communication between the FWC and USFS for bear management and public education. DOW’s Habitat for Bears Campaign Coordinator’s involvement in statewide bear issues and educational programs logically brought DOW into cooperative relationship with FWC and USFS in educating the public on bear safety. As formal and informal interactions among DOW, FWC, and USFS regarding bear issues became more frequent over the years, it became obvious that each organization had unique abilities that they could contribute to an organized bear safety education effort. The Be Bear Aware Team was initiated in 2001, with the objective of reducing negative interactions with, and increasing the survival potential for, bears in Florida by educating residents and visitors about bear ecology and methods of coexistence.

The partners have identified target audiences (i.e., urban residents, rural residents, activists, outdoor recreationists, educators, and policymakers) and are developing strategies tailored to effectively educate each type of audience. Tasks are divided among partners to capitalize on their different strengths and concerns, with all partners providing feedback. The FWC’s bear management section leader and FWC’s conservation education director provide expert review of all materials submitted by partners, which not only insures that the information being generated is consistent with the most current scientific literature on bears, but also makes the education effort more effective by developing consistent language in the bear safety messages presented by all the partners.

The FWC has developed a scripted visual presentation, “Understanding human/bear conflicts in Florida,” that can be given by wildlife professionals throughout the state, thus insuring consistency in the information provided to residents. In the past year, biologists, public information specialists, and conservation educators from the FWC’s Northeast Regional Office have given approximately 55 bear safety programs

to homeowners, federal and state agency personnel, schools, and organizations (D. F. Coyner, pers. commun.). The FWC also has created a homeowner's guide on bear-proofing techniques that is distributed by the FWC, DOW, and USFS and has added a bear information website (Fla. Fish and Wildl. Conserv. Comm. 2002) linked to the FWC website. In 2002, the FWC passed a rule, with DOW support, that makes it a second degree misdemeanor to intentionally feed bears.

In the near future, FWC will be initiating local working groups to address the complex issues and concerns associated with the bear populations in Florida. Members will include representatives from FWC, USFS, and other local natural resource agencies, DOW and other stakeholder organizations, and members of local communities. The first working group will be formed in the ONF area. Concurrently, the FWC, with input and support from partners, is leading a concentrated effort using the Be Bear Aware Campaign to educate residents through direct mail and hand-delivery of information to every household in 27 residential communities in a suburban county that has great incidences of human/bear conflicts. In addition, FWC is training a community bear liaison from each neighborhood in the targeted county, or in the more exclusive communities—the property management company, whom residents can call when they sight a bear. The community liaisons will be trained to know the threshold of bear activity that necessitates further communication to FWC. FWC and partners hope that trivial phone calls to FWC will be reduced, and education and diligence to reduce the habituation of bears by these communities will be increased. FWC's conservation education director will measure the effectiveness of these targeted efforts through pre- and post-assessments using telephone surveys. DOW and USFS capitalized on the availability of materials developed for FWC's Seminole County education effort, and combined their resources to purchase and mail Be Bear Aware educational information and the Florida Black Bear Festival schedule of events to the 10,618 rural mailboxes within and adjacent to the Ocala National Forest.

DOW sponsored a statewide essay contest for grades 3 through 7 on "The Florida black bear—an umbrella species." The contest goal was to encourage students to learn about bears and about important ways that different species depend on one another. In addition, DOW provided comprehensive biological and ecological information about Florida black bear and their habitat including information on bear-proofing one's property at their website (Defenders Wildl. 2002a, 2002b).

In 1991, DOW launched a public awareness campaign in Florida called "Be Bear Aware" to address the troublesome issue of human/bear complaints that undermine conservation of bears. The campaign explained that people most often create humans/bears conflicts, and it was necessary for residents to take personal responsibility in abating conflicts to thereby prevent loss of property and reduce the potential for human injury or death. In 2001, DOW's efforts concentrated on incorporating the Be Bear Aware message into existing programs including slide presentations, fact sheets and the festival. For 2002 and 2003, DOW has funded the Proactive Bear Conservation Fund, a cost-share fund for homeowners, landowners, and businesses to bear-proof their properties.

Starting in 2001, the ONF now requires all employees and employees of concessionaires to receive training on reducing human conflicts with bears based on the FWC's presentation. In addition, ONF developed a response protocol for concession employees to follow when they receive reports of bear activities from forest visitors and requires concessionaires to give all visitors entering concession areas informational fliers on bear safety. Signs posted at all designated campgrounds and stickers on the lids of bear-proof garbage cans instruct visitors on bear safety. All media were developed with collaboration of the partners in the Be Bear Aware Campaign. Interpretive signs that include information on Florida black bear ecology and safety measures for outdoor recreationists are planned for ONF visitor centers and kiosks. The USFS presents educational programs on bears to forest visitors, local schools, and residents in the Ocala National Forest area, and gives attendees promotional items printed with bear safety messages. At events that allow exhibits, the USFS displays a mock campsite and give attendees checklists to identify the items that could attract bears. Also, the USFS digitally photographed the components of the mock campsite, and transformed it into a computer-based activity that has been used by school children.

An Overview of the Partnerships

The partnerships discussed herein were formed and operate at different levels. The partnerships among FWC, FDOT, and USFS to study the relationship of black bears and highway 40 was a formal agreement, formulated and administered through upper-level managers of all 3 agencies. The project expectations were outlined in a contract and FWC presents the project results in semi-annual reports each fiscal year. The partnerships formed to plan and conduct the annual Florida Black Bear Festival involves lower-, mid-, and upper-level managers who participate as equals on the executive board. The partners have formally defined the objectives of the festival, and what is required for one to qualify as a "partner." All other aspects of the interrelationships among the partners are informal. Agreements of work and finances that will be contributed are verbal and in good faith, allowing a partner to default if needed. The executive board maintains communications with scheduled monthly meetings and bulletins sent by electronic mail. In contrast, the partnership of the Be Bear Aware team was a result of proactive necessity. That is, the situation and needs regarding black bears and humans are more complex and greater than any 1 entity. This partnership was born from key people in low- to mid-level management that were aware of the problems overwhelming their organizations, were able to clearly identify actions to address these problems and took the initiative to cooperate with one another and share information. There is no formal agreement or scheduled meetings guiding this partnership; each partner identifies its organization's needs and brings them to the attention of the others. There is a verbal agreement that to use the Be Bear Aware logo all partners must reach consensus on the final product or action. While strategic planning meetings have occurred when necessary, most communication is done through electronic mail and telephone calls. It was through work on more for-

mal partnerships and agency-led projects that the relationships among the individuals who initiated the informal partnerships developed. The more formal partnerships that were entered to address human/bear conflicts built a feeling of involvement within the different partner organizations and improved communications and the exchange of information. Another result of the formal partnerships was the growing trust and respect that formed among the individuals from different organizations, which led to the formation of the informal Be Bear Aware partnership. The Be Bear Aware effort reflects a partnership of people, not just their organizations. It is the relationship that developed among these people that enable us to accomplish our goals, even when our organizations may not share the same missions or are in disagreement over other issues.

Other Benefits of Partnerships

The immediate benefits of the partnerships discussed in this paper are not readily quantifiable in terms of showing a reduction in human/bear conflicts because of continued encroachment of human developments in formerly rural and natural areas. Anecdotal feedback from partners indicates that success of education efforts in the ONF area is apparent from increased awareness of school children and the local public regarding bear issues. The partnerships formed to reduce human/bear conflicts in the ONF area have greatly increased the amount of pertinent information attained and shared by the partners and transmitted to the public. Such information exchange is due to the growing network of wildlife professionals interested in bear management and safety in Florida that has become established. The educational outreach capabilities of each organization have expanded through the partners' efforts to involve more agency employees, volunteers, and educators in learning how to present bear safety messages. Partnerships spawn further partnerships; as working relationships, respect, and trust build among the partners, they begin to envision more that can be attained and may recruit additional partners who have unique abilities to contribute. We have found that these working relationships carry over into other aspects of our jobs and have added to our abilities to accomplish other goals unrelated to bears. The partnerships have made it possible to leverage more grant monies, especially from grants that require matching contributions or in-kind services from nongovernmental organizations, non-profit organizations, or local communities. And, perhaps one of the most important but least recognized informal benefits of having partnerships, is that partnering agencies or organizations can exert pressure on one's own agency to take actions towards the partnership's objectives.

Future Needs and Actions

Florida's rapid human population growth is predicted to continue (Campbell 1996), and we expect that human conflicts with bears also will continue as a consequence. To address needs of areas with chronic human/bear conflicts, the Be Bear Aware Campaign will have to be expanded to other problem areas and eventually will have to cover all regions of Florida with bear populations. Similarly, as growth con-

tinues, FDOT will need to address bear mortality when planning future highway projects in regions of Florida where high human growth is anticipated. Educating the public about bear safety has presented 2 challenges: increasing awareness and changing the behavior of low income rural residents, many of whom cannot afford to implement bear-proofing (e.g., cannot change their trash containers), and educating new Florida residents, most of whom do not realize there are bears in Florida and that their housing community or rural ranchette was built in bear habitat. The partnerships must continue to develop creative strategies and explore funding opportunities to meet these challenges now and in the future.

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