SUITABILITY OF STREAM BUFFERS AND RIPARIAN HABITATS FOR BROWN BEARS

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Abstract: We studied riparian habitat use by a high density brown bear (*Ursus arctos*) population on the Tongass National Forest (Tongass) where spawning salmon (*Oncorhyncus* spp.) provide an important seasonal food resource. The Tongass contains large tracts of pristine old-growth coniferous forest and some of these tracts are within riparian zones that are subject to timber harvest and various timber management guidelines. Determining the size of protective riparian no-cut buffers to conserve fish and wildlife habitat and water quality was a major component of a revision of the U.S. Department of Agriculture (USDA) Forest Service's Tongass Land Management Plan (TLMP; U.S. Forest Service 1997). We radiocollared 111 brown bears on a 1,119 km^2 portion of Chichagof Island to evaluate bear use of riparian habitats and to determine how proposed buffers might be used by brown bears. Our study area was managed for timber harvest and had >25 salmon spawning streams and associated riparian habitats with various riparian-zone management opportunities. Sixty-three percent of 2,069 aerial radiotelemetry locations were in riparian habitats during August and 61% of all August locations were <1,000 m from a salmon-spawning stream. The new Tongass forest plan has 2 types of administrative buffers on salmon streams: (1) a riparian standard and guideline, which is a variable-width buffer and usually incorporates <150 m of protection, and was established primarily to protect salmon habitat and water quality, and (2) a 153-m no-cut buffer established to protect foraging areas for brown bears. Twenty-four percent of the August locations were within the riparian standard and guideline buffer, and 39% fell within the brown bear buffer, assuming it was applied across all salmon spawning streams used by bears. These results were useful in revising the Tongass forest plan and in assisting decision-makers with the necessary information to change historic land allocations and provide more habitat conservation for brown bears. A panel of brown bear scientists recommended that a 153-m no-cut forest buffer be placed on all salmon spawning streams that are used by brown bears. The final forest plan weakened this recommendation, and its implementation will be subject to future interpretation. However, compared with previous forest planning efforts that had little protection of riparian habitats and none specifically for brown bears, this conclusion was an important measure for brown bear conservation.

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Wildlife biologists interested in providing useful information for resource management decision-makers often find the link between science-based information and land allocation decisions to be a complex combination of political, regulatory, and conservation issues. Resource agencies often strive to integrate research and management to assist with problems of uncertainty in ecosystem management and to minimize future controversy with objective information (e.g., Christensen et al. 1996,Thomas 1996). The Tongass National Forest covers most of southeast Alaska and its management has been the source of controversy. Much of the debate has focused on determining how much old-growth coniferous forest should be set aside to maintain habitat for viable fish and wildlife populations versus how much should be allocated for timber harvest. Completion of TLMP (USDA Forest Service 1997) for the Tongass National Forest in 1997 was the culmination of >10 years of planning. During part of this planning, scientists analyzed and synthesized new information in a value-neutral manner; this information was provided to TLMP decision-makers (Everest et al. 1997). Most of the wildlife information was subject to peer-review. For selected wildlife species including the brown bear, assessment panels were convened with experts, and they evaluated the risk to that species of draft forest plan alternatives (Swanston et al. 1996).

Conservation of brown bears on the Tongass has received considerable attention over the past decade. This is because brown bears (1) occur in very high densities in some portions of the Tongass (Schoen and Beier 1990, Titus and Beier 1993), (2) have high public interest for viewing and hunting (Titus et al. 1994), (3) have economic value (McCollum et al. 1996), and (4) are subject to conservation concerns associated with development activities (McLellan 1990). Pacific salmon are an important component of the annual cycle of coastal Alaskan and British Columbia brown bears (Hamilton and Bunnell 1987, Barnes 1990, Schoen and Beier 1990), and some think that maintaining high brown bear densities may be linked to the conservation of forested riparian habitats (Schoen et al. 1994). Maintaining forested buffers along anadromous fish streams also is recognized as important for the long-term health of salmon stocks (Anadramous Fish Habitat Assessment 1995). As the Tongass forest plan was being developed, we provided information to the science team and decision-makers about our findings regarding brown bear use of salmon-spawning habitats and associated riparian areas. We report on brown bear use of riparian habitats and on how the scientific findings and subsequent land allocation decisions fit these data relative to the conservation of riparian habitats. Our objectives were to (1) demonstrate