

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 20**

RIN 1018-AE39

Migratory Bird Hunting; Temporary Conditional Approval of Tin Shot as Nontoxic for the 1998-99 Season

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes to amend Section 20.21(j) and grant temporary and conditional approval of tin shot as nontoxic for the 1998-99 migratory bird hunting season while chronic toxicity/reproductive testing is being completed. Tin shot has been submitted for consideration as nontoxic by the International Tin Research Institute, Ltd. (ITRI), of Uxbridge, Middlesex, Great Britain.

DATES: Comments on the proposed rule or draft Environmental Assessment (EA) (see caption NEPA CONSIDERATION) must be received no later than January 4, 1999.

ADDRESSES: Copies of the EA are available by writing to the Chief, Office of Migratory Bird Management (MBMO), U.S. Fish and Wildlife Service, 1849 C Street, NW., ms 634-ARLSQ, Washington, DC 20240. Comments may also be forwarded to this same address. The public may inspect comments during normal business hours in room 634, Arlington Square Building, 4401 N. Fairfax Drive, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Robert J. Blohm, Acting Chief, or James R. Kelley, Jr., Wildlife Biologist, Office of Migratory Bird Management (MBMO), (703) 358-1714.

SUPPLEMENTARY INFORMATION: Since the mid-1970s, the Service has sought to identify shot that does not pose a significant toxic hazard to migratory birds or other wildlife. Currently, only steel and bismuth-tin shot are approved by the Service as nontoxic. Tungsten-iron and tungsten-polymer shot have been given temporary conditional approval for the 1998-99 hunting season. Compliance with the use of nontoxic shot has been increasing over the last few years. The Service believes that this level of compliance will continue to increase with the availability and approval of other nontoxic shot types. The Service is eager to consider these other materials for approval as nontoxic shot.

The revised procedures for approving nontoxic shot (50 CFR 20.134) consist of

a three-tier process whereby existing information can minimize the need for full testing of a candidate shot.

However, applicants still carry the burden of proving that the candidate shot is nontoxic. By developing the new approval procedure, it was the Service's intent to discontinue the practice of granting temporary conditional approval to candidate shot material. However, the application by ITRI was initiated prior to implementation of the new protocol. To date, scientific information presented in the application suggests that tin is nontoxic under conditions for the proposed shot configuration. Therefore, the Service proposes to grant temporary conditional approval for the 1998-99 hunting season. Permanent approval will not be granted until chronic toxicity/reproductive testing is successfully completed and the results are reviewed and approved by the Director.

ITRI's candidate shot is made from commercially pure tin; no alloying or other alterations are intentionally made to the chemical composition of the shot. The shot material has a density of approximately 7.29 g/cm³. The shot is 99.97 percent tin, with a low level of iron pickup due to the steel production equipment.

ITRI's application includes a statement of proposed use, a description of the new tin shot, a toxicological report (Thomas 1997), and results of a 30-day dosing study of the toxicity of the candidate shot in game-farm mallards (Wildlife International, Ltd. 1998). The toxicological report incorporates toxicity information (a synopsis of acute and chronic toxicity data for mammals and birds, potential for environmental concern, and toxicity to aquatic and terrestrial invertebrates, amphibians and reptiles), effects of firing on tin shot, and information on environmental fate and transport. The toxicity study is a 30-day dosing test to determine if the candidate shot poses any deleterious effects to game-farm mallards. This will meet the requirements for Tier 2, as described in 50 CFR 20.134(b)(3).

Toxicity Information

Detailed reviews of the toxicological impacts of different tin compounds have been conducted by Eisler (1989) and Cooney (1988). Both reviews indicate that elemental tin, which is the material used in this shot, is non-toxic to animals. Tin shot designed for waterfowl hunting is utilized in several European countries and no reports exist that suggest that tin shot is causing toxicity problems for wildlife in those countries.

Environmental Fate and Transport

Tin pellets will undergo slow surface oxidation to form hydrated tin oxide, which is extremely insoluble in water (Lide 1990). Therefore dissolution will be slow, and highly localized aqueous concentrations will not arise. This means that elemental tin will over time remain largely in the same inorganic form as when it is discharged. Tin pellets discharged into wetlands where sulphur ions are released during organic decomposition would become coated with tin sulphide, which is highly insoluble in water and resistant to aquatic hydrolysis (Hoiland 1995).

Environmental Concentrations

Calculation of the estimated environmental concentration (EEC) of tin in a terrestrial ecosystem is based on 69,000 shot per hectare (Pain 1990). The EEC for tin in soil is 19.3 g/m³. Calculation of the EEC in an aquatic ecosystem assumes complete erosion of the shot in one cubic foot of water. The EEC in water for tin is 19.3 mg/L. Tin shot is considered insoluble and is stable in basic, neutral, and mildly acidic environments. Therefore, erosion is expected to be minimal, and adverse effects on biota are not expected to occur.

Effects on Birds

Several studies have been conducted in which pellets made of tin or tin alloys have been placed inside the digestive tract or tissues of ducks to determine if toxic effects occur. Grandy et al. (1968) and the Huntingdon Research Centre (1987) conducted 30 and 28-day, respectively, acute toxicity tests on mallard ducks and reported that all treatment ducks survived with insignificant weight loss or development of pathological lesions.

Ringelman et al. (1993) conducted a 32-day acute toxicity study which involved dosing game-farm mallards with a shot alloy of tungsten-bismuth-tin (TBT), which was 39, 44.5 and 16.5 percent by weight, respectively. No dosed birds died during the trial, and behavior was normal. Examination of tissues post-euthanization revealed no toxicity or damage related to shot exposure. Blood calcium differences between dosed and un-dosed birds were judged to be unrelated to shot exposure. This study concluded that "... TBT shot presents virtually no potential for acute intoxication in mallards under the conditions of this study."

Kraabel et al. (1996) surgically embedded TBT shot in the pectoralis muscles of ducks to simulate wounding by gunfire and to test for toxic effects of

the shot. These authors found that TBT shot produced no toxic effects nor induced any adverse systemic effects on the health of ducks during the 8-week period.

The potential for bismuth-tin (BT) shot to produce toxicological effects in ducks during reproduction has been investigated under both acute and chronic testing conditions. Tin as a 2% component of the tested shot, did not pose a toxic risk to ducks when fed a nutritionally-imbalanced, corn-based diet. Neither has BT shot been shown to pose an adverse risk to the health of ducks, the reproduction by male and female birds, nor the survival of ducklings over the long term (Sanderson et al. 1997).

The studies cited above summarize the available published information on shot types in which tin is a component. However, these studies involve either short-term acute toxicity tests, or shot compositions in which tin is a minor component. Additional information is needed to fully assess the toxicity of tin shot.

ITRI's 30-day dosing study (Wildlife International Ltd., 1998) with the candidate shot included 4 treatment and 1 control group of game-farm mallards. Treatment groups were exposed to 1 of 3 different types of shot: 8 #4 steel, 8 #4 lead, or 8 #4 TM; whereas the control group received no shot. The 2 tin treatment groups (1 group deficient diet, 1 group balanced diet) each consisted of 16 birds (8 males and 8 females); whereas remaining treatment and control groups consisted of 6 birds each (3 males and 3 females). All tin-dosed birds survived the test and showed no overt signs of toxicity or treatment-related effects on body weight. There were no differences in hematocrit or hemoglobin concentration between the tin treatment group and either the steel shot or control groups. No histopathological lesions were found during gross necropsy. In general, no adverse effects were seen in mallards given 8 #4 size tin shot and monitored over a 30-day period. No levels of tin above the limit of detection were observed in any tissues collected from either tin treatment group.

Based on the results of the toxicological report and the toxicity test (Tier 1 and 2), the Service concludes that tin shot, (approximately 99.9 percent tin by weight with <1 percent residual lead), does not appear to pose a significant danger to migratory birds or other wildlife and their habitats. However, the Service is concerned that available information on the effect of tin on reproduction in birds is based on shot alloys in which tin is a small

component. Therefore, effects of the candidate shot on reproduction in birds is relatively unknown.

The first condition of approval is toxicity testing. Candidate materials not approved under Tier 1 and/or 2 testing are subjected to standards of Tier 3 testing. The scope of Tier 3 includes chronic exposure under adverse environmental conditions and effects on reproduction in game-farm mallards, as outlined in 50 CFR 20.134 (b)(4)(A and B) (Tier 3), and in consultation with the Service's Office of Migratory Bird Management and the U.S. Geological Survey's Division of Biological Resources. This study includes assessment of long-term toxicity under depressed temperature conditions using a nutritionally-deficient diet, as well as a moderately long-term study that includes reproductive assessment. The tests require the applicant to demonstrate that tin shot is nontoxic to waterfowl and their offspring.

The second condition of final unconditional approval is testing for residual lead levels. Any tin shot with lead levels equal to or exceeding 1 percent will be considered toxic and, therefore, illegal. In the **Federal Register** of August 18, 1995 (60 FR 43314), the Service indicated that it would establish a maximum level for residual lead. The Service has determined that the maximum environmentally acceptable level of lead in any nontoxic shot is trace amounts of <1 percent and has incorporated this requirement (50 CFR 20.134(b)(5)) in the December 1, 1997, final rule (62 FR 63608). ITRI documented that tin shot had no residual lead levels equal to or exceeding 1 percent.

The third condition of final unconditional approval involves enforcement. In the August 18, 1995 **Federal Register** (60 FR 43314), the Service indicated that final unconditional approval of any nontoxic shot would be contingent upon the development and availability of a noninvasive field testing device. Several noninvasive field testing devices are under development to separate tin shot from lead shot. Furthermore, tin shot can be drawn to a magnet as a simple field detection method. This requirement was incorporated into regulations at 50 CFR 20.134(b)(6) in the December 1, 1997, final rule (62 FR 63608).

This proposed rule would amend 50 CFR 20.21(j) by temporarily and conditionally approving tin shot as nontoxic for the 1998–99 migratory bird hunting season throughout the United States. It is based on the request made to the Service by ITRI on November 17,

1997, the toxicological reports, and the acute toxicity studies. Results of the toxicological report and 30-day toxicity test undertaken for ITRI indicate the apparent absence of any deleterious effects of tin shot when ingested by captive-reared mallards or to the ecosystem. The comment period for the proposed rule has been shortened to 30 days. This time frame will make it possible for tin shot, if temporarily approved, to be available for use by hunters during the 1998–99 hunting season. This will increase the number of nontoxic shot options available to hunters.

Literature Cited

- Cooney, J.J. 1988. Microbial transformations of tin and tin compounds. *J. Industr. Microbiol.* 3:195–204.
- Eisler, R. 1989. Tin hazards to fish, wildlife, and invertebrates: a synoptic review. *Biological Rep.* 85 (1.15). Contaminant Hazard Reviews Report No. 15. Fish and Wildlife Service, U.S. Dept. Interior. Washington, DC 85 pp.
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- Huntingdon Research Centre Ltd. 1987. The effects of dosing mallard ducks with Safe Shot. Huntingdon, Cambridge, U.K. Report dated Dec. 19, 1987. 15pp.
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- Sanderson, G.C., W.L. Anderson, G.L. Foley, K.L. Duncan, L.M. Skowron, J.D. Brawn, and J.W. Seets. 1997. Toxicity of ingested bismuth alloy shot in game farm mallards: chronic health effects and effects on reproduction. *Illinois Nat. History Survey Bull.* 35:217–252.
- Wildlife International, Ltd. 1998. Tin shot: An oral toxicity study with the mallard. Project No. 476–101. 158 pp.

NEPA Consideration

In compliance with the requirements of section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4332(C)), and the Council on Environmental Quality's regulation for implementing NEPA (40 CFR 1500-1508), the Service prepared an Environmental Assessment (EA) in October 1998. This EA is available to the public for comment at the location indicated under the ADDRESSES caption.

Endangered Species Act Considerations

Section 7 of the Endangered Species Act (ESA) of 1972, as amended (16 U.S.C. 1531 *et seq.*), provides that, "The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act" (and) shall "insure that any action authorized, funded or carried out * * * is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of (critical) habitat * * *". The Service has initiated a Section 7 consultation under the ESA for this proposed rule. The result of the Service's consultation under Section 7 of the ESA will be available to the public at the location indicated under the ADDRESSES caption.

Regulatory Flexibility Act, Executive Order 12866, and the Paperwork Reduction Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) requires the preparation of flexibility analyses for rules that will have a significant effect on a substantial number of small entities, which includes small businesses, organizations, or governmental jurisdictions. The Department of the Interior certifies that this document will not have a

significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act. The approved shot will merely supplement nontoxic shot already in commerce and available throughout the retail and wholesale distribution systems, therefore, this rule would have minimal effect on such entities. The Service anticipates no dislocation or other local effects with regard to hunters and others. This document is not a significant rule subject to Office of Management and Budget review under Executive Order 12866. This rule does not contain collections of information that require approval by the Office of Management and Budget under 44 U.S.C. 3501 *et seq.*

Unfunded Mandates Reform

The Service has determined and certifies pursuant to the Unfunded Mandates Act, 2 U.S.C. 1502 *et seq.*, that this rulemaking will not impose a cost of \$100 million or more in any given year on local or State government or private entities.

Civil Justice Reform—Executive Order 12988

The Department has determined that these proposed regulations meet the applicable standards provided in Sections 3(a) and 3(b)(2) of Executive Order 12988.

Authorship

The primary author of this proposed rule is James R. Kelley, Jr., Office of Migratory Bird Management.

List of Subjects in 50 CFR Part 20

Exports, Hunting, Imports, Reporting and record-keeping requirements, Transportation, Wildlife.

Accordingly, Part 20, subchapter B, chapter 1 of Title 50 of the Code of

Federal Regulations is proposed to be amended as follows:

PART 20—[AMENDED]

1. The authority citation for Part 20 continues to read as follows:

Authority: 16 U.S.C. 703-712 and 16 U.S.C. 742 a-j.

2. Section 20.21 is amended by revising paragraph (j) introductory text, and adding paragraph (j)(5) to read as follows:

§ 20.21 Hunting methods.

* * * * *

(j) While possessing shot (either in shotshells or as loose shot for muzzleloading) other than steel shot, or bismuth-tin (97 parts bismuth: 3 parts tin with <1 percent residual lead) shot, or tungsten-iron (nominally) 40 parts tungsten: 60 parts iron with <1 percent residual lead) shot, or tungsten-polymer (95.5 parts tungsten: 4.5 parts Nylon 6 with <1 percent residual lead) shot, or tungsten-matrix (95.9 parts tungsten: 4.1 parts polymer with <1 percent residual lead) shot, or tin (99.9 percent tin with <1 percent residual lead) shot, or such shot approved as nontoxic by the Director pursuant to procedures set forth in § 20.134, provided that:

* * * * *

(5) Tin shot (99.9 percent tin with <1 percent residual lead) is legal as nontoxic shot for waterfowl and coot hunting for the 1998-1999 hunting season only.

Dated: November 17, 1998.

Stephen C. Saunders,

Acting Assistant Secretary for Fish and Wildlife and Parks.

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