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Canada



STUDY TO GATHER USE PATTERN
INFORMATION ON LEAD SINKERS
AND JIGS AND THEIR NON-LEAD
ALTERNATIVES IN CANADA

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List of Acronyms

BAU	Business as usual
BLL	Blood lead levels
CCC	Canadian Company Capabilities
CEPA	<i>Canadian Environmental Protection Act (CEPA, 1999)</i>
CHMS	Canadian Health Measures Survey
CID	Canadian Importers Database
CIMT	Canadian International Merchandise Trade Database
CMP	Chemical Management Plan
CWS	Canada Wide Standards
DSL	Domestic Substances List
ECB	European Chemicals Bureau
ECCC	Environment and Climate Change Canada
EU	European Union
HC	Health Canada
IC	Industry Canada
ILA	International Lead Association
LIA	Lead Industry Association
OECD	Organisation of Economic Cooperation and Development
P2	Pollution Prevention
Pb	Lead
PBT	Persistent, Bioaccumulative, and Toxic
PSL	Priority Substances List
RCC	Retail Council of Canada
RMO	Risk Management Objective
RMS	Risk Management Strategy
SoC	Substances of Concern
TSMP	Toxic Substances Management Policy
US EPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service

1.0 Introduction

1.1 Background

Lead (Pb) is a soft, bluish metallic element mined from rock and it occurs naturally in the environment all over the world (e.g. in bedrock, soils, sediments, surface waters, groundwater and seawater). Lead also occurs naturally at low levels in foods (e.g. via uptake from soils by plants; subsequent consumption of plants by animals; and via uptake of water and sediments by fish).

An assessment of the most current science on lead was recently conducted and consolidated in a 'State of the Science' Report (Health Canada, Feb 2013¹). The current Canadian blood lead intervention level is 10 µg/dL. However, since the establishment of that blood lead intervention level, scientific evidence has been published that demonstrates critical health effects occur below 10 µg/dL. The risks associated with lead include developmental neurotoxicity, neurodegenerative, cardiovascular, renal and reproductive effects. Environmental risks include toxicity to wildlife. The Government of Canada therefore developed a Risk Management Strategy (RMS) for lead that outlines actions to further reduce risks associated with exposure to lead. The overall risk management objective (RMO) is to reduce exposure to lead to the greatest extent practicable by strengthening current efforts in priority areas where the government can have the greatest impact upon exposure of Canadians.

Canadians are exposed to low levels of lead via various routes including; food, drinking water, air, dust, soil, and lead-containing products. Although blood lead levels (BLLs) have declined by over 70% in Canada since 1978–1979, lead is still widely detected in the Canadian population. BLLs tend to rise after infancy, peak between 18 and 36 months, and decline slightly during childhood and adolescence before rising again with age. For example, the 2007–2009 Canadian Health Measures Survey (CHMS) data indicate that the mean BLLs for 6–11-year-olds are 0.90 µg/dL and 0.80, 1.12, 1.60, and 2.08 µg/dL for the age groups of 12–19, 20–39, 40–59, and 60–79 years, respectively.

Several sources of potential lead exposure of the general population and the environment remain a concern and require further analyses. This study is focused on the uses of lead in fishing sinkers and jigs. The use pattern of lead fishing sinkers and jigs in Canada was reviewed in 2003². This review noted that more than 5 million Canadians take part in recreational angling each year, spending over 50 million days fishing on open water. It was concluded that recreational anglers contribute to environmental lead deposition through the loss of lead fishing sinkers/jigs and these losses amounted to an estimated 500 tonnes of lead - representing up to 14% of all non-recoverable lead releases in Canada. It is well documented that wildlife, primarily piscivorous birds and other waterbirds, ingest fishing sinkers and jigs during feeding, when they either mistake the sinkers and jigs for food items or grit or consume lost bait fish with the line and weight still attached³. Lead fishing weights that weigh less than 50 g and are smaller than 2 cm in any dimension are generally the size found to be ingested by wildlife. Ingestion of a single lead sinker or lead-headed jig, representing up to several grams of lead, is sufficient to expose a loon or other bird to a lethal dose of lead. Lead sinker and jig ingestion has been documented in 10 different wildlife species in Canada. In the United States, ingestion of lead sinkers and jigs by 23 species of wildlife, including loons, swans, other waterfowl, cranes, pelicans, and cormorants, has been documented. Evidence gathered to date indicates that lead sinker and jig ingestion is the only significant source of elevated lead exposure and lead toxicity for Common Loons (*Gavia immer*) and the single most important cause of death reported for adult Common Loons in eastern Canada and the United States, frequently exceeding deaths caused due to entanglement in fishing gear, trauma, disease, and other causes of mortality (Scheuhammer *et al.*, 2003).

¹ Health Canada. State of the Science Report on Lead. Final Report: February 2013

² Scheuhammer AM, Money SL, Kirk DA, Donaldson G. Lead fishing sinkers and jigs in Canada: Review of their use patterns and toxic impacts on wildlife. Canadian Wildlife Service Occasional Paper no. 108, Environment Canada, Ottawa. 2003, 48 pp; Available from: http://www.collectionscanada.gc.ca/eppp-archive/100/200/301/environment_can/cws-scf/occasional_paper-e/n110/html/publications/AbstractTemplate.cfm?lang=e&id=1031

³ Scheuhammer AM, Norris SL. A Review of the Environmental Impacts of Lead Shotshell Ammunition and Lead Fishing Weights in Canada. Canadian Wildlife Service Occasional Paper No. 88, 1995, 54 pp; Available from: <http://publications.gc.ca/collections/Collection/CW69-1-88E.pdf>

Scheuhammer *et al* (2003) also noted that some limited regulatory actions have been taken to reduce the use of lead sinkers and jigs both in Canada and elsewhere. For example, in 1987, Britain banned the use of lead fishing sinkers weighing less than 28.35 g. Examples of actions in the US include the fact that the use of lead sinkers and jigs in three National Wildlife Refuges and in Yellowstone National Park is banned. In addition, US States have taken action including New Hampshire, Maine, and New York who ratified statewide regulations prohibiting the use of lead sinkers beginning in 2000, 2002, and 2004, respectively. An example of more recent action includes the prohibition of lead sinkers and jigs by the Massachusetts Department of Fish and Wildlife as of Jan 1st, 2012⁴. Environment Canada and Parks Canada prohibited the possession of lead fishing sinkers or lead jigs weighing less than 50 g by anglers fishing in National Wildlife Areas and National Parks under the *Canada Wildlife Act* and the *National Parks Act*, respectively, in 1997. However, these latter two regulations are of limited geographic scope, covering <3% of Canada's land mass, and they affect only about 50 000 (<1%) of the estimated 5.5 million recreational anglers in Canada. Scheuhammer *et al* (2003) noted that, at that time, the majority of recreational anglers continued to use lead sinkers and jigs.

Alternatives to lead sinkers and jigs have been available for some time. There are numerous viable alternative materials for producing fishing sinkers and jigs, including tin, steel, bismuth, tungsten, ceramics, and other materials. Tin, steel, and bismuth sinkers and bismuth jigs were previously found to be the most common commercially available alternatives in Canada (Scheuhammer *et al.*, 2003). Some of the available alternative products we found to be more expensive than lead; however, the analysis conducted in 2003 estimated that switching to these products would increase the average angler's total yearly expenses by less than 1% (~\$2.00). In 2003, it was concluded that the continued availability of (often cheaper) lead products made it difficult for the manufacture and sale of nontoxic alternatives to achieve commercial viability.

Under the Risk Management Strategy for Lead a commitment has been made to encourage the use of alternatives to lead which are already available at major retailers in Canada. In order to support this commitment a comprehensive current picture of lead uses in sinkers/jigs in Canada is required. At this stage, an accurate and up to date picture of the current use pattern of lead sinkers/jigs in Canada, a lifecycle analysis for lead in sinkers/jigs, and a review of current management measures in Canada and internationally is now required in order to assist risk managers at ECCC in developing appropriate risk management measures for lead use in sinkers/jigs to achieve the RMO. In addition, any measures to reduce the use of lead in sinkers/jigs would require increased use of alternatives hence it is also important to assess the availability and pros and cons of alternatives in terms of availability, technical efficacy, and relative health and environmental profiles amongst other factors.

1.2 Purpose of the study

The purpose of this study is to research and gather background and use pattern information on lead sinkers/jigs and their non-lead alternatives. The information and analysis provided in the resultant report will assist risk managers in finalizing an effective risk management strategy for lead that includes appropriate actions that address the use of lead in this application.

1.3 Objectives of the study

The specific objectives of this study are as follows:

- Provide a profile of the Canadian lead sinkers and jigs supply chain (including the identification and description of manufacturers, importers, distributors, retailers, and waste management/recycling companies involved, and provision of quantities and types of sinkers/jigs involved)
- Identify and describe existing lead sinker and jigs products found on the Canadian market and their non-lead alternatives.

⁴ <http://www.mass.gov/eea/agencies/dfg/dfw/hunting-fishing-wildlife-watching/fishing/loons-lead-sinkers-and-jigs.html>

- Conduct a lifecycle analysis for lead used in sinkers and jigs in the Canadian market including provision of a detailed analysis of the quantities manufactured, imported, exported, sold, recovered and released. We also provide projections for the future based on available data on future trends, anticipated growth, market knowledge and intelligence.
- Provide a comprehensive review of existing measures and management practices aimed at restricting the use of lead sinkers and jigs in Canada, the U.S. and other OECD countries. We analyze the pros and cons of the findings in a Canadian context.

2.0 Sinkers and Jig Supply Chain

This section of the report provides details on the major manufacturers, importers and retailers involved in the sinkers/jigs supply chain in Canada (sections 2.1 to 2.4). A list of the key associations/interest groups that represent the stakeholders involved in the supply chain is provided in section 2.5.

In developing the profile of the sinker/jig supply chain in Canada we used the following sources:

- Publicly available data on stakeholders involved in the supply chain (e.g. company websites, market research studies, business profiles and directories)
- Available data on sinker/jig trade (e.g. from Industry Canada, Statistics Canada, Canada Border Services Agency)
- Scientific literature and other publications related to sinkers and jigs (e.g. peer-reviewed studies, other published studies, information from other jurisdictions, market research data etc.)
- Direct contact with stakeholders at all levels of the supply chain requesting input, including surveys (e.g. survey questions were sent to manufacturers, importers, distributors, major retailers, and end users; the end user surveys included an electronic survey sent to anglers⁵).

Overall, we received very little information from stakeholders hence most of the analysis is based on publicly available data.

2.1 Manufacturers Profile

Lead fishing sinkers are manufactured by pouring molten lead into moulds of various sizes and shapes. Spin casting is commonly used to cast lead onto fish hooks for small jig making. Examples of moulds that can be used to produce fishing sinkers and jigs are provided in Figures 1 and 2 below. The same process is used to manufacture sinkers and jigs with alternative materials with low melting points such as bismuth and bismuth/tin alloys. The process for making tungsten jigs is somewhat different as the melting point for tungsten is too high to allow pouring molten tungsten into a traditional lead jig mould. Tungsten jig heads are generally manufactured by injection moulding; some machining and soldering may also be used depending on the complexity of the final jig. Sinkers can also be made of steel and can be coated to prevent corrosion⁶.

⁵ The survey sent out to anglers is provided in Appendix 1

⁶ It has been noted that stainless steel weights can leach cadmium, and other elements, under acidic conditions however the pH required are unlikely to be encountered during most fishing uses. USGS Replacement Materials for Lead Weights by Katz and Jelinski, 1999. Open-File Report 99-52: <https://pdfs.semanticscholar.org/4706/6c6e6cc4391b4559a5d1f245db27f3587087.pdf>

Figure 1. Illustration of moulds used for making lead sinkers⁷



Figure 2. Illustration of spin casting moulds for making jigs⁸



The resulting fishing sinkers and jigs are available in a wide variety of types and sizes – some examples are provided in Figure 3 for sinkers and Figure 4 for jigs.

⁷ Example of moulds for making split-shot sinkers and differing sizes: <http://www.hiltsmolds.com/SplitShotMolds.htm>

⁸ Tek Industries – spin casting equipment: http://www.tekcast.com/Fishing-Lure-Manufacturing- c_120.html

Figure 3. Example Illustration of Fishing Sinkers

(a) Split shot sinkers (Sizes shown: #B, #BB, #3/0, #7, #5, #4, #3 and #2)



(b) Egg sinkers



(c) Bullet shaped sinkers



Only a few examples of sinkers are shown in Figure 3 above for illustration – there are many more variations of sinkers in terms of types, shapes, and weights available. In addition, manufacturers use codes and numbering systems to indicate sinker sizes in some cases (as illustrated in Figure 3(a) for split shot sinkers) however the weights associated with each code are not standardized in the industry so a split shot sinker size #2 from one manufacturer may not weigh the same as a split shot sinker size #2 from another manufacturer. There are also types of lead fishing weights (e.g. cannonball / downrigger weights) which can vary very widely in size e.g. from 1oz to 12lbs.⁹

Fishing jigs can range from relatively simple (which can be sold unpainted or painted (see Figure 4 (a)) and in differing sizes) to increasingly complex and elaborately decorated jigs (e.g. see Figure 4 (b) and (c)).

⁹ These are commonly used when drifting bait in bays, rivers or in coastal fisheries. For examples see : <http://www.cabelas.com/product/Cabelas-Cannonball-Sinkers-Unpainted/739412.uts>; <http://www.gratefullead.com/products.html#drball> ; <http://www.outdoorproshop.com/Lead-Cannonball-Weights-p/lead-cannonball.htm>

Figure 4. Example illustrations of Fishing Jigs¹⁰

(a)



(b)



(c)



There is a large and diverse range of sizes and types of fishing sinkers and jig products available for sale in Canada (see section 3.0 of this report for further details on the range of products).

There are a number of sinkers and jigs manufacturers in Canada – these were identified from previous studies (e.g. Scheuhammer and Norris, 1995), from Industry Canada Canadian Company Capabilities Database, and from researching details on manufacturer identities for sinker/jig products currently available for sale in Canada from major retailers. Industry Canada's Company Capabilities database provides a listing of 26 companies relevant to fishing tackle¹¹. Further research on these company's products listing identified several that were sinker/jig manufacturers.

A previous study (Scheuhammer and Norris, 1995) found that fishing tackle supplies, including lead sinkers and jigs, are manufactured by Canadian-based companies. The researchers contacted 15 Canadian fishing tackle companies, either by letter or by phone, to determine 1) if they manufactured sinkers or jigs, 2) the approximate amounts of lead used to manufacture these products, and 3) the approximate proportion of the companies' total sales that could be attributed to sinkers and jigs. The companies contacted that provided data to Scheuhammer and Norris (1995) were the following:

- Caribou Lures, Dorval, Quebec
- D & D Lures, Windsor, Ontario
- Gibbs/Nortac, Burnaby, British Columbia
- Peetz Mfg. Co., Victoria, British Columbia
- Radiant Lures, Victoria, British Columbia

¹⁰ Example illustrations from Wingsing Fishing Tackle Manufacturer: <http://www.wsfishing.com/>

¹¹ <http://www.ic.gc.ca/app/ccc/srch/>

The researchers found that few, if any, of these companies make only sinkers or jigs. Sinkers accounted for <5–20% of total annual sales, depending on the company. From the information that they were able to obtain, Scheuhammer and Norris (1995) estimated that a maximum of about 40 tonnes of lead sinkers were produced annually by fishing tackle companies in Canada.

Table 1 provides a list of the major Canadian manufacturers of sinker and jigs that have been identified.

Table 1. Major Manufacturers of Sinkers and Jigs in Canada

Company Name	Province	Products and Company Profile	Size	Web	Supply Lead and/or Alternatives
Balo Industries	AB	Balo Industries was formed in 1960 to manufacture high quality solid brass fishing spoons for the sport fishing markets in Canada and the United States. In addition to the various spoons, Balo Industries manufactures and supplies a wide variety of other sport fishing tackle for game fish. Currently, distribution is handled through wholesale distributors, jobbers and large volume buyers with sales in Japan, the United States, Australia, Norway, Sweden, and New Zealand. Exports are \$500,000 to \$999,000 indicating 25% to 50% of production may be exported. No reply to request for information.	SME: 17 employees; sales \$1-5 million	www.balindustries.ca	Non-lead alternatives
Brecks International Inc.	Quebec	Fishing lures, tackle manufactured in Sherbrooke plant (NAICS 339920 - Sporting and Athletic Goods Manufacturing): Brands are: Williams, Mooselook, Maxima, Lake Clear, Mepps, Savant spoon, mister twister. Industry Canada Canadian Company Capabilities database provides sales data for this company. Also an importer of fishing tackle. No reply to request for information.	SME: 15 employees / Sales \$1-5 million	www.brecksinc.com	Non-lead alternatives
Buzzbomb & Zzinger Lures, Inc.	BC	Buzz bomb is lead alloy bodied jig-type lure - 'best-selling jig-type lure in North America'; Zzinger lead alloy bodied jig type lure that represents fat-bodied baitfish. Listed under NAICS 339920 Sporting and athletic goods manufacturing Exports \$200,000 to \$499,999 per year – indicates that they export approximately 50% of production (Industry Canada Canadian Company Capabilities Database)	SME: 8 employees / sales \$0.5-1 million	www.buzzbombzzinger.com	Lead
Caribou Inc	QC	Lead products listed here: http://caribou.ca/index.php?main_page=index&cPath=25_6 - also responded to Scheuhammer study 1995 & listed IC CCC 2016 (NAICS 339920 - Sporting and Athletic Goods Manufacturing). Now entering its 34th year in the fishing industry, Caribou Inc. is one of the world leaders in fishing lure manufacturing and export. We specialize in providing premium products that set the standard for top producing jigs and baits; Brand is JIG-A-JO® family of products, also produce a range of other products including bug spray.	SME: 15 employees / sales \$0.5-1 million	www.caribou.ca	Lead
D&D Lures	ON	Company profile states: D&D Lures is an OEM manufacture specializing in centrifugal castings of Lead, Tin, Bismuth for the fishing tackle trade. We have in house 2000 molds for various jigs, sinkers, ice lures, spinnerbaits & many more. We also custom mold for many companies using your lure or idea's. We use MUSTAD hooks & Components vinyl chip proof paints. We can upgrade any jig by using Red Chrome or Black Nickel Mustad Ultra point hooks. D&D can also provide private label	SME	http://www.ddlures.20m.com/	Lead

Company Name	Province	Products and Company Profile	Size	Web	Supply Lead and/or Alternatives
		packaging using printed on zip lock bags or clamshell packaging, Under your name or D&D Lures. We currently make over 2 million pcs per year			
Gibbs Fishing Tackle (Gibbs-Nortac / Gibbs-Delta Tackle) / Thompson Lures	BC	Gibbs/Nortac Industries Ltd. has been a leading Canadian manufacturer of quality fishing tackle since 1908. Gibbs manufactures a full line of sports and commercial fishing tackle, sports fishing nets, accessories and lead fishing sinkers. In addition, Delta Tackle, Zak Tackle and Rhys Davis Teasers products are produced and distributed through this location. Export sales are \$500,000 to \$999,999 (Industry Canada Canadian Company Capabilities Database). Manufacturer that lists lead sinkers and jigs on their website here: Lead sinkers and jigs: https://www.gibbsdeltacom/lead Supply primarily BC, with some retailers in AB and SK: https://www.gibbsdeltacom/store-locator . Distributed by REDL Sports.	SME: 25 employees / Sales \$1-5 million	www.gibbsdeltacom	Mainly lead, some alternatives
Jim's Jigs and Tackle Ltd	AB	Manufactures lead sinkers and jigs. Products distributed by REDL Sports.	SME: Sales \$500,000	See product listing on REDL: www.REDLSports.com	Mainly lead, some alternatives
Lucky Strike Bait Works	ON	Lucky Strike supplies over two thousand different fishing tackle related items to buyers, mainly in Canada, but has annual exports to the United States, Great Britain, and Scandinavian countries.	SME: 15 employees / Sales \$1-5 million	http://www.luckystrikebaitworks.com	Discontinued sinker and jig production; some products may still be in retail inventories/available for sale, or still in use
Peetz Outdoors Ltd.	BC	Manufactures sinkers - listed as sinkers mfr under IC CCC profile.	SME: Sales \$0.5 to 1million	www.peetzoutdoors.com	Lead
Radiant Lures Ltd	BC	Radiant Lures has offered a superior line of fresh and saltwater trolling and casting lures since 1967. Founded by fishing experts, Radiant Products continues to be top producers for all types of fish, year round. No response to request for information.	SME	No website; sold by www.tyeetackle.com	Lead
Redwing Tackle	BC	Fishing tackle manufacturer that supplies Blackbird split shot brand sinkers sold by Canadian Tire. Products also sold by Bass Pro shops, and independent sporting goods shops. No response to request for information.	SME	http://redwingtackle.com	Lead
Scott Plastics Ltd. (Scotty)	BC	Sell lead fishing weights Appear to be only larger cannonball type weights (e.g. downrigger weights). Do not sell directly to the public - dealers/retailers across Canada. Also use plastics in manufacture of fishing lures. Also an importer of fishing tackle. Scott Plastics Ltd. started	SME: 90 employees / Sales \$10-25	http://www.scotty.com/	Lead (phasing out product line)

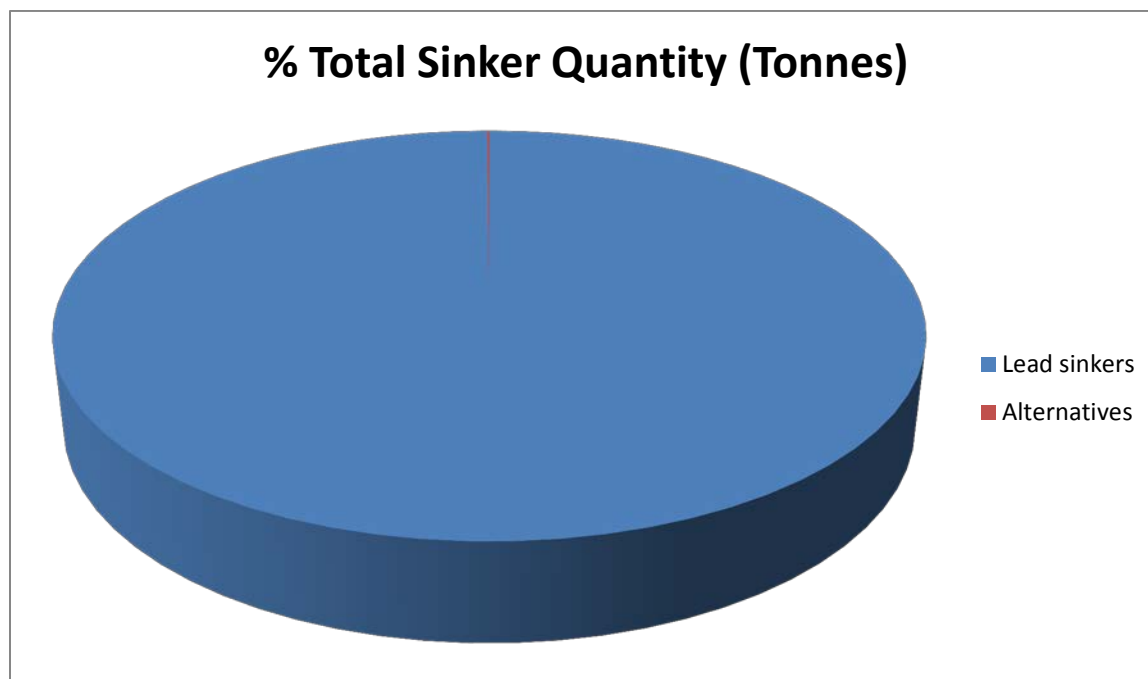
Company Name	Province	Products and Company Profile	Size	Web	Supply Lead and/or Alternatives
		<p>manufacturing plastic injection moulded products in Victoria in 1952. In sixty five years of business the company has developed into one of the major suppliers of sport fishing and marine accessory equipment. Scott Plastics manufactures the 'Scotty' range of manual and electric downriggers, rodholders and related sports fishing equipment. The company also produces a range of marine products for the leisure boat market, as well as a line of firefighting products including nozzles, educators and pump and backpacks. 70% export sales to the United States, through its company. Scotty Inc. and to Europe, Japan, South African, and S.E. Asia. (IC CCC).</p>	million		

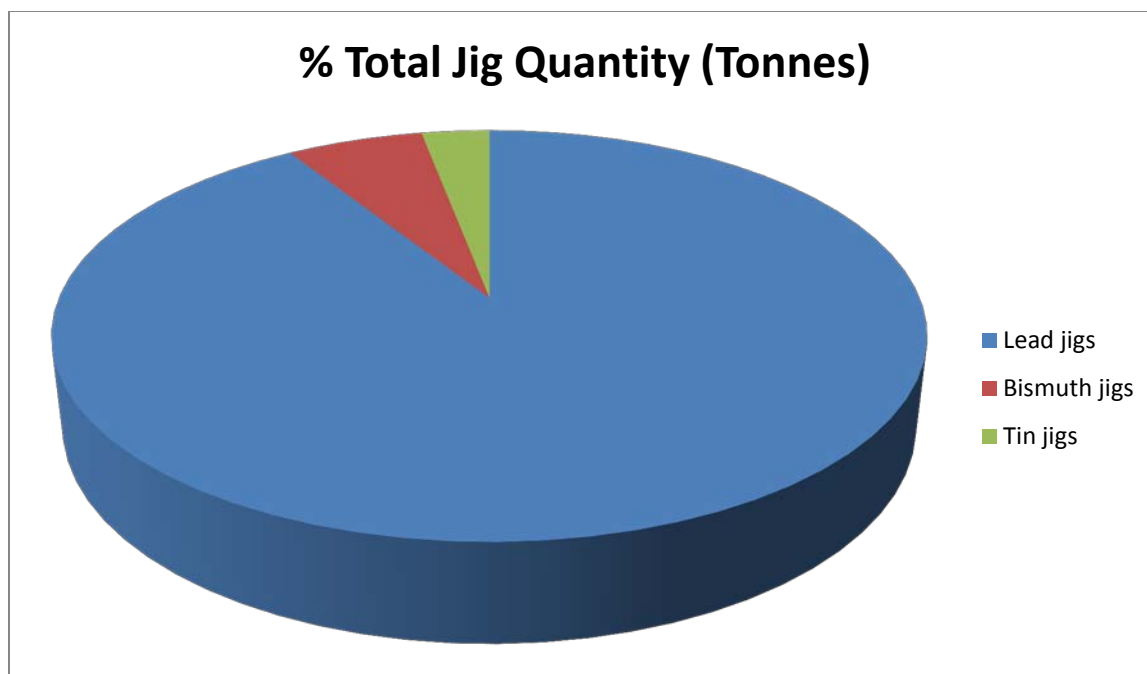
Several of the major retailers also sell sinkers and jigs under their own brand name e.g. Cabelas and Bass Pro Shops sell a range of jig products under their own brand name. These could be sourced from an overseas manufacturer and/or some custom manufactured in Canada. These retailers did not respond to requests for information so it is currently difficult to clarify who manufactures these products for the retailers.

Scheuhammer and Norris (1995) estimated that approximately ~40 tonnes of lead sinkers were manufactured in Canada based on reports from manufacturers. The quantity of lead-headed jigs manufactured in Canada was not estimated in the Scheuhammer and Norris (1995) study. In an update to this study, Schuehammer et al., (2003) concluded that domestic manufacture of lead sinkers had not changed substantially in the intervening years (Scheuhammer et al., 2003).

We confirmed that 50.3 tonnes of lead are currently used annually in the domestic manufacture of sinkers and jigs with 29 tonnes used in production of sinkers and 21.3 tonnes used in production of jigs. Several domestic manufacturers that supply major retailers with lead sinkers and jigs (e.g. Gibbs Delta and Redwing Tackle) did not respond to request for information. A survey of Gibbs Delta products in stores and online indicates that the vast majority of the lead sinkers and jigs supplied by this company are manufactured in China. Much smaller amounts of alternatives were used (0.7 tonnes bismuth and 0.7 tonnes tin) in the manufacture of jigs in Canada. One manufacturer indicated that they used <20lb per year of non-lead materials for production of sinkers, all other sinker manufacturers reported using lead in production of sinkers. The quantity of lead vs alternatives used for sinker and jig production in Canada is summarized in Figure 5.

Figure 5. Percentage of domestic production of sinkers and jigs that is lead vs alternatives





Note that individuals can make their own sinkers and jigs for personal use and/or to sell to others. The quantities of production associated with this informal cottage industry are unknown and very difficult to quantify. Responses to the survey of anglers indicate that <10% of anglers make their own sinkers and jigs (Angler Survey, 2017).

2.2 Sinkers/Jigs Importers

In developing the profile of importers we focus initially on major importers that control the majority of the market in Canada. Major importers in this market are expected to be overseas manufacturers of sinkers and jigs, wholesale distributors of fishing supplies, and retailers of fishing supplies and sporting goods.

Some importer information can be obtained from publicly available sources (e.g. Industry Canada databases e.g. Canadian Importers Database (CID)) and was assessed to identify major importers. The available CID data is limited to the HS 6-digit level which encompasses a wide variety of fishing/hunting supplies limiting its value for identifying importers of sinker/jigs specifically. In addition, detailed data were provided by CBSA via a confidential data request. The publicly available data from Industry Canada's Canadian Company Capabilities (CCC) database is summarized in Table 2 below. Of the 39 companies identified only a subset were determined to be relevant to sinkers and jigs (see notes column of Table 2)

Table 2. Importers of Fishing Tackle, Nets, and other fishing/hunting requisites (HS 950790)

Company Name	City	Province	Notes	Lead or non-lead
ALTAN SAFE OUTDOORS INC.	Markham	Ontario	Not relevant: No sinkers or jigs on web site product listing: http://www.altansafeoutdoors.com/accessories.aspx	Not relevant to this study

Company Name	City	Province	Notes	Lead or non-lead
BARON PRODUITS DE PLEIN AIR LTEE (note: owned by SAIL Outdoors)	Montréal	Quebec	Relevant: Although Baron store itself is listed as 'going out of business' the store was bought by SAIL outdoors that continues to operate and sells lead sinkers and jigs at its stores.	Lead and non-lead
BASS PRO SHOPS CANADA ULC	Concord	Ontario	Relevant: Major retailer: sells sinkers and jigs (bought Cabelas in 2016)	Lead and non-lead
BG DISTRIBUTION & MARKETING	North York	Ontario	Relevant: Manufacturer/supplier of Lunker hunt brand fishing products: http://www.bgdmgroup.com/	Lead and non-lead
BLACK'S FLIES LTD.	Winfield	British Columbia	Not relevant: wholesale distributor specializing in premium hand tied fishing flies	Not relevant to this study
BRS CANADA ACQUISITION INC.	Winnipeg	Manitoba	Not relevant: Mainly distributor of firearms	Not relevant to this study
BUSHNELL CORPORATION OF CANADA	Concord	Ontario	Not relevant to sinkers and jigs	Not relevant to this study
C.G. EMERY INTERNATIONAL LIMITED	Markham	Ontario	Relevant: Supplies fishing supplies including lead sinkers to 300 locations across Canada: http://fishingandhuntingheaven.com/fishing/sinkers/bulk	Lead and non-lead
CANADIAN TIRE CORPORATION , LIMITED	Brampton	Ontario	Relevant: Major retailer: sells sinkers and jigs	Lead and non-lead
CONTINENTAL SPORTS INC	Winnipeg	Manitoba	Relevant: Wholesale distributor of fishing supplies including sinkers and jigs: http://csisports.ca/	Lead and non-lead
DIRECT FACTORY SALES LIMITED	Toronto	Ontario	Relevant: May be relevant as supplier of fishing tackle.	Lead and non-lead
DISTRIBUTION NIGAVA INC	Saint-Nicolas	Quebec	Not relevant: No sinkers and jigs in product listing. Specializes in flies.	Not relevant to this study
DISTRIBUTION PLEIN AIR	Laval	Quebec	Not relevant: No sinkers and jigs in product listings. Specializes in hunting supplies.	Not relevant to this study
DOLLARAMA S.E.C./DOLLARAMA L.P.	Montréal	Quebec	May be relevant as sells wide variety of products, but no evidence of sinkers and jigs	Not relevant to this study
ETIC PRODUITS PLEIN-AIR INC. / ETIC OUTDOOR PRODUCTS INC.	Sainte-Croix	Quebec	Relevant: Brand name of some sinkers/jigs	Lead and non-lead

Company Name	City	Province	Notes	Lead or non-lead
EVERGOING PRODUCTS GROUP, LLC	Kent	Washington	Not relevant: No sinkers and jigs in product listings.	Not relevant to this study
FLY ANGLER DISTRIBUTION INC.	Surrey	British Columbia	May not be relevant: No sinkers and jigs in product listings.	Not relevant to this study
GIBBS/NORTAC INDUSTRIES LTD.	Delta	British Columbia	Relevant: Major manufacturer/supplier of sinkers and jigs	Lead and non-lead
HI-LINER FISHING GEAR AND TACKLE COMPANY	Halifax	Nova Scotia	Not relevant: No sinkers and jigs in product listings.	Not relevant to this study
JOHNSON OUTDOORS CANADA INC.	Burlington	Ontario	Not relevant: No sinkers and jigs in product listings.	Not relevant to this study
KOPPERS FISHING AND TACKLE CORP.	Niagara on the Lake	Ontario	Not relevant: No sinkers and jigs in product listings	Not relevant to this study
KTL CANADA INC.	Mississauga	Ontario	Relevant: Fishing tackle distributor recently bought by Big Rock Sports Canada ¹²	Lead and non-lead
LUCKY STRIKE BAIT WORKS LIMITED	Cavan Monaghan	Ontario	Relevant: Major manufacturer/supplier of sinkers and jigs	Non-lead
MAGASIN LATULIPPE INC.	Québec	Quebec	Relevant: Sinkers and jigs in product listings ¹³	Lead
MAURICE SPORTING GOODS DISTRIBUTOR INC (REDL)	Chicago	Illinois	Relevant: Large wholesale distributor of sinkers and jigs to numerous retailers across Canada	Lead and non-lead
NORMARK INC. (Now called Rapala)	Oshawa	Ontario	Not relevant: No sinkers and jigs in product listings: https://rapala.ca/products	Not relevant to this study
PACIFIC NET & TWINE LTD.	Richmond	British Columbia	Not relevant: No sinkers and jigs in product listings	Not relevant to this study
PUREFISHING CANADA	Brantford	Ontario	Not relevant: No sinkers and jigs in product listings: www.purefishing.com	Not relevant to this study
REDL SPORTS (Maurice - same parent company)	Northbrook	Illinois	Relevant: Large wholesale distributor of sinkers and jigs to numerous retailers across Canada	Lead and non-lead
S.I.R. MAIL ORDER (Cabelas)	Winnipeg	Manitoba	Relevant: Major retailer: Sells sinkers and Jigs	Lead and non-lead
SAIL	Laval	Quebec	Relevant: Major retailer: Sells sinkers and Jigs	Lead and non-lead

¹² <http://fishingtackleretailer.com/big-rock-sports-canada-acquires-ktl-canada/>

¹³ <http://www.latulippe.com/fr/catalogue/peche/greements-de-peche/plombs/>

Company Name	City	Province	Notes	Lead or non-lead
SCOTT PLASTICS LTD. (Scotty)	Sidney	British Columbia	Relevant: Manufacturer/supplier of sinkers	Lead, but phasing out product line
SERVICE DE GUIDE MAGNUM/MAGNUM MARKETING	Montréal	Quebec	Not relevant: No sinkers and jigs in product listings: www.magnummarketing.net	Not relevant to this study
SHIMANO CANADA LTEE SHIMANO CANADA LTD .	Peterborough	Ontario	Not relevant: International manufacturer and distributor of cycling and fishing equipment and accessories: no sinkers or jigs: www.shimano.com	Not relevant to this study
SOCIETE BRECK'S INTERNATIONALE INC	Sherbrooke	Quebec	Relevant: Manufacturer/supplier of sinkers/jigs	Non-lead
SUPERFLY INTERNATIONAL INC.	Edmonton	Alberta	Not relevant: No sinkers and jigs in product listings: www.simplysuperfly.com	Not relevant to this study
THE FISHIN' HOLE (1982) LTD	Edmonton	Alberta	Relevant: Retailer of sinkers and jigs: Several retail locations in AB: /www.thefishinhole.com	Lead and non-lead
THE GASPE FLY CO. INC./LA CIE DE MOUCHES GASPE INC.	Blainville	Quebec	Not relevant: No sinkers and jigs in product listing: Specializes in flies: http://gaspefly.com/	Not relevant to this study
WHOLESALE SPORTS CALGARY	Calgary	Alberta	Relevant: Major retailer: Sells sinkers and Jigs	Lead and non-lead

Source: Industry Canada CID database: Major Importers under HS 950790 Fishing Tackle, Nets, And Other Fishing/Hunting Requisites 2014 (latest data available, CID listing accessed Oct 2016). Value of imports in 2014 for HS 950790: C\$56.7 million with above importers responsible for 80.2% of these imports.

The importers relevant to fishing sinkers and jigs are primarily retailers or wholesale distributors. The following table provide a summary of importers that are retailers vs those that are wholesale distributors (see Table 3).

Table 3. Importers – Retailers vs Wholesale Distributors (HS950790)

Retailers	Wholesale Distributors
<ul style="list-style-type: none"> • BARON PRODUITS DE PLEIN AIR LTEE (note: owned by SAIL Outdoors) (QC) • BASS PRO SHOPS CANADA ULC (ON) • CANADIAN TIRE CORPORATION, LIMITED (ON) • MAGASIN LATULIPPE INC. (QC) • S.I.R. MAIL ORDER (CABELAS) (MB) • SAIL OUTDOORS (QC) • THE FISHIN' HOLE (1982) LTD (AB) • WHOLESALE SPORTS CALGARY (AB) 	<ul style="list-style-type: none"> • BG DISTRIBUTION & MARKETING (ON) • C.G. EMERY INTERNATIONAL LIMITED (ON) • CONTINENTAL SPORTS INC (MB) • ETIC PRODUITS PLEIN-AIR INC. / ETIC OUTDOOR PRODUCTS INC.* (QC) • GIBBS/NORTAC INDUSTRIES LTD.* (BC) • KTL CANADA INC. (ON) • LUCKY STRIKE BAIT WORKS LIMITED*(ON) • REDL SPORTS/ MAURICE SPORTING GOODS DISTRIBUTOR INC (US) • SCOTT PLASTICS LTD* (BC) • SOCIETE BRECK'S INTERNATIONALE INC (QC)
Total Importing Retailers: 8	Total Importing Wholesale Distributors: 10

*Also a manufacturer

The publicly available data on imports does not allow us to determine the relative quantities of imports for each of the above importers. However, it appears that retailers are directly responsible for significant quantities of imports under this HS code and directly import some of the fishing supplies that they sell.

The wholesale distributors import fishing supplies and then supply stores across Canada including the major retailers and also the smaller independent retailers. For example, REDL /Maurice Sporting Goods¹⁴ is the largest sporting goods distributor in North America with annual revenues of >\$9 million, employing >750 people, and it supplies over 1,400 vendors and 15,000 stores fronts including larger retailers such as Bass Pro Shops, Cabelas, Canadian Tire, Walmart as well as smaller local retailers, and online retailers (e.g. Amazon, ebay)¹⁵. It is expected that REDL/Maurice Sporting Goods is a major distributor of fishing sinkers and jigs in Canada however this company has not responded to requests for information.

The overall geographical distribution of importers is provided in the following table (see Table 4).

Table 4. Geographical Distribution of Major Importers (HS950790)

Importer HQ location by Province (based on CID importer of record address)	Number of Importers		
	Retailers	Wholesale distributors	Total
ON	2	4	6

¹⁴ REDL Sports – a BC-based sporting goods distributors was acquired in 2011 by Maurice Sporting Goods a US-based distribution company with Canadian corporate HQ in Ontario, combined these companies carry >50,000 products and are the largest fishing supplies distributor in Canada: www.redlsports.com

¹⁵ Vendors include fishing sinkers and jigs manufacturers, and customers include larger format stores such as Bass Pro Shops, Cabelas, Walmart, smaller locals shops and online retailers: <http://www.maurice.net/>

QC	2	2	4
MB	0	1	1
AB	2	0	2
BC	0	2	2
USA-based importers	0*	1	1

Source: Industry Canada, Canadian Importers Database (CID) latest data available (2014). Publicly available data covers major importers only i.e. those responsible for 80% of total import value under this HS Code. For companies with multiple retail operations in different regions the importer location is based on the location of the company HQ. *Note that REDL Sports was acquired by US-based Maurice Sporting goods in 2011 although the REDL HQ remains in BC and Bass Pro Shops which bought Cabelas Canada (importing under S.I.R Mail Order) in Oct 2016 is a US-based company, Cabelas HQ remains in AB.

The top importers (based on total import value) of fishing tackle (2015) and Fishing Sinkers (2015) are provided in Table 6a and b below.

Table. 5a. Top Ten Importers of Fishing Tackle (2015)

Importer Name ¹⁶	Total Value of Imports (C\$)	Company Type
Outdoor Technologies (Outdoor) Inc.	\$1,000,000- 10,000,000	Distributor/ Wholesaler ¹⁷
Maurice Sporting Goods Distributor Inc	\$1,000,000- 10,000,000	Distributor/Wholesaler
Maurice Sporting Goods, Inc	\$1,000,000- 10,000,000	Distributor/Wholesaler
Cabela's Retail Inc.	\$1,000,000- 10,000,000	Retailer
Bass Pro Shops Canada ULC	\$1,000,000- 10,000,000	Retailer
Shig's Enterprises Limited	\$1,000,000- 10,000,000	Unknown
Sail Plein Air Inc. Sail Outdoors	\$1,000,000- 10,000,000	Retailer
Wholesale Sports Canada Ltd.	\$1,000,000- 10,000,000	Retailer
W.C. Bradley/Zebco ¹⁸ Holding Inc	\$1,000,000- 10,000,000	Manufacturer/Distributor
Magasin Latulippe Inc.	\$100,000- 1,000,000	Retailer

Notes: These are the top ten importers of fishing tackle into Canada in 2015 based on data received from CBSA. The import codes covered include sinkers and jigs but also many other fishing tackle products and hence this list is not specific to sinker/jig imports.

¹⁶ As stated in the data provided by CBSA – note importers use varying names when importing hence names may vary for different imports for the same company based on what name they used on the bill of lading.

¹⁷ <http://www.manta.com/ic/mt6cd7s/ca/outdoor-technologies-canada-inc>

¹⁸ <http://www.zebcobrand.com/>

Table. 5b. Top Importers of Fishing Sinkers (2015)

Importer Name ¹⁹	Total Value of Imports (C\$)	Company Type
Maurice Sporting Goods Distributor Inc	\$100,000 – 1,000,000	Distributor/Wholesaler
Cabela's Retail Inc.	\$100,000 – 1,000,000	Retailer
Bass Pro Shops Canada ULC	\$10,000 – 100,000	Retailer
Le Baron Outdoor Products Ltd. (Sail)	\$10,000 – 100,000	Retailer
Maurice Sporting Goods Inc.	\$10,000 – 100,000	Distributor/Wholesaler
Wholesale Sports Canada Ltd.	\$10,000 – 100,000	Retailer

Notes: These are the top importers of fishing sinkers into Canada in 2015 based on data received from CBSA.

The product directories of major suppliers/retailers such as Canadian Tire, Walmart, Cabela's/Bass Pro Shops (amongst others) provide product listings of sinkers and jigs that they sell in Canada along with the names of the manufacturers. For example, Canadian Tire, Walmart, and Cabelas all list Danielson Outdoors lead sinkers and jigs²⁰ in this case the manufacturer 'Danielson Outdoors'²¹ is US-based and the retailer or the manufacturer may be the importer. Since Danielson Outdoors does not appear among the list of publicly available importers it can be assumed that the importer is either the retailer or a wholesale distributor that supplies the retailers. Water Gremlin is also a US-based supplier of lead sinkers and important in the Canadian market²².

The following Table 6 profiles a profile of the major wholesale distributors of fishing sinkers and jigs in Canada. All these distributors were contacted for information on imports and distribution of fishing sinkers and jigs in Canada but none provided data for this study. The major US-based manufacturers important in the Canadian market (e.g. Water Gremlin and Danielson Outdoors), whose products are carried by these distributors, were also contacted directly for information but also did not respond to requests for information. Stakeholders (including manufacturers, importers, distributors, retailers, and end-users) in this market are extremely reluctant to voluntarily provide data for this analysis and are suspicious of the intent of the study - they appear to think that any data they provide will be used to justify a ban or restriction on lead sinkers and jigs. There is a great deal of overlap between the stakeholders active in the hunting and fishing sector and there has been a similar negative response to requests for information on lead ammunition sales and uses in Canada. Given this reluctance to provide data voluntarily ECCC could consider using CEPA Section 71 to require mandatory reporting of the required information.

¹⁹ As stated in the data provided by CBSA – note importers use varying names when importing hence names may vary for different imports for the same company based on what name they used on the bill of lading.

²⁰ e.g. Danielson sinkers for example see <http://www.canadiantire.ca/en/sports-rec/fishing/terminal-tackle/sinkers.html>; <http://www.cabelas.ca/category/weights/692>

²¹ The Danielson® Company | 4510 'B' Street NW | Auburn, WA 98001| Phone: 253.854.1717 | FAX: 253.852.2794 | E-mail: danielson@danielsonoutdoors.com

²² Based on retailers product listings and V. Thomas, pers. comm. 11 Oct 2016)

Table 6. Major Wholesale Distributors of Fishing sinkers and Jigs in Canada

Company Name	Details	Street Address	City	Province	Postal Code	Web	Size	And/or non-lead
A.J. Pope Sports Agency	Distributor for Water Germlin sinkers and jigs	27 Meadowalk Road	Barrie	ON	L4M 6E1		SME	Lead and non-Lead
BGDM Group (BG Distribution and Marketing)	Importer and distributor specializing in outdoor sporting supplies. Retail partners include Brass Pro Shops, Cabela, Canadian Tire, SAIL Outdoors, Sportsman's Warehouse, Tackle Warehouse, amazon.ca	42 Laird Drive	Toronto	ON	M4G 3T2	http://www.bgdmgroup.com/	Warehouses in Canada, US and UK No employment or sales data available.	Lead and on-lead
C.G. Emery International	Importer and distributor wholesale sporting goods – sells to 300 retail location across Canada	165 Idem a Road	Markham	ON	L3R 1A9	https://fishingandhuntingheaven.com/fishing	SME: 11 employees; <\$2 million sales	Lead and non-lead
Continental Sports Inc	Wholesale distributor specializing in fishing tackle (other products also prodided) – primary customer is the Independent Retailer ranging from the large full line retail chain stores to tackle shops	2-1460 Chevrier Blvd.	Winnipeg	MB	R3T 1Y6	http://csisports.ca/	SME: 36 employees	Lead and non-lead
Tim Bailey and Associates, Inc.	US Distributor with warehouse in Canada in BC. Distributor for the Danielson Company (US-based fishing sinkers and jigs manufacturer) in Canada	HQ California, USA	Surrey	BC	V3S 1V1	http://www.tim-bailey.com/territory.html	SME: 36 employees	Lead and non-lead
REDL / Maurice Sporting Goods	Largest hunting/fishing supplies distributor in North America. Maurice Sporting Goods (US-based) acquired Canadian distributor REDL Sports in 2011.	19100 Airport Way, Unit 516	Pitt Meadows	BC	V3Y 0E2	http://www.redl.com/content.aspx?file=customerpages/about.htm	Large: >750 employees; >\$9 million in sales (REDL sales)	Lead and non-Lead

2.2.1 Quantity of Sinkers Imported

To estimate the quantity of sinkers imported into Canada in recent years we conducted an assessment using data on sinker imports for 2011-2015 from CBSA. In this analysis we used the average price per tonne for lead (C\$ per tonne) for each year 2011-2015. Prices for lead ranged from ~C\$2000 to C\$2500 during this time period (e.g. see Figure 6 below). We also used annual import data that indicated total imports of sinkers reported to CBSA ranged from \$892,629 to \$1,596,306 during the 2011-2015 period (CBSA data). In examining the raw data from CBSA we noted that a number of companies included in the original list of sinker importers were not involved in the fishing sinker supply chain – these were therefore removed from the dataset. This resulted in the total value of imports for fishing sinkers being reduced to \$444,160 to \$849,130 per year. The estimated total quantity of sinkers imported into Canada is provided in Table 7. This estimate assumes that the vast majority of sinkers imported into Canada are made of lead.

Figure 6: Illustration of Fluctuations in the Price of lead 2012-2016 (C\$ per tonne)



Source: Investment Mine: 5-year lead prices and price charts: <http://www.infomine.com/investment/metal-prices/lead/5-year/>

The following table provides estimates for the total quantity of sinker imports for 2011-2015 based on the total value of fishing sinker imports and the average annual price of lead for each year (see Table 7).

Table 7. Total quantity of Sinkers imported into Canada 2011-2015

Year:	2011	2012	2013	2014	2015	Average 2011-2015
Sinker imports per year (C\$) ²³	444,160	415,336	729,915	849,901	835,130	654,888
Average price of lead (C\$ per tonne) ²⁴	2,369	2,060	2,202	2,313	2,282	2,246
Total quantity of sinkers (tonnes)	187	202	331	367	366	291

Using the same approach described above, and data that indicates total import values in the 1988-1993 period were ~\$465,000²⁵, while average lead prices during that period were ~C\$1,000 per tonne (USGS, Historical Lead Price Data²⁶), we estimated that ~465 tonnes of sinkers were imported annually on average into Canada during the 1988-1993 period (see Figure 7a). In the 2011-2015 we observe imports of ~200 tonnes in 2011 and 2012, and then an average of 355 tonnes per year for 2013-2015 (see Figure 7b).

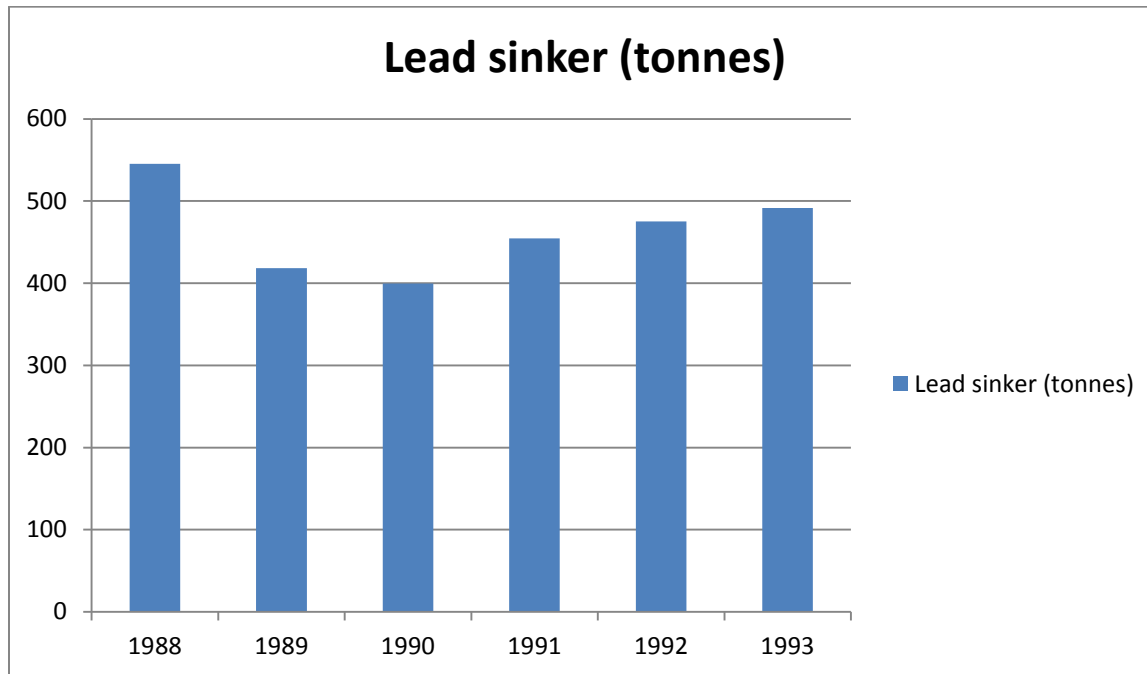
²³ Data from CBSA for HS 9507909910 Fishing sinkers. Companies not relevant to fishing sinkers were removed from the list before analysis. A total of 13 companies were excluded.

²⁴ Average price of lead per year: <http://www.indexmundi.com/commodities/?commodity=lead&months=120¤cy=cad>

²⁵ Scheuhammer and Norris 1995. Authors state that the sinker import data they used in their analysis were obtained from CBSA. However, the price of lead used by Scheuhammer and Norris in their 1995 analysis is not referenced and does not appear to match with historical lead prices. We therefore used the import data from the 1995 study and updated the calculation using accurate prices for lead for the time when those imports entered Canada (Scheuhammer and Norris used \$0.027/g whereas the average price of lead 1988-93 was \$0.001/g). Although Scheuhammer et al (2003) updated this analysis in 2003 they used the same unreferenced and inaccurate price for lead as used for 1988-93. The total import values cited in the 2003 study vary very dramatically year to year (by >85%) without explanation and – without access to the raw import data used by Scheuhammer et al (2003) we cannot determine why these wide fluctuations from year to year occurred. It should be noted that when using import data it is important to confirm as far as possible that the imports are specific to the products of interest. Errors in import data can occur for several reasons, for example, importers can use the wrong HS in error on the bill of lading at import or include multiple products under one HS code with only some of the imported products being accurately described by the HS code. In these cases it is important to identify which imports are clearly not relevant to the products under study and remove them from the total before further analysis. The wide fluctuation in the annual import data described by Scheuhammer et al 2003 indicate to us that non-sinker imports are included with sinker imports in some years in error. We have not used the additional import values cited in the 2003 paper due to these concerns.

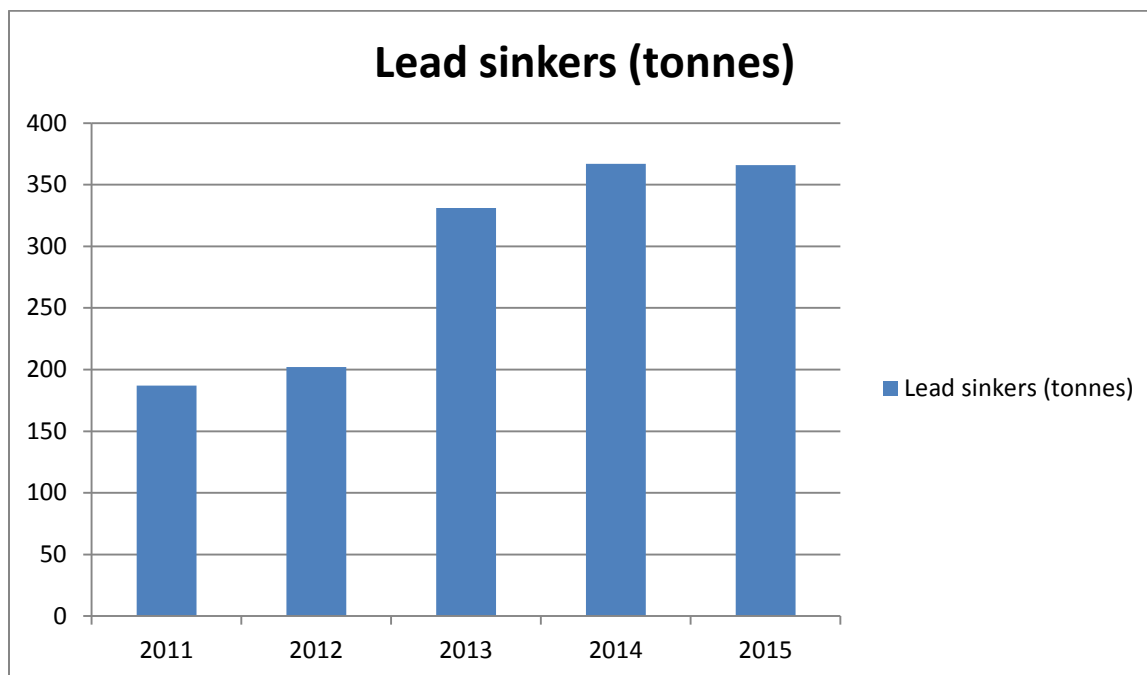
²⁶ Metal prices in US through to 1998: <https://minerals.usgs.gov/minerals/pubs/commodity/lead/380798.pdf>; converted to Cdn dollars using the average exchange rate during 1988-1993 which was 1 USD: 0.77 C\$: <http://fx.sauder.ubc.ca/etc/CADpages.pdf>

Figure 7a. Annual quantity of sinker imports 1988-1993



Source: Based on total value of sinker imports (1988-1993) from (1) Statistics Canada (1999) as referenced in Scheuhammer and Norris (1995) with a recalculation of quantity based on accurate lead pricing for the 1988-1993 period; (2) Based on CBSA import data for fishing sinkers for 2011-2015.

Figure 7b. Annual quantity of sinker imports 2011-2015



Source: Based on CBSA import data for fishing sinkers for 2011-2015 and the average price of lead 2011-2015.

Our estimates of imports based on CBSA data are lower overall than those of Scheuhammer and Norris (1995) for the 1988-93 period. However, prior to excluding companies from the CBSA dataset that we identified as not being relevant for fishing sinkers, the CBSA total import value for sinkers was comparable (2011-2012) or higher (2013-2015) than the Scheuhammer and Norris (1995) estimates. It is unclear whether Scheuhammer and Norris (1995) confirmed the CBSA dataset they received contained only companies relevant to fishing sinkers. Some importing companies may have used the ‘fishing sinker’ HS code in error when importing similar types of metal products/weights – but ones not used in fishing – resulting in an overestimation of the total value of fishing sinker imports for 1988-93.

Although Scheuhammer and Norris (1995) and Scheuhammer et al., (2003) concluded that most lead sinkers were manufactured in Canada rather than imported our re-analysis of import data from that period indicates that most sinkers were imported during that time. For the 1988-93 period approximately 460 tonnes of sinkers were imported based on the total value of imports²⁷ and 40 tonnes were manufactured in Canada hence >90% of demand was met with imports. The average quantity of imported sinkers 2013-2015 was estimated to be 355 tonnes and total domestic manufacturing of lead sinkers in 2016 was 29 tonnes²⁸ indicating imports cover >90% of sinker demand in Canada in recent years. Our re-analysis of import data used by Scheuhammer *et al.* indicates that this situation, with imports dominating the market, has remained largely unchanged since 1988.

2.2.2 Countries of Origin

In general terms, most fishing tackle imports come from China (e.g. 52% of imports were from China in 2015 based on total value of imports, and 31% were from the US). Based on fishing tackle imports overall (under HS codes 9507).

Most imports of fishing sinkers originate in China and the US, with smaller quantities from Taiwan. These three countries are responsible for >90% of fishing sinker imports into Canada (see Table 8). Import quantities from other countries are very small in comparison.

Table 8. Imports of Fishing Sinkers: Percentage of Total Imports by Country of Origin

Country of Origin	2011	2012	2013	2014	2015
China	53%	45%	59%	60%	50%
USA	28%	33%	28%	24%	32%
Taiwan	12%	13%	4%	9%	6

Source: CBSA data 2011-2015

2.3 Sinkers/Jigs Major Retailers

The major retailers for fishing equipment and supplies, including sinkers and jigs, in Canada are the large big box stores/ outfitters i.e. Canadian Tire, Cabelas/Bass Pro Shops, Walmart, Wholesale Sports and SAIL Outdoors Inc. The major retailers of fishing sinkers and jigs in Canada are profiled in the following Table 9. The major retailers did not provide any data on their sales of sinkers and jigs for this study, hence we cannot provide information on total sales by major retailers, details on the relative importance of each retailer in the market, or details on the total quantities of each type of sinker/jig product sold by major retailers.

²⁷ Import value from CBSA as reported in Scheuhammer and Norris (1995)

²⁸ An additional 21.3 tonnes was used in lead jig manufacturing in Canada.

Table 9: Major Retailers Profile – All sell lead sinkers and jigs and non-lead alternatives

Company Name	Stores	Number Employees	Gross Annual Revenue
Canadian Tire Corporation Ltd	493 Stores across Canada, HQ in Toronto	27,772	\$12,462 million
Cabela's Canada& Bass Pro Shops (note US and Canadian operations of Cabelas bought by Bass Pro for \$2.25 billion in Oct 2016)	65 Stores in US and Canada combined. HQ in Winnipeg with 70,000-square-foot location at 25 de Baets St, Winnipeg, plus 10 stores in Canada: http://www.cabelas.ca/find-a-store	19,700	~\$500 million in Canada (Cabelas & Bass Pro); \$3 billion in sales for US and Canada combined
Wal-Mart Canada Corp	395 Stores across Canada. HQ for Wal-Mart Canada in Mississauga	89,358	\$6,500 Million
Wholesale Sports Outdoor outfitters "Canada's outdoor Outfitter Wholesale Sports" (subsidiary of United Farmers of Alberta (UFA) Co-operative Ltd; Acquired by UFA in 2008)	13 stores, e-commerce business and 470,000 square feet of retail space across British Columbia, Alberta, Saskatchewan and Manitoba. HQ in Calgary. Annual Report 2015 States "Wholesale sports is the largest multi-channel retailer in Western Canada dedicated to the outdoors"	501-1000	\$113 million (Wholesale Sports outdoor outfitters); \$1,591 million (UFA)
SAIL Outdoors Inc. (Owners of SAIL also bought Baron hunting and fishing stores; SAIL is branded as "the Outdoors Superstore" owners also operate Sportium sporting goods stores)	10 stores in QC and ON. SAIL stores can presently be found in Beloeil, Brossard, Burlington, Cambridge, Etobicoke, Laval, Oshawa, Ottawa, Quebec City and Vaughan. Currently offering the largest network of outdoor, camping, hunting and fishing stories in Eastern Canada, SAIL intends to pursue its development plans by opening additional stores in Quebec and Ontario in the near future.	>1000	~\$150 million

Fishing supplies, including sinkers and jigs, are also sold by numerous smaller retailers (e.g. fishing tackle supply shops, outfitters) across Canada. Responses to the survey of anglers so far indicate that >85% of respondents buy their sinkers and jigs from traditional storefronts (including major retailers and local outfitters/tackle shops), <5% buy them online, and <10% make their own.

2.4 Non-traditional Distributors of Sinkers/Jigs

As part of this study we sent out an electronic survey to anglers and received 240 responses. One of the questions on the survey requested details on where anglers buy their sinkers and jigs.

The results from the survey indicate that traditional storefronts appear to still be the primary source for anglers to buy sinkers and jigs, with non-traditional distribution being much less important in this market. Less than 9% of anglers who responded to the electronic survey of anglers indicated that they shopped for sinkers and jigs online. In addition, 8% of respondents indicated that they made their own sinkers and jigs at home, and 2% of respondents bought their sinkers/jigs from an individual that they knew e.g. through their fishing club.

Lead sinkers and jigs can be bought from the online sites of retailers that have both traditional storefronts and online purchasing options – all major retailers have both of these options (e.g. Bass Pro Shops/Cabelas, Canadian Tire, Walmart etc.). In addition, there are companies that sell sinkers and jigs that are exclusively online retailers (e.g. sinkers and jigs can be bought from online retailers focused on fishing supplies such as Tackle Warehouse²⁹, or online retailers that sell a wide variety of products such as amazon, ebay etc.)

Online sites such as amazon.ca and ebay sell lead sinkers and jigs^{30 31}. Third party vendors on online retail sites such as these can be individuals who make sinkers and jigs as a home-based business, micro or small companies, or larger manufacturers/retailers that may or may not also have a traditional storefront business. These vendors are diverse, numerous and can be based in Canada or elsewhere. Tracking and quantifying sales, and other details, of sinkers and jigs in Canada through all these online third party vendors would be an impossible task. Responses from the anglers survey so far indicates that online sales are a relatively small fraction of the current market.

²⁹ Large US-based online retailer of fishing tackle that sells sinkers and jigs: <http://www.tacklewarehouse.com/>

³⁰ Example of lead sinkers product listing on amazon.ca: https://www.amazon.ca/s/?ie=UTF8&keywords=lead+sinker&tag=googcana-20&index=aps&hvadid=79311501066&hvpos=1t1&hvnetw=s&hvrnd=9838597698783490345&hvpone=&hvptwo=&hvgmt=b&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9060815&hvtargid=kwid-89635778&ref=pd_sl_91f08w3ajk_b

³¹ Lead sinkers for sale on ebay: http://www.ebay.com/sch/?_nkw=lead+sinkers

3.0 Lead and non-lead sinkers and jigs products in Canada

3.1 Product description

Previous studies have noted that sinkers used in freshwater sport fishing range in weight from about 0.3 to 230 g and in length or diameter from about 2 mm to 8 cm. Although sinkers vary considerably in size and shape, there are a few common types used in freshwater angling: split shot, worm weights, egg sinkers, bass casting sinkers, and pyramid sinkers (USEPA 1994a). Split shot sinkers were estimated to account for almost half of total U.S. sinker production; and the majority of lead sinkers of all types were less than 2 cm in any direction (USEPA 1994a). Jigs are weighted hooks, often brightly painted and otherwise decorated, used as lures in sport angling. Like sinkers, they are made in a variety of shapes and sizes. Scheuhammer *et al.*, 2003 estimated that ~99% of sinkers used in Canada were made from lead at that time. The quantity of lead associated with each type of available sinker was not estimated and the quantity of lead associated with jigs was not studied (Scheuhammer *et al.*, 2003).

Waterbirds usually ingest smaller weights, weighing less than 50g and being smaller than 2 cm in any dimension.³² There are exceptions, however, as larger waterbirds can ingest larger-sized, heavier weights.³³ The weights that tend to be ingested are exclusively used for sport angling.³⁴ The sizes vary but the majority of these fishing weights have a size of less than 2 cm in any dimension.^{35,36} Ingestion of a single fishing weight can lead to acute or lethal lead poisoning.³⁷

Discussions with stakeholders indicate that the market for sinkers and jigs continues to be dominated by lead products. Domestic manufacturers indicate that they offer non-lead alternatives but that no-one wants to buy them. One company that does not sell any lead sinkers and jigs anymore said they used to carry bismuth jigs but when there was little interest in jigs made with alternative materials they simply discontinued the product line (retailer personal communication 2017). In this case, this product line was a minor one for the company since they sell a diverse range of other products. Another Canadian manufacturer also used to sell some jigs made from alternative materials but has not sold any non-lead jigs in the last >5 years (retailer personal communication, 2016). Table 10 provides a summary of the relative amount of lead vs alternative materials used to manufacture domestically produced sinkers and jigs.

³² Scheuhammer & Norris (1995). UNEP-AEWA 2011 : http://www.unep-aewa.org/sites/default/files/document/mop5_inf_5_2_lead_fishing_weights_lit_review_0.doc

³³ E.g. Franson et al. (2003) documented a pyramid lead weighing 78.2 g in a Common Loon.

³⁴ UNEP-AEWA 2011: http://www.unep-aewa.org/sites/default/files/document/mop5_inf_5_2_lead_fishing_weights_lit_review_0.doc

³⁵ Cf. Scheuhammer & Norris (1995), p. 14: For most freshwater angling activities, fishing weights of a weight of up to 230g, and measuring from ca. 2 mm to 8 cm in the longest dimension are used.

³⁶ US EPA. 1994. as cited in: Scheuhammer & Norris (1995), p. 14.

³⁷ Cf. Scheuhammer & Norris (1995), p. 24. and Pokras et al. (1993) as cited in: Scheuhammer et al. (2003), p. 17.

Table 10. Domestic Production of Sinkers and Jigs: % Lead







Company Name	Lead			Alternative materials			% Lead	
	Sinkers (tonnes)	Jigs (tonnes)	Total (tonnes)	Sinkers (tonnes)	Jigs (tonnes)	Total (tonnes)	Sinkers	Jigs
Company 1							100.0%	99.8%
Company 2							n/a	100.0%
Company 3							100.0%	76.4%
Company 4							100.0%	n/a
Total	0	0	0	0	0	0	100%	91%






Based on reports so far, virtually all domestically manufactured fishing sinkers are lead and >90% of fishing jigs are manufactured with lead. This indicates that the situation in Canada is largely unchanged from that found by Scheuhammer *et al.* (2003).

We examined product listings of major retailers to gather more information to the types, sizes and prices of fishing sinkers and jigs currently on the Canadian market. This information is summarized in Appendix 3. The main types of sinkers and jigs available on the market in Canada are described briefly below (see Tables 11 and 12). We requested data from the major retailers on the quantities of each size and type of sinker and jig sold in Canada. The retailers - when contacted through the Retail Council of Canada (RCC) indicated that they were reluctant to provide these types of detailed sales data (RCC pers. comm. 2016). We contacted the retailers directly and the deadline for responses was extended to Jan 31st, 2017 – no retailers responded with information. We also contacted the major suppliers identified from product listings but none provided data for this study.

In some cases, it is possible to identify whether the sinker or jig listed for sale is made from lead or another material as these details are provided in the product description, and in some cases it is not stated. The material used in sinkers is more commonly stated in the product description, whereas it is often unclear what jigs are made from. There is a very wide and diverse range of products in this category, hence the provided listing provides only an illustration of some of the commonly available sizes and types, but is not an exhaustive listing. Within each main type of sinker or jig there can be multiple variations of size and subtype, even within a single brand. An illustrative listing of the types of sinkers and jigs commonly available for sale in Canada are summarized in Appendix 3. A summary table of the most commonly used types of sinkers and jigs is provided below (see Table 11 and 12). We cannot quantify the total quantities sold by type or size based on currently available data.

Table 11. Illustration of Commonly Used Sinkers (see appendix 3 for further product details)





Sinkers	Description
Split shot 	Split shot sinkers have a groove that runs the full length of the sinker. This opening holds the line once the sinker is pinched in place. They are often used in combination with live-bait. For example, a split shot above a hook with a worm suspended below a bobber is a commonly used combination. A split shot weight can be used below a float to control the speed of bait's drift down a stream. Split shot sinkers are one of the most frequently used types of sinkers.
Rubber core 	Similar to a split shot, rubber grip sinkers have grooves in their center to hold line. They are oval, or football shaped, and have a rubber core that has two tabs (also referred to as 'ears') on each end of the sinker. The line is placed in the sinker's groove, and then the tabs are twisted in opposite directions, wrapping the line around the rubber core. When the tabs are twisted in reverse, the line is released.
Walking 	Walking sinkers are commonly used for walleye fishing. They resemble a rectangle with rounded, outside edges. The top has an eye for the line. The sinker's bottom is slightly wider and larger in size than the top. The bottom is also slightly rounded and bent upwards. This weight distribution positions the sinker with its round edge on bottom, so it will easily glide over rocks, reducing its chances of snagging on the bottom. The semi-flat design also prevents it from rolling along bottom in fast currents. These sinkers are often used to drag live bait rigs along the bottom, and are sometimes called a live bait rig. To tie the rig, the sinker is threaded onto the line. A swivel is then used which is large enough so it will not pass through the sinker's eye. One end of the main line is tied to the swivel. Then, various terminal tackle can be added e.g. from a floating jig head, a plain hook, or a worm harness to complete the rig. Walking sinkers are considered a good option for fishing in sandy or mud bottom areas.
Disc 	Disc sinkers are used in fast water currents. The design ensures the sinker lays flat on the bottom where snags may be a problem. Typical sizes are 1/2 oz to 4 oz.
Egg shaped / Slip 	The shape of egg sinkers makes them fairly snag resistant and able to roll along the bottom. These sinkers slip on the line, which is threaded through a hole that runs lengthwise through the sinkers. The sinker can be used with a rig (similar to walking sinkers described above) and some anglers hold the sinkers in place using a split shot instead of a swivel. Egg shaped inkers are considered a good option to get a bait to the bottom whilst still allowing the fish to take the bait with little to no resistance.
Drop / Bank / Bell (bass) 	These sinkers resemble a tear-drop or bell shape with a brass loop or a lead eye at their tapered top. The fishing line can be fed through or tied directly to the eye. Some of these sinkers have




casting) 	snaps, which allows anglers to clip-on or remove sinkers from the line without retying. These winkers cast well in windy conditions and so are particularly useful for shore anglers. They are also used by boat anglers who typically used these sinkers on a three-way rig - this type of rig is designed to get bait deep without needing any extra equipment, like downriggers. The rig consists of a three-way swivel with one eye for the main line. The next loop holds a drop line with a bell sinker at its end. Finally, the last loop holds a leader and a lure or a live bait rig. The rig is effective when bounced along the bottom or lowered to a desired depth and trolled in open water. These sinkers are considered a good option for straight down presentations where the angler wants to keep the bait a certain distance above the bottom. Typical weights: Weight Sizes 1/8 oz to 1 oz.
Pyramid 	Pyramid sinkers have a line eye which sits at its base, giving it an inverted pyramid profile when tied. These types of sinkers are often used in fast currents. Their streamline profile causes them to sink quickly, and their flat edges prevent them from being rolled along bottom in fast currents. When used in water bodies with sand- or mud-floors, the sinker will bury itself into the soft bottom. These two traits make them particularly useful for striper bass and surf fishing.
Pencil 	Pencil drop shot weights, round or rectangular of lead or tungsten and come with a tie on clip on the top. The weights range from 1/8oz to 1/2oz.
Cone / Bullet / Worm 	Cone, bullet and worm sinkers are used in the same way as egg sinkers in that they are threaded onto the line, with the narrow point facing towards the rod. The cone-shape of these sinkers makes them ideal for gliding through weeds. These sliding sinkers can be used on a live bait rig to replace a walking sinker when used in weedy areas.
Bottom Bouncer 	Bottom bouncer is an effective rigging tool while trolling or drifting presenting the lure/bait rig above snag laced bottom of small rocks, logs, over mud/sand flats, or open basins. A weighted wire feeler arm minimizes hang-ups while riding upright across underwater structure deflecting snags.

Sources: Introduction to fishing sinkers: Bass Pro Shops: <http://1source.basspro.com/index.php/component/k2/238-fishing-tackle/849-introduction-to-fishing-sinkers>; Sinker basics: The Scientific Fisherman: <http://thescientificfisherman.com/sinker-basics/> and <http://learninghowtofish.com/fishing-equipment/fishing-with-hooks-sinkers-bobbers-basic-rigging/>

Jigs come in a wide variety of designs but can be broken down into two main groups – undressed and dressed. Simple undressed jigs can vary in terms of the jig head shape, size and weight. Some can have attachments such as spinners or blades to create flashes and vibrations to attract fish, and they can be painted or unpainted. Dressed jigs can also vary in terms of the jig head size, shape and weight but also in terms of how elaborately decorated they are.

Table 12: Illustration of Typical Jig Types

Jig Types	Description
<p>Undressed e.g, Round head jigs</p> 	<p>The jig head is typically formed from moulded lead and provides the required weight. The jig collar is positioned directly behind the jig head. Straight collars are used to tie dressings or attach on the jig such as hair, feathers, tinsel, living rubber and silicone skirts.</p>
<p>Horsehead with blade</p> 	<p>The main consideration when selecting which jig to use is its weight. Jig selection is based on the type of fish being sought and water depth. For example, the jig must be heavy enough to reach the desired depth, but not so heavy that it sinks too rapidly as fish prefer a slow drifting down bait than one that just plummets toward the bottom. As a general rule it is recommended to use 1/8 oz for every 10 feet of water. If the angler is fishing in fast currents such as rivers additional weight may be required to reach the bottom. Wind is also a factor in selection as it can have the same impact as fast currents, by increasing the water resistance on the line and lure, which make it more difficult to reach the desired depth. Higher weight jigs may therefore be selected in windy conditions.</p>
<p>Roundhead Jig with blade</p> 	<p>For example, the following is a suggested jig weight guide for specific fish species:</p> <p>Panfish and Crappies 1/32 – 1/16 – 1/8 oz</p> <p>River Trout and Salmon 1/16- 1/8 – 1/4 oz</p> <p>Walleyes and Bass 1/16 – 1/8 – 3/8 – 1/2 oz.</p>
<p>Stand-up jig</p> 	<p>Northern Pike and Muskies 3/4 – 1 – 1 1/2 oz.</p> <p>Lake Trout and Stripers 3/4 – 1 – 1 1/2 – 2 oz.</p> <p>Bed head or flat head jigs have a flat base which allows them to be pulled more easily through cover. Jigs with elongated heads are called tube jigheads and can be used with tube-style lures.</p> <p>Blades and similar additions are designed to add flashes and vibrations to the jig when in use hence attracting fish.</p> <p>Stand-up jigs are designed to keep live bait off the bottom and within</p>

	the strike zone.
<p>Dressed</p> 	<p>Many jigs are dressed by adding hair, feathers, tinsel, soft plastic, silicone or rubber skirts to the moulded hook shank, it adds bulk and profile reducing the sink rate in replicating forage such as crawfish, leeches, minnows and amphibians.</p> <p>Weedless jigs have an additional attachment to the hook to prevent snagging. Pictured here is a dressed weedless football jig. The jig head is round and coated with black paint. The 'weedless' feature is achieved by the brush guard in front of the hook. The 'full skirt' is made of silicone.</p>
<p>Dressed Example: Bass jigs</p> 	<p>Bass jigs are also known as flipping jigs and are a very popular lure for largemouth and small mouth bass. Bass jigs have a low profile stand-up head design and typically weight from 1/8 oz to 3/4 oz. The lighter weights are used for fishing smallmouths, the heavier weights are used for fishing largemouths in weeds and for flipping (an underhand toss of the jig to a specific area).</p>
<p>Dressed Example: Tied jigs</p> 	<p>Depending on their size dressed jigs can be used for most all species including: panfish, crappies, bass, stripers, northern pike, walleyes, and lake trout. The dressing material is tied to the jig collar to form a body they include: bucktail hair, marabou, mylar and tinsel which is designed to provide a mimicking life-like action in the water of minnows and other aquatic life. Dressed jigs can also hold fish scent and hence can be tipped with live bait as an added attractant.</p>

Sources: Cabelas.com and <http://learninghowtofish.com/fishing-equipment/fishing-jigs/>

3.2 Profile of Alternatives vs Lead

Soft lead split shot sinkers have been described as easier to apply to lines using only finger pressure, that soft lead is less likely to damage. Split shot sinkers made of harder materials (e.g. steel) take longer to use because pliers must be used to crimp the weight onto the line, and the process of crimping the weight to the line may weaken the line.³⁸ Other malleable alternatives such as those made with bismuth or tungsten putty would not be expected to have these issues. However, metals such as bismuth and tungsten are more expensive than lead.

Because some alternatives are less dense than lead the resulting weight is larger than the lead equivalent. Some anglers believe that larger weights may deter fish from taking the bait.³⁹

Rattner et al. (2008) conclude that “although several substitutes for lead sinkers currently are available, lead fishing sinkers remain very popular with anglers as they are economical and perform well. None of the lead-free alternatives offer the overall performance of lead fishing tackle with respect to gravity, malleability, ease of production, and cost.”⁴⁰ Scheuhammer and Norris predicted, in 1995, that the market for non-lead fishing gear will remain marginal until lead weights are made unavailable.⁴¹

A 2004 European Commission report found that, driven by the UK ban of smaller lead weights, “substitutes seem to be available for many but not all types of lead sinkers”, while noting that the development of substitutes is somewhat limited by the fact that the most extensive ban on lead exists only in Denmark, which is a small market not necessarily interesting enough for foreign manufacturers.⁴²

In reviewing the available information on lead sinker and jig alternatives, AEWA found that “in addition to effectiveness, cost is a decisive criterion for the purchase of fishing gear by anglers. Lead fishing weights account for only a very small proportion of an angler’s overall annual expenditure on fishing equipment (less than 1%)⁴³ and hence switching to non-lead alternatives is expected to involve only small additional cost. Scheuhammer and Norris (1995) calculate that a switch could mean an increase of up to \$10⁴⁴ (for using more expensive alternatives) on an angler’s annual budget, an increase which they do not deem significant or prohibitive.⁴⁵ Scheuhammer et al. (2003) estimated that using non-lead fishing weights will raise the average angler’s annual expenditure by less than 1% (approx. \$2.00).⁴⁶ However, many raw materials have become more expensive than in recent years and this may make switching to non-lead fishing gear more difficult.^{47 48}

The 2004 European Commission report estimates that a restriction of the use of lead fishing weights used in inland waters would lead to incremental costs of approx. €1.2 – €10.4 per angler per year⁴⁹, noting that the ongoing process of outsourcing European production to Asia made a comparison of the prices of lead versus non-lead fishing equipment more complicated.⁵⁰

³⁸ Sinker Basics. The Scientific Fisherman: <http://thescientificfisherman.com/sinker-basics/>

³⁹ UNEP-AEWA 2011: Lead fishing weights literature review: http://www.unep-aewa.org/sites/default/files/document/mop5_inf_5_2_lead_fishing_weights_lit_review_0.doc

⁴⁰ Ibid, p. 39.

⁴¹ Scheuhammer & Norris (1995), p. 44.

⁴² European Commission (2004), p. 13.

⁴³ Scheuhammer & Norris (1995), p. 52.

⁴⁴ Canadian dollars.

⁴⁵ Scheuhammer & Norris (1995), p. 52.

⁴⁶ Scheuhammer et al. (2003), p. 38.

⁴⁷ Cf. also Goddard et al. (2008), pp. 232f.

⁴⁸ UNEP-AEWA 2011: http://www.unep-aewa.org/sites/default/files/document/mop5_inf_5_2_lead_fishing_weights_lit_review_0.doc

⁴⁹ European Commission (2004), p. 112.

⁵⁰ Ibid, p. 107.

The advantages and disadvantages associated with non-lead alternatives are summarized in Table 13.

Table 13. Summary of Advantages/Disadvantages of Main Alternative Materials vs Lead

Primary Material ⁵¹	Advantages	Disadvantages
Bismuth	Similar softness to lead Malleable Tackle can be of similar size to lead equivalent Lower toxicity	More expensive
Tungsten	Tackle can be of similar size to lead equivalent Lower toxicity	More expensive Tungsten tackle can have sharp edges requiring plastic sleeves to cover these edges at additional expense
Steel / iron /stainless steel	Iron/Steel lower cost metals Lower toxicity	Tackle is larger than lead equivalent as steel less dense Iron corrodes after prolonged exposure to water Tackle made with steel more expensive at the retail level due to higher production costs, low demand hence lower economies of scale
Tin	Malleable Lower toxicity	Tackle is larger than lead equivalent as tin less dense More expensive
Brass (alloy of copper and zinc)	Lower toxicity	More expensive

⁵¹ Combinations of materials can also be used e.g. bismuth /tin and various additive can be used to impart differing properties to the products – this refers to the primary material used.

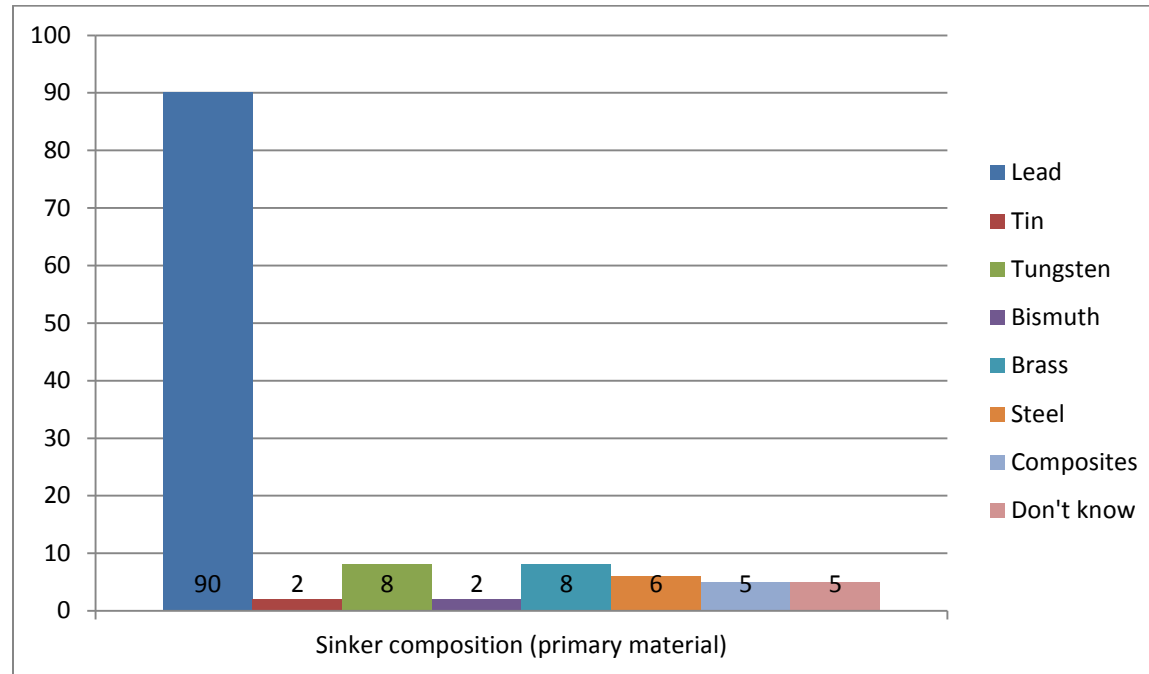
	Note zinc is toxic to aquatic organisms, and some types of brass can contain low levels of lead. In the solid alloy it is not expected that zinc or lead will leach from the brass during normal conditions of use.	
Glass / Ceramics	Lower toxicity	More expensive Considerably larger than lead equivalents

In addition to the usual alternatives as summarized in Table 13, a sinker based on cadmium-zinc was identified as being sold in Canada. This product was imported and distributed by CTG Brands Inc.⁵² The sinker was marketed as 'lead-free' and according to the package contained 53% zinc, 45% cadmium and 1.5% magnesium. Zinc is toxic to aquatic organisms and cadmium is listed on Schedule 1 of CEPA. Hence, sinkers/jigs based on these metals are not recommended as alternatives to lead. No other sinker/jig products based on zinc or cadmium were identified as being on sale in Canada. CTG Brands Inc (BC office) confirmed that they sold this product and that it was manufactured in China but they were not able to provide data on quantities imported or sold in Canada, and suggested follow-up with the head office. Follow-up emails and phone-calls to CTG Brands Inc head office (ON) requesting further information yielded no responses. The use of cadmium-zinc sinkers/jigs as alternatives to lead should be strongly discouraged.

The electronic survey of anglers provided some additional perspective on the types of sinkers and jigs being used by anglers in Canada. The results are summarised in Figure 8 below:

⁵² CTG Brands Inc. is an importer and distributor of seasonal and general merchandise that sells directly to retailers. CTG sells over 13,000 products and >99% are made in China. It has offices in BC, QC and ON (HQ). The zinc-cadmium sinker is considered a seasonal product and is identified by the following product number: 59656. See: <http://www.ctgbrands.com/home.aspx> and pers. comm. 2017 with CTG Brands Inc. BC Office.

Figure 8. Type of Sinkers Currently used by Anglers in Canada (% of anglers using each type)



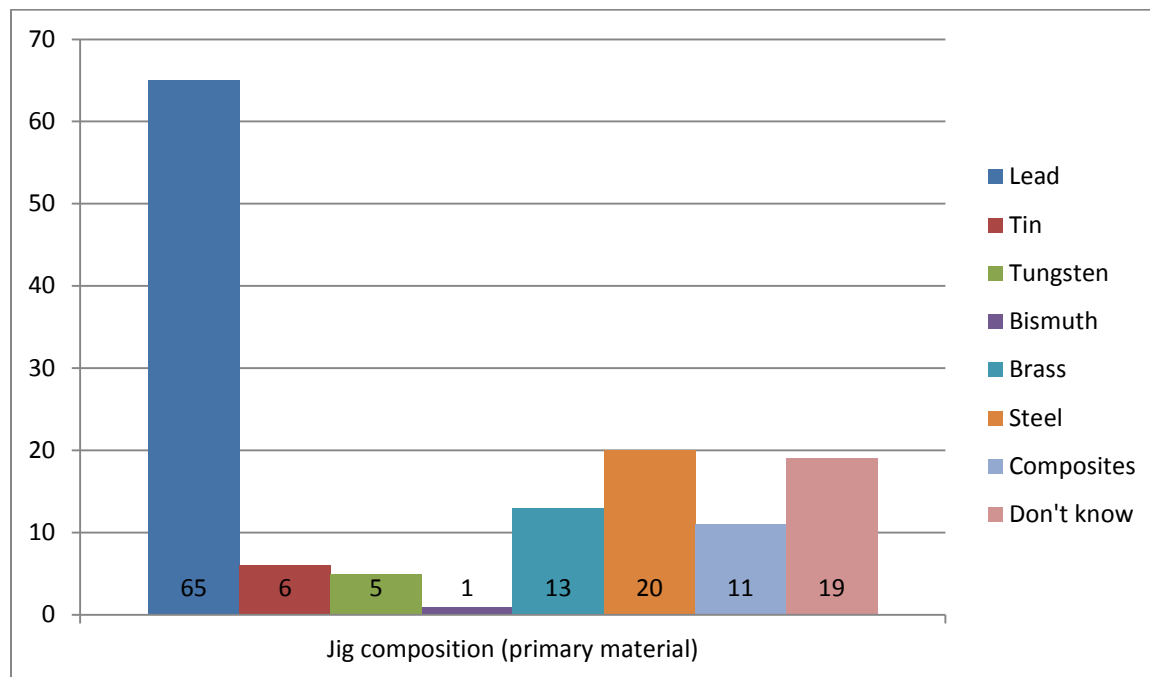
Source: Angler survey 2017. Based on 240 responses. Responses to statement 'The fishing sinkers I use are made from...' Some anglers use multiple types of sinkers so percentages will not add up to 100%

In angler survey 90% of anglers reported that they used lead sinkers, and 5% did not know what their sinkers were made from. Tungsten and brass were the most commonly reported alternatives used with 8% of anglers reporting using sinkers made of these materials; 6% reported using steel sinkers and 5% reported using sinkers made of composite materials. Only 2% of anglers reported using tin and bismuth sinkers. These results confirm that the majority of the sinkers used in Canada currently are lead sinkers (used by 90% of anglers reporting to the survey). None reported buying cadmium-zinc sinkers.

Anglers also provided information on how many sinkers they had purchased in the last 12 months. Of the 225 anglers that responded to this question, 114 (49%) had not bought any sinkers in the preceding 12 months with many stating that they did not need to purchase any as they had enough in their existing supplies. The remaining 111 anglers reported buying a total of 2422 sinkers in total in the last 12 months. The average number of sinkers purchased by these 111 anglers was 22 per angler. The average number of sinkers purchased per angler, for all anglers responding to the question, was 11 sinkers per year.

The following figure provides the results of the survey in regard to jigs (see Figure 9). Of anglers that responded to the survey 22% said that they did not use jigs when fishing.

Figure 9. Type of Jigs Currently used by Anglers in Canada (% of anglers using jigs use this type)



Source: Angler survey 2017 which received 240 responses in total. Responses to statement 'The fishing jigs I use are made from...' Some anglers use multiple types of sinkers so percentages will not add up to 100%

In the survey, 65% of anglers reported using lead jigs, and 19% did not know what their jigs were made from. This also reflects our findings from online research and surveying products at stores – it is typically clear whether a sinker is made from lead or alternatives materials but the same cannot be said for jigs. For a substantial number of jig products it was not possible to discern from the product packaging or product details provided whether the jig contained lead or not. This is reflected in the angler survey results with only 5% of anglers not being able to determine what their sinkers were made from – but a substantially higher proportion (19%) were unable state what their jigs were made from. In the case of jigs, steel is the most commonly reported alternative material used with 20% of anglers using steel jigs. The next most popular were brass jigs (13%) and composites (11%). Tungsten jigs and tin jigs were used by 5-6% of anglers. Use of bismuth jigs were reported by only 1% of anglers.

These results confirm that the majority of the jigs used in Canada contain lead (used by 65% of anglers reporting to the survey). Note that 19% of anglers did not know what their jigs were made from so the number of anglers using lead jigs could be higher as at least some of these anglers are likely to be using lead jigs.

Anglers also provided information on how many jigs they had purchased in the last 12 months. Of the 225 anglers that responded to this question, 158 (70%) had not bought any jigs in the preceding 12 months with some stating that they did not need to purchase any as they had enough in their existing supplies. The remaining 67 anglers reported buying a total of 1048 jigs in total in the preceding 12 months. The average number of

jigs purchased by these 67 anglers was 16 per angler. The average number of jigs purchased per angler, for all anglers responding to the question, was 5 jigs per year.

Numerous viable alternative materials have been available for some time including tin, bismuth, antimony, steel, brass, tungsten, terpene resin putty, and polypropylene. All of the alternative products have historically been more expensive than lead (e.g. Scheuhammer and Norris, 1995), and each differs slightly with respect to the types of uses for which it is appropriate. Fishing sinkers are diverse in shape and weight, reflecting the different fishing methods for which they are used. The alternative products, either alone or in combination, appear to have effectively provided substitutes for all of the current lead sinkers and jigs on the market. In 1995 it was found that the majority of nontoxic sinker manufacturers were located in the United States (Scheuhammer and Norris, 1995). Many of the non-lead products continue to be manufactured outside of Canada based on the survey of manufacturers and research on current product listings conducted for this study. Only one domestic manufacturer reported using any significant quantities of alternative materials in sinker and jig production – in this case bismuth and tin were used. However, this manufacturer used much greater quantities of lead than alternatives in production (see section 2.1).

Scheuhammer and Norris (1995) found that tin sinkers were perhaps the most common and popular alternatives to lead and are available in most styles and sizes. Bismuth sinkers were found to be available in various forms including egg, worm, swivels, bullet slips, jig heads, etc.). Low melting point metals, including bismuth and tin, may be poured into the same or similar moulds currently used to manufacture lead sinkers; however, bismuth expands as it cools, in contrast to lead, and therefore must be poured only into high-quality milled moulds. Steel, zinc, and brass sinkers are currently available in various forms and sizes; however, metallic zinc is known to be toxic to waterfowl and other birds, although it is less toxic than lead (Grandy et al. 1968; Zdziarski et al. 1994). Tungsten and tungsten composites were relatively expensive and were not widely available in North America at the time of the previous surveys according to Scheuhammer and Norris (1995), Scheuhammer et al., (2003). Tungsten jigs are currently available at major Canadian retailers (see appendix 3).

Some current online retailers specialize in providing non-lead sinkers and jigs e.g. <http://www.leadfreefishingtackle.com/> which a listing of non-lead options.

Note that some non-profit organizations in Canada offer small-scale programs that exchange angler-owned lead tackle for free non-lead substitutes (personal communication, Cobequid Wildlife Rehabilitation Centre, Nova Scotia, 2016).⁵³ See section 5.3 for further details of voluntary programs.

Responses to the anglers survey (2017) indicate that anglers have purchased jigs made of lead, tin, tungsten, brass, steel, bismuth and composites. Approximately 20% of responding anglers state that they do not know what their jigs are made from. Although 90% of anglers reported using lead sinkers, there were reports of anglers using tungsten, tin, brass, steel, bismuth, and composites as sinkers, with ~5% of anglers not knowing what their sinkers were made from (see section 3.2 for further details).

In regards to the anglers that stated that they did not know what their sinkers/jigs were made from it is interesting to note that fishing sinkers and jigs containing lead are required to carry a warning label in California (Proposition 65 warning). As a result, retailers and purchasers of fishing gear in nearly all states can currently identify gear containing lead, and can routinely avoid using lead-containing products, if they choose. Not all states require a lead warning, but because California is a large market, most manufacturers routinely label fishing gear packages that are retailed in most states (TSCA Petition, 2011). Some sinker/jig products sold in Canada carry the California Proposition 65 warning label due to their lead content as some manufacturers/suppliers simply sell the same product in the same packaging into both markets (California and Canada). However, this labelling is not a requirement in Canada. During the research for this study it was noted that it was not always possible to identify whether

⁵³ http://cwrc.net/cms2/wp/wp-content/uploads/2016/08/Lead_Ammo_Tackle_Brochure_2016_web.pdf

sinkers/jigs sold in Canada were manufactured with lead – particularly for jigs – indicating that mandatory labelling of lead sinkers and jigs is an option that could be explored further in the Canadian context. This is an approach that could raise awareness of anglers and also enable them to make informed choices when purchasing these products.

Alternatives to lead fishing sinkers and jigs were recently reviewed by The Center for Biological Diversity⁵⁴ and the following observations were made:

Review of Alternatives from TSCA Section 21 Petition on Lead Fishing Tackle

Tungsten, one of the more widely used alternatives to lead fishing tackle, is sold as a tungsten-plastic composite and as tungsten putty, a specialty item marketed to flyfishers. Tungsten putty can be moulded into varying shapes and sizes and affixed to fishing line, allowing anglers to vary the sink rate of their fly presentation. Tungsten is comparable to lead in density and can be manufactured to be more dense than lead, allowing for smaller tackle. Tungsten tackle can also have noise-making attributes that may attract fish in some situations. Tungsten is more expensive than lead, and tungsten tackle may require plastic sleeves to cover sharp edges, at additional expense.

Stainless steel tackle is larger than lead tackle of equivalent weights. Carbon steel tackle is available on the internet. Some carbon steel tackle is made from recovered waste steel mixed with resins, within a cotton sleeve. Anglers can add or subtract steel balls on a three-way swivel to adjust the sink rate to hold bait on the bottom. This gear is gaining popularity in river fisheries and steel is replacing lead in a variety of commercial traps. Iron is one of the less expensive alternatives to lead, but has the disadvantage of eventually corroding after continued exposure to water.

Tin is a malleable metal that allows anglers to reuse split shot many times. The lower density of tin also allows for a slower sink rate, potentially keeping the bait in the “strike zone” longer. Tin tackle tends to be larger and more expensive than lead, but is widely available. Bismuth is a brittle metal that can be used in non-split fishing weights such as egg, worm, swivel, bullet slips, and jig heads (Scheuhammer and Norris 1995). Bismuth/tin compounds are popular among anglers who manufacture their own jigs, partly due to better paint quality on jig heads using this material. A disadvantage is that bismuth is a relatively expensive metal.

Brass fishing tackle is also advertised as producing sound with fish-attracting qualities. Brass is an alloy of copper and zinc, and metallic zinc is known to be highly toxic to birds when ingested. Also, brass fishing tackle often includes lead mixed in with brass, and is not lead-free, even though the lead is bound in a state not thought to be toxic (MOEA 2006).

Fishing tackle made of glass tends to be larger and is currently more expensive than its lead equivalents. Certain types of glass can be made to “glow” after exposure to light, a quality purported to improve fish biting frequency. Glass sinkers are available primarily through the internet. Ceramic fishing tackle is also considerably larger than lead tackle.

Zinc was used as a replacement for lead sinkers until it was demonstrated that the industrial grade zinc used in the tackle is also toxic in aquatic environments. Lead-free pewter tackle is another potential alternative, but pewter is not in wide use and not currently available to consumers. It is expected that pewter tackle will need to be larger than lead equivalents and more expensive.

⁵⁴ US EPA (2011) Petition for Rulemaking under Section 21 of the Toxic Substances Control Act (“TSCA”), 15 U.S.c. § 2620(b)(3). Petitioners Center for Biological Diversity, Loon Lake Loon Association, and Project Gutpile. Nov. 16, 2011. The Center for Biological Diversity is a US non-profit conservation organization with over 100 staff (including scientists and lawyers) and >1 million members, and was founded in 1989. <http://www.biologicaldiversity.org/about/staff/index.html> The Center has six program areas: Biodiversity, Climate, International, Oceans, Wildlands, and Urban Wildlands and annual budget of ~\$13 million USD. <https://www.charitynavigator.org/index.cfm?bay=search.summary&orgid=8194>

The EPA has already determined that the economic impact of banning smaller-sized lead fishing tackle would be nominal (EPA 1994). Similarly, when the National Wildlife Refuge System implemented “Lead-Free Fishing Areas,” they acknowledged that non-toxics sometimes cost more than lead weights but stated that as sinkers only comprise 3% of yearly equipment costs, the increase did not create a burden for anglers (Federal Regulation 50 CFR 32 and 36, proposed rule)⁵⁵.

The prices of sinkers per gram vary depending on the materials used, the sinker type/design, the brand name, size, and number of sinkers per package. Even lead sinker prices vary per gram depending on these factors. The following table (see Table 14) provides an illustrative example of sinker costs per gram for sinkers made from lead and alternative materials, all compared products were available for sale from major retailers in Canada in Dec 2016-Jan 2017. Despite variation in price depending on the sinker type and number per package etc. the lead sinkers are less expensive than the sinkers made from tungsten or bismuth (note there were not many types of tungsten/bismuth, or other alternative sinkers available in current Canadian product listings at retail stores to make comparisons), however, steel sinkers were cheaper than lead. Note however, that few steel sinker types were available for comparison.

⁵⁵ Extracted from US EPA (2011) TSCA Section 21 petition from the Center for Biological Diversity

Table 14. Cost Comparison: Sinkers (prices from major retailers Dec 2016-Jan 2017)

Manufacturer / Brand Name	Product	Description	Price per package	Lead or Non- Lead	Weight of product per unit (listed (oz)	Weight of product per sinker unit (metric) (g)	# sinkers per package	Total weight of product per package sold (metric) (g)	Price per g
Dominion	Rubber core sinkers (made in Canada)	25 rubber twist lock lead-free rubber core sinkers in five popular sizes Sinkers are easy to put on and take off with just a twist of their rubber ears	5.49	bismuth	0.125	3.54	6	21.26	1.55
Eco Pro	Tungsten Flipping Weights	Ideal for bass fishing 1/8 oz	9.99	tungsten	0.125	3.54	4	14.17	2.82
Water Gremlin	Drop shot sinkers	14-pk: Water Gremlin Drop Shot Sinkers attach easily to a variety of bass and panfish rigs to weight your line so you can guide it through weeds and rocky bottoms. Ideal for all fish species by region. 14-Pack includes a variety of sinker weights: 3 x 1/8 oz, 7 x 3/16 oz, 4 x 1/4 oz	11.49	steel	0.125	3.54	3	10.63	0.15
Red Wolf	Sinker worm worm weights	Sinker is a perfect addition for your rubber worms. The deep tunnel base of these weights secure the worm nose and protect it from snags and tears	2.49	lead	0.25	7.09	8	56.70	0.35
Danielson	Round drop shot sinkers/weights - 6 x 3/16oz	Drop Shot Sinkers feature a V-shaped eye, in which the line wedges itself for quick and easy adjustments	5.99	lead	0.188	5.32	6	31.89	1.13
Canadian Tire (no other brand name provided)	Rubber core twist lock sinker	Rubber core twist lock sinkers are easy to put on and take off without disturbing other tackle; The rubber core in the sinkers guard against line damage; They fit snugly against the line by simply twisting their rubber ears	2.49	lead and rubber	0.125	3.54	1	3.54	0.70

One question on the angler survey (2017) asked 'What is your experience with non-lead fishing sinkers and jigs?' and provided optional responses regarding cost, efficacy, and availability as well as an open option 'Other' to allow other experiences to be described. The responses indicated that more than 40% of anglers had not tried using non-lead alternatives. This survey question was set-up to allow anglers to choose multiple options but anglers found that in practice that they could only select one answer – this technical issue with this survey question unfortunately limited the number of reasons the anglers could provide - although some respondents provided multiple reasons and additional details under the 'Other' option to cover this issue. Of the responses received, 10% indicated availability issues (e.g. their local stores didn't carry the sinkers/jigs they needed in non-lead versions) and 10% responded that the non-lead alternatives didn't work as well as the lead equivalents. Approximately 3% of respondents said that the non-lead versions worked as well as the lead ones. Responses under 'other' included the following perspectives on non-lead sinkers and jigs;

'too expensive, not available, not as effective'

'lead is cheap, it works and the minimal amount that gets lost in a year wouldn't impact the ecosystem'

'I have no issue with banning lead from fishing gear. As long as the replacement is suitable and the same cost'

'I think you need to focus on industry such as oil and gas pipelines, mining, development projects etc that have far more reaching negative impacts than some lead sinkers.'

'Enough with the lead witchhunt'

'I could be swayed to use alternative weight as long as it is cost effective and works the same'

'Alternatives are more expensive and less available making them unviable.'

'dumb survey...typically "other" jigs and sinkers aren't available in anything other than lead'

'I have no interest in trying non-lead alternatives that are hard to find and cost much more.'

'Please don't EVER get rid of lead. It has excellent qualities for both hunting and fishing. There are far greater concerns/ factors facing wildlife and environment than something as trivial as this. Examples: excessive logging, gas and oil exploration and extraction. Even all the garbage that people leave behind is more of a concern to me.'

'Leave us alone'

'Lead is the ideal material to make fishing sinkers from. The problem of lead contamination in the environment is much overblown and I have no interest in switching to non-lead as I already have a lifetime supply of sinkers and a stock pile of lead to make sinkers and caste bullets for shooting should I feel the need to. I do not support any legislation restricting my use of lead for fishing or hunting. The federal government has much greater problems that it should be dealing with (e.g., the federal deficit, jobs for young people, care of the elderly and mentally ill, etc.).'

'There is no need for more regulations regarding non-toxic fishing equipment of any kind.'

'lead in fishing has not caused any health problems that have been reported as far as I have seen'

'I believe lead weights pose no environmental risks and. Lead is enert [sic]'

'I find it very hard to believe that lead in fishing gear would have any effect either negatively or positive as it would be such a small amount when you consider the size of our lakes and rivers. I do not lose a lot of lead, I re-use my lead split shot sinkers. Bottom bouncing in rivers is probably the only area I would lose any amount of lead weights.'

'I agree that the amount of lead entering our streams and rivers is a problem'

'lead rocks'

'The fear over lead is far too over exaggerated. Lead is the best option out there.'

'would like to see more lead free sinkers/weights and jigs where I shop.'

'I have not seen the same variety of sizes or styles or availability of nonlead sinkers'

'Hard to find non lead products. I would gladly buy non lead if the price was reasonable'

A number of responses also indicated that the anglers could not comment on lead vs non-lead as they did not know what their sinkers and jigs were made from.

Responses indicated some anglers have concerns regarding cost, availability, and effectiveness of alternatives. Some also indicated that they had not been convinced that lead uses in fishing were a significant enough concern to require a switch to non-lead. However, some responses did indicate a recognition of the problem and a willingness to change – if alternatives were not more expensive.

4.0 Lifecycle analysis of lead used in sinkers and jigs in Canada

4.1 Total uses and losses of sinkers and jigs in Canada

4.1.1 Total uses of Sinkers and Jigs: Summary of Previous Studies

Scheuhammer *et al* (2003) used the estimated total number of anglers in Canada at that time (they estimated 5.5 million) and the average yearly expenditure per angler on sinkers (\$3.25)⁵⁶ to calculate that Canadian anglers spent \$17.9 million per year buying sinkers. Using the average retail cost of lead (\$0.032 per gram) they estimated that approximately 559 tonnes of lead was used annually in sinkers sold in Canada. Scheuhammer *et al.*, (2003) also took into account the regulations prohibiting the use of lead sinkers and jigs within National Wildlife Areas and National Parks that were initiated in 1997. These regulations were estimated to affect about 50,000 anglers and to reduce lead sinkers and jig uses by 4-5 tonnes equating to <1% of total uses. They concluded that 'recreational anglers continue to purchase in excess of 500 tonnes of lead annually in the form of sinkers and jigs'.

The most recent information currently available indicates that there were 3.3 million anglers in Canada in 2010 (DFO, 2010⁵⁷). The average number of days fished per year per angler has remained unchanged since 1995 at 13 days. Total expenditures by anglers were \$2.5 billion in 2010. Over 80% of these expenditures were for food, lodging, and travel/transportation. Expenditures related to lures, lines, tackle, bait and other fishing supplies were \$201 million or 8% of total expenditures in 2010 (DFO, 2010). The relative expenditures on fishing lures, lines, baits and other supplies has remained unchanged at 8% of the total since 1995 (see Scheuhammer and Norris, 1995)

4.1.2 Sinker and Jig Loss Rates: Summary of Previous Studies

It has previously been noted that accurate quantitative information on how much lead is entering the environment due to lost sinkers and jigs is not available, but approximations can be made from quantities of sinkers/jigs sold assuming most sinkers are purchased to replace those lost while fishing (e.g. approach used by Scheuhammer *et al.*, 2003), and from studies of sinker and jig losses by anglers⁵⁸. The results from studies on sinker and tackle loss rates vary from study to study – a variety of factors can influence the loss rates including; (1) type of fishing activity, (2) location of the fishing activity, (3) the time of year, and (4) the skill of the angler. Published data on loss rates are summarized in Table 15 below.

⁵⁶ Based on Scheuhammer and Norris (1995)

⁵⁷ DFO 2010. Survey of Recreational Anglers.

⁵⁸ US EPA TSCA Section 21 Petition requested EPA to regulate lead in fishing weights, submitted by the Center for Biological Diversity 2011: https://www.epa.gov/sites/production/files/2015-10/documents/tscs_sinker_petition.pdf

Table 15. Summary of Loss Rates for Sinkers and Jigs

Study	Loss Rates	Location Details
Bell et al., 1985	0.18 sinkers per hour	UK
	0.23 hooks and lures per hour	
Radomski et al., 2006	0.0081 large sinkers per hour	Minnesota Lakes
	0.0057 split shot sinkers per hour	
	0.0247 jigs per hour	
	0.0127 lures per hour	
	0.0257 hooks per hour	
	1 tonne total lead lost per 6,000 anglers per year	
Duerr and DeStefano., 1999	0.01 sinkers/m ² of shoreline	Concentration of sinkers found in areas of low angling pressure (US)
	0.47 sinkers/m ² of shoreline	Concentration of sinkers found in areas of low angling pressure (US)
Cryer et al., 1987; Sears, 1988	Up to 190 sinkers/m ²	Europe

Radomski et al. (2006) estimated lead tackle loss for five large lake fisheries focusing on walleye (*Sander vitreus*), in 2004. The authors used “creel surveys,” also known as angler interviews, asking questions of anglers upon their return to the shore after a fishing excursion by boat. Interviewers asked 6,489 anglers whether they had lost any fishing tackle. If the answer was yes, interviewers followed up with questions to ascertain how much and what types of tackle the angler lost that day. Estimated loss of the weight of lead items was calculated by multiplying the most common weight of the item by the estimated number of items lost. The estimated total loss of tackle (lead-based and non-lead-based) for the five lakes in the summer of 2004 was 214,811 items. Of these, over 100,000 lead-based items were estimated to have been lost, representing about 1.1 tonnes of lead.

In addition, the Washington State Departments of Ecology and Health estimated of the quantity of lead fishing weights lost to Washington waterways each year and published the results in their Lead Chemical Action Plan in September of 2009. This study indicates that the average number of lead sinkers and jigs lost per year per angler was 14 which is consistent with Radomski et al., (2006).

4.1.3 Estimated Quantity of Lead Sinkers and Jigs Lost per year in Canada

The results from the Radomski et al (2006) study indicate that the average number of lead items lost by anglers was 15 per year, and the average weight per lost item was 11g. Using these loss rates data and the total number of anglers in Canada an estimated amount of lead lost in Canada can be derived (see Table 16)

Table 16. Estimated total losses of lead sinkers and jigs in Canada (tonnes)

Total Number of Anglers in Canada (#) (DFO, 2010)	Average Number of Lead Sinkers and Jigs Lost per Year (#) (based on Radomski et al., 2006)	Average Weight of Lost Items (g) Radomski et al., 2006)	Total Quantity of Lead in Lost Sinkers and Jigs per Year in Canada (Tonnes)
3.3 million	15	11	545

The above estimate of 545 tonnes is consistent with the previous estimate of 554⁵⁹ tonnes by Scheuhammer et al., (2003). Scheuhammer et al (2003) based their estimate on average angler's expenditures on sinkers and the total number of anglers in Canada, whereas our estimate is based on more recent studies of sinker/jig loss rates and the average weight of lost sinkers/jigs. Despite this difference in methodology the results are very comparable. Information from manufacturers in Canada also indicates that market for sinkers and jigs continues to be dominated by lead products (>90% of domestically manufactured products are made of lead), with little interest in alternatives. In addition, the angler survey indicates 90% of anglers use lead sinkers and at least 65% of anglers use lead jigs. The market in Canada continues to be dominated by lead products hence the situation in Canada in terms of the market share for lead products is largely unchanged from the time of the Scheuhammer et al., (2003) study.

For comparison, approximately 4,000 tonnes of lead fishing sinkers are sold annually in the US (USGS, 2008⁶⁰). Hence the estimate for Canada indicates similar per capita use rates for lead sinkers in Canada and the US.

We can also use the total number of anglers in Canada from DFO, and results from the recent angler survey to provide an alternative estimate for the total uses and losses of sinkers and jigs in Canada. In this estimate we use the average number of sinkers and jigs purchased per year, as reported to the angler survey (2017), as an estimate of the number of sinkers and jigs lost on average per angler each year. This approach assumes that sinkers and jigs are purchased to replace lost items. We also adjust the estimated losses of lead to the environment taking into account that not all anglers reported using lead sinkers and jigs. The angler survey results indicated that 90% of anglers use lead sinkers, and 65% were aware that they used lead jigs. The results are summarized in Table 17 below.

Table 17. Estimated total losses of lead sinkers and jigs in Canada using purchase data from the Angler Survey (2017) (tonnes)

Terminal tackle product	Total Number of Anglers in Canada (#) (DFO, 2010)	Average Number Lost per Year (#) (based on Angler Survey 2017)	% of Anglers using lead (based on Angler Survey, 2017)	Average Weight of Lost Items (g) (from Radomski et al., 2006)	Total Quantity of Lead in Lost Sinkers and Jigs per Year in Canada (Tonnes)
Sinkers	3.3 million	11	90%	11	352
Jigs		5	65%		110
Total lead lost in sinkers and jigs per year:					462

⁵⁹ Scheuhammer et al 2003 estimated total sinker purchases of 559 tonnes but took into account that up to 5 tonnes would be non-lead due to restrictions on uses of lead in National Parks (559-5=554 tonnes).

⁶⁰ U.S. Geological Survey (USGS). 2008 Lead Shot and Sinkers: Weighty Implications for Fish and Wildlife Health. USGS Press Release 7/11/2008. [4,382 tons of lead fishing sinkers]: <https://archive.usgs.gov/archive/sites/www.usgs.gov/newsroom/article.asp-ID=1972.html>

These estimates indicate that total losses of lead to the environment associated with the use of sinkers and jigs are ~460 tonnes per year, with most of these losses (~75%) associated with sinkers and ~25% associated with lost jigs.

Since ~29 tonnes of lead sinkers were manufactured in Canada, and ~21 tonnes of lead jigs were manufactured in Canada (see Section 2.1) we estimate that >90%⁶¹ of lead sinkers were imported and >80%⁶² of lead jigs were imported in 2016⁶³.

Our previous estimates of sinker imports using CBSA import data indicated that ~200-380 tonnes of sinkers per year (2011-2015). The average quantity of lead imported in fishing sinkers for the last 3 years for which data is available (2013-2015) was 355 tonnes per year based on the CBSA import data. This is very close to the estimated quantity of lead sinkers purchased and lost per year shown in the above table (352 tonnes).

We have used loss rates of 5 per year for jigs and 11 per year for sinkers based on the recent angler survey (2017). These loss rates are lower than those available in the published literature (e.g. Radomski et al., 2006) – we have used these lower loss rates in the above analysis as these are the most recent data available to us that are specific to Canadian anglers.

The above estimates for total sinkers and jigs lost year indicate that ~460 tonnes of lead are lost to the environment per year in Canada due to the use of lead sinkers and jigs.

The lifecycle of sinkers and jigs consists of domestic manufacturers and importers supplying retailers, often via wholesalers/distributors, anglers purchase the sinkers and jigs for their fishing tackle supplies and some are lost each year. Anglers then purchase new sinkers/jigs to replace the ones lost. Once lost it is not expected that sinkers/jigs are recycled to any great extent as they are hard to locate and retrieve once lost, and given the small size of most lost sinkers and wide dispersal once lost there is little economic incentive for organized collection and recycling (see Table 18).⁶⁴

Table 18: Lifecycle Analysis of Sinkers and Jigs from manufacturing/import to loss to the environment based on the most recent data available: 2015/2016 (tonnes)

Product Type	Manufactured in Canada (2016)	Imported (2015)	Domestic Manufacturing + Imports: Total	Lost to Environment	Inventory	Recover/ Recycled
Sinkers (lead)	29	366	395	352	43	negligible
Sinkers (non-lead)	0	39	39	39	0	negligible
Jigs (lead)	21.3	148	169	110	38	negligible
Jigs (non-lead)	1.4	57	59	59	0	negligible

Notes: Data from manufacturers regarding the quantity of lead, and non-lead alternatives, used in manufacturing sinkers and jigs was obtained directly from manufacturers in 2016. For sinkers the total imports are based on CBSA data for the most recent year available (2015) – note that estimated sinker imports based on CBSA import data ranged from ~200-380 tonnes per year depending on the year of import (2011-2015). No import data specific for jigs is available from CBSA. Imports of jigs were calculated by first estimating total jig demand from the average number of jigs purchased per year from the angler survey and the number of anglers in Canada (DFO 2010) then the quantity of jigs manufactured in

⁶¹ Based on the angler survey data (2017) on purchases in the preceding 12 months resulting in the estimate of 352 tonnes of lead sinkers lost per year in Canada. Assuming purchases and losses were equivalent.

⁶² Based on the angler survey data on jig purchases in the preceding 12 months, resulting in the estimate of 110 tonnes of jigs purchased (to replace lost jigs).

⁶³ Data from manufacturers and anglers was obtained for the 2016 year although manufacturers indicated the market was stagnant and changed little from year to year.

⁶⁴ Although we also recognize the important efforts of lead-tackle exchange programs, and that these may be having highly localized positive impacts, it is expected that these are currently too few and too small to have an impact on the total quantity of lead used by anglers across Canada. We assume in this analysis that current lead exchange programs in Canada are having a having negligible impact on the total quantity of lead in sinkers/jigs that is collected and recycled.

Canada was removed from the total assuming the remaining demand must be met with imported products. Losses were estimated based on the total number of anglers in Canada (DFO, 2010) and the average number of sinkers and jigs purchased per year by anglers in 2016 (Angler survey, 2017), and the average weight of lost sinkers/jigs from Radomski et al (2006). Where imports + domestic manufacturing total exceed estimated losses it is assumed that the remaining sinkers/jigs are held in inventories (in retail stores and in angler personal supplies). Since no specific import data is available for jigs we only have estimates of total purchases per year for jigs and hence there is no estimate for potential inventory. Overall, it is estimated that the market for sinkers and jigs is at steady state with purchases of these products being made to replace lost products. Negligible recycling of lost sinkers/jigs is assumed.

In summary, most sinkers and jigs used in Canada are imported with >90% of lead sinkers being imported and >80% of lead jigs being imported. Most anglers purchase sinkers and jigs at traditional storefront retailers (major retailers and smaller sporting goods retailers) and purchases are generally to replace lost items. Losses to the environment during use can occur due to snagging, breaking lines, and spillage. It is estimated that approximately 460 tonnes of lead sinkers and jigs are lost to the environment each year in Canada.

4.2 Projection for the next 10 years

The market for fishing sinkers and jigs has remained largely unchanged for more than a decade. Stakeholders described the market as 'steady' or 'stagnant' and the market remains dominated by lead products. The number of anglers is not expected to change substantially over the next decade as it hasn't changed much over the previous decade so the demand overall for tackle products is expected to be steady over the next 10 years. Manufacturers indicated that 'no-one wants to buy' non-lead alternatives and the market for these products remains very small. The main reason given by manufacturers for this lack of interest is the higher cost of the alternatives. Many anglers are reluctant to buy the alternatives when they can buy the lead versions at a cheaper price. Alternatives to lead have not made any noticeable gains in the market in Canada over the last 10-years and we have no evidence that indicates that this will change in the next 10-years. We therefore expect that the situation as described in the previous sections of the report and summarized in Table 18 will remain unchanged over the next decade in the absence of any additional regulatory measures applied to lead sinkers and jigs. Since 460 tonnes of lead sinkers and jigs are lost to the environment each year, and this situation is not expected to change, it can be expected that a total of ~4,600 tonnes of lead will accumulate in the Canadian environment over the next decade due to the continued use of lead sinkers and jigs.

5.0 Review of measures and management practices, and promotional material for lead alternatives for sinkers and jigs

5.1 Canada

Canada prohibited the use of lead sinkers and jigs weighing less than 50 g (1.76 oz) or 2 cm (.79 in) on their longest axis in all of its National Parks and Wildlife Areas in 1997. A ban in other areas was proposed by an Environment Minister in January 2005, and a discussion paper was circulated that included a proposed ban on the import, manufacture and sale of lead sinkers less than 50 g and 2 cm in length (Fishing Lead Free: A Regulatory Proposal). This proposal was met with a huge amount of opposition from tackle manufacturers and sportfishing groups. Their main criticism was lack of consultation with the industry and that the proposal was based on misinterpreted statistics and “junk science.” In their response to the proposal, the Canadian Sport Fishing Industry Association asserted there was insufficient data to warrant a widespread ban on lead fishing tackle. On a population level, they asserted, lead fishing tackle was not limiting loon populations in Canada. (Response to “Fishing Lead Free: A Regulatory Proposal”). To address the “junk science” criticism a science symposium was held. The symposium was held in October 2005. Some key opponents to the restriction of lead fishing tackle, most notably the Ontario Federation of Anglers and Hunters, refused to work with the group and were opposed to any sort of partnership with the government (personal communication⁶⁵).

A petition to eliminate lead shot and fishing weights under the authority of CEPA 1999 was submitted to Environment Canada in 2006. The response to this petition was “Environment Canada is working with representatives from the sport fishing industry to find a solution that would lessen the risk posed by lead fishing sinkers and jigs to waterbirds and other wildlife. As part of risk management, various options such as regulations, codes of practice and guidelines are being considered. If a regulation is deemed the most appropriate action, it would be developed under CEPA 1999.”⁶⁶

There are also some small scale educational outreach and voluntary exchange programs in Canada related to lead fishing tackle – these are reviewed in section 5.3.

5.2 US

The United States Fish and Wildlife Service (USFWS) banned the use of lead sinkers in 13 wildlife refuges containing habitat used by loons, and in Yellowstone National Park. In their 1994 response to a citizen’s proposal to require labels or warnings on lead fishing sinkers stating that the products are toxic to wildlife, the Environmental Protection Agency (EPA) proposed a ban on the manufacture, processing, and distribution of lead and zinc sinkers for use in the U.S. The EPA estimated that the proposed rule would prevent an estimated 450 million lead and zinc-containing sinkers from being produced each year, and from potentially entering the environment. The economic impact (purchase price of sinkers) was estimated to be less than \$4.00 for the average angler per year. They estimated that approximately 4.7 million birds could be potentially saved by the proposed regulation. A bill was introduced into the 1994 Legislature containing these restrictions, but was not passed into law.⁶⁷

In 1994, the proposed nationwide ban on smaller lead weights faced opposition from several states and angling organizations claiming there was not sufficient evidence to justify a ban. That is a part of the reason that the proposed regulations were never enacted at that time. Thomas and Guitart (2009) suggest that part of the difficulties in regulating the use of lead fishing sinkers in the US is due to the fact that two competing agencies (the USEPA and the United States Fish and Wildlife Service, USFWS) have been involved in regulating lead use in recreational sports leading to possible problems in coordinated action, disconnects in agency priorities, and uncertainties regarding regulatory responsibilities (UNEP, 2011).

⁶⁵ As stated in; Michael, P. 2006. Fish and Wildlife issues related to the use of lead fishing gear. Washington State Department of Fish and Wildlife Dec 2006

⁶⁶ Office of the Auditor General of Canada: http://www.oag-bvg.gc.ca/internet/English/pet_175_e_28910.html

⁶⁷ Ibid

On August 3, 2010 and March 13, 2012 a petition was submitted to the US EPA⁶⁸ to ban the production and sale of lead based fishing tackle which argued that lead fishing tackle should be regulated under the *Toxic Substances Control Act* (TSCA). Both petitions were denied.

EPA denied the request to prohibit under TSCA section 6(a) the manufacture, processing, and distribution in commerce of lead fishing gear because “the petitioners have not demonstrated that the action requested is necessary to protect against an unreasonable risk of injury to health or the environment, as required by TSCA section 21. The petitioners do not provide a sufficient justification for why a national ban of lead fishing sinkers and other lead fishing tackle is necessary given the actions being taken to address the concerns identified in the petition. The petitioners also have not demonstrated that the action requested—a uniform national ban of lead for use in all fishing gear—is the least burdensome alternative to adequately protect against the concerns identified in the petition, as required by section 6. There are an increasing number of limitations on the use of lead fishing gear on some Federal lands, as well as Federal outreach efforts. A number of states have established regulations that ban or restrict the use of lead sinkers and have created state education and fishing tackle exchange programs. The emergence of these programs and activities over the past decade calls into question whether the broad rulemaking requested by petitioners would be the least burdensome, adequately protective approach. EPA notes that the prevalence of non-lead alternatives in the marketplace continues to increase.”

US EPA also goes on to state that ‘Several state fish and game agencies submitted comments⁶⁹. All support denial of the petition and provide several reasons why they do not support the actions requested in the petition. These comments assert that mortality from ingestion of lead fishing tackle is rare and is primarily limited to some areas of the country, that states are already working closely with the Fish and Wildlife Service on education and exchange programs, and that where there have been impacts on loons and trumpeter swans, states have already taken action. These states contend that these impacts are best addressed by geographically targeted actions that the states are undertaking. As noted by these commenters, states in the northern part of the country, where the majority of the impacts on loons has been observed, have taken action to limit or ban the use of lead sinkers or have implemented tackle exchange programs.’⁷⁰

In sum, EPA is not persuaded that the action requested by the petitioners—a sweeping national uniform rule on lead in all fishing gear—is necessary. The petitioners also have failed to demonstrate that a national ban on lead fishing gear is the least burdensome approach⁷¹ to adequately address the risk to the environment addressed in the petition, as required by TSCA section 6, given the mix of actions that state agencies and the Federal Government already are taking to address the impact of lead fishing sinkers on local environments. The risk described by the petitioners does appear to be more prevalent in some geographic areas than others, and the trend over the past decade has been for increasing state and localized activity regarding lead in fishing gear. For these reasons, EPA denied the petitioners' request for a national ban on lead in all fishing gear.”⁷²

After passing the House on June 26, 2015, the US Senate Appropriations Committee marked up and approved the FY 2016 Interior and Environment Appropriations Bill that includes a provision that blocks the US EPA from regulating lead in ammunition and fishing tackle. The bill was bundled into an omnibus spending package, which was approved by Congress and then signed by the President on December 18, 2015. US EPA currently therefore does not have the jurisdiction to regulate lead fishing sinkers and jigs.

One of the last actions of President Obama before leaving office was to issue an Executive Order (No.219) on Jan 19, 2017 that banned the use of lead ammunition and sinkers on federal lands. The Order requires ‘the use of nontoxic ammunition and fishing tackle to the fullest extent practicable for all activities on service lands, waters and facilities by January 2022, except as needed for law

⁶⁸ TSCA section 21 petition: <https://www.federalregister.gov/d/2010-28972/p-8>

⁶⁹ Arizona, Kentucky and Virginia state game and fish departments.

⁷⁰ <https://www.federalregister.gov/d/2010-28972/p-16>

⁷¹ When reviewing US EPA's decision it is important to note that under TSCA (1976) the 'least burdensome' requirement was an onerous legal requirement that greatly restricted US EPA's ability to take regulatory action on chemicals of concern during the 1976-2015 period. For example, in 1991 the EPA ban on asbestos under TSCA was invalidated in court due to this requirement. Since that time, US EPA regarded this principal risk management provision of TSCA, section 6, as an insurmountable obstacle to regulating chemicals. TSCA was finally updated in 2016. The new TSCA legislation deletes the “least burdensome requirements” language and other provisions that the court found EPA failed to satisfy with its asbestos ban, and it allows EPA to develop chemical regulations based on appropriate risk management considerations.

⁷² <https://www.federalregister.gov/d/2010-28972/p-19>

enforcement or health and safety issues, as provided for in policy'. The Order was effective immediately and remains in effect until incorporated into the Fish and Wildlife Service Manual, or until it is amended, superseded or revoked. On March 2nd 2017 and on his first full day in office, Trump's Interior Secretary Ryan Zinke issued an [order](#) revoking EO219.

5.2.1 US States

New Hampshire: On January 1, 2000, New Hampshire became the first state to ban the use of lead sinkers of one ounce (28.35 g) or less and lead jigs less than one inch (2.54 cm) long on freshwater lakes and ponds. The size range was based on sizes more likely to be ingested by birds. Violators are subject to a maximum fine of \$250. A later law, which became effective January 1, 2005, extended the ban to rivers and streams (effectively all waters of the state), and on January 1, 2006 it became illegal to sell these lead sinkers or jigs statewide. Michael (2006) provides the following perspective on enforcement of the law: 'According to New Hampshire Fish and Game personnel (personal communication), Fish and Game wardens have been performing random checks on anglers. Unless the disregard of the rule is blatant, anglers are educated on the rule and the reasons behind it, rather than fined. Most anglers, even bass anglers who commonly use lead-headed jigs, have made the switch to other materials. Although the bans for use and sale of lead tackle in New Hampshire and other states are opposed by the American Sportfishing Association, most local sportfishing groups, who were not involved in the legislative process, have not shown much strong opposition. Some of the smaller retail outlets for fishing gear were unhappy with the rule banning the sale of small lead tackle. Larger chain stores were not affected as much because they could transfer stock to stores in other states where it was still legal. Some questions about the sale of this gear remain to be answered, though, and have been referred to the NH Attorney General's office. Among these is the legality of mail order or internet sales – can a company based in New Hampshire sell small lead weights or lead jigs to an angler with an address outside the state (personal communication)',⁷³

California Department of Toxic Substances Control (DTSC) added lead fishing sinkers and jigs to the Department's Draft Priority Product Work Plan with a public comment period beginning in Sept 2014. DTSC released a draft of its Priority Product Work Plan in April 2015, the first program within Governor Jerry Brown's Green Chemistry Initiative, and identified seven product types (including fishing sinkers and gear that contain lead, zinc, and copper) to be banned within the state. DTSC can propose Priority Products, at any time over the subsequent three-year period. Issuance of a proposed Priority Product starts the regulatory process, including public review and comment for that Priority Product, which can take up to one year.

California requires manufacturers of consumer products that contain lead to print a warning on the packaging that reads "This product contains lead, a chemical known to the State of California to cause cancer and birth defects and other reproductive harm."⁷⁴

New York and Vermont have banned the sale of lead fishing weights weighing one half ounce or less:

New York: As of May 7, 2004, it is unlawful to sell "at retail" lead fishing sinkers weighing ½ ounce (14.17 g) or less. A sinker is defined as a device designed to be attached to a fishing line and intended to sink the line. It does not include artificial lures, weighted line, weighted flies, or jig heads. "Sell at retail" is defined as the sale to any person in the state for any purpose other than resale. Fish and Wildlife staff from New York reported that this regulation was championed by the loon lobby in Adirondack Park, which successfully lobbied the state legislature (Michael, 2006). The original proposal was more restrictive, but input from marine constituents and the agency reduced the scope of the ban to only sinkers under ½ ounce. The ban on sale, rather than use, allowed anglers to transition from lead sinkers to lead-free alternatives. The challenge was to get the word out to smaller retailers (large chain stores were easy to contact). The primary tool used was press releases, information in the regulations guide, and signs posted at license sales agents. The Adirondack Cooperative Loon Program sponsored a Lead Sinker Exchange Program. Overall, there was little resistance to the regulation, and sporting goods stores started stocking small non-lead sinkers.⁷⁵ The educational materials distributed included pictures of split shot sinkers in gravel showing how difficult it was to distinguish the sinkers from the small stones regularly ingested by loons.

⁷³ Michael 2006. Ibid

⁷⁴ Under Proposition 65

⁷⁵ Ibid

Vermont: Vermont Fish and Wildlife Commission has taken several actions to help educate anglers about lead tackle and its effect on wildlife, as well as working to encourage anglers to be aware of and use lead-free tackle. In 2004 the Vermont Legislature passed H.516, An Act Relating to a Prohibition Against the Use and Sale of Lead Sinkers. The new legislation, supported by the Vermont Federation of Sportsmen's Clubs and the National Wildlife Federation, contained three sections that took effect on three different dates. Staff of the Vermont Fish and Wildlife Commission reported little opposition to the rules from either sportfishers or retailers (Michael, 2006). The three relevant sections are as follows:

Sec 3. Lead Sinkers; Public Education Program; Appropriation

This section took effect July 1, 2004. It directed the Commissioner of Fish and Wildlife to develop and carry out a public education program designed to alert the public to the threat that lead fishing tackle can pose to wildlife, and also a program to provide Vermont anglers lead-free fishing sinkers in exchange for leaded sinkers. The commissioner was to report back to the legislature on January 15, 2006 on expenditures for the programs. A sum of \$25,000 was appropriated from the state's general fund to develop the education program.

Sec 2 10 V.S.A. Section 4614. Lead Sinkers; Sales Prohibited This section took effect January 1, 2005 and reads:

"It is unlawful to sell or offer for sale a lead sinker in the state of Vermont. In this section, "sinker" means any device which weighs one-half ounce or less and is attached to a fishing line for the purpose of sinking the line, and does not include other lead fishing-related items such as weighted fly line, lead-core fishing line, downrigger cannon balls, weighted flies, lures, spoons, or jig heads."

Sec 1 10 V.S.A. Section 4604(g).

This section will take effect January 1, 2007 and reads:

"A person shall not use a lead sinker for taking of fish in any state waters. In this section, "sinker" means any device which weighs one-half ounce or less and is attached to a fishing line for the purpose of sinking the line, and does not include other lead fishing-related items such as weighted fly line, lead-core fishing line, downrigger cannon balls, weighted flies, lures, spoons, or jig heads."

To comply with Section 3 (Public Education Program) Vermont Fish and Wildlife Department did the following:

- A full-page description of the issue, including workings of the new law, was placed in the Vermont Digest of Hunting, Fishing, and Trapping Laws, and in their Angler's Pocket Guide for 2005.
- An educational poster was developed and placed on the Department's web site. Laminated versions of this poster will be placed at all Vermont public boating access areas and selected State parks before the beginning of the spring fishing season.
- An enlarged version of the poster was used at the Yankee Classic Outdoor Sportsmen's show, and other similar public events.
- A hunting/fishing license holder was designed and made available to license agents statewide, and at outdoor and sportsmen's shows. It includes a description of the new law, information about loons, and contact information telling where the public can learn more about the issues.
- An information packet was mailed to all state game wardens, check-in stations, bait dealers, licensing agents, and selected State Parks (those with fishing opportunities). The packet included an educational poster, a list of manufacturers/suppliers of lead-free fishing tackle, some of the license holders described above, and information on where to properly dispose of lead sinkers.
- A full-sized page and three smaller inserts were put into the 2006 Vermont Fish and Wildlife calendar describing the hazards of lead fishing tackle and the effects of the new law.
- Lead-free fishing sample packets with educational tags were handed out at fishing clinics and educational programs, and were available to the public at Fish and Wildlife district offices, federal fish hatcheries, and selected Vermont State Parks.
- Web pages linked to the Vermont Fish and Wildlife Homepage were developed featuring information on bald eagles, great blue herons, common loons, and Canada geese; 4 species of birds affected by lead sinker use; and detailing the new law designed to protect them. Other items on the web site

include the educational poster, a copy of the lead-free tackle manufacturer list, links to other sites providing useful information about lead tackle, loons and lead, wildlife and lead, humans and lead, lead poisoning and disposal, the "Lets Get the Lead Out" brochure, and FAQ's about lead and the new law.

- Prior to the opening of open water trout and salmon fishing seasons in April 2006 and 2007, paid advertising/Public Service Announcements will be placed on television and radio and in newspapers and magazines concerning the new laws and health impacts of lead on wildlife

Figure 8. Lead Tackle Exchange Program Poster



Source: Michael (2006)

Maine: In September 1997, the state of Maine passed a law allowing the commissioner of Inland Fisheries and Wildlife to accept money, goods, or services donated to the department for the purpose of educating the public on ways to minimize the threat to loons and other bird species from discarded or lost lead sinkers and lures. In 1999, a new law banned the sale of small lead sinkers (weighing 0.5 oz (14.17 g) or less), beginning January 1, 2002. A sinker was defined as "a device that is designed to be attached to a fishing line and intended to sink the line. It does not include artificial lures, weighted line, weighted flies or jig heads". During the legislative process, testimony against the bills was mostly from members of the Bass Anglers Sportsmens' Society (BASS) and people associated with youth fishing programs. They had raised money and given out thousands of dollars of fishing gear to kids over the last few years and were concerned that some of this gear would become illegal if the bill passed.⁷⁶

Massachusetts's Fisheries and Wildlife Board, (similar to Maine's Senate Bill 268 (2013), and New Hampshire's bill, SB 89 (2013)), have all banned the use and sale of jigs and sinkers weighing one ounce or less. As of January 1, 2012 the Massachusetts Department of Fish and Game (DFW) prohibited 'the use of any lead fishing sinkers and lead jigs weighing less than 1 ounce in all inland waters (fresh water) of the Commonwealth'.⁷⁷ In terms of this regulation, "lead sinker" or "lead weight" is defined as any sinker or weight made from lead that weighs less than 1 ounce. A "lead jig" is defined as any lead-weighted hook weighing less than 1 ounce. Prohibited tackle includes lead sinkers and jigs weighing less than an ounce regardless of whether they are painted, coated with rubber, covered by attached "skirts" or some other material. In response to this, the US Congressional Sportsmen's Foundation stated that 'alternative metals for small split shots (1/2 ounce or less) are available but are more expensive and do not offer the same level of performance as lead'.⁷⁸

⁷⁶ Ibid

⁷⁷ <http://www.mass.gov/eea/agencies/dfg/dfw/hunting-fishing-wildlife-watching/fishing/loons-lead-sinkers-and-jigs.html>

⁷⁸ <http://sportsmenslink.org/policies/state/lead-sinker-ban>

Washington: In 2012, legislation which would have further restricted the use of lead sinkers and fishing tackle was introduced in Washington (HB 2241) but the bill was defeated.

5.3 Overview of Voluntary Initiatives in North America

As the US, the Canadian Government and a number of NGOs have also disseminated information material on the problems related to the use of lead fishing tackle and non-lead substitutes. In addition, there have been small-scale programs to promote the voluntary exchange of lead weights for non-toxic alternatives (UNEP, 2011). Lead tackle exchange programs generally allow anglers to exchange lead sinkers and jigs for non-lead alternatives for free.⁷⁹ Lead fishing-tackle exchange programs in several US states, were introduced largely to protect loon and swan populations (Ross-Winslow and Teel 2011), did show some success. For example, more than 40,000 lead sinkers were collected from anglers in state parks and fishing stores in 1 yr in New Hampshire and Vermont (1999-2000) and received free steel sinkers in return (Haig et al., 2014)⁸⁰ This effort was used to educate anglers as to the toxicity of lead in their gear and allow them to try alternatives without risk. However, these voluntary efforts were not considered sufficient and both Vermont and New Hampshire subsequently went on to ban lead fishing weights – New Hampshire in 2000 and Vermont in 2004.

Minnesota has taken an educational approach to the problem and distributed educational information about the impacts of lead on loon populations and the availability of non-toxic alternatives. An example is provided below:

⁷⁹ Nova Scotia, Cobequid Wildlife Rehab Centre, pers. comm. 2016 http://cwrc.net/cms2/wp/wp-content/uploads/2016/08/Lead_Ammo_Tackle_Brochure_2016_web.pdf ; other examples of similar programs include: Pemaquid Exchange Program: <http://www.pemaquidwatershed.org/education/lead-tackle-exchange/> Alameda Country Program: <http://www.acwd.org/index.aspx?nid=368>

⁸⁰ https://www.fws.gov/cno/es/CalCondor/PDF_files/2014-9-CONDOR-Orn-Applications.pdf ; also see: (<http://www.nwf.org/news-and-magazines/national-wildlife/news-and-views/archives/2001/getting-the-lead-out.aspx>).

Figure 9. Educational brochure from Minnesota Department of Environmental Assistance

Get the lead out!



Non-lead fishing tackle is an effective alternative, and it protects loons, eagles and other wildlife.

Tackling the problem

Lead is a toxic metal that, in sufficient quantities, has adverse effects on the nervous and reproductive systems of animals. Found in most fishing jigs and sinkers, this metal is poisoning wildlife such as loons and eagles.

More anglers are using fishing tackle made from non-poisonous materials such as tin, bismuth, steel, and tungsten. And these alternatives are becoming easier to find.



Sink like a stone



These pebbles and sinkers were found in the gizzard of a lead-poisoned loon from Minnesota. You can see how loons can mistake lost fishing weights for the pebbles they seek to help grind their food. Loons die within two to three weeks after swallowing a lead sinker or jig.

Non-lead weights and jigs

There's been an explosion of innovations in the tackle industry, and your options are becoming more plentiful each year.

<p>Tin *</p> 	<p>Tungsten</p> 	<p>Stainless steel</p> 
<p>Snap-on tungsten composite *</p> 	<p>Bismuth *</p> 	<p>Glass *</p> 
<p>Bismuth/tin</p> 	<p>Bismuth/tin *</p> 	<p>Tungsten composite *</p> 

X-ray of a dead loon with ingested lead fishing tackle, found in a northern Minnesota lake.



Loons and eagles sometimes ingest lead by eating fish which have themselves swallowed lead tackle.

More resources → www.moea.state.mn.us/sinkers *** Made in Minnesota**

What's the risk? Weigh the evidence:

While it is hard to get an accurate count of water birds and birds of prey that die from ingesting lead tackle, current research indicates that lead poisoning is a serious concern.

- ▶ Research on loons from six New England states has shown that 26% of the more than 1,000 dead adult breeding loons found between 1987 and 2004 died from lead poisoning. On some "hot spot" lakes, lead caused over 50% of the documented causes of death.
- ▶ In Michigan, another 17-year study revealed that lead poisoning – primarily from lead jigs – was the second leading cause of death at 22% of the 204 loons examined.
- ▶ Although research in Minnesota is limited, a study conducted by the Minnesota Pollution Control Agency concluded that lead poisoning accounted for 12% of the dead adult loons with known causes of death.

The Raptor Center at the University of Minnesota has monitored injured bald eagles for lead since 1980. Lead poisoning has been the cause of admission of 315 out of a total of 1,398 eagles, or 23%. This percentage has remained steady in spite of 1991 federal restrictions on using lead shot for hunting waterfowl. Of increasing concern, eagles are inadvertently eating bullet fragments lodged in the flesh of big game they find in the field. Lead fishing tackle may also be a source of exposure.

Additionally, there are risks associated with the production of lead tackle. These risks can be reduced by using non-toxic materials to manufacture fishing products.

Teach your tadpoles

Outfit kids' tackle boxes with non-lead weights. They are non-toxic and safer for youngsters to handle. Plus, it's a way to help instill a strong conservation ethic.



MinnAqua is a statewide DNR education program that teaches participants about Minnesota's aquatic resources through learning how to fish. The program provides hands-on learning, teaching aquatic stewardship, fish identification, management, safety and fishing skills. To learn more:

www.dnr.state.mn.us/minnaqua

Price check

You can expect to pay for non-lead tackle in general, but the difference is not great, especially for basic items. Steel is often less expensive than its leaded counterparts.

	LEAD	TIN	STEEL	TUNGSTEN
3/0 REUSABLE SPLIT SHOT	3¢	4¢	–	–
1/8 OZ. PAINTED JIG	40¢	51¢	–	\$1.99
1/4 OZ. WORM WEIGHT	14¢	50¢	23¢	66¢

Don't throw old lead tackle in the trash. Bring them to your local household hazardous waste collection site during your next visit. Some scrap metal recyclers may also accept lead.

Trolling for Change

Minnesota is fishing country. We buy a lot of tackle. That's a big reason why our focus is on educating and partnering with others to stimulate the marketplace and speed the transition toward lead-free angling. Today, more environmentally-friendly tackle is being made and sold, and growing numbers of anglers are going lead-free.

In Minnesota, there are no bans on the sale or use of lead weights and jigs. In many areas though, non-lead tackle isn't just a good idea – it's the law. Restrictions on lead tackle are becoming more common in the United States and other countries:

- ▶ New Hampshire has banned the use of lead sinkers that weigh less than an ounce and lead jigs smaller than an inch.
- ▶ Vermont banned the use and sale of lead sinkers weighing 1/2 oz. or less.
- ▶ Maine and New York have banned the sale of lead sinkers weighing a half-ounce or less.
- ▶ Great Britain banned the use of lead sinkers in 1987.
- ▶ In Canadian national parks and national wildlife areas, it is illegal to use lead sinkers and jigs weighing less than 50 grams, a ban that went into effect in 1997. Environment Canada is pursuing actions to prohibit the import, manufacture, and sale nationwide of lead sinkers and jigs.
- ▶ The U.S. Fish and Wildlife Service has already banned lead sinkers in three wildlife refuges and Yellowstone National Park. The Service is currently discussing restrictions on the use of lead sinkers and jigs at other national wildlife refuges where loons and trumpeter swans nest.



Minnesota Office of Environmental Assistance

www.moea.state.mn.us/sinkers

Source: Michael (2006); MOEA

The Minnesota Pollution Control Agency maintains a list of >35 manufacturers of non-toxic fishing tackle.⁸¹

The outreach and education programs by state and federal agencies and non-governmental organizations promoting the use of non-lead fishing tackle, while important, have not resulted in a widespread switch to non-toxic fishing tackle by anglers and there is no evidence these programs by themselves have significantly reduced lead exposure to wildlife. The fact that there are some limited state regulations addressing lead sinkers has not ended lead poisonings of birds in those states, nor do those regulations address continued lead poisoning and likely lead exposure to birds in numerous other states where there are not even limited state regulations (TSCA Petition, 2011).

⁸¹ Cf. <http://www.pca.state.mn.us/index.php/living-green/living-green-citizen/household-hazardous-waste/get-the-lead-out/get-the-lead-out-manufacturers-and-retailers.html>

State laws requiring anglers to use lead-free tackle has increased the availability of lead-free alternatives. Although the costs of alternatives are higher than lead the difference is not prohibitive (Michael, 2006).

Note that some non-profit organizations in Canada offer small-scale programs that exchange angler-owned lead tackle for free non-lead substitutes (personal communication, Cobequid Wildlife Rehabilitation Centre, Nova Scotia, 2016).⁸² The exchange program allows anglers to bring in lead tackle for exchange for non-lead versions for free. This program also does active outreach by bringing non-lead tackle to local fishing competitions and fishing events and encouraging anglers to exchange for non-lead at these events as well as providing educational information (personal communication, Cobequid Wildlife Rehabilitation Centre, Nova Scotia, 2016). These programs are typically run by NGOs, are small, have limited geographical scope, and often struggle for funding. Although these voluntary efforts are considered important, and likely have positive local benefits in terms of educating anglers and promoting alternatives in the local area, the impact on overall uses of lead sinkers and jigs in Canada is expected to be negligible. The lack of impact of current voluntary programs is evidenced by the fact that the overall Canadian market for sinkers and jigs continues to be dominated by lead products.

5.4 Europe

UK: The importation and sale of lead fishing weights weighing more than 0.06 g and less than 28.35 g were banned in the UK in 1987 and in the same year the use of these weights was banned in England and Wales. These restrictions were introduced in response to a 1981 report by the Nature Conservancy Council identifying lead poisoning from fishing weights as being the biggest single cause of mute swan mortality in the UK. Previous voluntary measures had proved not to be sufficient (UNEP, 2011). The number of cases of lead poisoning in swans in the Thames Valley fell by 70% in the two years following the ban (Friend and Franson 1999). Although the precipitous decline of mute swans was reversed, Kelly and Kelly (2004) report that many birds still show elevated blood lead levels and many swans are still dying from injuries caused by lost or discarded fishing tackle (mostly hooks and pieces of fishing line).

Denmark: In 2001, Denmark banned the importation of many commodities containing lead. Since December 2002, it has not been legal to use lead in fishing tackle in Denmark

Sweden: For some rivers in Sweden, voluntary restrictions on lead fishing weights are in place. A voluntary phase-out approach for lead tackle was deemed inadequate in a 2007 report from the Swedish Chemicals Agency (KEMI) which pointed out, the "voluntary phasing-out of lead in angling has been in progress for 15 years without adequate results having been achieved, stronger incentives are needed." The report referred to the estimated amounts of lead used in non-commercial angling (200t/year), which had not decreased over a period of ten years (1995-2005) despite information campaigns encouraging anglers to switch to non-lead alternatives. In the report, KEMI together with the Swedish Environmental Protection Agency state that one way of achieving a restriction on lead in fishing tackle might be via an EU-wide approach, using the Limitations Directive / the Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). However, the report prefers a national ban - arguing it could be implemented more quickly than a regulation on the European level - and proposes restricting to 0.1% the lead concentration in fishing gear.

European Union: The European Commission in 2004 ordered a study exploring the consequences that might be expected from a restriction of the use of lead in fishing weights (as well as in ammunition and candle wicks). The European Commission report stated that "it is obvious that reasonable solid arguments related to migratory birds exist for a community wide approach regarding the use of lead split shot and small sinkers for fishing in inland waters." However, no legislative action followed from this study and a 2007 Swedish Chemicals Agency report "(Lead in articles)" describes the reasons for this decision as follows: "[...] the Commission finally considered that the basis for regulating fishing sinkers was too weak and that there could also be problems with some of the alternatives. The only environmental problem identified in the report was the risk of poisoning of seabirds, which the Commission did not consider to be sufficient reason for restriction. The Commission therefore decided not to proceed with any regulation of fishing sinkers in the Limitations Directive. The conclusion drawn by the Commission from the study was instead that the EU should

⁸² http://cwrc.net/cms2/wp/wp-content/uploads/2016/08/Lead_Ammo_Tackle_Brochure_2016_web.pdf

press for lead to be prohibited in the OSPAR convention for the protection of the marine environment in North Atlantic. [...] However, the Swedish Chemicals Agency and the Swedish Environmental Protection Agency regard the Commission report as deficient [...]."

5.5 International

5.5.1 UNEP-AEWA

The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland and the Canadian Archipelago.

Developed under the framework of the Convention on Migratory Species (CMS) and administered by the United Nations Environment Programme (UNEP), AEWA brings together countries and the wider international conservation community in an effort to establish coordinated conservation and management of migratory waterbirds throughout their entire migratory range.

Based on a review of the evidence AEWA developed the following recommendations:⁸³

Based on existing data and literature, the Technical Committee could recommend to the 5th Meeting of the Parties to AEWA (MOP5):

1) to decide to amend the AEWA Action Plan as follows:

4.1.4 Parties shall endeavour to phase out the use of lead shot for hunting in wetlands and the use of lead fishing weights as soon as possible in accordance with self-imposed and published timetables.

2) To request Contracting Parties to collect and/or publish data on the relevance of fishing with lead weights in their countries, and to inform the Secretariat accordingly e.g. by 30 November 2013 through a written report or questionnaire.

In the case of 1) a draft Resolution could, moreover, include the following action points for the Meeting of the Parties to decide on:

- to urge Contracting Parties to phase out the use of lead fishing weights as soon as possible, in close cooperation with all interest groups involved including fishing associations, to report to each session of the Meeting of the Parties on progress made in this matter and to stimulate and facilitate the replacement of lead fishing weights by non-toxic weights;
- to further urge Contracting Parties to establish enforcement procedures in order to assure compliance with an introduced ban;
- to invite other MEAs to join in a common effort with AEWA to phase out the use of lead fishing weights;
- to instruct the Secretariat to disseminate information on the problems caused by the use of lead fishing weights on the basis of existing materials on lead shot;
- to call upon fishing associations and clubs to support and promote the ban;
- to call upon fishing weight manufacturers and traders to actively promote non-toxic materials

5.5.2 UNCED Rio Declaration

From an international perspective, Thomas (1997) also noted that the Rio Declaration on Environment and Development states that the costs of pollution remediation should be internalized among those responsible for contamination (UNCED 1992).⁸⁴ It is expected that a switch to non-lead alternative sinkers would result in an increase in costs to anglers for these products. However, the incremental costs are small and are expected to be <\$10.00 per year per angler (US EPA 1994, Scheuhammer and Norris, 1995; Thomas, 1997; Scheuhammer et al., 2003). Despite this relatively small increase in costs the economic factor has been used to oppose restrictions on lead sinker/jig use in fishing (Thomas, 1997).

Note that consistent with the Rio Declaration, one of guiding principles of CEPA is the polluter pays principle. In this regard, CEPA embodies the principle that users and producers of pollutants and

⁸³ UNEP-AEWA 2011: http://www.unep-aewa.org/sites/default/files/document/mop5_inf_5_2_lead_fishing_weights_lit_review_0.doc

⁸⁴ UNCED 1992 Rio Declaration: <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

wastes should bear the responsibility for their actions. Companies or people that pollute should pay the costs they impose on society.⁸⁵

Thomas (1997) makes the following observation regarding the economic implications of restricting lead uses in sport-fishing: 'Anglers and hunters view the higher costs of lead free alternatives as a government imposition upon a decreed right rather than a user payment to maintain the sustainability of a recreational practice. Paradoxically, the same people may contribute large sums of money to non-governmental organisations which purport to bolster wild animal populations and improve their habitats' – Thomas (1997) notes that Canadian and American contributions to Ducks Unlimited were >\$95 million in 1994; other relevant examples include contributions to the various hunting and angling federations across Canada. These contributions are much greater than the average costs of adopting non-toxic materials (Thomas, 1997). In this case, individuals are prepared to pay, voluntarily, for something which they see as benefiting their recreation and provides a tangible return to the individual (Thomas, 1997). Although non-toxic fishing products would reduce toxic risks to existing animals and help to decontaminate environments anglers may not view these as having a direct and significant benefit to their sport. Fishing and game animal orientated conservation organizations emphasize habitat acquisition and game production for consumptive sports, and this is what the average sportsperson is willing to pay for. In addition, these organizations lobby governments to effectively maintain rights of access, rights to pursue consumptive sports, and to resist government infringement on these sports (Thomas, 1997). For many people, angling represents foremost a diversionary outdoors, and/or social experience, and the acquisition of fish is secondary. In these cases, gaining access to, or expanding, the outdoors experience becomes the principal object of an individual's investment (Thomas, 1997).

Voluntary adoption of non-lead sinkers and jigs would require a widespread shift in perception amongst anglers in Canada. A voluntary program is unlikely to be effective unless anglers believe that non-lead products will be a significant benefit to their sport and view the increased costs associated with non-toxic alternatives as being reasonable in light of the benefits to be achieved.

5.6 Summary of Pros and Cons in the Canadian Context

The pros and cons of implementing the measures and management practices discussed in 5.1-5.5 in the Canadian context are summarized below:

Partial and Full Prohibitions:

Partial prohibitions include the current Canadian situation where lead sinkers <50g in weight or <2cm long are banned in National Parks, and the ban on lead sinkers in the US in Wildlife Refuge Areas and some US parks. In addition, the following US States have banned lead sinkers: New Hampshire; New York, Vermont, Maine and Massachusetts. In Europe, Denmark has banned lead fishing gear and England and Wales have banned lead fishing weights of 1oz or less. Where bans specify the size of the weights to be banned these are the sizes thought most likely to be ingested by birds. Angling associations have strongly opposed bans on lead fishing weights wherever they have been proposed.

Pro: Extending the current partial ban on lead fishing weights in Canada to a National ban would be expected to reduce wildlife exposure to lead; and reduced wildlife toxicity and mortality would be expected. For example, US EPA estimated that 4.7 million birds would be saved with a National ban and that the costs to anglers would be minimal (\$4 per year).

Pro: Experiences from other jurisdictions indicates that initial opposition is reduced with education programs and a phased-in approach allowing sufficient time to transition to alternatives. A similar approach could be used in Canada.

Pro: No evidence for a drop in fishing participation or detrimental economic impacts have been associated with bans in other jurisdictions. This is not surprising given the minimal cost increase associated with using alternatives. The minimal cost increase expected in Canada would not be expected to impact fishing participation.

Con: Angling groups will strongly oppose any restrictions on lead fishing weights in Canada, as they have in all other jurisdictions.

⁸⁵ CEPA 1999 Guiding Principles: <https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=E00B5BD8-1&offset=3&toc=hide>

Voluntary Programs

New Hampshire and Vermont initially tried voluntary programs before enacting bans. Minnesota has taken an education/voluntary approach but it is unclear to what extent this has been successful.

Pro: May result in less opposition from angling associations in Canada than a full ban, but opposition would still be expected.

Pro: Some voluntary programs have achieved some success in getting anglers to try alternatives by giving free exchanges of non-lead sinkers for lead (e.g. more than 40,000 lead sinkers were collected from anglers in state parks and fishing stores in 1 yr in New Hampshire and Vermont (1999-2000) and received free steel sinkers in return). If the approach in Canada includes free exchanges the same uptake could be expected.

Con: Some jurisdictions that tried voluntary approaches initially found them insufficient and went on to apply bans (e.g. Vermont). The same could be expected for voluntary approaches in Canada.

Con: Anglers are resistant to change and voluntary programs have had limited success in other jurisdictions, particularly as long as non-lead alternatives are more expensive. The same could be expected for voluntary approaches in Canada.

Any voluntary approach used should have a means of effectively quantifying success of the program in achieving the aims of reduced uses and releases of lead.

6.0 Overall Summary

It is well documented that wildlife, primarily piscivorous birds and other waterbirds, ingest fishing sinkers and jigs during feeding, when they either mistake the sinkers and jigs for food items or grit or consume lost bait fish with the line and weight still attached⁸⁶. Lead fishing weights that weigh less than 50 g and are smaller than 2 cm in any dimension are generally the size found to be ingested by wildlife. Ingestion of a single lead sinker or lead-headed jig, representing up to several grams of lead, is sufficient to expose a loon or other bird to a lethal dose of lead. Lead sinker and jig ingestion has been documented in 10 different wildlife species in Canada. In the United States, ingestion of lead sinkers and jigs by 23 species of wildlife, including loons, swans, other waterfowl, cranes, pelicans, and cormorants, has been documented. Evidence gathered to date indicates that lead sinker and jig ingestion is the only significant source of elevated lead exposure and lead toxicity for Common Loons (*Gavia immer*) and the single most important cause of death reported for adult Common Loons in eastern Canada and the United States, frequently exceeding deaths caused due to entanglement in fishing gear, trauma, disease, and other causes of mortality (Scheuhammer *et al.*, 2003).

The lifecycle of sinkers and jigs consists of domestic manufacturers and importers supplying retailers, often via wholesalers/distributors, anglers purchase the sinkers and jigs for their fishing tackle supplies and some are lost each year. Anglers then purchase new sinkers/jigs to replace the ones lost. Once lost it is not expected that sinkers/jigs are recycled to any great extent as they are hard to locate and retrieve once lost, and given the small size of most lost sinkers and wide dispersal once lost there is little economic incentive for organized collection and recycling.

Currently, ~50 tonnes of lead are used annually in the domestic manufacture of sinkers and jigs with 29 tonnes used in production of sinkers and 21.3 tonnes used in production of jigs. Much smaller amounts of alternatives were used (0.7 tonnes bismuth and 0.7 tonnes tin) in the manufacture of jigs in Canada. Virtually all domestically manufactured fishing sinkers are lead and >90% of fishing jigs are manufactured with lead. This indicates that the situation in Canada is largely unchanged from that found by Scheuhammer *et al.* (2003) more than a decade ago.

The average quantity of imported sinkers 2013-2015 was estimated to be 355 tonnes and total domestic manufacturing of lead sinkers in 2016 was 29 tonnes⁸⁷ indicating imports cover >90% of sinker demand in Canada in recent years. Our analysis indicates that this situation, with imports dominating the market, has remained largely unchanged since 1988. Most imports of fishing sinkers originate in China and the US, with smaller quantities from Taiwan. These three countries are responsible for >90% of fishing sinker imports into Canada.

Alternatives to lead sinkers and jigs have been available for some time and include brass, tin, steel, bismuth, tungsten, ceramics, and other materials. A wide variety of sinkers and jigs are available on the Canadian market and the prices of alternatives vs lead can be less than, comparable to, or higher for the alternatives depending on the type of sinker/jig and the alternative material used. For example, steel sinkers can be cheaper than lead whereas tungsten and bismuth sinkers tend to be more expensive. Feedback from sinker/jig manufacturers indicates that there is very little demand for non-lead sinkers and jigs in Canada so there is no incentive to manufacture or supply them.

Our survey of anglers indicated that >85% of the 240 respondents purchased their sinkers and jigs from traditional storefronts (including major retailers and local outfitters/tackle shops), <5% buy them online, and <10% make their own. Approximately 90% of anglers reported that they used lead sinkers, and 5% did not know what their sinkers were made from. Tungsten and brass were the most commonly reported alternatives used with 8% of anglers reporting using sinkers made of these materials; 6% reported using steel sinkers and 5% reported using sinkers made of composite materials. Only 2% of anglers reported using tin and bismuth sinkers. These results confirm that the majority of the sinkers used in Canada currently are lead sinkers (used by 90% of anglers reporting to the survey). In the case of jigs, 65% of anglers reported using lead jigs, and 19% did not know what their jigs were made from. This also reflects our findings from online research and surveying products at stores – it is typically clear whether a sinker is made from lead or alternatives materials but the same cannot be said for jigs. For a substantial number of jig products it was not possible to discern

⁸⁶ Scheuhammer AM, Norris SL. A Review of the Environmental Impacts of Lead Shotshell Ammunition and Lead Fishing Weights in Canada. Canadian Wildlife Service Occasional Paper No. 88, 1995, 54 pp; Available from: <http://publications.gc.ca/collections/Collection/CW69-1-88E.pdf>

⁸⁷ An additional 21.3 tonnes was used in lead jig manufacturing in Canada.

from the product packaging or product details provided whether the jig contained lead or not. Steel is the most commonly reported alternative material used for jigs with 20% of anglers using steel jigs. The next most popular were brass jigs (13%) and composites (11%). Tungsten jigs and tin jigs were used by 5-6% of anglers. Use of bismuth jigs were reported by only 1% of anglers.

Losses to the environment during use can occur due to snagging, breaking lines, and spillage. It is estimated that approximately 460 tonnes of lead sinkers and jigs are lost to the environment each year in Canada. Most of these losses (~75%) are associated with sinkers and ~25% associated with lost jigs.

The most recent information currently available indicates that there were 3.3 million anglers in Canada in 2010 (DFO, 2010⁸⁸). The average number of days fished per year per angler has remained unchanged since 1995 at 13 days. Total expenditures by anglers were \$2.5 billion in 2010. Over 80% of these expenditures were for food, lodging, and travel/transportation. Expenditures related to lures, lines, tackle, bait and other fishing supplies were \$201 million or 8% of total expenditures in 2010 (DFO, 2010). The relative expenditures on fishing lures, lines, baits and other supplies has remained unchanged at 8% of the total since 1995 (see Scheuhammer and Norris, 1995). The costs associated with switching to non-lead alternatives are expected to be negligible when compared to overall angler expenditure on their sport each year.

The market for fishing sinkers and jigs has remained largely unchanged for more than a decade. Stakeholders described the market as 'steady' or 'stagnant' and the market remains dominated by lead products. The number of anglers is not expected to change substantially over the next decade as it hasn't changed much over the previous decade so the demand overall for tackle products is expected to be steady over the next 10 years. Manufacturers indicated that 'no-one wants to buy' non-lead alternatives and the market for these products remains very small. The main reason given by manufacturers for this lack of interest is the higher cost of the alternatives. Many anglers are reluctant to buy the alternatives when they can buy the lead versions at a cheaper price. Alternatives to lead have not made any noticeable gains in the market in Canada over the last 10-years and we have no evidence that indicates that this will change in the next 10-years. Since 460 tonnes of lead sinkers and jigs are lost to the environment each year, and this situation is not expected to change, it can be expected that a total of ~4,600 tonnes of lead will accumulate in the Canadian environment over the next decade due to the continued use of lead sinkers and jigs.

Partial prohibitions on lead sinkers and jigs have been used in various jurisdictions including the current Canadian situation where lead sinkers <50g in weight or <2cm long are banned in National Parks, and the ban on lead sinkers in the US in Wildlife Refuge Areas and some US parks. In addition, the following US States have banned lead sinkers: New Hampshire; New York, Vermont, Maine and Massachusetts. In Europe, Denmark has banned lead fishing gear and England and Wales have banned lead fishing weights of 1oz or less. Where bans specify the size of the weights to be banned these are the sizes thought most likely to be ingested by birds. Angling associations have strongly opposed bans on lead fishing weights wherever they have been proposed. Voluntary programs to encourage the use of alternatives have been attempted in other jurisdictions and there are small scale lead tackle exchange programs in Canada. Voluntary adoption of non-lead sinkers and jigs would require a widespread shift in perception amongst anglers in Canada. A voluntary program is unlikely to be effective unless anglers believe that non-lead products will be a significant benefit to their sport and view the increased costs associated with non-toxic alternatives as being reasonable in light of the benefits to be achieved.⁸⁹

⁸⁸ DFO 2010. Survey of Recreational Anglers: <http://www.dfo-mpo.gc.ca/stats/rec/can/2010/index-eng.htm>

⁸⁹ Thomas, V.G. 1997. Attitudes and Issues Preventing Bans on Toxic Lead Shot and Sinkers in North America and Europe. J. Environmental Values 6(2): 185-199.

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AEWA Resolutions, Conservation Guidelines and publications on phasing out the use of lead shot for hunting in wetlands

AEWA Resolutions on phasing out lead shot:

- Resolution 1.14 on phasing out lead shot (1999): http://www.unep-aewa.org/sites/default/files/document/r14_0.pdf
- Resolution 2.2 on phasing out lead shot for hunting in wetlands (2002): http://www.unep-aewa.org/sites/default/files/document/resolution2_2_0.pdf
- Resolution 4.1 on phasing out lead shot for hunting in wetlands (2008): http://www.unep-aewa.org/sites/default/files/document/res4_1_phasing_out_lead_shot_final_0.pdf

AEWA Conservation Guidelines (as adopted by MOP1 in 1999):

The issue of lead poisoning is addressed in two of the published AEWA Conservation Guidelines:

- Conservation Guidelines on identifying and tackling emergency situations for migratory waterbirds: http://www.unep-aewa.org/sites/default/files/publication/cg_2new_0.pdf
- Conservation Guidelines on sustainable harvest of migratory waterbirds: <http://www.unep-aewa.org/en/publication/aewa-conservation-guidelines-no-5-guidelines-sustainable-harvest-migratory-waterbirds-ts>

Appendix 1 Angler Survey

The Angler Survey (2017): The electronic survey was sent out by email using SurveyMonkey⁹⁰ under Toxecology's professional survey subscription and responses were protected with SSL encryption. Responses were received from 240 anglers. Not all respondents answered all the questions. More than 95% of responses were from BC, with remaining responses received from Nova Scotia. Although other major hunting / wildlife associations and federations across Canada were sent the survey for distribution to their members, the BCWF was the most effective in distributing the survey to their members.

Fishing Sinkers and Jigs in Canada - Survey for Anglers - Study for Environment and Climate Change Canada

Study Background and Questions

Environment and Climate Change Canada requires information on the uses of fishing sinkers and jigs made from lead in Canada. Lead is associated with risks to human health and the environment. A State of the Science report published by Health Canada in 2013 indicated that there were no safe blood lead levels for neurotoxicity. In addition, lead fishing sinkers and jigs are known to have detrimental effects on wildlife in Canada.

The overall objective of this study is to gather information on current uses of lead fishing sinkers and jigs in Canada using a wide variety of different sources. The purpose of this survey form is to gather information directly from anglers in Canada to ensure the perspectives and experience of anglers is captured by the study.

Toxecology – Environmental Consulting Ltd has been retained by the Federal Government to gather the required information. If you have any questions regarding the survey please contact Dr. Pamela Campbell (604) 899-3388; Email: Campbell_pm@telus.net. Your participation in this survey is important. The data you provide via this survey is secure – it will be transmitted securely by FluidSurveys/Survey Monkey directly to Dr. P.M. Campbell only and will be protected as confidential business information. You may also choose to return this survey anonymously – just do not give your name on the form – but we do request you provide us with some details on your uses of fishing sinkers and jigs and your location (Province) so that we can combine responses appropriately in the analysis. We recognize that you are busy and appreciate you taking the time to complete this survey – as a small token of appreciation we will enter your name into a draw for a \$100 gift card for Chapters/Indigo. If you wish to be entered into the draw your response to this survey must be returned by the deadline of January 31st, 2017. In order to be entered into the draw you must also complete the last question - this contact information will only be used if you win the draw so that we can get the gift card to you, it will not be used for any other purpose.

1

⁹⁰ <https://www.surveymonkey.com>

1. Where do you live?

- ☐ Ontario
- ☐ Quebec
- ☐ Alberta
- ☐ British Columbia
- ☐ Manitoba
- ☐ Saskatchewan
- ☐ Newfoundland and Labrador
- ☐ New Brunswick
- ☐ Nova Scotia
- ☐ Yukon
- ☐ Northwest Territories
- ☐ Nunavut
- ☐ Prince Edward Island
- ☐ Other (please specify)

2. Where do you fish most frequently?

- ☐ Ontario
- ☐ Quebec
- ☐ Alberta
- ☐ British Columbia
- ☐ Manitoba
- ☐ Saskatchewan
- ☐ Newfoundland and Labrador
- ☐ New Brunswick
- ☐ Nova Scotia
- ☐ Yukon
- ☐ Northwest Territories
- ☐ Nunavut
- ☐ Prince Edward Island
- ☐ Other (please specify)

3. How many years have you been fishing?

4. How many times do you fish per year?

5. What types of water-bodies do you typically fish on?

- ☐ Rivers
- ☐ Lakes
- ☐ Ocean
- ☐ Other (please specify)

6. The fishing **sinkers** I use are made from:

- ☐ Lead
- ☐ Tin
- ☐ Tungsten
- ☐ Bismuth
- ☐ Brass
- ☐ Steel
- ☐ Composites
- ☐ I don't know
- ☐ Other (please specify)

7. Sinkers are available in a wide variety of types and sizes. What sizes and types of fishing sinkers do you mainly use? Please list the ones you use in the box below (e.g. I mainly use lead split shot sinkers size 2) - give brand names if possible.

8. The fishing **jigs** I use are made from:

- ☐ Lead
- ☐ Tin
- ☐ Tungsten
- ☐ Bismuth
- ☐ Brass
- ☐ Steel
- ☐ Composites
- ☐ I don't know
- ☐ Other (please specify)

9. What sizes and types of fishing jigs do you primarily use? Please list the main ones you use in the box below and give brand names if possible.

10. In the last 12 months approximately how many fishing sinkers and jigs did you purchase? You can provide a range (e.g. 5-10). If possible, please provide breakdown of the number of lead vs non-lead sinkers and jigs.

TOTAL number of sinkers purchased:

Number of LEAD sinkers purchased:

Number of NON-LEAD sinkers purchased:

TOTAL number of jigs purchased:

Number of LEAD jigs purchased:

Number of NON-LEAD jigs purchased:

11. In the last 12 months approximately how many fishing sinkers did you lose? If possible, please specify the type and size of the lost sinkers.

Number of sinkers lost:

Typical size of lost sinkers:

Type of lost sinker (e.g. lead or non-lead):

12. In the last 12 months how many fishing jigs did you lose? If possible, please specify the type and size of the lost jigs.

Number of jigs lost:

Typical size of lost jigs:

Type of lost jig (e.g. lead or non-lead):

13. Where do you buy your fishing sinkers and jigs from?

- ☐ Large retailer
- ☐ Local outfitter/fishing tackle shop
- ☐ Directly from an individual that comes to my fishing club
- ☐ Online
- ☐ Other (please specify)

14. What is your experience with non-lead fishing sinkers and jigs? Select all that apply.

- ☐ I haven't tried them
- ☐ They are not as easy to buy as lead ones, the places where I buy my sinkers/jigs don't carry them
- ☐ They are not available in the sizes/types I need
- ☐ They are more expensive
- ☐ They don't work as well as lead ones
- ☐ They are available for me to buy, and the places where I buy my fishing supplies carry them
- ☐ They are available in the sizes/types I need
- ☐ They cost about the same as lead ones
- ☐ They work as well as lead ones
- ☐ Other (please specify)

15. If you have any other comments you would like to add please provide these below.

Fishing Sinkers and Jigs in Canada - Survey for Anglers - Study for Environment and Climate Change Canada

Optional information to enter draw for \$100 Chapters/Indigo gift card

16. If you would like to be entered into the draw for the gift card - please provide your name and email below (optional)

Name:

Email:

Appendix 2 Stakeholder Listings

Provided as a separate MSEXcel spreadsheet

Appendix 3 Product Examples

Illustrative List of Sinkers available for Sale in Canada (2016-2017)

Manufacturer / Brand Name	Product	Description	Price per package (C\$)	Lead or Non-Lead	Weight of product per unit (listed) (oz)	Weight of product per sinker unit (metric) (g)	# sinkers per package	Total weight of product per package sold (metric) (g)
Canadian Tire (no other brand name provided)	Walking sinker	Walking sinkers are designed to slide freely on the line to keep bait off the bottom and to resist snags. These walking sinkers feature a unique quick change, no-tie eyelet Available in various sizes	2.49	lead	0.375	10.63	1	10.63
			2.49	lead	0.5	14.17	1	14.17
Canadian Tire (no other brand name provided)	Egg sinkers (dial pack)	Non-lead egg sinker is ideal for sinker drops and three-line hook-ups this dial box features Bass casting sinkers with swivelling brass eyelets Available in various sizes	5.49	brass	nd			
Canadian Tire (no other brand name provided)	Bass sinkers (dial pack)		5.49	brass	nd			
Canadian Tire (no other brand name provided)	Bead chain sinker	Lead chain sinker Attaches to your leader Used to weigh down your lure to hit a desired depth	5.99	lead	0.25	7.09	1	7.09
Canadian Tire (no other brand name provided)	Bead chain sinker	Lead chain sinker Attaches to your leader Used to weigh down your lure to hit a desired depth	5.99	lead	0.625	17.72	1	17.72
Canadian Tire (no other brand name provided)	Rubber core twist lock sinker	Rubber core twist lock sinkers are easy to put on and take off without disturbing other tackle; The rubber core in the sinkers guard against line damage; They fit snugly against the line by simply twisting their rubber ears	2.49	lead and rubber	0.125	3.54	1	3.54
			2.49	lead and rubber	0.375	10.63	1	10.63
			2.49	lead and rubber	0.5	14.17	1	14.17
			2.49	lead and rubber	0.25	7.09	1	7.09
			2.49	lead and rubber	0.75	21.26	1	21.26
Danielson	Round drop shot sinkers/weights - 10 x 1/8 oz	Drop Shot Sinkers feature a V-shaped eye, in which the line wedges itself for quick and easy adjustments	5.99	lead	0.125	3.54	10	35.44
Danielson	Round drop shot sinkers/weights		5.99	lead	0.188	5.32	6	31.89

	- 6 x 3/16oz							
Danielson	Round drop shot sinkers/weights - 6 x 1/2oz		5.99	lead	0.5	14.17	6	85.05
Danielson	Vinyl Cannon Ball	Vinyl coated cannon-ball weights 1-oz 4-pack	4.49	lead and vinyl	1	28.35	4	113.40
Danielson	Removeable split shot	sz 3	1.99	lead?	0.25	7.09	40	283.50
Danielson	Pencil drop shot weights	Pencil Drop Shot Weights feature a slim profile that allows your rig to get down quick, and slip through rocks and snags without hanging up, 3/16 oz, 6 pieces	6.99	lead	0.1875	5.32	6	31.89
Danielson	Pencil drop shot weights	Pencil Drop Shot 1/4 oz, 6 pieces	6.99	lead	0.25	7.09	6	42.52
Danielson	Pencil drop shot weights	Pencil Drop Shot Weights 3/8 oz, 5pieces	6.99	lead	0.375	10.63	6	63.79
Danielson	Pencil drop shot weights	Pencil Drop Shot Weights 3/16 oz, 5 pieces	6.99	lead	0.1875	5.32	5	26.58
Danielson	Pencil drop shot weights	1/4" diameter Eyed pencil lead, 17 pieces. Weight not provided, Pencil lead is used in drift or river fishing.	10.99	lead	?		17	
Danielson	Cannonball weights	Used for downrigger fishing - 5lb	19.99	?	80	2267.96	1	2267.96
Danielson	Assorted panfish	None provided	5.99					
Dominion	Rubber core sinkers (made in Canada)	25 rubber twist lock lead-free rubber core sinkers in five popular sizes	5.49	bismuth	0.125	3.54	6	21.26
Dominion	Rubber core sinkers (made in Canada)	Sinkers are easy to put on and take off with just a twist of their rubber ears	5.49	bismuth	0.375	10.63	6	63.79
Eagle Claw	Split shot	Removeable split shot sinkers sz 3/0, 3, 4,5,7, BB size	5.49	non-lead	nd		20	
Eco Pro	Tungsten Flipping Weights	Ideal for bass fishing 1/8 oz	9.99	tungsten	0.125	3.54	4	14.17
Eco Pro	Tungsten Flipping Weights	Ideal for bass fishing 3/16 oz	10.99	tungsten	0.1875	5.32	4	21.26
Eco Pro	Tungsten Flipping Weights	Ideal for bass fishing 1/4 oz	12.99	tungsten	0.25	7.09	3	21.26

Eco Pro	Tungsten Flipping Weights	Ideal for bass fishing 5/16 oz	14.99	tungsten	0.3125	8.86	3	26.58
Eco Pro	Tungsten drop shot weights	Ideal for bass fishing 1/8 oz	7.99	tungsten	0.125	3.54	3	10.63
Eco Pro	Tungsten drop shot weights	Ideal for bass fishing 3/16 oz	7.99	tungsten	0.1875	5.32	3	15.95
Eco Pro	Tungsten drop shot weights	Ideal for bass fishing 1/4 oz	8.99	tungsten	0.25	7.09	3	21.26
Etic	Etic walking sinker	3/4 oz ideal for walleye fishing	2.49	?	0.75	21.26	1	21.26
Etic	Etic walking sinker	1 oz ideal for walleye fishing	2.49	?	1	28.35	1	28.35
Etic	Etic walking sinker	2 oz	2.99	?	2	56.70	1	56.70
Etic	Etic walking sinker	3 oz	3.29	?	3	85.05	1	85.05
Fintech	Tech bottom bouncer	Tech bouncer is an innovative bottom bouncer that features interchangeable weights, # 7 shape wire with removable sinker shape, Ideal for bass, walleye, pike, perch, and panfish - 3/4 oz Available in assorted sizes	9.49	?				
Fintech	Tech bottom bouncer	interchangeable weights # 7 shape wire with removable sinker shape Ideal for bass, walleye, pike, perch, and panfish - 1.5 oz Available in assorted sizes	10.99	?				
Gibbs Delta Pyramid sinker (Canada)	Pyramid sinker	Pyramid Sinker is mostly used for weighting a rig for a sandy bottom. This sinker also has a line eye which sits at its base, giving it an inverted pyramid profile when tied. These sinkers are often used in fast currents. Their streamline profile causes them to sink quickly, and their flat edges prevent them from being rolled along bottom in fast currents. When used in water bodies with sand- or mud-floors, the sinker will bury itself into the soft bottom. These two traits make it a staple piece of tackle for striper bass and surf fishing.	4.99	lead	8	226.80	1	226.80

Gibbs Delta Pyramid sinker (Canada)	Mooching sinker	salmon fishing	3.49	lead	2	56.70	1	56.70
Gibbs Delta Pyramid sinker (Canada)	Mooching sinker	salmon fishing	3.49	lead	3	85.05	1	85.05
Jim's Jigs and Tackle Ltd.	Vinyl Cannonballs	Vinyl Cannonballs are great for freshwater spinner rig fishing with 3-way swivel Used for bottom bouncing for salmon in rivers Pack of 3, 3oz	4.49	vinyl	3	85.05	3	255.15
Lunkerhunt	Drop shot pencil weight	1/8 oz	5.49	?	0.125	3.54	6	21.26
Lunkerhunt	Drop shot pencil weight	1/4 oz	5.49	?	0.25	7.09	6	42.52
Matzuo America	Egg sinker	Non-lead casting sinker	2.99	non-lead	0.5	14.17	4	56.70
Matzuo America	Egg sinker	Non-lead casting sinker	2.99	non-lead	0.75	21.26	4	85.05
Matzuo America	Egg sinker	Using a lead base substitute Dipsy diver type sinker 4 sinkers in each package	3.99	non-lead	0.125	3.54	4	14.17
Matzuo America	Bass sinker	Using a lead base substitute Dipsy diver type sinker 4 sinkers in each package	3.99	non-lead	0.375	10.63	4	42.52
Matzuo America	Bass sinker	Non-lead casting sinker - bass sinker	2.99	non-lead	0.5	14.17	4	56.70
Matzuo America	Bass sinker	Non-lead casting sinker - bass sinker	2.99	non-lead	0.75	21.26	4	85.05
Matzuo America	Fast Slide Clip Bottom Bouncer	various sizes - 1/2 oz	6.49	?	0.5	14.17	2	28.35
Matzuo America	Fast Slide Clip Bottom Bouncer	various sizes - 3/4 oz	6.49	?	0.75	21.26	2	42.52
Matzuo America	Fast Slide Clip Bottom Bouncer	various sizes - 1 oz	6.99	?	1	28.35	2	56.70
Matzuo America	Fast Slide Clip Bottom Bouncer	various sizes - 1.5 oz	7.99	?	1.5	42.52	2	85.05
Matzuo America	Fast Slide Clip Bottom Bouncer	various sizes - 2 oz	8.99	?	2	56.70	2	113.40

Red Wolf	Mixed pack of sinkers of different sizes (made in China)	Dial box weight sinker is made with soft virgin lead to ensure quality and consistency This 62-piece sinker assortment contains split-shot, bass casting, pinch-on and worm eights in a variety of sizes Designed to meet any casting, trolling or bottom fishing situation	5.49	lead	various	various	60	?
Red Wolf	Sinker worm worm weights	Sinker is a perfect addition for your rubber worms. The deep tunnel base of these weights secure the worm nose and protect it from snags and tears	2.49	lead	0.125	3.54	8	28.35
Red Wolf	Sinker worm worm weights		2.49	lead	0.25	7.09	8	56.70
Red Wolf	Sinker worm worm weights		2.49	lead	0.375	10.63	8	85.05
Red Wolf	Sinker worm worm weights		2.49	lead	0	0.00	8	0.00
Red Wolf	Sinker worm worm weights		2.49	lead	0.5	14.17	8	113.40
Red Wolf	Split shot sinkers	BB size - They are very helpful when a small amount or slight variation of weight is required	1.99	lead		0.40	60	24.00
Red Wolf	Split shot sinkers	sz 4	1.99	lead		0.20	60	12.00
Red Wolf	Split shot sinkers	sz 7	1.99	lead		1.83	60	109.80
Red Wolf	Bell sinkers	1 1/2 oz 2-pack	1.99	lead	1.5	42.52	2	85.05
Red Wolf	Bell sinkers	3/4 oz 2-pack	1.99	lead	0.75	21.26	2	42.52
Red Wolf	Bell sinkers	3/8 oz 2-pack	1.99	lead	0.375	10.63	2	21.26
Red Wolf	Bell sinkers	3/16 oz 2-pack	1.99	lead	0.1875	5.32	2	10.63
Red Wolf	Bell sinkers	1/8 oz 2-pack	1.99	lead	0.125	3.54	2	7.09
Red Wolf	Bell sinkers	1/4 oz 2-pack	1.99	lead	0.25	7.09	2	14.17
Red Wolf	Bell sinkers	1/2 oz 2-pack	1.99	lead	0.5	14.17	2	28.35
Red Wolf	Bell sinkers	1 oz 2-pack	1.99	lead	1	28.35	2	56.70
Red Wolf	Twist lock sinkers	lead with rubber ears - assortment contains 25 rubber twist lock sinkers in five popular sizes	6.49	lead and rubber	?		25	
Red Wolf	Bottom bouncer sinker	bottom walking sinkers eliminate snagging when you're trolling or drifting with live bait or a lure; Choose from several different weights,	6.49	lead?	0.75	21.26	2	42.52

		each on a 12" (30 cm) leg with a 4-1/2" (11 cm) arm and snap swivel for mainline hook-up						
Red Wolf	Split shot	Round split shot sinkers (dial pack different sizes) - Four popular sizes of round split-shot sinkers are featured in this 78-piece dial box selector	4.19	lead			78	
Red Wolf	Bass bell sinker	Ideal for sinker drops and three-line hook-ups, this dial box selector features 27 bass casting sinkers with swivelling brass eyelets. Dial pack - 5 different sizes	6.49	lead			27	
Redwing Tackle	Blackbird Split shot refill	Blackbird Split Shot Refill is ideal for salmon, steelhead and trout Available in a variety of sizes: BB sz 1	5.49	lead?	0.35	9.92	80	793.79
Redwing Tackle	Blackbird Split shot refill	Blackbird Split Shot Refill is ideal for salmon, steelhead and trout Available in a variety of sizes: BB sz 2	5.49	lead?	0.27	7.65	80	612.35
Redwing Tackle	Blackbird Split shot refill	Blackbird Split Shot Refill is ideal for salmon, steelhead and trout Available in a variety of sizes: BB sz 3	5.49	lead?	0.15	4.25	80	340.19
Redwing Tackle	Blackbird Split shot refill	Blackbird Split Shot Refill is ideal for salmon, steelhead and trout Available in a variety of sizes: BB sz 4	5.49	lead?	0.13	3.69	80	294.84
South Bend	Bar sinker	None provided	1.29	lead	0.75	21.26	1	21.26
South Bend	Slip sinker	Fishermen use slip sinkers to fish on the bottom with live-bait rigs for such fish species as catfish and walleyes.	5.49	lead	8	226.80	1	226.80
South Bend	Slip sinker	Fishermen use slip sinkers to fish on the bottom with live-bait rigs for such fish species as catfish and walleyes.	5.49	lead	12	340.19	1	340.19
South Bend	Slip sinker	Fishermen use slip sinkers to fish on the bottom with live-bait rigs for such fish species as catfish and walleyes.	6.49	lead	16	453.59	1	453.59
South Bend	Wedge weight	Wedge Weight is perfect for casting long distances beyond cover	6.49	lead?	12	340.19	1	340.19
South Bend	Wedge weight	Wedge Weight is perfect for casting long	7.49	lead?	14	396.89	1	396.89

		distances beyond cover						
South Bend	Wedge weight	Wedge Weight is perfect for casting long distances beyond cover	8.49	lead?	16	453.59	1	453.59
South Bend	Wedge weight	Wedge Weight is perfect for casting long distances beyond cover	9.49	lead?	17	481.94	1	481.94
South Bend	Mooching sinker	Recommended for salmon fishing (US; http://www.south-bend.com/products)	1.99	lead	1	28.35	1	28.35
Water Gremlin (US)	Bagged round shot sinker	Water Gremlin Bagged Round Shot Sinker is ideal for fishing in weedy waters BB Made of soft lead with controllable hinge that grips the finest lines Squeeze on with fingers; remove with thumbnail	1.49	lead	0.56	15.88	40	635.03
Water Gremlin (US)	Removeable bagged split shot sinkers	PSS BB	1.49	lead	0.56	15.88	40	635.03
Water Gremlin (US)	Removeable bagged split shot sinkers	B	1.49	lead	0.31	8.79	40	351.53
Water Gremlin (US)	Removeable bagged split shot sinkers	Sz 3/0	1.49	lead	1.04	29.48	40	1179.34
Water Gremlin (US)	Removeable bagged split shot sinkers	Sz 5	1.49	lead	2.54	72.01	40	2880.31
Water Gremlin (US)	Removeable bagged split shot sinkers	Sz 3	1.49	lead	4.31	122.19	40	4887.46
Water Gremlin (US)	Removeable bagged split shot sinkers	Sz 7	1.49	lead	1.83	51.88	40	2075.18
Water Gremlin (US)	Dipseys swivel sinkers, 5-pk	Water Gremlin Dipseys Swivel Sinkers swivel on the attached looped, brass wire Ideal for trolling or bottom fishing with live bait	1.49	lead	0.25	7.09	5	35.44
Water Gremlin (US)	Dipseys swivel sinkers, 5-pk		1.49	lead	0.375	10.63	5	53.16
Water Gremlin (US)	Dipseys swivel sinkers, 5-pk		1.49	lead	0.5	14.17	5	70.87
Water Gremlin (US)	Dipseys swivel sinkers, 5-pk		1.79	lead	0.75	21.26	5	106.31
Water Gremlin (US)	Dipseys swivel sinkers pro-pack (Pro-DS)	27 pieces - sizes not provided	8.49	lead				0.00
Water Gremlin (US)	Egg sinker Pro Pack	Water Gremlin Egg Sinker is oblong-shaped and slips easily through weeds and rocks Large smooth centre	7.99	lead				0.00

		hole lets sinker move easily on your line, 55 pack						
Water Gremlin (US)	Egg sinker pack	bagged 1/4 oz	1.79	lead	0.25	7.09	11	77.96
Water Gremlin (US)	Egg sinker pack	bagged 1/2 oz	1.79	lead	0.5	14.17	11	155.92
Water Gremlin (US)	Egg sinker pack	bagged 3/4 oz	1.79	lead	0.75	21.26	11	233.88

From these product listings lead appears to be frequently used in sinkers sold by major retailers. Alternatives available from major suppliers include tungsten, bismuth and brass

The following is an illustrative list of jigs available from major retailers to show examples of the typical range and type of products available. There is an extremely wide range of jigs available for sale in Canada. The following list is not exhaustive.

Illustrative List of Jigs available for Sale in Canada (2016-2017)

Manufacturer / Brand Name	Product	Description	Price per package C\$	Lead or Non-Lead	Weight of product per unit (listed) (oz)	Weight of product per jig unit (metric) (g)	# jig/ package	Total weight of product per package sold (metric) (g)	Sold in Canada by
4x4 Bass Jigs	4x4 Bass Jigs Duckett Jig	Duckett Jig. Wieghted 5/0 black nickel hook .	5.29	not provided	0.375	10.63	1	10.63	Bass Pro Shops
4x4 Bass Jigs	4x4 Bass Jigs Duckett Jig	Duckett Jig. Wieghted 5/0 black nickel hook .	5.29	not provided	0.5	14.17	1	14.17	Bass Pro Shops
4x4 Bass Jigs	4x4 Kevin Hawk Signature Series Football Jig	Football Jig. Weighted (coated lump) 4/0 extra-heavy Mustad hook and skirt	4.19 - 4.29	lead	0.5	14.17	1	14.17	Tackle Warehouse
4x4 Bass Jigs	4x4 Kevin Hawk Signature Series Football Jig	Football Jig. Weighted (coated lump) 4/0 extra-heavy Mustad hook and skirt	4.19 - 4.29	lead	0.75	21.26	1	21.26	Tackle Warehouse
4x4 Bass Jigs	4x4 Swim Jig	Swim Jighead. Weighted (coated fishhead) black-nickel hook and skirt.	4.99	lead	0.25	7.09	1	7.09	Tackle Warehouse
4x4 Bass Jigs	4x4 Swim Jig	Swim Jighead. Weighted (coated fishhead) black-nickel hook and skirt.	4.99	lead	0.375	10.63	1	10.63	Tackle Warehouse
Bass Assassin	Bass Assassins Jighead Electric Chicken	Jighead. Weighted (coated fish head) Mustad Wide Gap Ultrapoint hook.	4.99	not provided	0.25	7.09	1	7.09	Walmart

Bass Assassin	Bass Assassin Ball Head Jighead Lure	Jighead. Weighted (uncoated and coated ball) hook.	11.12-12.54	lead?	0.25	7.09	1	7.09	Walmart
Bass Pro Shops	Bass Pro Shops Enticer Pro Series Rattling Jig	Rattling Jig. Weighted (coated fish) Eagle Claw® Lazer Sharp® needle point 2X hook.	3.79	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Bass Pro Shops	Bass Pro Shops Striper Stump Jumper Jig Baits	Striper Jig. Weighted black nickel hook. Bucktail and blade.	4.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Bass Pro Shops			4.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Bass Pro Shops			4.99	not provided	1	28.35	1	28.35	Bass Pro Shops
Bass Pro Shops			4.99	not provided	1.5	42.52	1	42.52	Bass Pro Shops
Bass Pro Shops			4.99	not provided	2	56.70	1	56.70	Bass Pro Shops
Bass Pro Shops	Bass Pro Shops Enticer Pro Series Football Jigs	Football Jig. Weighted (coated lump) Eagle Claw® Lazer Sharp® Extra Wide Gap needle point hook and 44-strand silicone skirt	3.79	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Bass Pro Shops			3.79	not provided	0.625	17.72	1	17.72	Bass Pro Shops
Bass Pro Shops			3.79	not provided	1	28.35	1	28.35	Bass Pro Shops
Bass Pro Shops	Bass Pro Shops Enticer Swim Jigs	Football Jig. Weighted (coated lump) Mustad black nickel hook and silicone metalflake skirt	4.49	not provided	0.375	10.63	1	10.63	Bass Pro Shops
BassTEK	BassTEK Tungsten Flipping Jigs	Flipping Jigs. Weighted Mustad 60-degree Black Nickel Hook and skirt.	4.99 - 6.99	non lead	0.375	10.63	1	10.63	Tackle Warehouse
BassTEK			4.99 - 6.99	non lead	1.375	38.98	1	38.98	Tackle Warehouse
BassTEK			4.99 - 6.99	non lead	2.375	67.33	1	67.33	Tackle Warehouse

Beast Coast	Beast Coast Tungsten & Tackle Finesse Dragging Jig	Finesse Jig. Weighted hook and flash fiber and premium silicon skirt. Poured using 97% tungsten.	5.49 - 5.99	non lead	0.04375	1.24	1	1.24	Tackle Warehouse
Beast Coast			5.49 - 5.99	non lead	0.625	17.72	1	17.72	Tackle Warehouse
Berkley	Berkley Gulp! BDS Jighead	BDS (Bait Delivery System) Jighead. Black nickel finish. Lure (fish) and weighted hook.	3.97	non lead	0.25	7.09	2	14.17	Cabelas
Berkley	Berkley Gulp! BDS Jighead	BDS (Bait Delivery System) Jighead. Black nickel finish. Lure (fish) and weighted hook.	3.97	non lead	0.125	3.54	2	7.09	Cabelas
Berkley	Berkley Gulp! BDS Jighead	BDS (Bait Delivery System) Jighead. Black nickel finish. Lure (fish) and weighted hook.	3.97	non lead	0.375	10.63	2	21.26	Cabelas
Berkley	Berkley Power Minnow	Power Minnow. Used for crappie, panfish, bass, walleye and trout. Length: 2" or 3". Soft lure and weighted hook.	5.99	not provided	not provided	#VALUE!	1	#VALUE!	Cabelas
Berkley or Johnson	Berkley Johnson Beetle Bou Marabou Jig	Dressed Beetle Jig. Weighted hook and bucktail	1.56-1.59	not provided	0.0652	1.85	1	1.85	Walmart
Big Bite Baits Inc.	Big Bite Fin Twist Jig Heads	Fin Twist Jighead. Weighted (ball) hook and screw.	8.99	not provided	0.1875	5.32	4	21.26	Cabelas
Big Bite Baits Inc.	Big Bite Fin Twist Jig Heads	Fin Twist Jighead. Weighted (ball) hook and screw.	8.99	not provided	0.25	7.09	4	28.35	Cabelas
Blakemore Road Runner	Road Runner Jigheads	Jighead. Used for crappie, panfish, bass and walleye. Weighted (coated fish head) hook and blade	4.3	not provided	0.0625	1.77	6	10.63	Walmart
Blakemore Road Runner	Blakemore Road Runner Jighead 5 Pack	Jighead. Used for crappie, panfish, bass and walleye. Weighted (coated fish head) hook and blade	3.87	not provided	0.125	3.54	5	17.72	Walmart
Booyah Bait Co.	BOOYAH® Boo Jig	Dressed Boo Jig. Weighted (two cylinders, magnum rattles?) Mustad® Ultra Point hooks and a Bio-Flex® silicone skirt	4.49 (3.29)(not provided	0.25	7.09	1	7.09	Cabelas
Booyah Bait Co.			4.49 (3.29)	not provided	0.375	10.63	1	10.63	Cabelas
Booyah Bait Co.			3.79	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Booyah Bait			3.29	not	0.1875	5.32	1	5.32	Wholesale

Co.				provided					Sports
Booyah Bait Co.			3.29	not provided	0.75	21.26	1	21.26	Wholesale Sports
Booyah Bait Co.			3.29	not provided	0.3125	8.86	1	8.86	Wholesale Sports
Booyah Bait Co.	BOOYAH® Pigskin Football Jig	Dressed Football Jig. Weighted (round) hook and skirt of rubber and silicone strands. Size 4/0 hook	4.99	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Booyah Bait Co.	BOOYAH® Pigskin Football Jig	Dressed Football Jig. Weighted (round) hook and skirt of rubber and silicone strands. Size 4/0 hook	5.99	not provided	0.5	14.17	1	14.17	Wholesale Sports
Booyah Bait Co.	BOOYAH Bankroll Jig	Dressed Football Jig. Weighted (round) hook and skirt of rubber and silicone strands. Size 4/0 hook	4.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Booyah Bait Co.	BOOYAH Bankroll Jig	Dressed Football Jig. Weighted (round) hook and skirt of rubber and silicone strands. Size 4/0 hook	4.99	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Booyah Bait Co.	BOOYAH Baby Boo Jig	Baby Boo Jig. Weighted (round) hook and skirt	3.29	not provided	0.1875	5.32	1	5.32	Bass Pro Shops
Booyah Bait Co.	BOOYAH Baby Boo Jig	Baby Boo Jig. Weighted (round) hook and skirt	3.29	not provided	0.3125	8.86	1	8.86	Bass Pro Shops
Buckeye	Buckeye Lures Football Mop Jigs	Football Jig. Weighted (coated lump) Mustad Flippin' hook and rubber skirt	4.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Buzzbomb and Zzinger Lures Inc.	Buzz Bomb Zelda Jig	Zelda Jig. Used for salt and freshwater fish. Lure (fish) and hook.	6.99 (5.99)	lead	2.5	70.87	1	70.87	Cabelas
Buzzbomb and Zzinger Lures Inc.	Buzz Bomb Zelda Jig	Zelda Jig. Used for salt and freshwater fish. Lure (fish) and hook.	6.99	lead	5	141.75	1	141.75	Cabelas
Buzzbomb and Zzinger Lures Inc.	Halibut Spinnow	Halibut Spinnow. Weighted (fish) hook and skirt.	15.99	lead	9.5	269.32	1	269.32	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.	Spinnow	Spinnow. Weighted (fish) hook.	3.79	lead	0.67	18.99	1	18.99	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			3.79	lead	1.5	42.52	1	42.52	Wholesale Sports

Buzzbomb and Zzinger Lures Inc.			3.79	lead	2.5	70.87	1	70.87	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			3.79	lead	5.25	148.83	1	148.83	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.	Zzinger	Zzzinger. Used for Salmon, Trout, Bass & bottom fish. Weight (fish).	4.29	lead	0.5	14.17	1	14.17	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			5.99	lead	1.5	42.52	1	42.52	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			5.99	lead	2.5	70.87	1	70.87	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			6.99	lead	3.5	99.22	1	99.22	Wholesale Sports
Buzzbomb and Zzinger Lures Inc.			6.99	lead	4.5	127.57	1	127.57	Wholesale Sports
Cabelas	Cabela's Fisherman Series Finesse Football Jig	Football Jig 1 3/4". Hook and spherical weight	3.49	not provided	0.25	7.09	5	35.44	Cabelas
Cabelas	Cabela's Fisherman Series Button Eye Jig	Button Eye Jig. Lure (circular weighted "eye") and hook.	4.49	not provided	0.25	7.09	6	42.52	Cabelas
Cabelas	Cabela's Fisherman Series Button Eye Jig	Button Eye Jig. Lure (circular weighted "eye") and hook.	4.49	not provided	0.375	10.63	6	63.79	Cabelas
Cabelas	Cabela's Fisherman Series Button Eye Jig	Button Eye Jig. Lure (circular weighted "eye") and hook.	4.49	not provided	0.5	14.17	6	85.05	Cabelas
Cabelas	Cabela's Mean-Eye Jig	Mean Eye Jig. Lure (spherical weighted "eye"), hook and barb.	4.99	not provided	0.125	3.54	6	21.26	Cabelas
Cabelas	Cabela's Mean-Eye Jig	Mean Eye Jig. Lure (spherical weighted "eye"), hook and barb.	4.99	not provided	0.25	7.09	6	42.52	Cabelas
Cabelas	Cabela's Mean-Eye Jig	Mean Eye Jig. Lure (spherical weighted "eye"), hook and barb.	4.99	not provided	0.375	10.63	6	63.79	Cabelas
Cabelas	Cabela's Fisherman Series Round-Head Jig	Round-Head Jig. Lure (coated spherical weighted "eye") and aberdeen bronze-finish hook.	2.99	not provided	0.0625	1.77	6	10.63	Cabelas

Cabelas	Cabela's Fisherman Series Round-Head Jig	Round-Head Jig. Lure (coated spherical weighted "eye") and aberdeen bronze-finish hook.	2.99	not provided	0.125	3.54	6	21.26	Cabelas
Cabelas	Cabela's Fisherman Series Round-Head Jig	Round-Head Jig. Lure (coated spherical weighted "eye") and aberdeen bronze-finish hook.	2.99	not provided	0.25	7.09	6	42.52	Cabelas
Cabelas	Cabela's Fisherman Series Round-Head Jig	Round-Head Jig. Lure (coated spherical weighted "eye") and aberdeen bronze-finish hook.	3.29	not provided	0.375	10.63	6	63.79	Cabelas
Cabelas	Cabela's Fisherman Series Round-Head Jig	Round-Head Jig. Lure (coated spherical weighted "eye") and aberdeen bronze-finish hook.	3.29	not provided	0.5	14.17	6	85.05	Cabelas
Cabelas	Cabela's Fisherman Series Wacky Jighead	Wacky Jighead. Ball weight and hook.	2.99	not provided	0.0625	1.77	5	8.86	Cabelas
Cabelas	Cabela's Fisherman Series Wacky Jighead	Wacky Jighead. Ball weight and hook.	2.99	not provided	0.125	3.54	5	17.72	Cabelas
Cabelas	Cabela's Fisherman Series Wacky Jighead	Wacky Jighead. Ball weight and hook.	2.99	not provided	0.1875	5.32	5	26.58	Cabelas
Cabelas	Cabela's Bed Jig	Bed Jig. Weighted (coated mushroom shaped) hook and barb.	3.49	not provided	0.9375	26.58	6	159.47	Cabelas
Cabelas	Cabela's Bed Jig	Bed Jig. Weighted (coated mushroom shaped) hook and barb.	3.49	not provided	0.125	3.54	6	21.26	Cabelas
Cabelas	Cabela's Bed Jig	Bed Jig. Weighted (coated mushroom shaped) hook and barb.	3.99	not provided	0.1875	5.32	6	31.89	Cabelas
Cabelas	Cabela's Bed Jig	Bed Jig. Weighted (coated mushroom shaped) hook and barb.	3.99	not provided	0.25	7.09	6	42.52	Cabelas
Cabelas	Cabela's Fisherman Series Tender Tube Jigheads	Tender tube Jigheads. Weighted unpainted hook.	3.99	lead?	0.0625	1.77	10	17.72	Cabelas
Cabelas			3.99	lead?	0.125	3.54	10	35.44	Cabelas
Cabelas			3.99	lead?	0.25	7.09	10	70.87	Cabelas
Cabelas			6.49	lead?	0.0625	1.77	25	44.30	Cabelas
Cabelas			6.49	lead?	0.125	3.54	25	88.59	Cabelas

Cabelas			6.49	lead?	0.25	7.09	25	177.18	Cabelas
Cabelas	Cabela's Fisherman Series Weedless Football Jigs	Weedless Football Jigs. Used for larger panfish. Weighted (ball) black nickel hooks. BLACK	1.97	not provided	0.25	7.09	5	35.44	Cabelas
Cabelas			2.48	not provided	0.375	10.63	5	53.16	Cabelas
Cabelas			2.47	not provided	0.25	7.09	5	35.44	Cabelas
Cabelas			2.48	not provided	0.25	7.09	5	35.44	Cabelas
Cabelas			2.99	not provided	0.375	10.63	5	53.16	Cabelas
Cabelas			2.99	not provided	0.5	14.17	5	70.87	Cabelas
Cabelas	Cabela's Fisherman Series Rattlin' Jig	Rattlin' Jig. Lure (coated spherical weighted "eye", rattles) and aberdeen bronze-finish hook.	5.99	not provided	0.375	10.63	6	63.79	Cabelas
Cabelas			5.99	not provided	0.5	14.17	6	85.05	Cabelas
Cabelas	Cabela's Red Hook Roundhead Jigs	Red Hook Roundhead Jigs. Lure (coated spherical weighted "eye", rattles) and red hook.	3.99	not provided	0.25	7.09	6	42.52	Cabelas
Cabelas			3.99	not provided	0.375	10.63	6	63.79	Cabelas
Cabelas			3.99	not provided	0.5	14.17	6	85.05	Cabelas
Cabelas	Cabela's Shake 'E Jighead	Shake 'E Jighead. Used for bottom fishing. Weighted (coated ball) hook and screw.	4.99	not provided	0.125	3.54	5	17.72	Cabelas
Cabelas			2.98	not provided	0.1875	5.32	5	26.58	Cabelas
Cabelas			4.99	not provided	0.25	7.09	5	35.44	Cabelas
Chompers	Chompers Skirted Football Jigs	Football Jig. Weighted (coated lump) size Mustad® Ultra Point™ Black Nickel Hook and skirt.	5.49	not provided	0.25	7.09	2	14.17	Bass Pro Shops
Chompers			5.49	not provided	0.375	10.63	2	21.26	Bass Pro Shops
Chompers			5.49	not provided	0.5	14.17	2	28.35	Bass Pro Shops
Chompers			5.49	not provided	0.75	21.26	2	42.52	Bass Pro Shops
Chompers			5.49	not provided	0.625	17.72	2	35.44	Bass Pro Shops
Damiki Jigs	Damiki TG Tungsten Micro Jig	Micro Jig. Weighted (compact, resin tungsten head) hook and silicone skirt.	4.99	non lead	0.0705479	2.00	1	2.00	Tackle Warehouse
Damiki Jigs	Damiki TG Tungsten Micro	Micro Jig. Weighted (compact, resin tungsten head) hook	4.99	non lead	0.0881849	2.50	1	2.50	Tackle Warehouse

	Jig	and silicone skirt.							e
Damiki Jigs	Damiki TG Tungsten Micro Jig	Micro Jig. Weighted (compact, resin tungsten head) hook and silicone skirt.	4.99	non lead	0.10582	3.00	1	3.00	Tackle Warehouse
Delta-Gibbs Tackle	Delta Jig-A-Lu Lure	Jig-A-Lu Lure. Used for bottom fish. Lure (squid) and hook.	14.99	not provided	16	453.59	1	453.59	Cabelas
Delta-Gibbs Tackle	Gibbs-Delta Mudraker	Mudraker. Used for bottom fish. Hooked lure (squid) and chrome plated cylindrical weight.	14.99	not provided	16	453.59	1	453.59	Cabelas
Delta-Gibbs Tackle	Gibbs-Delta Mudraker	Mudraker. Used for bottom fish. Hooked lure (squid) and chrome plated cylindrical weight.	19.99	not provided	24	680.39	1	680.39	Canadian Tire
Delta-Gibbs Tackle	Gibbs Delta Big Eye Jig	Big Eye Jig. Used for all bottom fish - halibut, lingcod, rockfish, etc. Weighted (fish) hook and soft body.	7.99-9.99	not provided	8	226.80	1	226.80	Canadian Tire
Delta-Gibbs Tackle	Gibbs Delta Ultra Violet Big Eye Jig	Big Eye Jig. Used for all bottom fish - halibut, lingcod, rockfish, etc. Weighted (fish) hook and soft body.	12.99	not provided	12	340.19	1	340.19	Canadian Tire
Delta-Gibbs Tackle	Gibbs Delta Ultra Violet Big Eye Jig	Big Eye Jig. Used for all bottom fish - halibut, lingcod, rockfish, etc. Weighted (fish) hook and soft body.	16.99	not provided	16	453.59	1	453.59	Canadian Tire
Eco Pro Tungsten	Eco Pro Tungsten Money Maker Shakey Head Jig	Shakey Jighead. Weighted (ball) hook and screw.	5.99	non-lead (tungsten, titanium)	0.0625	1.77	3	5.32	Cabelas
Eco Pro Tungsten	Eco Pro Tungsten Money Maker Shakey Head Jig	Shakey Jighead. Weighted (ball) hook and screw.	5.99	non-lead (tungsten, titanium)	0.125	3.54	3	10.63	Cabelas
Eco Pro Tungsten	Eco Pro Tungsten Ball Jig	Ball Jig. Weighted (coated ball) hook	6.99	non-lead (tungsten)	0.125	3.54	3	10.63	Cabelas
Eco Pro Tungsten	Eco Pro Tungsten Ball Jig	Ball Jig. Weighted (coated ball) hook	7.99	non-lead (tungsten)	0.25	7.09	3	21.26	Cabelas
Eco Pro Tungsten	Eco Pro Tungsten Ball Jig	Ball Jig. Weighted (coated ball) hook	7.99	non-lead (tungsten)	0.375	10.63	3	31.89	Cabelas
Eco Pro Tungsten	Eco Pro Tungsten Ball	Ball Jig. Weighted (coated ball) hook	7.99	non-lead (tungsten)	0.5	14.17	3	42.52	Cabelas

	Jig			n)					
Evolution Tungsten Jigs	Evolution Tungsten Football Jigs	Football Jig. Weighted (coated lump) size 4/0 Mustad® Ultra Point™ Black Nickel Hook and silicone skirt. composed of 97% tungsten	4.99-6.99	non lead	0.5	14.17	1	14.17	Tackle Warehouse
Evolution Tungsten Jigs			4.99-6.99	non lead	0.75	21.26	1	21.26	Tackle Warehouse
Evolution Tungsten Jigs			4.99-6.99	non lead	1	28.35	1	28.35	Tackle Warehouse
Freedom Tackle	Freedom Tackle Hydra Live Action Hybrid Jig	Hybrid Jig. Lure (fish head, epoxy finished with brass echo chamber) and black nickel hook.	7.99	brass?	0.25	7.09	2	14.17	Cabelas
Freedom Tackle			7.99	brass?	0.5	14.17	2	28.35	Cabelas
Freedom Tackle			7.99	brass?	0.75	21.26	2	42.52	Cabelas
Freedom Tackle			7.99	brass?	1	28.35	2	56.70	Cabelas
Freedom Tackle	Freedom Lures Hydra Silver Shad Jig	Shad Jig. Weighted (epoxy finished fish head with brass echo chamber) hook.	7.99	not provided	0.125	3.54	1	3.54	Canadian Tire
Freedom Tackle			8.49	not provided	0.25	7.09	1	7.09	Canadian Tire
Freedom Tackle			8.49	not provided	0.5	14.17	1	14.17	Canadian Tire
Freedom Tackle			8.49	not provided	0.75	21.26	1	21.26	Canadian Tire
Freedom Tackle			8.49	not provided	1	28.35	1	28.35	Canadian Tire
Freedom Tackle	Freedom Lures Hydra Jig, Golden Shad	Shad Jig. Weighted (epoxy finished fish head with brass echo chamber) hook.	8.49	not provided	0.75	21.26	1	21.26	Canadian Tire
Freedom Tackle			7.99	not provided	1	28.35	1	28.35	Canadian Tire
Freedom Tackle	Freedom Lures Zodiac Hybrid Jig	Hybrid Jig. Weighted (epoxy finished fish head with brass echo chamber) hook.	6.99-7.49	not provided	0.375	10.63	1	10.63	Canadian Tire
Freedom Tackle	Freedom Lures Hydra Silver Shad Jig	Shad Jig. Weighted (epoxy finished fish head with brass echo chamber) hook.	7.99-8.49	not provided	0.125	3.54	1	3.54	Canadian Tire
Freedom Tackle			7.99-8.49	not provided	0.25	7.09	1	7.09	Canadian Tire
Freedom Tackle			7.99-8.49	not provided	0.5	14.17	1	14.17	Canadian Tire
Freedom Tackle			7.99-8.49	not provided	0.75	21.26	1	21.26	Canadian Tire
Freedom Tackle			7.99-8.49	not provided	1	28.35	1	28.35	Canadian Tire

Freedom Tackle	Freedom Lures Hydra Jig, Golden Shad	Shad Jig. Weighted (epoxy finished fish head with brass echo chamber) hook	8.49	not provided	0.75	21.26	1	21.26	Canadian Tire
Freedom Tackle			7.99	not provided	1	28.35	1	28.35	Canadian Tire
Freedom Tackle	Freedom Lures Zodiac Hybrid Jig	Hybrid Jig. Weighted (epoxy finished fish head with brass echo chamber) hook.	6.99-7.49	not provided	0.375	10.63	1	10.63	Canadian Tire
Gibbs	Mudraker	Dressed Mudraker. Used for bottom fish. Hooked lure (squid) and cylindrical weight. Scented	14.99	not provided	16	453.59	1	453.59	Wholesale Sports
Gibbs			14.99	not provided	24	680.39	1	680.39	Wholesale Sports
Gibbs	G2 Jig	Dresssed G2 Jig. Weighted hook and cylinder with skirt.	13.99	not provided	16	453.59	1	453.59	Wholesale Sports
Gibbs	Cod Jig	Cod Jig. Used for cod. Die cast in lead & nickel plated with a full spring stainless steel wire harness.	9.99	lead	#97	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs			10.99	lead	#98	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs			11.99	lead	#99	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs			14.99	lead	#100	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs			15.99	lead	#126	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs			19.99	lead	#135	#VALUE!	1	#VALUE!	Wholesale Sports
Gibbs	Big Eye Jig	Dresses Big Eye Jig. Weighted (coated) hook and skirt.	8.99	not provided	16	453.59	1	453.59	Wholesale Sports
Gibbs	Big Eye Jig	Dresses Big Eye Jig. Weighted (coated) hook and skirt.	8.99	not provided	8	226.80	1	226.80	Wholesale Sports
Gibbs	Bullet Jig	Bullet Jig. Weighted (uncoated) hook	4.99	lead?	8	226.80	1	226.80	Wholesale Sports
Gibbs	Bullet Jig	Bullet Jig. Weighted (uncoated) hook	7.49	lead?	16	453.59	1	453.59	Wholesale Sports
Gibbs	Bullet Jig	Bullet Jig. Weighted (uncoated) hook	5.49	lead?	12	340.19	1	340.19	Wholesale Sports
Gibbs	Bullet Jig	Bullet Jig. Weighted (uncoated) hook	9.49	lead?	24	680.39	1	680.39	Wholesale Sports
H.T. Enterprises	Marmooska	Jighead. Weighted (coated fish head) hook.	3.19	not provided	12B	#VALUE!	2	#VALUE!	Wholesale Sports
H.T. Enterprises	Mousee Jigs	Jighead. Weighted (coated fish head) hook.	2.39	not provided	Size 10	#VALUE!	3	#VALUE!	Wholesale Sports

H.T. Enterprises	Rocker Jigs	Jighead. Weighted (coated fish head) hook.	2.39	not provided	size 6	#VALU E!	3	#VALU E!	Wholesale Sports
Hart	Hart Tackle Swing Arm Swim Jigs	Swimming Jigs. Weighted (coated stainless wires tipped with flashy blades) hook.	5.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Hurricane	Hurricane Shad Jigheads	Shad Jighead. Weighted (fish head) hook	3.49	not provided	0.25	7.09	5	35.44	Cabelas
Hurricane	Hurricane Shad Jigheads	Shad Jighead. Weighted (fish head) hook	3.49	not provided	0.375	10.63	5	53.16	Cabelas
Hurricane	Hurricane Shad Jigheads	Shad Jighead. Weighted (fish head) hook	3.49	not provided	0.5	14.17	4	56.70	Cabelas
Hurricane	Hurricane Shad Jigheads	Shad Jighead. Weighted (fish head) hook	3.49	not provided	1	28.35	3	85.05	Cabelas
Hurricane	Hurricane Striper Bucktail Jigs	Bucktail Jig. Weighted (coated fish head) black nickel hook and bucktail (mylar/feathers) wrapped with epoxy coated thread.	3.99	not provided	0.5	14.17	1	14.17	Cabelas
Hurricane			3.99	not provided	1	28.35	1	28.35	Cabelas
Hurricane			3.99	not provided	1.5	42.52	1	42.52	Cabelas
Hurricane			3.99	not provided	2	56.70	1	56.70	Cabelas
Hurricane	Hurricane 3D Eye Bucktail Jig	3D Eye Bucktail Jig. Weighted (coated fish head) black nickel hook and bucktail wrapped with epoxy coated thread.	3.99	not provided	0.5	14.17	1	14.17	Cabelas
Hurricane			3.99	not provided	1	28.35	1	28.35	Cabelas
Hurricane			3.99	not provided	1.5	42.52	1	42.52	Cabelas
Hurricane			3.99	not provided	2	56.70	1	56.70	Cabelas
Hurricane			3.99	not provided	3	85.05	1	85.05	Cabelas
Hurricane			3.99	not provided	4	113.40	1	113.40	Cabelas
Hurricane	Hurricane Bugeye Bucktail Jig	Bugeye Bucktail Jig. Used for stripers and East Coast anglers. Weighted (coated fish head) hook and bucktail.	4.99	not provided	0.25	7.09	2	14.17	Cabelas
Hurricane			5.99	not provided	0.375	10.63	2	21.26	Cabelas
Hurricane			6.99	not provided	0.5	14.17	2	28.35	Cabelas
Hurricane			7.99	not provided	0.75	21.26	2	42.52	Cabelas

Hurricane			7.99	not provided	1	28.35	2	56.70	Cabelas
Hurricane			not provided	not provided	1.5	42.52	1	42.52	Cabelas
Hurricane			6.99	not provided	2	56.70	1	56.70	Cabelas
Hurricane			6.02-8.56	not provided	0.25	7.09	1	7.09	Walmart
Hurricane	Hurricane Kast-A-Way Spoon with Bucktail	Bucktail Jig. Weighted (coated fish head) hook and bucktail.	6.02-8.57	not provided	0.5	14.17	1	14.17	Walmart
Hurricane			6.02-8.58	not provided	1	28.35	1	28.35	Walmart
Hurricane									
Hurricane			3.99-4.49	not provided	0.5	14.17	1	14.17	Canadian Tire
Hurricane	Hurricane Bucktail Jig Lure	Bucktail Jig. Weighted (coated fish head) hook and bucktail epoxy finish on thread.	3.99-4.49	not provided	2	56.70	1	56.70	Canadian Tire
Hurricane			3.99-4.49	not provided	1	28.35	1	28.35	Canadian Tire
Jenko Fishing	Jenko Fishing Big Wig Magnum Hair Jig	Bucktail Jig. Weighted (coated fish head) Mustad Ultra-Point hook and bucktail (hair, flash material, and feathers).	8.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Jenko Fishing			8.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Jewel Baits	Jewel Bait Heavy Cover Finesse Football Jigs	Football Jig. Weighted (coated lump) size 4/0 Mustad® Ultra Point™ Black Nickel Hook and skirt.	7.29	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Jewel Baits			7.29	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Jewel Baits	Jewel Bait Old Skool Heavy Cover Football Jigs	Football Jig. Weighted (coated lump) size 5/0 Mustad® Ultra Point™ Black Nickel Hook, rubber skirt with rattle band	7.99	not provided	0.625	17.72	1	17.72	Bass Pro Shops
Jewel Baits			7.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Jewel Baits	Jewel Bait Heavy Cover Football Jigs	Football Jig. Weighted (coated lump) size 5/0 Mustad® Ultra Point™ Black Nickel Hook, rubber skirt with rattle band	7.99	not provided	0.625	17.72	2	35.44	Bass Pro Shops
Jewel Baits			7.99	not provided	0.75	21.26	2	42.52	Bass Pro Shops
Jewel Baits	Jewel Bait AJ Finesse Jig	Dressed Jig. Weighted hook and skirt.	7.29	not provided	0.3125	8.86	2	17.72	Bass Pro Shops
Jewel Baits	Jewel Bait AJ Finesse Jig	Dressed Jig. Weighted hook and skirt.	7.29	not provided	0.4375	12.40	2	24.81	Bass Pro Shops
Jim's Jigs	Round Lead Free Jigs	Lead Free Jigs. Weighted (coated fish	6.99	non-lead	0.0156 25	0.44	10	4.43	Wholesale Sports

Jim's Jigs		eye) hook.	6.99	non-lead	0.0312 5	0.89	10	8.86	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.0625	1.77	8	14.17	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.125	3.54	7	24.81	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.25	7.09	6	42.52	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.25	7.09	7	49.61	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.375	10.63	6	63.79	Wholesale Sports
Jim's Jigs			6.99	non-lead	0.375	10.63	5	53.16	Wholesale Sports
Jim's Jigs	Barbless Roundhead Jig	Roundhead Jig. Weighted (coated round) hook.	4.99	not provided	0.375	10.63	1	10.63	Wholesale Sports
Jim's Jigs			4.99	not provided	0.125	3.54	8	28.35	Wholesale Sports
Jim's Jigs	X-Strong Round Jig	Roundhead Jig. Weighted (coated round) hook.	4.99	not provided	0.25	7.09	8	56.70	Wholesale Sports
Jim's Jigs			4.99	not provided	0.375	10.63	8	85.05	Wholesale Sports
Jim's Jigs			4.99	not provided	0.125	3.54	9	31.89	Wholesale Sports
Jim's Jigs			4.99	not provided	0.25	7.09	9	63.79	Wholesale Sports
Jim's Jigs	Roundhead Jig Two Tone and Glow Colours	Roundhead Jig. Weighted (coated round) hook.	4.99	not provided	0.375	10.63	9	95.68	Wholesale Sports
Jim's Jigs			4.99	not provided	0.375	10.63	10	106.31	Wholesale Sports
Jim's Jigs	Barbless Lead Free Round Jig Head	Lead Free Roundhead Jig. Weighted (coated round) hook.	4.99	non lead	0.125	3.54	4	14.17	Wholesale Sports
Jim's Jigs	Snowman Jig	Snowman Jig. Weighted (coated double round) hook.	4.49	not provided	0.0312 5	0.89	6	5.32	Wholesale Sports
Jim's Jigs	Lead Free Blood Red Jigs	Roundhead Jig. Weighted (coated round) hook.	4.49	non lead	0.125	3.54	5	17.72	Wholesale Sports
Jim's Jigs	Waleye Lead Free Teaser	Lead Free Teaser. Weighted (fish head) hook and "belly blade".	4.49	non lead	0.125	3.54	2	7.09	Wholesale Sports
Jim's Jigs	Swimmin? Jigs	Swimming Jigs. Weighted (coated elongated) hook.	4.29	not provided	0.0625	1.77	3	5.32	Wholesale Sports

Jim's Jigs	Glow Darts Jigs	Glow Dart Jig. Weighted (coated lump) hook.	4.29	not provided	0.0156 25	0.44	6	2.66	Wholesale Sports
Jim's Jigs	Glow Darts Jigs	Glow Dart Jig. Weighted (coated lump) hook.	4.29	not provided	0.0625	1.77	6	10.63	Wholesale Sports
Jim's Jigs	Tube Jigs	Dressed Tube Jigs. Weighted (coated lump) hook with skirt.	4.19	not provided	0.25	7.09	4	28.35	Wholesale Sports
Jim's Jigs	Bumble Bee Jig	Bumble Bee Jig. Weighted (coated bee) hook and skirt.	3.99	not provided	0.25	7.09	2	14.17	Wholesale Sports
Jim's Jigs	Double Whirltail Jig	Double Whirltail Jig. Weighted (ball) hook and two hooked lures	3.79	not provided	0.25	7.09	3	21.26	Wholesale Sports
Jim's Jigs	Whirltail Jigs	Whirltail Jig. Weighted (coated) hook and hooked lure	3.69	not provided	0.125	3.54	3	10.63	Wholesale Sports
Jim's Jigs	Whirltail Jigs	Whirltail Jig. Weighted (coated) hook and hooked lure	3.69	not provided	1.4	39.69	3	119.07	Wholesale Sports
Jim's Jigs	Mini Tube Jig	Dressed Mini Tube Jigs. Weighted (coated lump) hook with skirt.	3.69	not provided	1.32	37.42	1	37.42	Wholesale Sports
Jim's Jigs	Bunny Zonker Jig	Bunny Zonker Jig. No other info	3.59	not provided	0.5	14.17	1	14.17	Wholesale Sports
Jim's Jigs	Bunny Zonker Jig	Bunny Zonker Jig. No other info	3.29	not provided	0.125	3.54	1	3.54	Wholesale Sports
Jim's Jigs	Jig Leech	Jig Leech. No other Info	3.49	not provided	0.25	7.09	3	21.26	Wholesale Sports
Jim's Jigs	Salmon/Steelhead Jig	Salmon/Steelhead Jig. Used for salmon. Weighted (coated lump) hook and skirt.	3.49	not provided	0.375	10.63	1	10.63	Wholesale Sports
Jim's Jigs	Salmon/Steelhead Jig	Salmon/Steelhead Jig. Used for salmon. Weighted (coated lump) hook and skirt.	3.49	not provided	0.5	14.17	1	14.17	Wholesale Sports
Jim's Jigs	Salmon/Steelhead Jig	Salmon/Steelhead Jig. Used for salmon. Weighted (coated lump) hook and skirt.	3.49	not provided	0.75	21.26	1	21.26	Wholesale Sports
Jim's Jigs	Bucktail Jig	Bucktail Jig. Weighted (coated fish head) hook and bucktail.	3.39	not provided	0.25	7.09	2	14.17	Wholesale Sports
Jim's Jigs			3.39	not provided	0.5	14.17	2	28.35	Wholesale Sports
Jim's Jigs			3.39	not provided	1	28.35	1	28.35	Wholesale Sports
Jim's Jigs			3.39	not provided	2	56.70	1	56.70	Wholesale Sports

Jim's Jigs	Round Jig Heads	Roundhead Jig. Weighted (coated round) hook.	3.39	not provided	1	28.35	3	85.05	Wholesale Sports
Jim's Jigs			3.39	not provided	1.5	42.52	3	127.57	Wholesale Sports
Jim's Jigs			3.39	not provided	2	56.70	3	170.10	Wholesale Sports
Jim's Jigs			3.39	not provided	3	85.05	3	255.15	Wholesale Sports
Jim's Jigs	Raw Tube Jighead	Tube Jigs. Weighted (coated lump) hook with skirt.	2.59	not provided	0.0625	1.77	10	17.72	Wholesale Sports
Jim's Jigs			2.99	not provided	0.25	7.09	10	70.87	Wholesale Sports
Jim's Jigs			3.09	not provided	0.375	10.63	10	106.31	Wholesale Sports
Jim's Jigs	Power Jig Heads	Power Jighead. Weighted (coated lump) hook.	2.49	not provided	0.125	3.54	2	7.09	Wholesale Sports
Jim's Jigs	Power Jig Heads	Power Jighead. Weighted (coated lump) hook.	2.49	not provided	0.25	7.09	2	14.17	Wholesale Sports
Jim's Jigs	Wobbler Jig	Wobbler Jig. Weighted hook. No other info	2.49	not provided	0.125	3.54	2	7.09	Wholesale Sports
Jim's Jigs			2.49	not provided	0.25	7.09	2	14.17	Wholesale Sports
Jim's Jigs	Moon Glow Jig	Moon Glow Jig. No other info	4.49	not provided	0.03125	0.89	1	0.89	Wholesale Sports
Jim's Jigs	Polar Bear Jig	Polar Bear Jig. Weighted (coated) hook.	2.19	not provided	0.25	7.09	1	7.09	Wholesale Sports
Jim's Jigs			2.59	not provided	0.75	21.26	1	21.26	Wholesale Sports
Jim's Jigs			2.89	not provided	1	28.35	1	28.35	Wholesale Sports
Jim's Jigs	Beetle Jig Pack	Beetle Jig. Weighted (coated bug) hook.	4.19	not provided	0.125	3.54	4	14.17	Wholesale Sports
Jim's Jigs	Beetle Grub Jig	Beetle Grub Jig. Weighted (coated bug) hook.	3.69	not provided	0.015625	0.44	3	1.33	Wholesale Sports
Jim's Jigs	Beetle Grub Jig	Beetle Grub Jig. Weighted (coated bug) hook.	3.19	not provided	0.03125	0.89	3	2.66	Wholesale Sports
Jim's Jigs	Round Jig Heads Solid Colours	Roundhead Jig. Weighted (coated round) hook.	1.89	not provided	0.015625	0.44	1	0.44	Wholesale Sports
Jim's Jigs			1.89	not provided	0.015626	0.44	4	1.77	Wholesale Sports
Jim's Jigs			1.89	not provided	0.03125	0.89	4	3.54	Wholesale Sports

Jim's Jigs			1.89	not provided	0.0625	1.77	4	7.09	Wholesale Sports
Jim's Jigs			1.89	not provided	0.125	3.54	10	35.44	Wholesale Sports
Jim's Jigs			1.89	not provided	0.25	7.09	10	70.87	Wholesale Sports
Jim's Jigs			1.89	not provided	0.375	10.63	10	106.31	Wholesale Sports
Jim's Jigs	Bullit Jig Plain	Bullit Jig. No other info	0.99	not provided	1	28.35	1	28.35	Wholesale Sports
Jim's Jigs			1.19	not provided	2	56.70	1	56.70	Wholesale Sports
Jim's Jigs			1.49	not provided	3	85.05	1	85.05	Wholesale Sports
Kalin	Kalin's Ultimate Jig Head	Jig Head. Weighted corrosion-resistant Mustad nickel-finish hook.	4.99	lead?	0.25	7.09	3	21.26	Cabelas
Kalin			4.99	lead?	0.375	10.63	3	31.89	Cabelas
Kalin			4.99	lead?	0.5	14.17	3	42.52	Cabelas
Kalin			4.99	lead?	0.75	21.26	3	63.79	Cabelas
Kalin			5.49	lead?	1.125	31.89	3	95.68	Cabelas
Kalin			5.49	lead?	1.5	42.52	3	127.57	Cabelas
Kalin			5.99	lead?	2	56.70	3	170.10	Cabelas
Kalin	Kalin's Triple Threat Crappie Jig	Crappie Jig. Used for panfish. Coated (colour) ball weighted hook and barb.	4.99	not provided	0.03125	0.89	10	8.86	Cabelas
Kalin			4.99	not provided	0.0625	1.77	10	17.72	Cabelas
Kalin			4.99	not provided	0.125	3.54	10	35.44	Cabelas
Kalin	Kalin's Ultimate Swim Bait Jighead	Swim Bait Jighead. Weighted black nickel hook. Unpainted. Size 3/0 hook	4.49	Lead?	0.125	3.54	3	10.63	Cabelas
Kalin		Swim Bait Jighead. Weighted black nickel hook. Unpainted. Size 3/0 hook	4.49	Lead?	0.25	7.09	3	21.26	Cabelas
Kalin		Swim Bait Jighead. Weighted black nickel hook. Unpainted. Size 3/0 hook	4.49	Lead?	0.375	10.63	3	31.89	Cabelas
Kalin		Swim Bait Jighead. Weighted black nickel hook. Unpainted. Size 4/0 hook	4.49	Lead?	0.5	14.17	3	42.52	Cabelas
Kalin		Swim Bait Jighead. Weighted black nickel hook. Unpainted.	4.49	Lead?	0.75	21.26	3	63.79	Cabelas

Lindy	Fuzz-e Grub Jig	Grub Jig. Used for game fish, from crappies to pike. Weighted (coated fish head) hook and grub with buck tail.	3.99	not provided	0.125	3.54	1	3.54	Wholesale Sports
Lindy			3.99	not provided	0.25	7.09	1	7.09	Wholesale Sports
Lindy	Watsit Ice Jig	Ice Jig. Used for walleye, perch, crappie and other gamefish. Weighted (coated fish head) hook and grub.	3.99	not provided	0.03125	0.89	1	0.89	Wholesale Sports
Lindy	Ice Jigs	Ice Jig. Used for perch, trout, panfish and other gamefish. Weighted (coated fish head) hook and grub.	3.79	not provided	0.03125	0.89	2	1.77	Wholesale Sports
Lindy	Slick Jig	Slick Jig. Weighted (coated fish) hook.	2.99	not provided	0.0625	1.77	1	1.77	Wholesale Sports
Lindy	Slick Jig	Slick Jig. Weighted (coated fish) hook.	2.99	not provided	0.125	1.77	1	1.77	Wholesale Sports
Luck-E-Strike	Luck-E-Strike Jig Head	Jighead. Weighted (coated fish head) hook.	4.2	lead	0.125	3.54	8	28.35	Walmart
Luck-E-Strike	Luck-E-Strike Jig Head - 25 Pack	Jighead. Weighted (coated fish head) Wright & McGill bronze #1 hook	3.96	not provided	0.0625	1.77	25	44.30	Walmart
Lunker Lure	Lunker Lure Original Rattleback Jig	Rattling Jig. Weighted (coated) hook and skirt	3.49	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Lunker Lure	Lunker Lure Original Rattleback Jig	Rattling Jig. Weighted (coated) hook and skirt	3.49	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Lunker Lure	Lunker Lure Original Rattleback Jig	Rattling Jig. Weighted (coated) hook and skirt	3.49	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Marmish	Marmish #2	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#12)	7.99	not provided	0.020106161	0.57	3	1.71	Wholesale Sports
Marmish	Larva #2	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#12)	7.99	not provided	0.02081164	0.59	3	1.77	Wholesale Sports
Marmish	Larva #1	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#14)	7.99	not provided	0.017636983	0.50	3	1.50	Wholesale Sports
Marmish	Garlic Clove #2	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#12)	7.99	not provided	0.023633557	0.67	3	2.01	Wholesale Sports
Marmish	Pellet #2	Jighead. Used for Pan fish, Trout & Whitefish. Weighted	7.99	not provided	0.038801362	1.10	3	3.30	Wholesale Sports

		(ball) hook (#12)							
Marmish	Giant Ant #2	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#12)	6.39	not provided	0.0201 06161	0.57	3	1.71	Wholesale Sports
Marmish	Pear	Jighead. Used for Pan fish, Trout & Whitefish. Weighted hook (#14)	6.39	non lead	0.0183 42462	0.52	3	1.56	Wholesale Sports
Matzuo	Matzuo Akai Jig Heads	Jighead. Weighted (coated fish head) Matzuo chrome hook.	4.49- 5.99	non lead (steel)	0.25	7.09	1	7.09	Walmart
Matzuo	Matzuo Akai Jig Heads	Jighead. Weighted (coated fish head) Matzuo chrome hook.	4.49- 5.99	non lead (steel)	0.1875	5.32	1	5.32	Walmart
Matzuo	Matzuo Akai Jig Heads Pack	Jighead. Weighted (coated fish head) Matzuo chrome hook.	4.19	non lead (steel)	0.125	3.54	5	17.72	Walmart
Missile Jigs	Missile Jigs Ike's Head Banger Jig	Football Jig. Weighted (coated lump) 5/0 VMC hook and skirt.	4.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Missile Jigs	Missile Jigs Ike's Head Banger Jig	Football Jig. Weighted (coated lump) 5/0 VMC hook and skirt.	4.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
NetBait	NetBait Paca Bug Jig	Bug Jig. Weighted hook and skirt.	3.79	not provided	0.375	10.63	1	10.63	Bass Pro Shops
NetBait	NetBait Paca Bug Jig	Bug Jig. Weighted hook and skirt.	3.79	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Northland Fishing	Northland Tackle Super-Glo Jig	Roundhead Jig. Weighted (coated round) hook.	9.75	not provided	0.25	7.09	6	42.52	Walmart
Northland Fishing	Northland UV Forage Minnow Fry Jig	Panfish Jig. Lure (fish) and hook.	4.49	not provided	0.0625	1.77	1	1.77	Cabelas
Northland Fishing	Northland UV Forage Minnow Fry Jig	Panfish Jig. Lure (fish) and hook.	4.49	not provided	0.0937 5	2.66	1	2.66	Cabelas
Northland Fishing			3.99	not provided	0.0625	1.77	1	1.77	Cabelas
Northland Fishing			NOT PROVIDED	not provided	0.125	3.54	1	3.54	Walmart
Northland Fishing			3.99	not provided	0.25	7.09	1	7.09	Cabelas
Northland Fishing			3.99	not provided	0.125	3.54	1	3.54	Cabelas
Northland Fishing			3.99	not provided	0.0312 5	0.89	1	0.89	Cabelas
Northland	Northland	Thumper Jig. Lure	3.89	not	0.25	7.09	2	14.17	Cabelas

Fishing	Thumper Jig	(fish and "belly blade"), hook and barb.	(4.99)	provided					
Northland Fishing			3.99 (4.99)	not provided	0.375	10.63	2	21.26	Cabelas
Northland Fishing	Northland Whistler Jig	Whistler Jig. Weighted Lure (metal fish and propeller) and hook.	3.99 (2.61)	not provided	0.25	7.09	2	14.17	Cabelas
Northland Fishing	Northland Whistler Jig	Whistler Jig. Weighted Lure (metal fish and propeller) and hook.	3.99 (2.61)	not provided	0.375	10.63	2	21.26	Cabelas
Northland Fishing			3.99 (2.61)	not provided	0.5	14.17	2	28.35	Cabelas
Northland Fishing			18.97	not provided	0.375	10.63	6	63.79	Walmart
Northland Fishing			19.47	not provided	0.25	7.09	6	42.52	Walmart
Northland Fishing	Northland Slurp! Jig	Slurp! Jig. Weighted (fish head) Mustad hook and barbs.	3.79	not provided	0.125	3.54	3	10.63	Cabelas
Northland Fishing			3.79	not provided	0.25	7.09	3	21.26	Cabelas
Northland Fishing			3.79	not provided	0.375	10.63	3	31.89	Cabelas
Northland Fishing	Northland Bug-A-Boo Jig - Random Selection	Bug-A-Boo Jigs. Recieve one random model of Northland Bug-A-Boo Jig. No specific choice of size or colour. Per each.	2.99	not provided	not provided	#VALUE!	1	#VALUE!	Cabelas
Northland Fishing	Northland Sling Shot Worm Weight	Sling Shot Worm Weight. Weighted cone shape.	3.29	not provided	0.375	10.63	1	10.63	Wholesale Sports
Northland Fishing	Northland Inner Tube Jig	Inner Tube Jig. Weighted (lump) Mustad Ultra Point hook.	4.49	not provided	0.375	10.63	5	53.16	Wholesale Sports
Northland Fishing	Northland Inner Tube Jig	Inner Tube Jig. Weighted (lump) Mustad Ultra Point hook.	4.99	not provided	0.125	3.54	5	17.72	Wholesale Sports
Northland Fishing	Northland Inner Tube Jig	Inner Tube Jig. Weighted (lump) Mustad Ultra Point hook.	5.49	not provided	MEDIUM?	#VALUE!	5	#VALUE!	Wholesale Sports
Northland Fishing	Northland Fire Ball Sting 'N' Jigs 4 Pack	Sting 'N' Jigs. Used for Wall-eye. Weighted (coated ball) hook.	7.49	not provided	0.25	7.09	4	28.35	Wholesale Sports
Northland Fishing	Northland "Rattlin" Jungle Jig	Rattling Dressed Jig. Used for bass and pike. Weighted hook and silicon skirt.	5.49	not provided	0.375	10.63	1	10.63	Wholesale Sports
Northland Fishing	Northland Eye Dropper Spoon	Spoon Jig. Used for crappie, walleye, trout	4.99	not provided	0.125	3.54	1	3.54	Wholesale Sports

	Jig	and perch. Weighted (coated shiny fish) hook.							
Northland Fishing	Northland Rattlin' Fire Ball Jig	Rattling Fire Ball Jig. Weighted (uncoated pill and fish head) hook. Brass rattle.	4.99	not provided	0.125	3.54	1	3.54	Wholesale Sports
Northland Fishing			4.99	not provided	0.25	7.09	1	7.09	Wholesale Sports
Northland Fishing			4.99	not provided	0.375	10.63	1	10.63	Wholesale Sports
Northland Fishing	Northland Gumdrops Floater Jig	Floater Jig. Used for night crawlers. Weighted (fish head) two hooks.	4.99	not provided	#2	#VALUE!	4	#VALUE!	Wholesale Sports
Northland Fishing	Northland Highball Floater Jig	Floater Jig. Used for crappie, walleye, trout and perch. Weighted (coated ball) hook.	4.99	not provided	#2	#VALUE!	1	#VALUE!	Wholesale Sports
Northland Fishing	Northland FireBall Standup Jig	Standup Jig. Used for walleye, trout, bass and perch. Weighted (coated fish head) hook.	4.49	not provided	0.25	7.09	1	7.09	Wholesale Sports
Northland Fishing	Northland Gypsy Jig	Gypsy Jig. Used for Crappie, Bluegill, Trout, Perch, Bass and Walleye. Weighted (coated fish head) hook.	3.49	not provided	0.03125	0.89	1	0.89	Wholesale Sports
Northland Fishing			3.49	not provided	0.0625	1.77	1	1.77	Wholesale Sports
Northland Fishing	Northland Buck-A-Roo Jig	Buck-A-Roo. Used for Crappie, Perch, Walleye, Bass, Trout & Stripers. Weighted (coated fish head) Mustad Ultra-Point hooks and buck tail.	2.99	not provided	0.25	7.09	1	7.09	Wholesale Sports
Northland Fishing			2.99	not provided	0.375	10.63	1	10.63	Wholesale Sports
Northland Fishing	Northland Sink'n Gum-ball Jig	Gum-ball Jig. Weighted (coated ball) hook.	4.29	not provided	0.25	7.09	1	7.09	Wholesale Sports
Northland Fishing	Northland Mud Bug Jig	Mug Bug Jig. Weighted (coated ball) Mustad Ultra-Point fine wire hook.	1.74	not provided	#10		2		Wholesale Sports
Northland Fishing			1.74	not provided	#12	#VALUE!	2	#VALUE!	Wholesale Sports
Pepper Custom Baits	Pepper Custom Baits Pro Series Football Jig	Football Jig. Weighted (coated lump) Gamakatsu® J-bend hook and rubber skirt	3.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Pepper Custom Baits			3.99	not provided	0.75	21.26	2	42.52	Bass Pro Shops
Picasso Lures.	Picasso School-E Rig Smart Mouth Fish Head Jigs	Fish Head Jig. Weighted (fish head) hook	8.99	not provided	0.125	3.54	1	3.54	Cabelas
Picasso Lures.			8.99	not provided	0.1875	5.32	1	5.32	Cabelas
Picasso			8.99	not	0.25	7.09	1	7.09	Cabelas

Lures.				provided					
Picasso Lures.	Picasso School-E Rig Dummy Head Jigs	Dummy Head Jig. No hook. "Dummy" weighted fish head and screw for multi-bait rigs. 1/4"	9.99	not provided	0.125	3.54	5	17.72	Cabelas
Picasso Lures.			9.99	not provided	0.1875	5.32	5	26.58	Cabelas
Picasso Lures.			9.99	not provided	0.25	7.09	5	35.44	Cabelas
Picasso Lures.	Picasso Lures Round Bend Spider Jig	Dressed Jig. Weighted (coated Hard Pro Metal Alloy) hook and skirt.	4.79	not provided	0.25	7.09	1	7.09	Cabelas
Picasso Lures.			4.79	not provided	0.375	10.63	1	10.63	Cabelas
Picasso Lures.			4.79	not provided	0.5	14.17	1	14.17	Cabelas
Picasso Lures.			4.79	not provided	0.75	21.26	1	21.26	Cabelas
Pradco	Moontalker	Dressed Jig. Weighted Mustad Ultra point hook and 55-strand Bio-Flex silicone skirt with black nickel Colorado blade	7.99	not provided	0.375	10.63	1	10.63	Wholesale Sports
Pradco			7.99	not provided	0.5	14.17	1	14.17	Wholesale Sports
Pradco	Booyah Blade	Dressed Jig. Weighted (Hard coat paint, Flex wire alloy frames) Mustad Ultra Point hook. Gold & nickel-plated blades and 55-strand Bio-Flex silicone skirts.	7.99	not provided	0.25	7.09	1	7.09	Wholesale Sports
Pradco			7.99	not provided	0.375	10.63	1	10.63	Wholesale Sports
Punisher	Punisher Jig	Football Jig. Weighted (coated lump) Gamakatsu® J-bend hook and rubber skirt	2.79	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Rapala	Rapala Jigging Rap	Jighead. Weighted (coated fish head) triple hook.	5.59-8.49	not provided	0.1875	5.32	1	5.32	Walmart
Rapala			5.59-8.50	not provided	0.3125	8.86	1	8.86	Walmart
Rapala			5.59-8.51	not provided	0.125	3.54	1	3.54	Walmart
Rapala			5.59-8.52	not provided	0.625	17.72	1	17.72	Walmart
Rapala	Rapala Jigging Shad Rap	Jighead. Weighted (coated fish head) triple hook.	5.22-7.49	not provided	0.125	3.54	1	3.54	Walmart
River2Sea	River2Sea Biffle Junkyard Jig	Rattling Dressed Jig. Used for bass and pike. Weighted hook, double-barreled rattle and skirt.	5.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
River2Sea			5.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops

Savage Gear	Savage Gear Stand Up Jighead	Stand Up Jighead. Used for crawfish. Weighted (elipse) hook. Size 1/0 hook	6.99	Lead?	0.25	7.09	3	21.26	Cabelas
Savage Gear	Savage Gear Stand Up Jighead	Stand Up Jighead. Used for crawfish. Weighted (elipse) hook. Size 2/0 hook	5.99	Lead?	0.25	7.09	2	14.17	Cabelas
Savage Gear	Savage Gear Stand Up Jighead	Stand Up Jighead. Used for crawfish. Weighted (elipse) hook. Size 3/0 hook	5.99	Lead?	0.5	14.17	2	28.35	Cabelas
Sebile	Sebile Vibrato Ice Jig Hard Bait	Ice Jig. Weighted (fish) hook.	9.99	not provided	0.25	7.09	1	7.09	Canadian Tire
Sebile	Sebile Vibrato Ice Jig Hard Bait	Ice Jig. Weighted (fish) hook.	9.99	not provided	0.375	10.63	1	10.63	Canadian Tire
South Bend	South Bend Unpainted Jig Head	Jighead. Weighted (uncoated ball) hook.	2.99	lead?	0.0625	1.77	1	1.77	Walmart
South Bend			2.99	lead?	0.03125	0.89	1	0.89	Walmart
South Bend			2.99	lead?	0.125	3.54	1	3.54	Walmart
South Bend			5.36	lead?	0.25	7.09	1	7.09	Walmart
South Bend			3.99	lead?	0.5	14.17	1	14.17	Walmart
South Bend	South Bend Crappie Jig	Crappie Jig. Used for panfish. Coated (colour) ball weighted hook.	2.00-3.44	not provided	0.0625	1.77	3	5.32	Walmart
SPRO	SPRO Fishing Bucktail Jig	Bucktail Jig. Used for wide range of fresh and saltwater fish. Weighted (coated fish head) Gamakatsu hook and bucktail.	8.42	not provided	6	170.10	1	170.10	Walmart
SPRO			5	not provided	0.75	21.26	1	21.26	Walmart
SPRO			6.42	not provided	2	56.70	1	56.70	Walmart
Stanley Jigs	Stanley Jigs SwimMax Jig	Swim Jighead. Weighted (coated fishhead) hook and skirt.	4.49	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Strike King	Strike King Pro Model Jig	Dressed Pro Model Jig. Weighted Mustad Ultra Point™ hook w/ skirt.	3.99 (2.99)	not provided	0.375	10.63	1	10.63	Cabelas
Strike King			3.99 (2.99)	not provided	0.5	14.17	1	14.17	Cabelas
Strike King	Strike King Lure Hack Attack Heavy Cover Swim Jig	Swim Jighead. Weighted (coated fishhead) Gamakatsu hook and skirt.	8.19	not provided	0.375	10.63	1	10.63	Walmart
Strike King	Strike King "Ratlin" Pro Model Jig	Dressed Jig. Weighted black nickel hook and silicone skirt.	2.77	not provided	0.5	14.17	1	14.17	Walmart

Strike King	Strike King Bitsy Flip Jig	Dressed Jig. Weighted black nickel hook and silicone skirt.	11.64	not provided	0.25	7.09	1	7.09	Walmart
Terminator	Terminator Weedless Football Jig	Football Jig. Weighted (coated lump) VMC Wide Gap hook and silicone skirt.	3.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Terminator	Terminator Weedless Football Jig	Football Jig. Weighted (coated lump) VMC Wide Gap hook and silicone skirt.	3.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Thill	Slick Jig Gold	Slick Jig. Weighted (coated fish) hook.	nd	not provided	0.0625	1.77	1	1.77	Walmart
Thill			Nd	not provided	0.125	3.54	1	3.54	Walmart
Thill			Nd	not provided	0.1875	5.32	1	5.32	Walmart
Thill			Nd	not provided	0.25	7.09	1	7.09	Walmart
Thill			Nd	not provided	0.375	10.63	1	10.63	Walmart
Thill			nd	not provided	0.625	17.72	1	17.72	Walmart
V&M	V&M Pacemaker Ledge Blade Jig	Jighead. Weighted (coated fish head) size 5/0 Mustad hook.	8.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
V&M			8.99	not provided	1	28.35	1	28.35	Bass Pro Shops
Wahoo Fishing	Wahoo Fishing Super Striper Jig	Super Striper Jig. Weighted (fish head) hook and bucktail.	4.99	not provided	1	28.35	1	28.35	Cabelas
Wahoo Fishing	Wahoo Fishing Super Striper Jig	Super Striper Jig. Weighted (fish head) hook and bucktail.	5.49	not provided	2	56.70	1	56.70	Cabelas
Wahoo Fishing	Wahoo Premium Bucktail Football Jig	Football Jig. Weighted (coated lump) Mustad NeedlePoint hook and bucktail skirt with silicone accents and epoxy-coated threads	5.99	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Wahoo Fishing			5.99	not provided	0.375	10.63	1	10.63	Bass Pro Shops
War Eagle	War Eagle Heavy Finesse Jigs	Finesse Jig. Weighted 3/0 Gamakatsu® flipping hook	6.49	not provided	0.375	10.63	1	10.63	Bass Pro Shops
War Eagle	War Eagle Heavy Finesse Jigs	Finesse Jig. Weighted 3/0 Gamakatsu® flipping hook	6.49	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Whizkers	Whizkers Glitz	Glitz Jig. Weighted	4.98	not	0.125	3.54	6	21.26	Cabelas

	Jig	(coated ball) hook.		provided					
Whizkers			4.98	not provided	0.25	7.09	6	42.52	Cabelas
Whizkers			4.98	not provided	0.375	10.63	6	63.79	Cabelas
Williams Lure	Williams Glo Ice Jig Ice Fishing Spoon	Ice Jig. Weighted (silver finished spoon) hook.	9.99	not provided	0.25	7.09	1	7.09	Canadian Tire
YUM Baits	YUM YUMBrella Money Head Jigs	Money Head Jig. Weighted (coated lump) hook. Used in multi-bait rigs. Size 3/0 hook	5.99	not provided	0.1875	5.32	1	5.32	Cabelas
YUM Baits	YUM YUMBrella Money Head Jigs	Money Head Jig. Weighted (coated lump) hook. Used in multi-bait rigs. Size 5/0 hook	5.99	not provided	0.25	7.09	1	7.09	Cabelas
YUM Baits	Yum Money Minnow Head	Minnow Jighead. Weighted (fishhead) hook. Size 3/0 hook	7.4	not provided	0.1875	5.32	5	26.58	Walmart
Z-Man	Z-Man The Original ChatterBait	Chatter Bait. Weighted size 5/0 hook and skirt.	4.99	not provided	0.375	10.63	1	10.63	Bass Pro Shops
Z-Man			4.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Z-Man			4.99	not provided	0.125	3.54	1	3.54	Bass Pro Shops
Z-Man			4.99	not provided	0.25	7.09	1	7.09	Bass Pro Shops
Z-Man	Z-Man Project Z Football Jig	Football Jig. Weighted (coated lump) size 4/0 Mustad® Ultra Point™ Hook and silicone skirt.	3.99	not provided	0.5	14.17	1	14.17	Bass Pro Shops
Z-Man			3.99	not provided	0.75	21.26	1	21.26	Bass Pro Shops
Z-Man	Z-Man Project Z Swim Jig	Swim Jighead. Weighted (coated fishhead) hook and 45-strand silicone skirt	4.49	not provided	0.25	7.09	1	7.09	Bass Pro Shops