

Release of Fish in the Sport Fishery



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RC 3, Tab 6

Release Mortality



- UCI and LCI (proposals 47-53)
 - Prohibit release of fish
 - Prohibit use of bait
 - Prohibit use of barbed hooks
 - Require circle hooks
- Sport fishing
- Why anglers release
- Factors in release mortality
- Studies
- Regulations

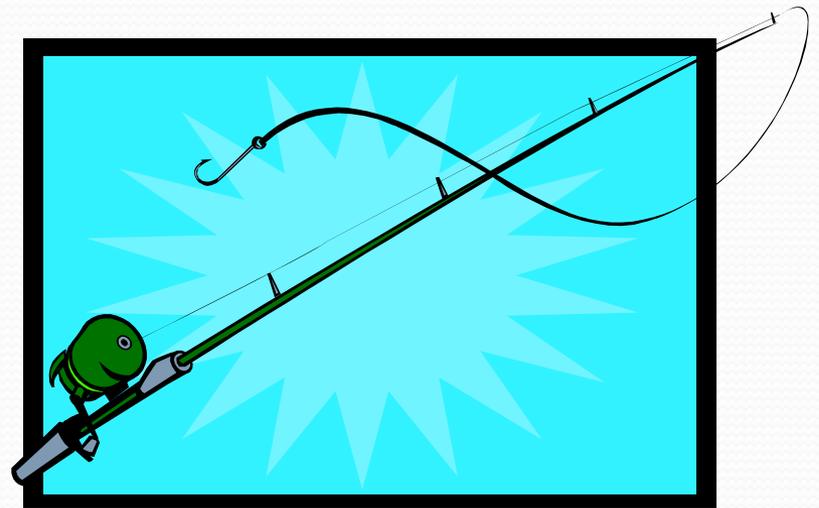
Best Practices

Characteristics of Alaskan Fisheries

- Statutory Definitions – AS 16.05.940
 - (30) “sport fishing”
 - the taking of or attempting to take for personal use, and not for sale or barter, any fresh water, marine, or anadromous fish by hook and line with the line attached to a pole or rod which is held in the hand or closely attended, or other means defined by the board of fish
- AS 16.05.020
 - Manage, protect, maintain, improve and extend the fish, game and aquatic plant resources of the state in the interest of the economy and general well-being of the state;

Sport Fishing

- Not for sale or barter
- Value in opportunity
- Specific gear
- Small numbers of fish per individual
- Number of participants



Sport Effort and Harvest

- Angler Participation

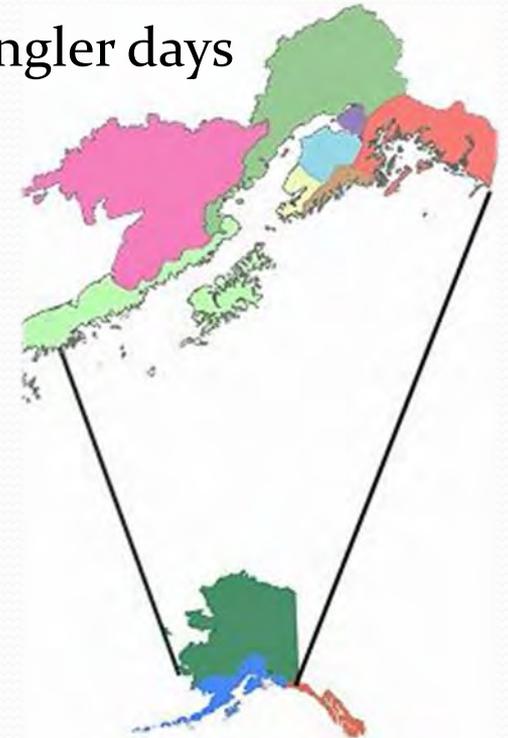
- 2006-2012 (annual average)

- Alaska 458,300 anglers 2,168,400 angler days
 - Southcentral 321,400 anglers 1,500,200 angler days

- Finfish Harvest

- 2006-2012 (annual average)

- Alaska 2,320,900 fish harvest
 - Southcentral 1,557,000 fish harvest



Release

- Southcentral, Alaska 2012 (SWHS)

- Finfish

- Caught 3,523,800 fish
- Harvested 1,447,900 (41%)

- Salmon

- Caught 1,754,000 salmon
- Harvested 871,000 salmon (50%)

- Harvest by species

- Sharks 2%
- Resident Species (rainbow, char, grayling) 5%
- Chum salmon 8%
- Sockeye & coho salmon 66%



Why Release?

- Catch & Release
- Release
 - Value in opportunity for success
 - Gear and methods
 - Target species
 - Regulations
 - Residency



Research



Study	Species	Location	Gear / Hook	Method	Hook Type	Days Held	Number of Captures	Mortality Rate	Author
Surrey Area, 1982 - 1995	Steelhead	B.C.	Bait	Rod & Reel			306	0.3%	B.C., MELP Staff
Chilliwack River, 1999 - 2000	Steelhead	B.C.	Bait	Rod & Reel			226	0.9%	Nelson et al., 2001
	Steelhead	B.C.	Flies	Rod & Reel				< 1.0%	Hooton, 2001
Kamloops Area, 1982 - 1995	Steelhead	B.C.	Bait	Rod & Reel			436	1.6%	B.C., MELP Staff
	Steelhead	B.C.	Artificial Lures	Rod & Reel				3.0%	Hooton, 2001
Vancouver Is. In 1980 - 1987	Steelhead	B.C.	Bait / Single Artificial	Rod & Reel	Barbed & Barbless	2	3,715	3.4%	Hooton, 1987
Keogh River in 1980-1985	Steelhead	B.C.	Lures	Rod & Reel		2	335	3.8%	Hooton, 1987
Somass River, 1988; Winter Run	Steelhead	B.C.	Bait	Rod & Reel			195	4.1%	Lirette, 1988
Surrey Area, 1982 - 1995	Steelhead	B.C.	Bait	Rod & Reel			201	4.3%	B.C., MELP Staff
Skeena River, 1995	Steelhead	B.C.	Bait	Rod & Reel				4.6%	Thomas, 1995
	Steelhead	B.C.	Artificial Lures	Rod & Reel				4.6%	Thomas, 1995
Keogh River in 1980-1985	Steelhead	B.C.	Bait	Rod & Reel	Barbless	2	335	5.6%	Hooton, 1987
Somass River, 1988; Summer Run	Steelhead	B.C.	Bait	Rod & Reel			76	7.9%	Lirette, 1988
Campbell River, 1989	Steelhead	B.C.	Bait	Rod & Reel			69	8.7%	Lirette, 1989
	Steelhead	B.C.	Bait	Rod & Reel				7 - 10%	Hooton, 2001
Keogh River in 1980-1985	Steelhead	B.C.	Bait	Rod & Reel	Barbed	2	335	9.1%	Hooton, 1987
	Steelhead	WA	Bait	Rod & Reel			390	11.0%	Mongillo, 1984



Study	Species	Size (mm) range / mean	Location	Method / gear	Hook type	Days held	Number of captures	Number of deaths	Mortality rate	Author
ADF&G; Anadromous	Dolly Varden		AK	unbaited / lure	Treble		60	0	0.0%	DeCicco, 1994
ADF&G; Anadromous	Dolly Varden		AK	unbaited / lure	Single		120	2	1.7%	DeCicco, 1994
ADF&G; Anadromous	Dolly Varden		AK	bait	Single		59	1	1.7%	DeCicco, 1994
ADF&G; Anadromous	Dolly Varden		AK	bait	Treble		60	2	3.3%	DeCicco, 1994
ADF&G; Char & Grayling	Arctic char		AK	unbaited	Treble Lure	2	60	0	0.0%	McKinley, 1993
ADF&G; Char & Grayling	Arctic char		AK	unbaited	Single	2	60	0	0.0%	McKinley, 1993
Various Lures & Temp	brook trout	339	MI	lures	Treble / Barbed	2	126		0.0%	Nuhfer and Alexander, 1992
	brook trout	203	MD	flies	Single	2	130	0	0.0%	Pavol, 1996
	brown trout	265	MD	flies	Single	2	69	0	0.0%	Pavol, 1996
	brown trout	91 - 391		lures and flies	Single /Treble	1	107		0.9%	Shetter and Allison, 1958
	brook trout	122 - 241		flies	Single	7 - 10	484		1.7%	Shetter and Allison, 1958
Various Lures & Temp	brook trout	339	MI	lures	Single / Barbed	2	251		2.4%	Nuhfer and Alexander, 1992
	brown trout	174	MD	lures	Treble	2	40	1	2.5%	Pavol, 1996
	brook trout	74 - 300		lures and flies	Single /Treble	1	806		2.6%	Shetter and Allison, 1955
ADF&G; Char & Grayling	Arctic char		AK	bait	Treble	2	60	2	3.3%	McKinley, 1993
ADF&G; Char & Grayling	Arctic char		AK	bait	Single	2	60	2	3.3%	McKinley, 1993
	brook trout	76- 251		lures	Single	1	23		4.4%	Shetter and Allison, 1955
Various Lures & Temp	brook trout	339	MI	lures	Treble / Barbed	2	253		8.3%	Nuhfer and Alexander, 1992
	brook trout	175	MD	lures	Treble	2	197	17	8.6%	Pavol, 1996
ADF&G; Char & Grayling	Arctic char		AK	bait	Treble Lure	2	60	6	10.0%	McKinley, 1993
Temp. 10 - 18 C	brook trout	135 - 228		bait	Single	12	490		13.5%	Hulbert & Engstrom, 1980
	brook trout	122 - 241		bait	Single	7 - 10	550		37.5%	Shetter and Allison, 1955
	brook trout	76- 251		bait	Single	1	45		48.9%	Shetter and Allison, 1955

Study	Species	Size (mm) range / mean	Location	Method / gear	Hook type	Days held	Number of captures	Number of deaths	Mortality rate	Author
	cutthroat	211	MT	flies	Single /Treble	30	315		0.3%	Dotson, 1982
	cutthroat		WY				72,698	236	0.3%	Schill et al., 1986
	cutthroat	356	WY	lures	Barbed Treble	10	113	3	2.7%	Hunsaker et al., 1970
	cutthroat	356	WY	Artificial flies	Barbless Single	10	60	2	3.3%	Hunsaker et al., 1970
	cutthroat	356	WY	Artificial flies	Barbed Single	10	75	3	4.0%	Hunsaker et al., 1970
	cutthroat	227	MT	lures	Barbed Single	30	630		4.3%	Dotson, 1982
	cutthroat	251 - 424	WY	bait / lure	Single /Treble	10	409		5%	Hunsaker et al., 1970
Temperature	cutthroat	274 - 442	WY	lures	Treble	30	352	18	5.1%	Marnell & Hunsaker, 1970
Temperature / Fatigue	cutthroat	274 - 442	WY	lures	Treble	30	300		5.5%	Marnell & Hunsaker, 1970
	cutthroat	356	WY	lures	Barbless Treble	10	100	6	6.0%	Hunsaker et al., 1970
Various Temperatures	cutthroat		CA	lures	Treble Barbless	4	175	21	12.0%	Titus & Vanicek, 1988
Various Temperatures	cutthroat		CA	lures	Treble Barbed	4	156	27	17.3%	Titus & Vanicek, 1988
Various Temperatures	cutthroat		CA	lures	Single Barbless	4	202	39	19.3%	Titus & Vanicek, 1988
	cutthroat	356	WY	bait; combined est.	Single	10	161	78	48.4%	Hunsaker et al., 1970
	cutthroat	251 - 424	WY	bait	Single /Treble	10	100		73.0%	Hunsaker et al., 1970
Anadromous Cutthroat	cutthroat		WA	Spinner with bait	Treble	3	38		10.5%	Pauley and Thomas, 1993
Anadromous Cutthroat	cutthroat		WA	Spinner No bait	Single	3	44		15.9%	Pauley and Thomas, 1993
Anadromous Cutthroat	cutthroat		WA	Spinner No bait	Treble	3	42		23.8%	Pauley and Thomas, 1993
Anadromous Cutthroat	cutthroat		WA	bait	Single	3	178		40% to 58%	Pauley and Thomas, 1993
	rainbow	193 - 344	B.C.	lures	Treble	2	145	4	2.8%	Stringer, 1967
Single vs. Treble	rainbow	173 - 302	CO	lures	Treble	3	495	17	3.4%	Klein, 1965
	rainbow		CO	flies	Single	21	457		3.9%	Schisler and Bergersen, 1996
	rainbow	79 - 272		lures and flies	Single /Treble	1	346		5.2%	Shetter & Allison, 1958
Single vs. Treble	rainbow	173 - 302	CO	lures	Single	3	505	28	5.5%	Klein, 1965
	rainbow	193 - 344	B.C.	flies	Single	2	190	15	7.9%	Stringer, 1967
Temp. 12 -17 C	rainbow	471		flies	Single / Barbed	1 - 2	65		20.0%	Faccin, 1983
	rainbow		CO	Artificial bait	Single; Fished actively	21	505		21.6%	Schisler and Bergersen, 1996
	rainbow		CO	Artificial bait	Single; Fished passively	21	511		32.1%	Schisler and Bergersen, 1996
Deeply Hooked Fish	rainbow	145	WI	bait	Hooks Left in & held	120	200	69	34.5%	Mason and Hunt, 1967
	rainbow	193 - 344	B.C.	bait / worm	Single	2	239	86	36.0%	Stringer, 1967
Temp 8.3 - 12.3 C	rainbow	155 - 272		bait		10	18		39.0%	Barwick, 1985
Deeply Hooked Fish	rainbow	145	WI	bait	Hooks removed & held	120	200	177	88.5%	Mason and Hunt, 1967

Study	Species	Size (mm) range / mean	Location	Method / gear	Hook type	Days held	Number of captures	Number of deaths	Mortality rate	Author
Meta-Analysis	resident trout		Various	flies	10 Studies Analyzed				3.8%	Taylor and White, 1992
Meta-Analysis	resident trout		Various	lures	11 Studies Analyzed				4.9%	Taylor and White, 1992
Meta-Analysis	resident trout		Various	bait	7 Studies Analyzed				31.4%	Taylor and White, 1992
Compilation, Res. & Anad.	trout		Various	flies	Barbless				1.8%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	lures and flies	Barbless				2.2%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	lures	Barbless				3.0%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	flies	Barbed & Barbless				3.3%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	flies	Barbed				3.9%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	lures and flies	Barbed				5.9%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	lures	Barbed & Barbless				6.6%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	lures	Barbed				6.7%	Wright, 1992
Compilation, Res. & Anad.	trout		Various	bait	Barbed & Barbless				30 - 50%	Wright, 1992

Alaska salmon studies

- Little Susitna coho (1993)
 - 384 coho in estuary 69% mortality
 - 77 coho above the estuary 12% mortality
 - Dipnetted coho above weir 1% mortality
- Kenai kings (1992)
 - Sampled in lower Kenai
 - Radio telemetry
 - 255 kings sampled from anglers 6-11% mortality
 - Gill/bleeding 22-27% mortality
- Unalakleet coho (2002)
 - 68 coho in lower river 15% mortality
 - No significant relationship between mortality and distance upstream



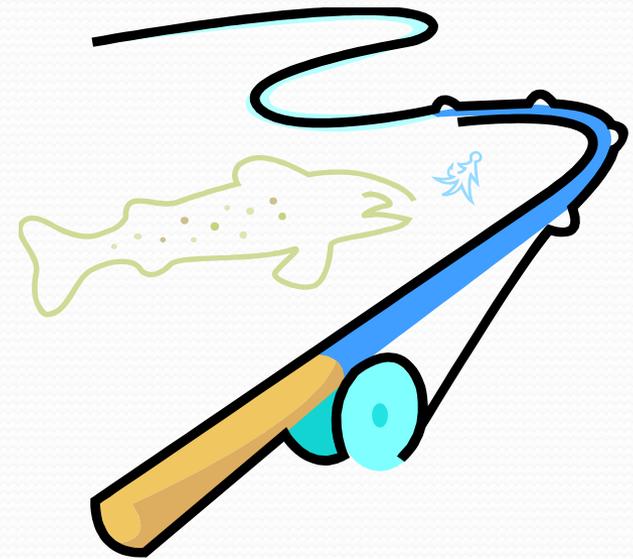
Factors in release mortality

- Species of fish
 - Coho
- Water temperature
- Landing time
- Time out of water
- Hook placement
 - Bait



Prohibiting release

- Only way to prevent release-related mortality
- Impose a harvest-centric ethic on sport fisheries
 - Unknown effect on sport harvest
 - Substantial effect on sport fishing
 - Keep species that were not targeted
 - Keep fish they couldn't eat
 - Regulatory conundrum
- Existing regulations



To barb or not to barb...



- Handling time
- Regulations in other states
- Ability to land fish
- Cost to anglers
- Enforcement
- Reduction in release mortality

To barb or not to barb...

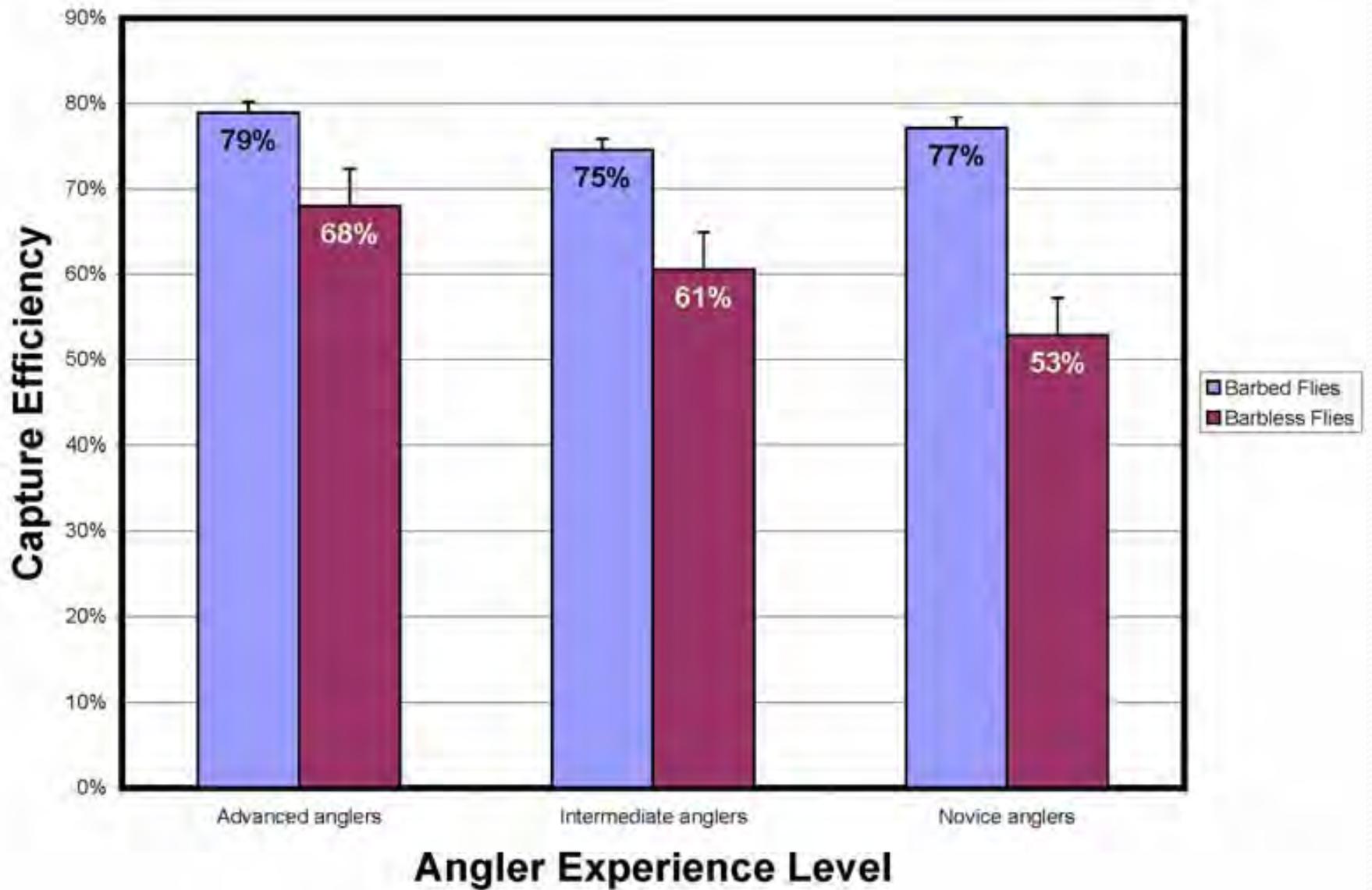


- Handling time
 - Bloom 2010, CA Dept. Fish and Game
 - Difference in handling time- 7.2 seconds
 - “difference is not likely biologically significant”
 - Significant factors
 - Size and species of fish
 - Method (landing net)
 - Angler’s experience

To barb or not to barb...



- Regulations in other states
 - Washington, Oregon, California
 - Washington Oregon- Columbia River Management
 - Washington- tied to C&R trout fisheries
 - Colorado, Wyoming, Utah, Montana
 - No barbless regulations
 - Data on barbless is inconclusive
 - Not needed with other terminal restrictions
 - Nevada, Idaho
 - Western region only in Trophy waters
 - Paired with C&R trout fisheries since 1960



To barb or not to barb...



- Cost to anglers
 - Local shops
 - Catalogs
 - No barbless, or few at higher cost
 - 8 barbless/90 styles
- Enforcement
 - Schill and Kline, 1995
 - “75% of violations were written to anglers attempting to comply with barbless regulations. If the regulation violated has little or no demonstrated biological value, maintenance of such restrictions may be self-defeating for regulatory agencies”

To barb or not to barb...



To barb or not to barb...



- Reduction in release mortality
 - Data are inconclusive



Best Practices

Regulation & Education

- Regulations
 - Don't remove fish from the water
 - Harvest and done
 - Bait and hook restrictions
- Education
 - Barbless
 - Don't exhaust the fish
 - Revive before release



DEPARTMENT OF FISH & GAME
State of Alaska

Proper Release Methods

Why Release?

Alaska's fish species and fishing opportunities are unique. The rainbow trout found in Alaskan waters are some of the largest in the world, the grayling fishing in the state is exceptional, and anglers could spend years pursuing the state's countless saltwater species. These unique attributes of Alaska have, for many years, held the attention of resident and non-resident anglers alike. In fact, Alaska is one of very few locations worldwide where truly wild fisheries still exist. It's also a fragile system of bounty that requires sound and ethical angling practices to ensure its continued health and angling opportunities.

Alaskan anglers are proud of the state's aquatic resources. Anglers harvest various species of fresh and saltwater fish each year to utilize for personal consumption. The health benefits of fish are countless and harvesting fish for food is a way of life in Alaska.

Still many anglers - and for various reasons - practice what is commonly called "catch-and-release" fishing. To some, the value of a day spent fishing is not measured in harvest, but in the experience outdoors. Others simply prefer to enjoy the act of fishing and have no desire to retain any of the species they catch. In some areas of Alaska there are "catch-and-release only" waterways. Others release fish due to improper hook placement, size, or incidental catches of undesired or prohibited species.

This brochure details some of the most important steps an angler can take to properly release fish and can be applied to all release situations. By following these



tips, an angler is doing their part to help maintain and preserve one of Alaska's most unique and important resources.

Tackle Choice

- Use appropriate line strength and hook size for the fish you are targeting. This will help to land the fish in a timely manner.
- Single hook lures or flies allow for easier release and lead to higher survival rates for fish.
- If using bait, use single circle hooks. This helps to minimize the fish swallowing the hook deep.
- Use barbless hooks to allow for a quicker and easier release.

DIVISION OF SPORT FISH

DEPARTMENT OF FISH AND GAME

In Summary



- Proposals before the board
- Sport fishing
- Why anglers release
- Factors in release mortality
- Studies
- Regulations

