

Authors	Species	Mortality	Tag Size/ Method	Sublethal	Delayed Mortality	Journal
Bateman & Gresswell 2006. Survival and growth of age-0 steelhead after surgical implantation of 23mm PIT tags.	Age-0 Steelhead (Aalsea Hatch) 73-97mm in length	14% with tag (tag retention 97%). 0% for surgery only. Most morts in first 3 days.	23mm, surgery. Also, incisions without tags.	Growth reduction in tagged fish noted for at least 20 days	Noted as a possibility in the wild. Research. was done in the lab.	N. Amer. Journal of Fisheries Mgmt.
Knudsen et al. 2009. Effect of PIT tags on smolt-to-adult recruit survival, growth and behavior of hatchery spr. Chinook.	Chinook (upper Yakima R. hatch.)	Mean of 10.3%, high of 33.3% (computed from SARS and corrected for tag loss.)	12mm, injector. Also CWT (double tag study).	Tagged adults were smaller than NPT adults in all age comparisons	Pretty much all the mort. is delayed. Still, cited as "best case" study due to tagging conditions. (Unknown initial morts.)	N. Amer. Journal of Fisheries Mgmt.
Tatara 2009. Size at implantation affects growth of juvenile steelhead implanted with 12mm Pit tags.	Steelhead parr. Skookumchuck hatch. Natural channel raised. (Down to 46mm fork.)	Unknown, but only 85% were recovered to measure.	12mm.	At <74mm, instantaneous growth rate of 0 or less in 17% of tagged group.	Unknown.	N. Amer. Journal of Fisheries Mgmt.
Roussel, Haro and Cunjak 2000. Field Test of a new method for tracking small fishes in shallow rivers using PIT technology.	Atlantic salmon size range not well described	21%--but all were <84mm. Larger fish all survived.	23mm, surgical.	Unknown	Unknown	Can. J. Fish. Aquat. Sci.
Sigourney and Horton 2005. Electroshocking and PIT tagging of juvenile Atlantic salmon: are there interactive effects on growth and survival?	Atlantic salmon. Ave. 62mm.	22% tagged, 3% untagged in first interval of test. Morts then decreased and evened out between the groups. Electroshocking did not seem to add significantly to the morts in either case.	11.5mm, surgery	Maybe reductions in growth	Unstated, but noted a probable inverse relationship between morts and fish size.	N. Amer. Journal of Fisheries Mgmt.
Acolas et al. 2007. Laboratory experiment on survival, growth and tag retention following PIT tag injection into the body cavity of juvenile brown trout.	Brown trout, 41-70mm.	13.1% v. 2.9% in the control on D13, 20.9% v. 4.4% on D27, with the effect decreasing as fish size increased	11.5mm, injection	Growth rate slightly depressed v. control, not deemed significant	Unknown	Fisheries Research

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Rabe and Nelson (?). <i>Relative survival of age-0 summer Chinook following application of an 8.5mm PIT tag.</i>	Summer Chinook	Zero over 30 days. (Controlled hatchery env.)	8.5mm (but, oddly, actual length after 450 measurements was a mean of 9.05mm)	"Significant" reductions in growth (length and weight) among tagged v. control fish.	Unknown.	Draft paper on Relative Surv. of age-0 Chinook
Hockersmith et al. 2003. <i>Comparison of migration rate and survival btwn radio- and PIT-tagged migrant-yearling Chinook salmon in the Snake and Columbia.</i>	Hatchery yearling Chinook: fish were at least ~150mm and 30 grams	2.4%, 1.8%, and 0.3% for Gastric radio and PIT, surgical radio and PIT, and just PIT respectively.	PIT: unstated. Radio: 18mm. Surgical and gastric implantation were tested.	Surgery: short term surv. effects. Gastric: long term surv. and growth effects. Longer migration, the greater the effects on surv.	At detection rates of about 81%. Surv. From LGO to MCN were 70.1%, 73.9%, and 85.1% for Gastric, surgical, and PIT, respectively.	N. Amer. Journal of Fisheries Mgmt.
Dare 2003. <i>Mortality and long term retention of PIT tags by spring Chinook.</i>	Leavenworth hatchery Chinook, sizes not described.	Less than 1%--but passing ref. to sig. higher levels among fish <130mmh	12mm injector	Unknown. And the math on shedding rates seems to be off.	Unknown.	N. Amer. Journal of Fisheries Mgmt.
Peterson et al. 1994. <i>Comparison of sequential CW and PIT tags for assessing overwinter growth and survival for juvenile coho salmon.</i>	Coho Salmon. Most ~75mm	Unstated. 22%-42% recovery after one year of residence.	Unstated, 12-gauge needle for PIT tags and 24 gauge for CWT	Unstated, but no differences btwn tag types for most fish	May have been some impact on the smaller fish (<65mm)	N. Amer. Journal of Fisheries Mgmt.
Gries and Letcher 2002. <i>Tag Retention and Surv. in age-0 Atlantic salmon following surgical implantation with PIT tags.</i>	Atlantic Salmon. Ave. 115mm.	Immediate mort of 0.7%, overall surv. of 94.3% -- similar to untagged fish in an adjacent tank (nine months study).	12mm, surgery.	Unstated.	Unstated, but acknowledged that the controlled setting may play a part in reducing other effects	N. Amer. Journal of Fisheries Mgmt.
Ombredane et al. 1998. <i>The effect of PIT tags on survival and growth of brown trout and their use in studying movement in a small river.</i>	Brown Trout, 54mm to 129mm	Unstated, but concluded no significant changes in survival due to PIT tags	11mm, injection, also left pelvic fin clip	None apparent.	Unstated.	Hydrobiol ogra.

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Newby et al. 2007. PIT tagging did not affect the short term feeding behavior or swimming performance of juvenile rainbow trout.	Rainbow, lengths not given	None	12mm, injector	None noted: swimming and feeding unaffected	Unstated, but probably none.	N. Amer. Journal of Fisheries Mgmt.
Crozier and Kennedy 2002. Impact of tagging w/CWTs on marine survival of Atlantic salmon migrating from the R. Bush in N. Ireland	Atlantic salmon, lengths not stated (mix of age-1 and age-2)	Unstated	Unstated	None noted	Survival of tagged fish ranged from 33% to 84% of untagged survival rates, with an average of 43% over ten years.	Fisheries research
ISRP/ISAB 2009. Tagging Report: a comprehensive review of Columbia River Basin Fish tagging technologies and programs	Various	Unstated. Acknowledge that SARs may be impacted.	Various	Unstated	Unstated	ISRP/ ISAB