

IMPROVING HABITAT OF FORMOSAN LANDLOCKED SALMON BY DAM REMOVAL

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With increasing recognition on conservation of endangered species in Taiwan, one of the major conservation projects is the habitat restoration of Formosan Landlocked Salmon, Figure 1, which is major threatened by check dams in the channel for their blocking pathway to upstream and causing the problems of population isolation and close-blood mating. By creating an opening in the central dam body appropriately, partial removal dams can provide pathway for the fish for the better upstream channel habitat. Four check dams at Gau-Shan Creek (Fig. 2) were remodeled between April of 1999 and September of 2002 with information

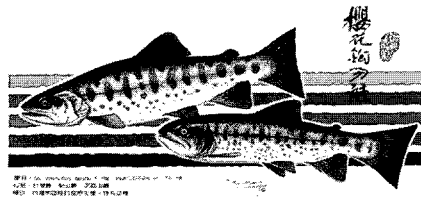


Fig. 1 Formosan Landlocked Salmon

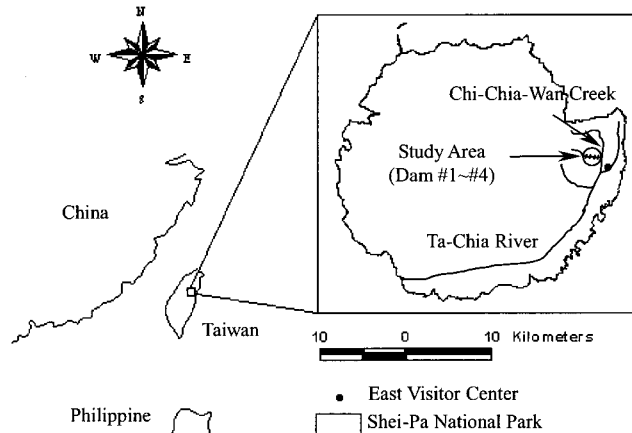


Fig. 2 Study Area

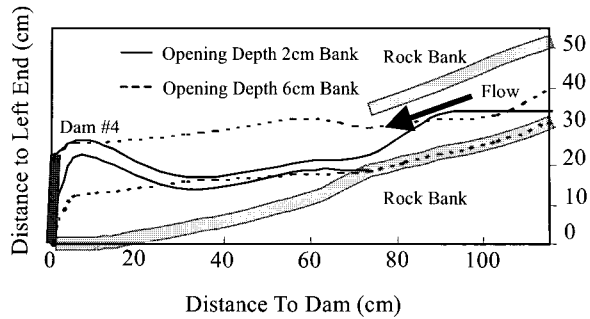


Fig. 3 Flush chutes under different experiment conditions

supported from model experiments (Fig. 3) under selected design storms and their hydrographs at dam sites. To record the process of morphological change at study sections, various follow-up surveys for longitude section and cross sections were applied since January of 2000. Compared to original condition, not only the transitions of cross sections at detention pools and scouring pools can be defined, the distance and channel slope between the end point of flush chute and dam site also can be estimated through the survey results on the longitude cross section of upstream channels, Fig. 4. Based on the follow-up investigation, the channel morphology of observation sections is in stable condition. To understand the effect of check dam partial removal, semi-annual population survey Formosa Landlocked Salmon in these reaches has been conducted since 1997. The investigation results (Table 1) not only show spatial distribution of the population in the creek and also displays the effect of dam removal on channel continuity.

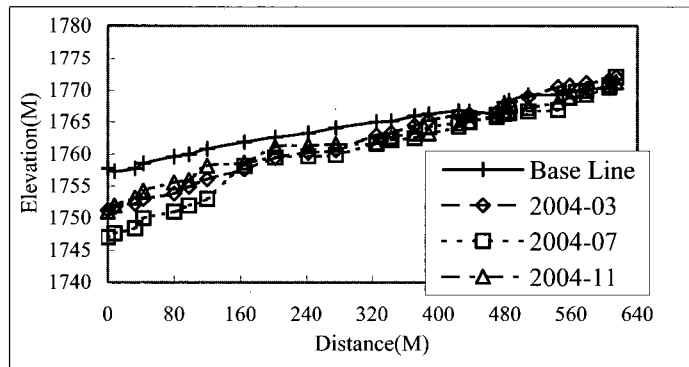


Fig. 4 Transition of upstream longitude cross section of Dam No. 2 in 2004



Photo 1. Dam No.4 (April, 1999)



Photo 2. Dam No.4 (October, 2001)



Photo 3. Dam No.3 (October, 1997)



Photo 4. Dam No.3 (November, 2000)

Table 1. Numbers of Formosan Landlocked Salmon found at different reaches during research period

	Downstream of Dam No. 1	Dam No. 1-2	Dam No. 2-3	Dam No. 3-4	Upstream of Dam No. 4	Total
Fall, 1998	84	28	3	3	?	118
Summer, 1999	31	61	2	1	?	95
Fall, 1999	77	95	0	0	17	189
Summer, 2000	39	28	1	43	37	148
Fall, 2000	68	3	0	28	50	149
Summer, 2001	3	5	3	3	25	39
Fall, 2001	*	*	10	14	33	57
Summer, 2002	14	3	27	277	274	595
Fall, 2002	43	20	52	235	225	575
Summer, 2003	16	31	88	130	200	465
Fall, 2003	32	29	150	65	136	412

Number with grey background means found in the reach containing partial-removed dam(s)

? : No data ; * : Implementation of dam removal at Dam No. 3.