



## Salmon Spawning game

### Introduction

Salmon are born and living the first years of their life in rivers. Young salmon, or smolts, migrate from the rearing areas to the sea to grow. Salmon spend most of their adult lives in the sea but migrate back home to spawn in the same rivers where they were born. Salmon populations of the Baltic have suffered a lot from human activities during the last century and the amount of natural born salmon has reduced dramatically. Nowadays only third of the original salmon rivers in the Baltic area are still suitable for salmon reproduction.

The Salmon Spawning Game is about life of salmon and how do they manage to get from the sea to spawning sites in river environment full of man-made obstacles, human activities and ecological interactions. The game offers a practical and fun way to explore human impact and also ecological interactions in aquatic environment.

The game is made by Natural History Museum of Latvia in co-operation with Riga Natural Sciences School and Youth Environmental Club 11. The original idea for the game comes from young people inspired by Salmon Ludis, the main actor of practical courses for children during the Baltic Sea exhibition in Natural History Museum of Latvia. The artistic work is done by Ilze Aulmane.

### Game Rules

2-6 players can participate in the game. At the beginning of the game each player receives 10 spawning salmon and one dice – the fish moving around the playing field. Throw the dice 2 or 5 to begin the play, then start the game and throw the dice once more. The player who has reached the spawning rapids having most salmon is the winner.

Game box	Obstacle	What does the player have to do?
1,2,3	<b>Nets in the sea</b>	<b>Player loses 2 fishes.</b> Salmon is captured by the nets and pods in the sea and in coastal waters
4,5,6	<b>Seals</b>	<b>Player loses 1 fish and goes 4 boxes forward.</b> Seal eats salmon. The fish dies, but it helps to survive the seal thus the player is allowed to move forward.
7	<b>Osprey</b>	<b>Player loses 1 fish and gets an additional throw.</b> The salmon dies, but it helps to survive osprey thus the player is allowed to move forward.
8,9,10	<b>Mown place</b>	<b>Player goes 3 boxes forward.</b> Coastal scrub, dense rushes and clogging significantly reduce the ability of fish to spawn and young fish to grow. When plants are mown, fish living conditions improve.

	<b>Female fish</b>	During the spawning salmon meet other male and female fish. <b>Give the player who is right next to you one fish.</b>
11,12,13	<b>Overgrown place near the town</b>	<b>Player skips the throw.</b> Residential waste waters flow into the river and contribute to the overgrowth; in turn it reduces the possibility of fish to spawn.
14	<b>Large stone</b>	<b>Player gets an additional throw.</b> Overcoming obstacles in the river salmon is resting in pits behind the large stones.
15	<b>HES low water level</b>	<b>Player skips the throw.</b> Salmon have to find deeper places because of low water level in the river and wait for water level to rise. Rapid water level fluctuations in the vicinity of power stations dams have a negative impact on fish migration. Salmon try to avoid the places in the river with rapid fluctuations of water level.
16,17	<b>Farm salmon</b>	<b>Player loses 2 fishes.</b> Farmed salmon are unable to cope with changing conditions in the natural environment and are not able to find a spawning site. Sometimes they swim to other rivers to spawn.
18,19,20	<b>Overgrown place near the farm</b>	<b>Player goes 3 boxes back.</b> Cattle-breeding waste waters entering the river contribute to the overgrowth and reduce the opportunity to fish to spawn and young fish to grow.
	<b>Female fish</b>	During the spawning salmon meet other male and female fishes. <b>Give the player who is right next to you one fish.</b>
21	<b>Angler without a license</b>	<b>Player loses 5 fish.</b> Illegally caught wild salmon during the spawning is too big loss to nature.
22	<b>Angler near the salmon resting place (with a license)</b>	<b>Player loses 1 fish.</b> Every year salmon choose the same resting places. Anglers go fishing there.
23	<b>Large stone</b>	<b>Player gets an additional throw.</b> Overcoming obstacles in the river salmon is resting in pits behind the large stones.
	<b>Female fish</b>	During the spawning salmon meet other male and female fish. . <b>Give the player who is right next to you one fish.</b>
24	<b>The big male salmon in the resting pit</b>	<b>The player returns to the start of the game.</b> The big male salmon pushes smolts out of the pit sometimes even as far as the river bank. Smolts are young salmon male, which are immature until the second year of life, but they participate in spawning before they migrate to the sea.

25	<b>Paper-mill dam</b>	<b>Player skips the throw.</b> Salmon friendly dam of the paper-mill was built with cascades, through which the salmon jump up and get over the dam, but this takes time.
	<b>Spawning rapids (nesting site)</b>	<p><b>Player</b> whose fish reaches the spawning rapids first, <b>gets back the 3 fish lost</b> because these fish take the best spawning sites.</p> <p><b>The second</b> player receives <b>2 fish, the third – one fish</b>. The players who have reached the spawning rapids late don't receive any fish because the best spawning sites are occupied.</p> <p>Females choose the spawning site, usually a gravel-bottom riffle above a pool. Female digs a hole called „redds” by flapping strongly with her caudal fin and peduncle while on her side; the redd is formed by her generated water currents. On average female deposits around 10 thousand eggs, a male participates in fertilization. The eggs are covered with gravel.</p>