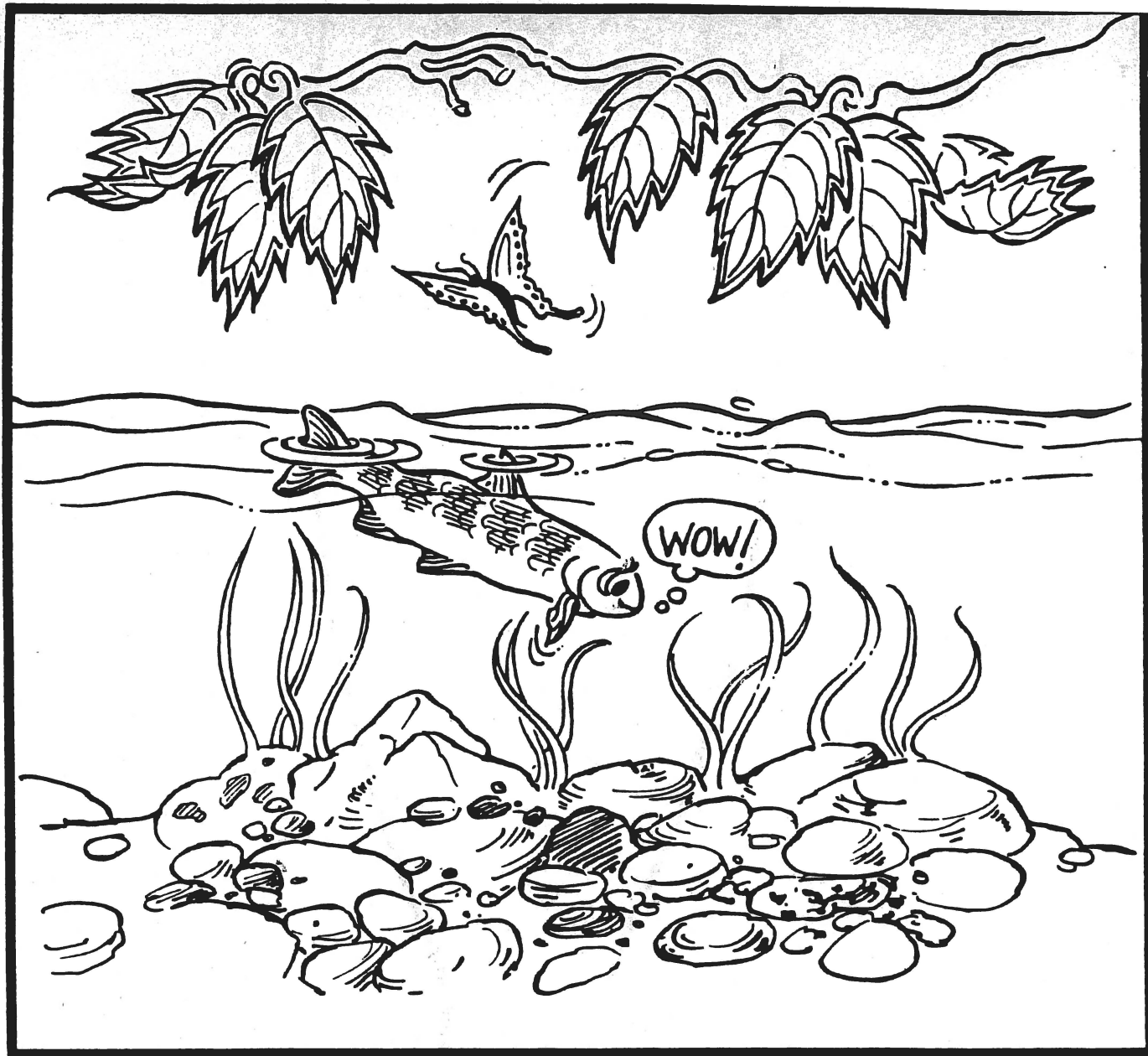


Charles E. Chum



Fisheries
and Oceans

Pêches
et Océans

Canada

CHUCKY - Chapter 1

REFUGE IN DARKNESS

Hi, my name is Charles E. Chum. I'm a salmon egg. I'm only a few weeks old and I'd like to tell you about my life. Things like where I live, what I look like, what's happening in my neighbourhood. You know, kinda like writing stuff in your journal.

Before I begin I'd like to make one thing very clear. My name is Charles E. Chum, however, just as soon as I have any say in the matter, I'll be known as Chuck. Charles is all right for a grown up or for a prince, but I feel it's a bit stuffy for just an ordinary guy like me. Charlie is O.K. But I like Chuck. Yes, I'll definitely be called Chuck by my friends. When my full signature is required it will read:

Charles E. Chum



One more thing. I said I was a salmon EGG. I should have been more accurate. I'm a chum salmon egg. There are five species or kinds of Pacific salmon altogether (chum, pink, coho, chinook, sockeye). Also, I probably should have mentioned that I will not be an egg forever. It's not noticeable from the outside but my body is already changing inside my shell. I began as a tiny cell on top of a clump of yolk. Then you could only have seen me through a microscope.

Here is my story:

I've been developing day by day. At first my tiny cell divided into two cells and then the two cells each divided again and again. Pretty soon I began to take shape. I was known as an embryo. I was just a head and a body and then came my eyes. Having eyes means I've survived the most crucial stage of my development. From what I understand, we eggs are extremely fragile during the first couple of weeks of our life.

I'm pinkish-orange in colour and about the size of a small pea. I live squished in between the cracks in the gravel. Along with hundreds, even thousands, of other eggs, I was deposited here about 55 days ago.

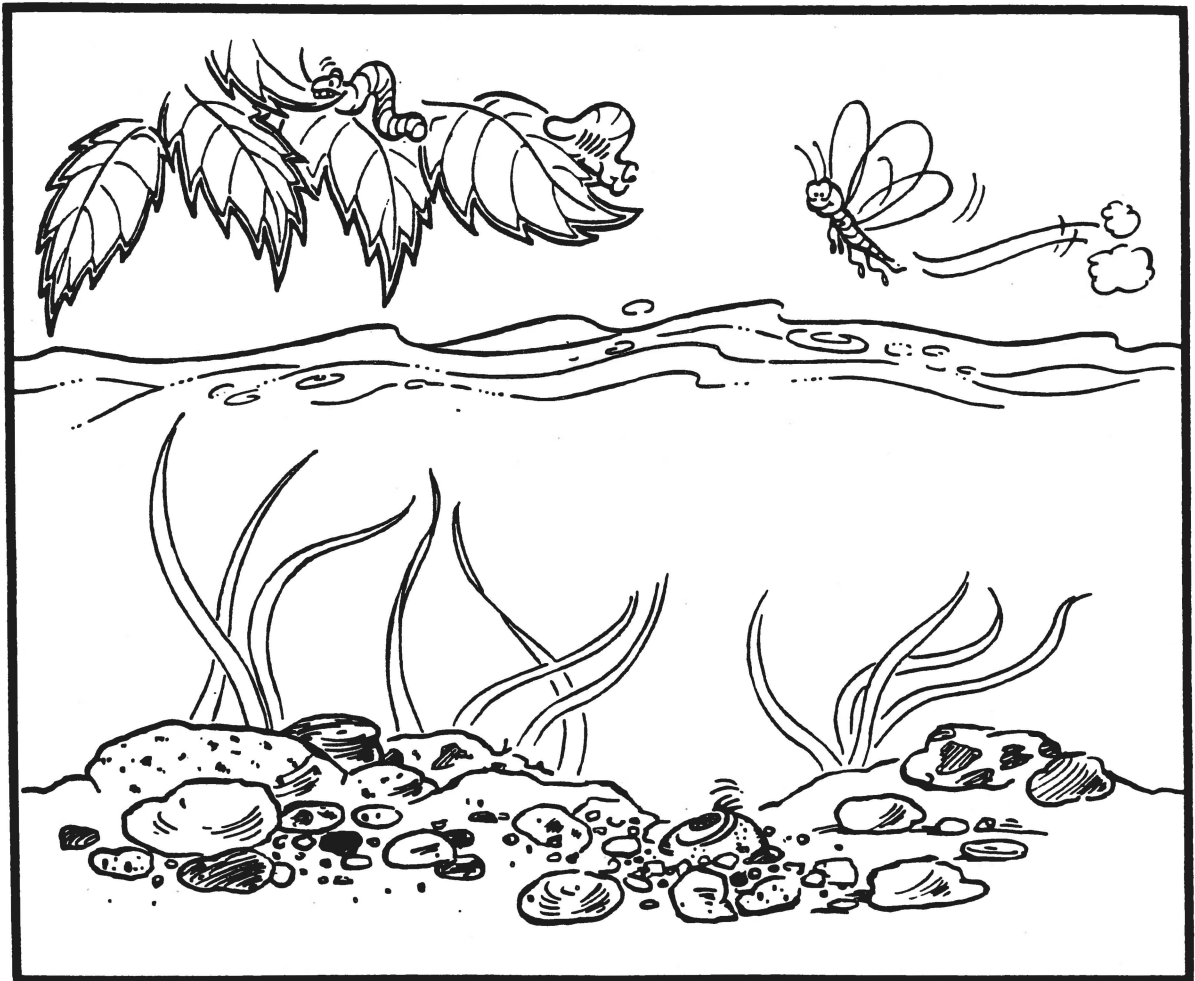
Any crushing or movement in the gravel in the stream above us, and, it's goodbye to any of us in the neighbourhood. Now that we're eyed we're much tougher. I suppose, we'll be able to withstand the bumps and bruises of stream life a whole lot better. For me, so far, so good.

I live in a nest that's called a REDD. It's dark down



HATCHING OUT

As I said before, we are packed in tight down here under the gravel. We're cramped but we're protected and we're living in an ideal stream. We all thank our lucky 'starfish' that our stream has the right environmental conditions. Mom picked a great spot for her redd. Apparently, she chose this particular area because it is within centimetres of her nursery redd where she was hatched over three years ago.



For a while I didn't understand why such a big deal was made over the gravel. I mean dirt is dirt and gravel is gravel. But I overheard a conversation the other day about the mortality

(death) rate in a STREAM near ours. Yikes! Almost all of the eggs died! All because the oxygen the eggs needed so badly from the water could not bubble down through the layers of gravel. If the gravel is packed too closely or if too much silt from up river flows in, we eggs just can't survive.

Living here, watching, waiting and looking at the gravel is not exactly exciting stuff. I feel cooped up. However, I am growing because of all the nutrients I've absorbed from my yolk sac, and I must be getting enough oxygen. I've seen some pieces of egg shells floating by lately, so I guess some of the original gang from our redd have already 'broken free'. Boy! I can hardly wait to stretch out. I need a little action.

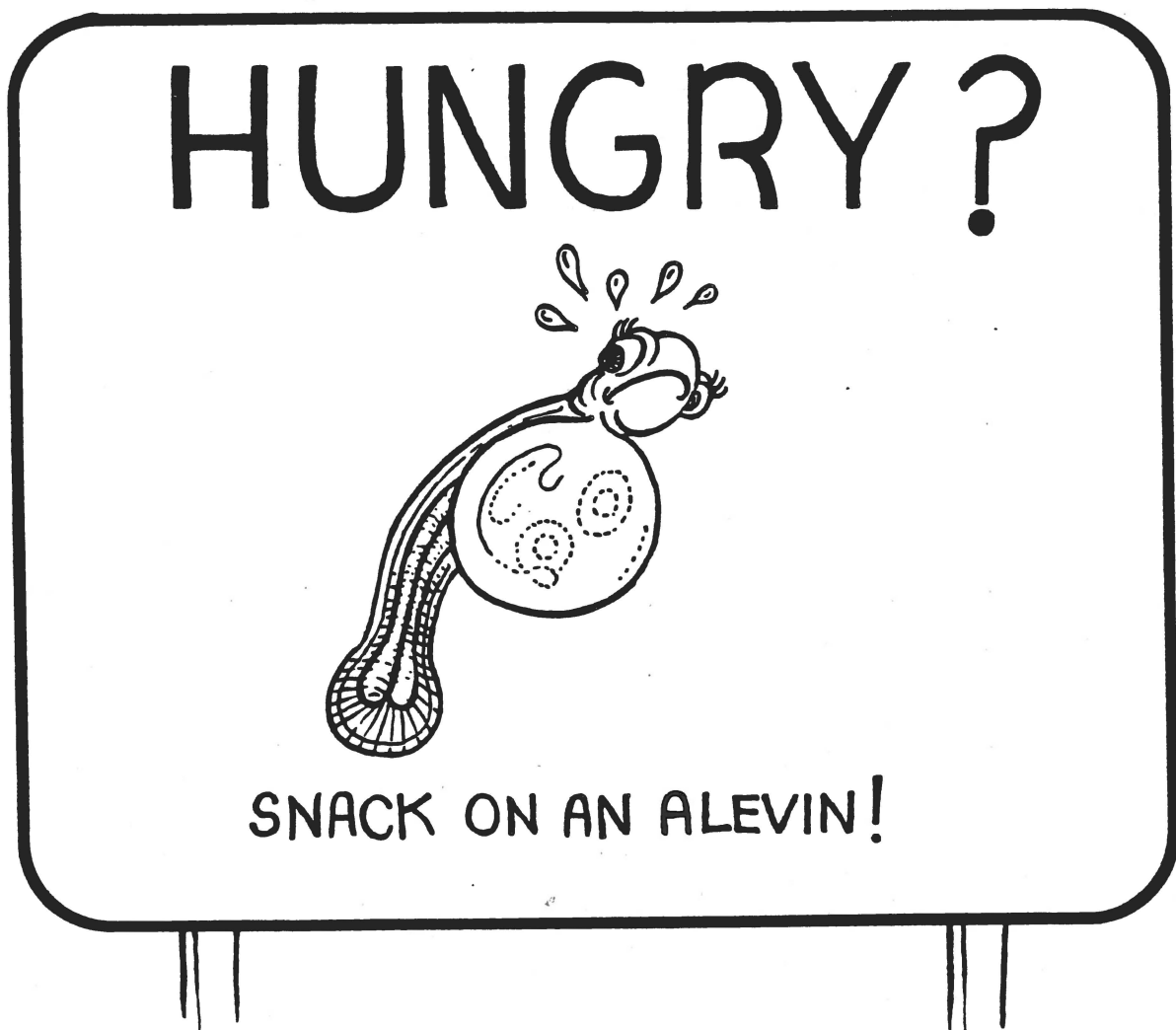
Whoops! I meant a little action! I just wanted to stretch a bit and all of a sudden I found myself wiggling and squirming harder than ever. It seemed like hours when suddenly I was free of my shell.



I'm exhausted but I'm hatched! I am officially an ALEVIN.

Alevin! The word has a nice ring to it. I can't say I'm very mobile yet. I have this incredibly cumbersome yolk sac attached to my stomach. It's like carrying around your lunch kit - all day and all night. Gravel all around you, even this perfect gravel, can be very limiting when you're anxious to explore. We're still pretty crowded in between the cracks and crevices.

I feel like a sitting duck every time even a ray of sunlight penetrates down here. I mean, we're BRIGHT ORANGE! With this yolk sac who needs neon lights. We may as well take out ads:



As I look around this watery blackness, I realize that each day there are fewer and fewer of us. Some never "eyed up". Some got squished. Some didn't make it out of the shell. And some were eaten by predators.

In two or three months we will have used up all of our yolk sac food supply and then we survivors will have to move up out of the gravel and search for real food. I heard the expression "buttoned up" the other day. When our yolk sacs have been completely absorbed all that's left is a little opening on our tummy like a button hole. I guess we've got belly buttons!

I figured out the answer to survival lies in growing as fast as I can. That means using up my yolk sac so I'll be slim and streamlined and able to wiggle up through the gravel and get to the surface. I am a bit bigger than average in size now and I can see that gives me lots of advantages.

I am practising catching food by snapping once in awhile, although I think the size thing will make all the difference. The biggest guys will be best at catching food. And I will have to watch for larger critters that live in and near our stream, because they will want to eat me!

But I'll worry about that problem when the time comes. For now, I'll take it one day at a time.

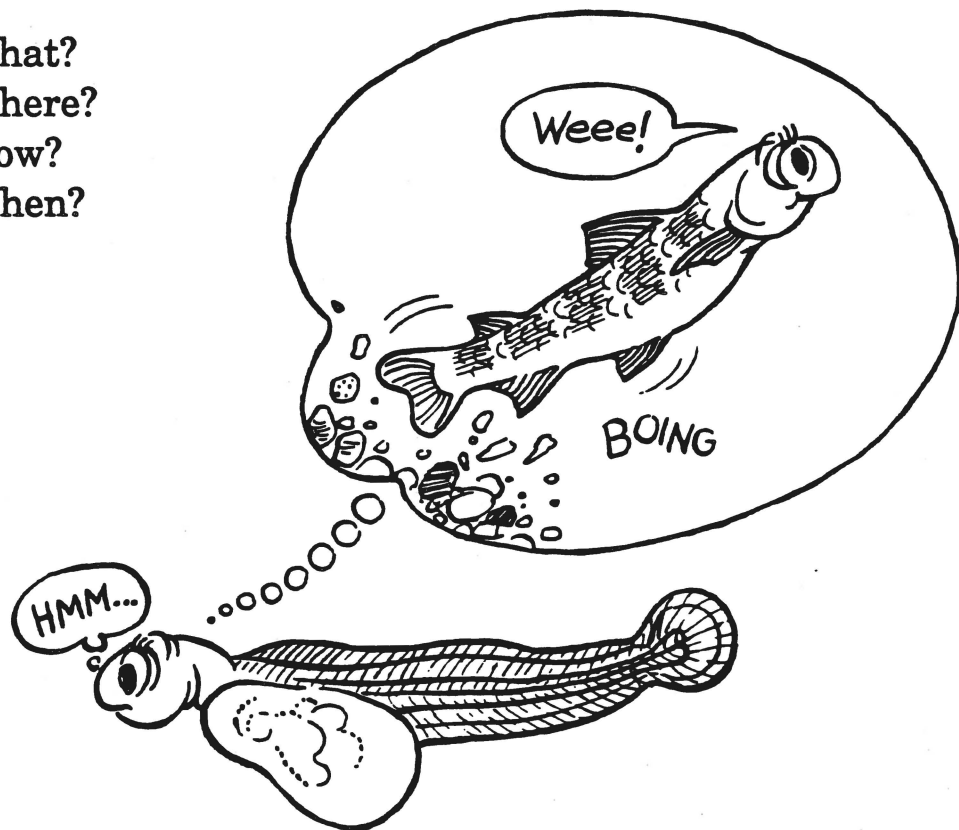
EMERGENCE

Now I can see why only a few of us survive to become adults. Holy smokes! I thought life down in the gravel as an alevin was hazardous. Just let me tell you what happened to me. . .

It all really began a few days ago. I noticed my yolk sac had shrunk to only a small bulge. Now I would have to do my own scrounging around for food if I wanted to eat regularly.

The big questions were:

What?
Where?
How?
When?

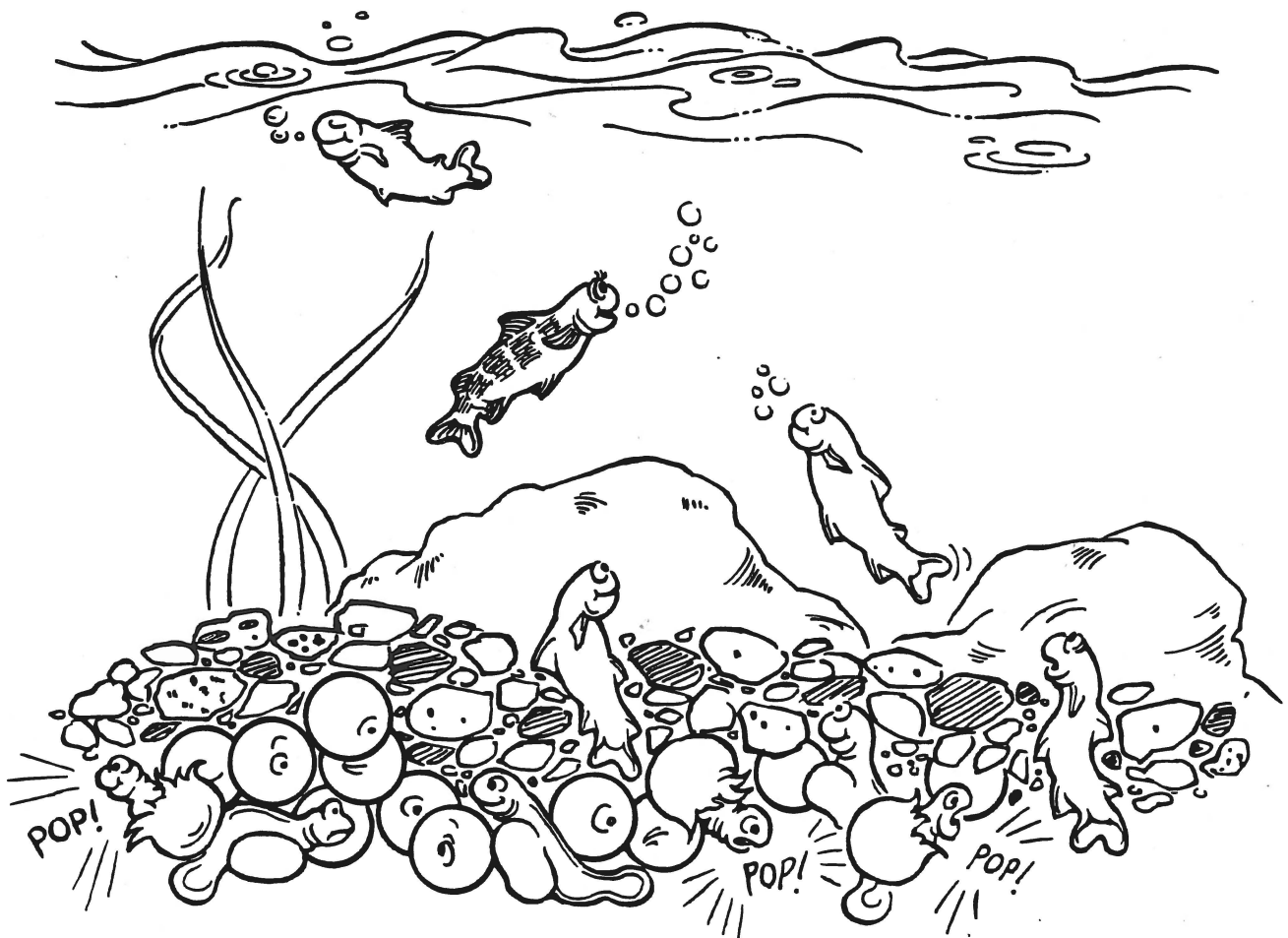


I wasn't the only one concerned with this problem. All the rest of us surviving alevins were noticeably slimmer in the tummy area. None of us had enrolled in aerobics or dancersize or "Slim Fins". We were so streamlined for a simple reason. We have absorbed our yolk sac.

Rumors were going around about how we survivors were going to solve the problem of getting food - real food. From what I could gather we were all going to make sort of a dash to the surface. It was to happen around midnight. We were to become SWIM-UP FRY.

“All you have to do,” they said, “is just leave the gravel and swim up.” Well, let me tell you, it may sound fairly straightforward and simple, but it wasn’t!

No one mentioned that we might be going against the current. Everyone left out the part about our bodies being heavier than water. And to top it off, my only means of locomotion was my caudal fin (that’s my tail). Nothing to it. Right! Right, if you compare it to what happened after I finally reached the surface.



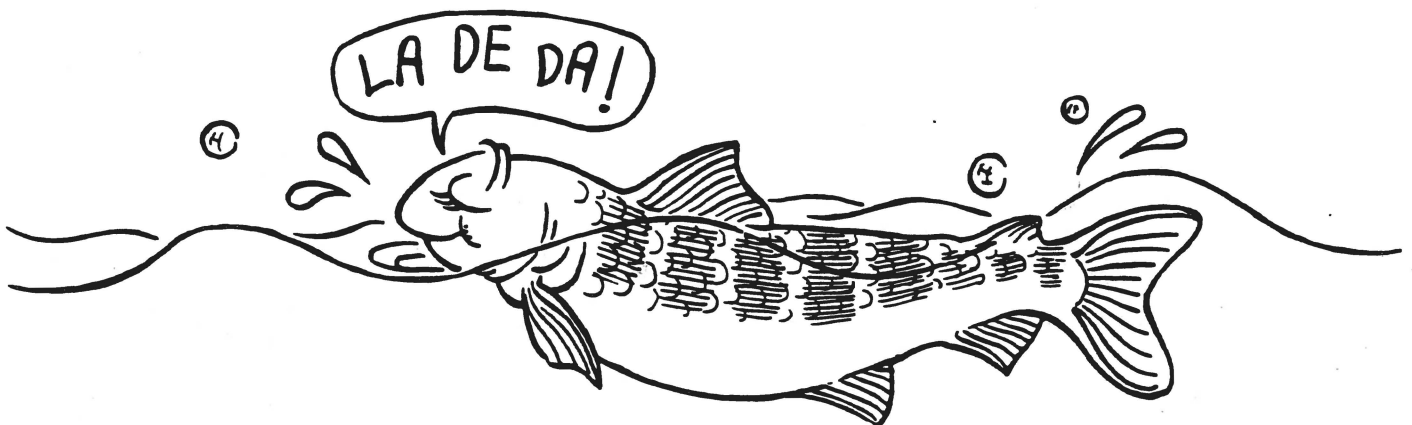
The journey from down under was only the beginning. I should have paid more attention to the gurgles and babbling going on around me on the way up. All I heard was something about, “if at first you don’t succeed try, try again”.

On the way up from the gravel, everything went well. The old tail had a real work out on the way up. But I did surface. Then the confusion began. “Snap your head sideways,” someone yelled. “Gulp some air!” “Try again.” “Inflate your swim bladder.” “Become buoyant.”

So I snapped and gulped and then snapped and gulped again. Would you believe it? All systems seemed go. It worked! My swim bladder filled up with air, like a balloon, and I could float.

I’m glad I swam up with my old gang. We arrived at the surface just before midnight, but as I said before, some of us took a bit longer than others to get the hang of floating.

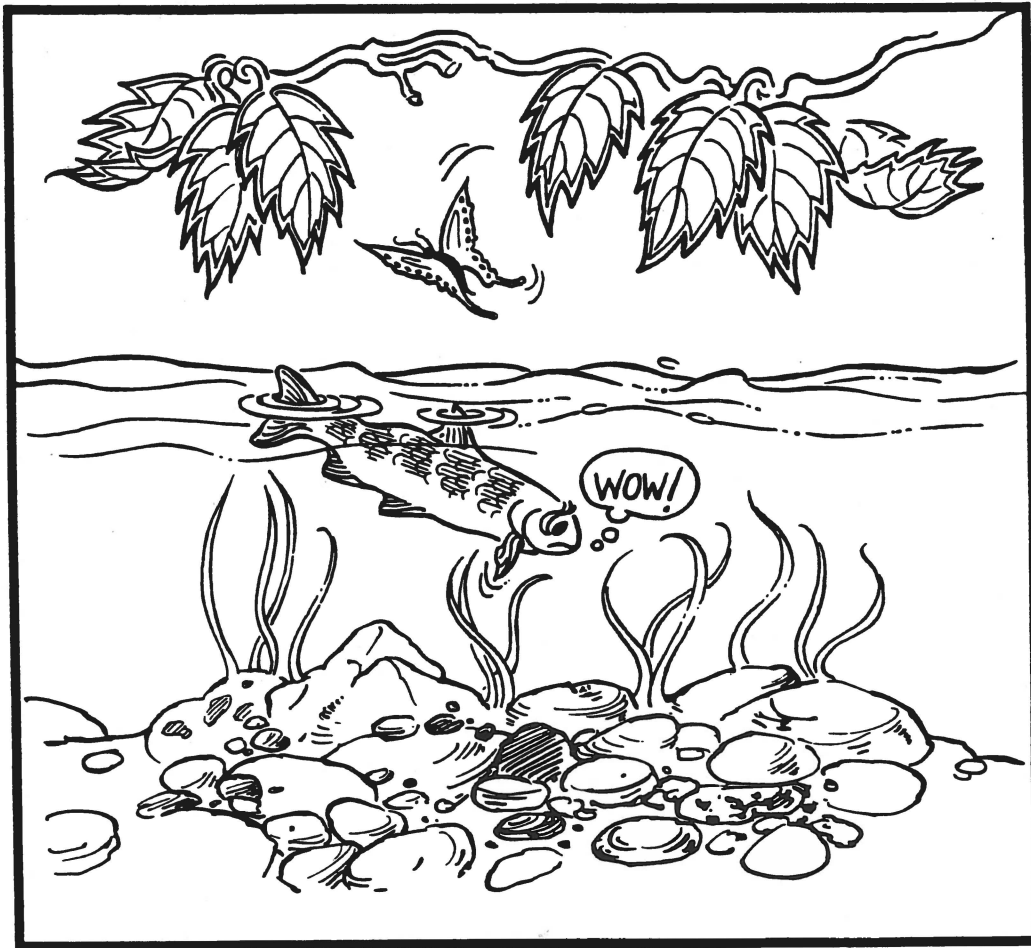
Look at me, would you. Charles Edward Chum floating. I mean Chucky Chum floating. Just like I’d been doing it all my life.



It’s calm and quiet and dark now. Almost like being in the redd. I guess this quiet time is nature’s way of letting us make the adjustments from stage to stage.

Nature always allows us some catch-our-breath time after periods of high activity. When we have a whole lot of physical changes to make like hatching, and swimming up and inflating our swim bladders, it's a good idea to have a little time to get used to our new surroundings.

Wouldn't it be a triple shock to swim up, and inflate our swim bladders and get adjusted to sunlight all at the same time! Maybe for the rest of the night I'll just lie here and rest. That sheltered gravel bed seems a long way away.



Life will probably get even more exciting tomorrow.

STREAM LIFE

Until we reach the swim-up fry stage of our lives, we salmon are all quite content to be just called salmon. Actually, as I told you at the very beginning of my story, there are five different kinds of Pacific salmon. And if you have forgotten, the names of the five species of PACIFIC SALMON are: chum, sockeye, pink, coho and chinook.

We all look pretty much the same and go through identical stages when we are eggs and alevins. When we become fry you will notice slight differences in our colouring. We develop parr marks along the sides of our body. Big changes occur in our behavior at the fry stage.

Since I won't be here long, you might think it does not matter what kind of water is in my stream. But no matter what species we are, the water in our stream is important to us. The quality of our lives depends on the quality of the water in which we live.

We are influenced by everything around us. It's called IMPRINTING. The gravel in our streambed, the earth, the plants, the other stream animals, and the minerals in the water all have an effect on us. Odours, or stimuli from the water act upon our bodies. We become "programmed" as we develop.

It's as if we memorize every detail of our surroundings, but we don't know that it's happening. Then we store this information inside our brains so we can use it later. Sharp little critters, aren't we?

I bet you're wondering why we need to remember how our home stream smells? I'll try and explain it in human terms.

Pretend your body is a tape recorder. Have someone sing a song to you. Can you play it back? Probably not. What if the person sings the same song over and over? Do you think you will soon be able to play it back?

Salmon must be like tape recorders. We do not learn the exact words to our stream song, but we know the details that are important to us. We sort of absorb the feeling of the stream. It's complicated, but it works. When we become adults we need to return to our home stream. We may have travelled hundreds of kilometres downstream and out to sea but when the time comes we must return. That is when we play back what we know about our stream to find our way home.

We are so sensitive that we can detect the slightest odours from the surrounding water. You humans think you are pollution conscious. When your factories spew out black smoke; when you see garbage floating in the water; or when an oil spill occurs, everyone is really upset. When the water looks mucky and yucky then you get concerned. Let me tell you, it's red alert time for us long before its front page headlines for you! Wow! There are so many HAZARDS that affect us in our habitat.

It's a shame you couldn't ask us about the water we live in. When you dump garbage in our stream it's too bad we can't make faces or carry protest signs. If we could speak up or scowl or scream you would be able to tell at once that we are extremely affected by unnatural odours.

A few of us swim-up fry began talking last night after we'd reached the surface of the water. Of course, the conversation began with our swim bladder experiences. After we compared stories about gulping and snapping and inflating someone began talking about the future. We were like campers around a bonfire, each trying to tell the scariest ghost story.

Everyone was trying to out-do the other guy with a question about our future. "What if we can't make it downstream because of a huge dam? What if we get caught in a fish net? What if the river downstream is so polluted by chemicals that there's no food? What if we get eaten by a hungry heron? What if ..."

I could tell some of the younger fry were starting to feel squeamish so I changed the subject. (Did I forget to mention that I was one of the first to swim up and, therefore, a natural leader.) I asked each fry to think of one Do and one Don't for humans when they are around streams.

STREAM CARE GUIDELINES

by Chucky and His Friends

1. Do not disturb the trees and plants near your stream.
2. Keep pets away from your stream.
3. Remove garbage from your stream.
4. Don't dig holes in your stream.
5. Leave natural things like fallen trees and boulders in your stream.
6. Don't build dams in your stream.
7. Leave the fry in your stream alone.
8. Don't throw rocks at the salmon spawning in your stream.

P.S. Remember! If you see anyone harming fish or their habitat, contact the nearest office of the Department of Fisheries and Oceans.

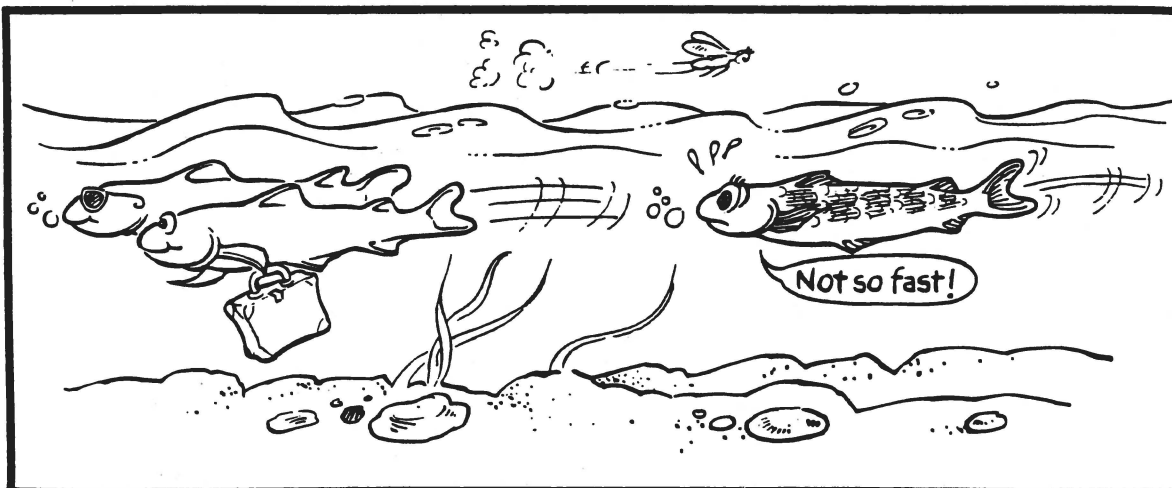
We can't wag our tails or purr when we are content; but I would like to say thank you to some of you folks who care about the environment. For any of you who are responsible for keeping my stream and my river just the way my relatives and I like it, here is Chuck E. Chum's thank you.



FRY MIGRANTS

I had a feeling that the time would come when someone would start making a big deal about which species was biggest, best, and most important. (I have another not-so-funny feeling that being most important might have its disadvantages when we get a little older and a little more catchable...). Sometimes I wonder what it would be like to trade places with another species of salmon. Even though we are all salmon, there are some differences in how and where we live.

You see, or maybe I forgot to mention the fact, we all spend only part of our lives in fresh water. The beginning part and the end part. In between being an egg and becoming a full grown adult, we all make a very long MIGRATION. We all leave our streams of birth and go down to the ocean. I realize I'm a little ahead of my story, but I think it's important that you know that we are a very unique species of fish. Now you see us, now you don't.



Anyway, back to the fascinating tale of Chuck E. Chum (Charming, Cheerful, and, yes, sometimes Chucky).

As I've said before, once we've become swim-up fry the differences between the species becomes quite noticeable. Some of us move downstream immediately. If we live in a coastal stream, we chum can be very close to the ocean the morning after we swim up as fry and the journey downstream and out to the ocean is very short. Other species of salmon spend a long time in freshwater before beginning their migration and may travel very long distances to the ocean.

I know, for instance, that the coho fry in our stream are in no hurry to leave. They were busy searching around for hiding spots along the edges of the stream bank, in small riffles and pools and even in beaver dams. They were settling in for a year or so.

Other relatives of mine, like the sockeye, spend even longer in freshwater. They move either upstream or downstream into lakes, and stay in freshwater for as long as one to three years!

A very distinguished branch of the family tree is reserved for our "90 day wonders". Chinook salmon remain in freshwater for 90 days before beginning their downstream migration. Of course there are exceptions, and some chinook stay longer than 90 days in freshwater.

Pink salmon are most like us chum. They begin their migration almost immediately after they swim up as fry. By the way, all this talk is making me hungry. (*Gulp*) That's better. There's nothing like a mayfly larvae for a quick snack.

Talk about your quick snack – I almost became one about an hour ago. I was just minding my own business, you know, practising my backstroke and looking for the perfect place for a nice quiet lunch, when out of nowhere came these huge jaws! You've heard of Jaws I and II and even Jaws III, but I bet you've never heard of Jaws One Zillion. That's what ye olde steelhead trout looked like from this small fry's perspective.

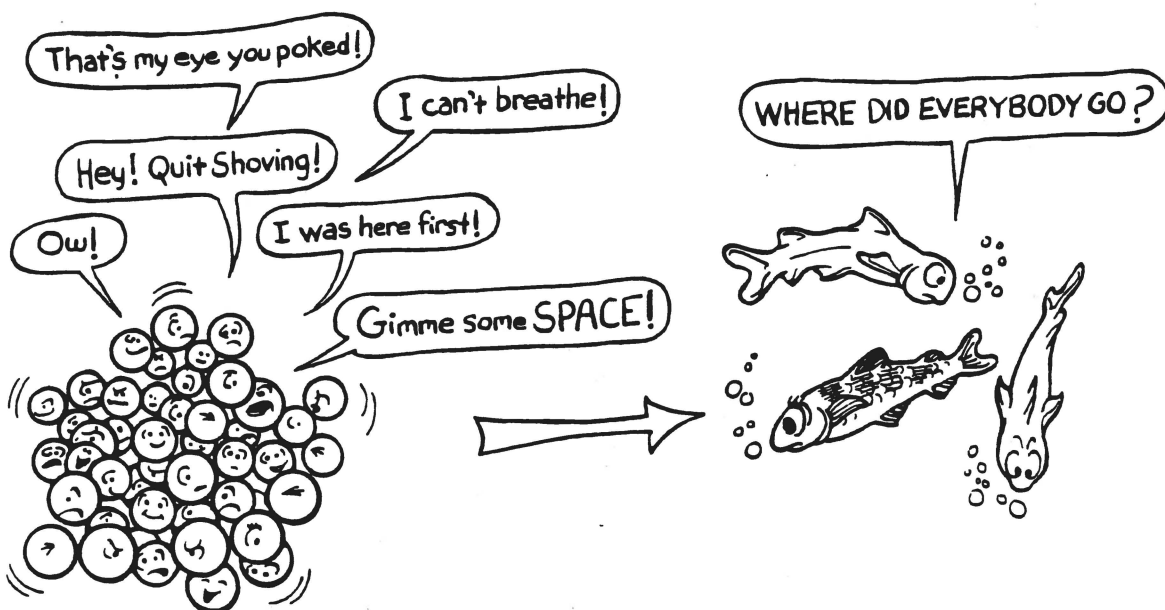
Seems like eating and avoiding being eaten are my two main activities. Some things in life are confusing like what ocean life will be like and what I want to be when I grow up. Some other things are real straightforward like avoiding PREDATORS.

CHUCKY'S No. 1 SURVIVAL RULE ...

look out for PREDATORS

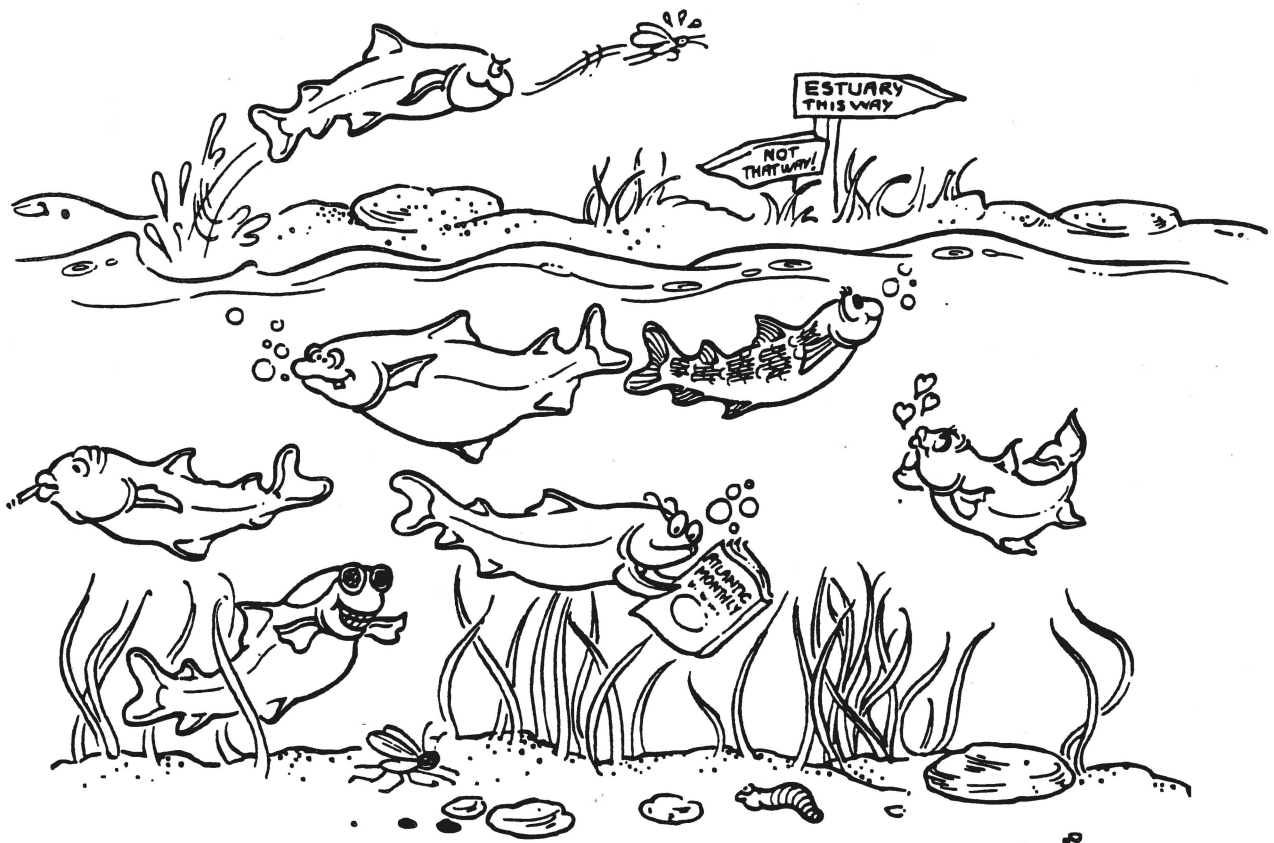
Speaking of survival - when I was an egg I talked about the overcrowded conditions in the stream bed. This showed my lack of understanding about how many of us actually survive.

I was one small egg among approximately 2,500 eggs which were deposited by my mother. Only about 250 of us survived to surface as fry. Now, I find out that less than 25 of us will ever even see the open sea!



Enough of doom and gloom. Onwards and upwards or rather downwards and outwards. Since I am a chum salmon, I won't be lingering very long in freshwater. As a matter of fact, it looks as if the gang is beginning to MIGRATE downstream already. According to many reliable sources, we will head down this stream until we get to the main river, then we'll keep on going downstream until we reach the sea.

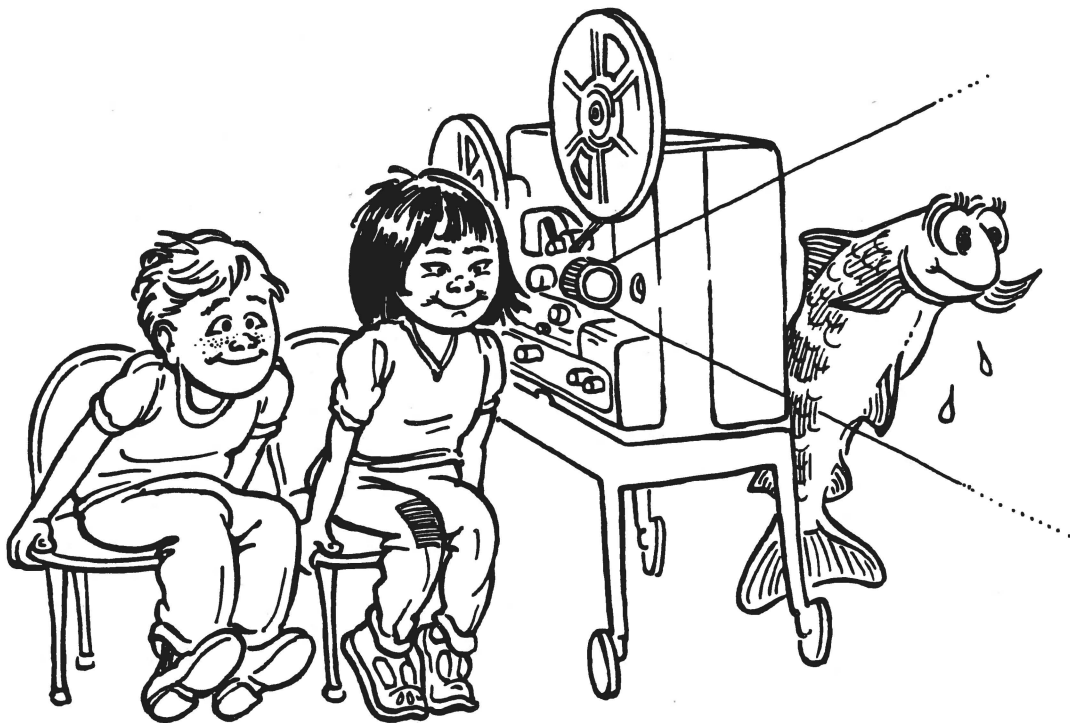
Chuck old boy, I said to myself, go for it! Looks like the rest of the troops are moving out, so have a quick look around, inhale this good stream water so you'll remember it forever, and off you go downstream towards the ocean.



Hey! Wait for me guys! How does that song go? ...“merrily, merrily, merrily, merrily, gently down the stream.”

LIFE IN THE ESTUARY

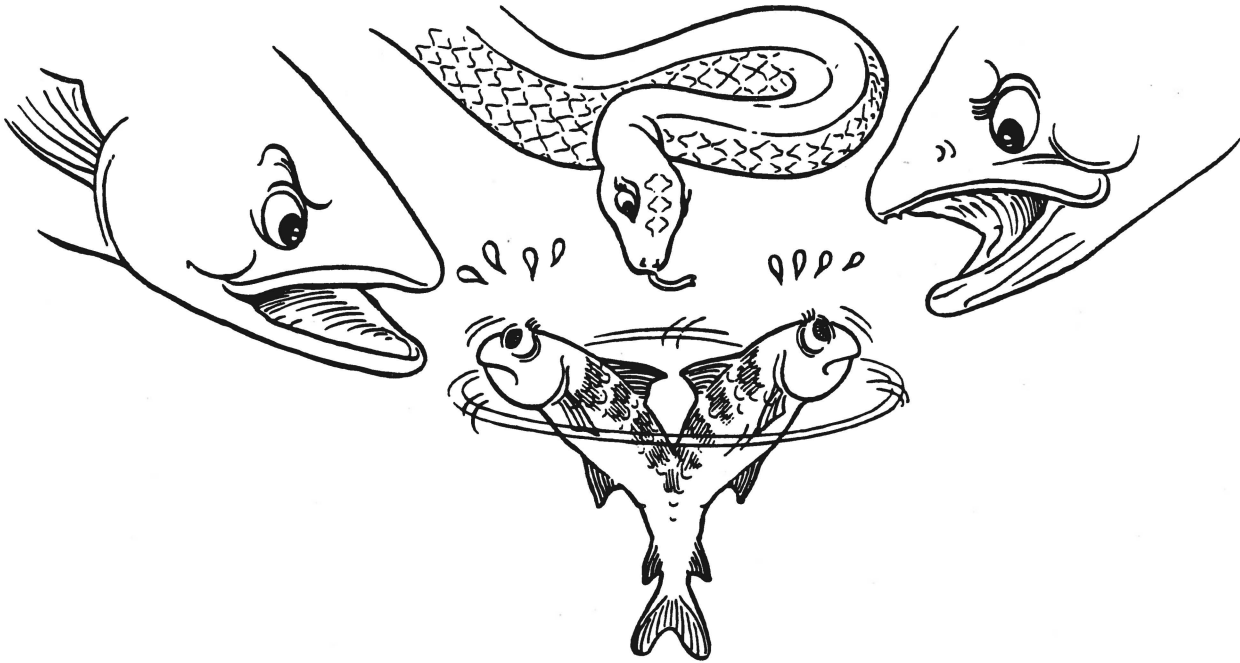
I know how most of you probably feel about adult travel journals, homemade slide shows, home movies and home videos of someone else's trip or birthday party. They are pretty dull unless it happens to be your trip or your birthday party. However, I really think you'll be on the edge of your seats as I describe my trip downstream from my home stream to the ocean.



I'll skip out the scenery and fill you in on what happened. There were a few sharp turns but our river, like our stream, was pretty free of debris and large obstructions. In other words, there was nothing big blocking my way. No hydro electric dams; no log jams; no rock slides.

The most adventurous part of my downstream migration was dodging the predators. This may sound like a playground game; but, let me tell you, no one plays at it. The predators I encounter don't fool around. They play for keeps and I was not about to stop and swap stories!

From my point of view, this survival business is very serious. I personally watched friends and relatives quickly become tasty snacks for snakes, birds, and larger fish. They were all out to get us – I guess they wanted to satisfy their ‘little fry attack’.



I knew I had to remain alert. I also knew that imprinting was still taking place. (You remember, that's when all the things around us influence our bodies and when we return to this river as adults we are able to navigate right back to a spot near our own redd area.)

I think the most educational part of my migration had to be when I entered the ESTUARY. I really had a lot to learn there. Good thing I was in a school. (Ha! Ha!).

Estuaries are the zones near the sea where fresh and salt water join and mix. The further I travelled into the estuary the saltier the water became. Most of us scoot to the edges of the

river for protection from predators. Many animals make their home in the area of the estuary. There are snow geese, the gulls, sandpipers, raccoons, crabs, trout and my personal favourite, Great Blue Herons - plus lots, lots more.

Not only is the water slightly salty in the estuary but it is also very crowded. The whole area teems with critters – large, small and microscopic. Everyday is a smorgasbord; goodies to eat everywhere. There are all shapes and sizes of creatures for me to munch on. My favourite estuary menu items include:

Chucky's	M E N U
<ul style="list-style-type: none">• zoo plankton appetizers• crustaceans sauteed in spicy red sauce	<ul style="list-style-type: none">• diatoms a la mode• amphiods baked in puff pastry

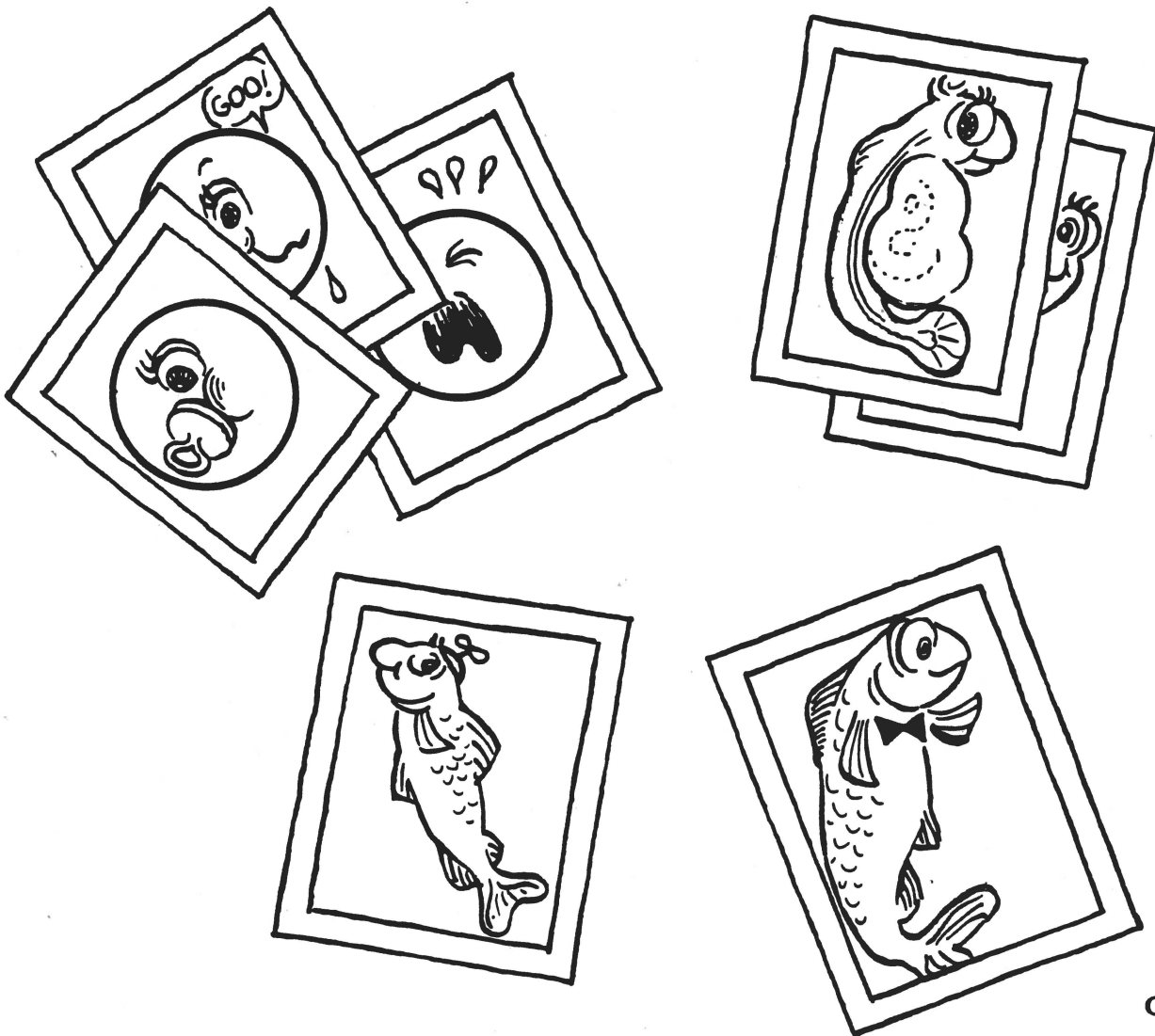
No wonder our growth rate is astonishing while we are in the estuary.

There is a lot of human activity in the estuary as well. Barges. Log booms. Many people like to live and work in the area of the estuary. Some people even use the estuary for a dumping ground. There is a lot of junk floating about. Too bad. More spoiled water.

By the way, not only am I eating constantly and growing like a weed, but somewhere along the way I've changed from a fry into a SMOLT. Changes have taken place in my body to prepare me for life in the ocean. Before I knew what was happening I had transformed from a scrawny, little fry into a fairly handsome smolt. It's like going from grade one to grade six in one day!

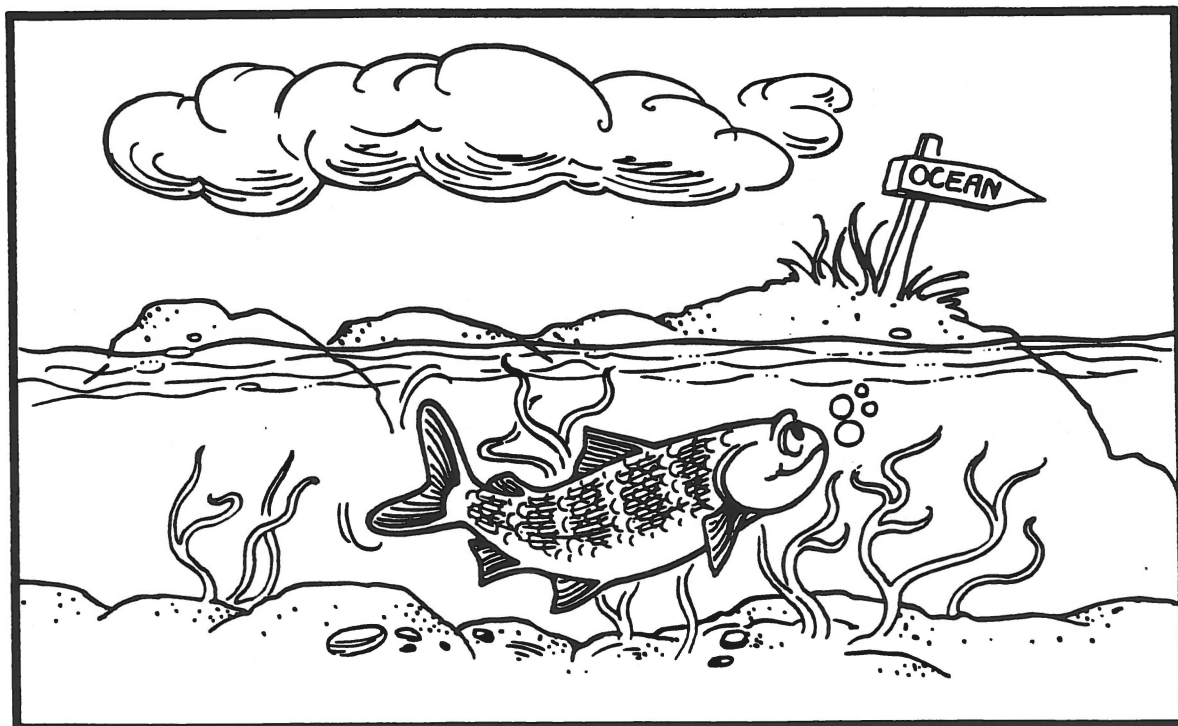
Bigger is definitely better now! But I'm not just bigger; I'm more versatile. As a smolt, I'm ready for life in salt water. I guess the time spent in the estuary is a very worthwhile adjustment period.

Compared to my other stages, my smolt stage just zoomed by. You know that feeling of always being too young? Childhood seems to last forever. Well, compared to the weeks and months we spent as eggs and alevins this smolt stage is short and sweet.



Yikes! I just about forgot two important things. First, I'd better do less talking and more hiding or I'll turn into some creature's breakfast; and, second, maybe I'd better not get too confident about my chances for survival. I can just barely see the ocean, but it looks pretty scary. If what the experts say is true, only about five of us from the original redd survive out there. (Remember, there were originally 2,500 eggs in our redd).

When I left the stream I intended to make it a round trip, not a one way excursion. By the way, I hope all of you on the tour with me are still snapping your cameras and picking up some souvenirs along the way. Come on. Get on your wet suits—Pacific Ocean here we come!

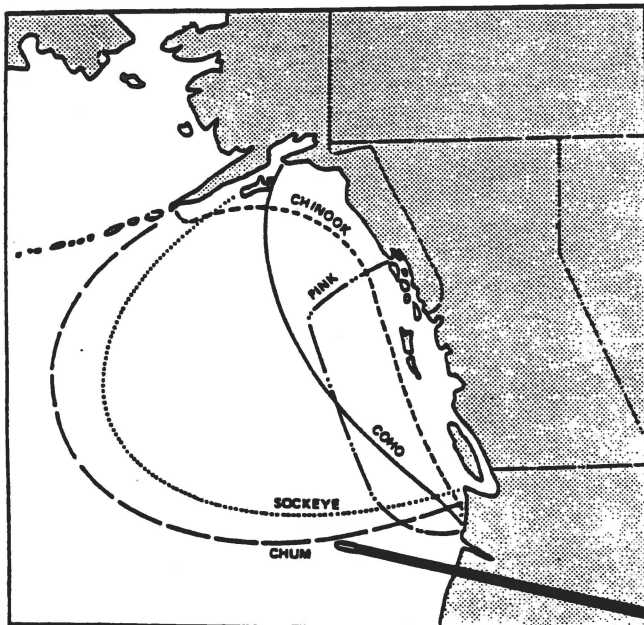


OCEAN MIGRATION

If I don't sound like my usual chipper Chum self for the next little while, I hope you'll try and understand. All this migrating is exhausting. I'm so busy going places that I don't have much energy left to discuss what interests me most – living out in the middle of the Pacific Ocean.

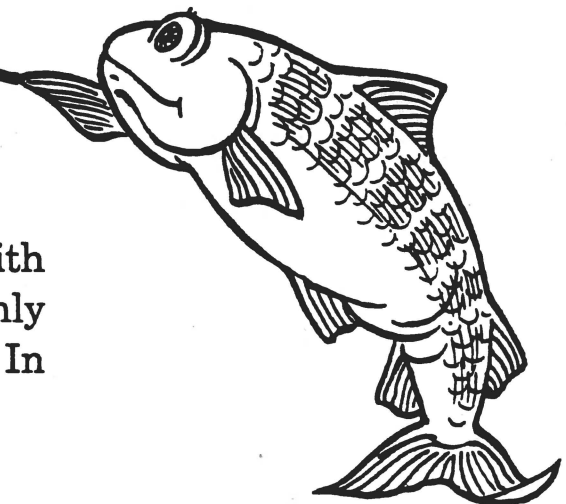
Since I'm on the subject, it feels scary and great at the same time. The scary part is because the ocean is so vast. I mean it just goes on and on forever. I feel great because my life is so exciting. Every day is an adventure. I am becoming a very handsome young salmon, if I do say so myself. This map may help you to realize where I've been and where I'm going.

MIGRATION BOUNDARIES



I'm really into travel these days. If you look at this map, you'll see that we chum salmon travel the greatest distances out into the ocean. We cover a lot of ocean before we head back for good old B.C.

We don't just drift along with the currents. Our course is mainly influenced by our food supply. In other words, we follow the food.

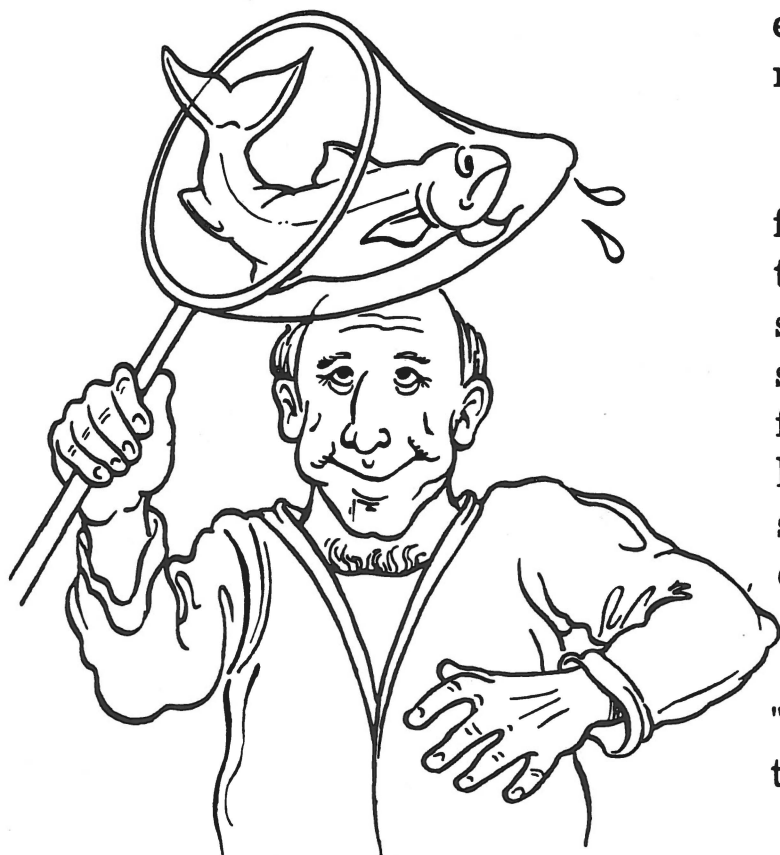


Most of our time is spent feeding in a 24-hour day. I travel for six to eight hours and eat the rest of the time. If I'm not careful, I'll begin to look like an alevin again. Wow, does that ever seem like a long time ago.

Of course, we have an inner clock ticking away so when the time comes we'll know to turn back and head for the coastline.

We travel in schools so I'm not too worried about getting lost. The group travel situation has advantages and disadvantages. It's terrific for protection from some predators, such as larger fish, but not so terrific when fishermen are

searching for a good place to drop a line or a net! You know, get on the C.B. and let everyone in the area know you've just sighted a huge school of salmon. "Great, everybody get their fishing rods and nets out."



I guess I'm one of the fortunate ones out here in this wide, wide ocean. I'm still alive. I've actually seen some close friends, a few relatives and hundreds of strangers swept up in huge nets by commercial fishermen.

You don't have to be an "A" student to realize that they will end up on a



sandwich, in a casserole or as the main attraction at a barbecue later this summer. A lot of my relatives have been eaten by bigger fish and other animals. I haven't kept accurate records of how many salmon have disappeared. But I do know that we chum (all salmon in fact) are very popular with you humans.

I was eavesdropping on a discussion the other day between a couple of salmon who had been TAGGED and they claim that biologists are not sure how we navigate so accurately. (Salmon are tagged when they are fry. Their adipose fins are clipped and a coded wire tag is placed in their snout.)



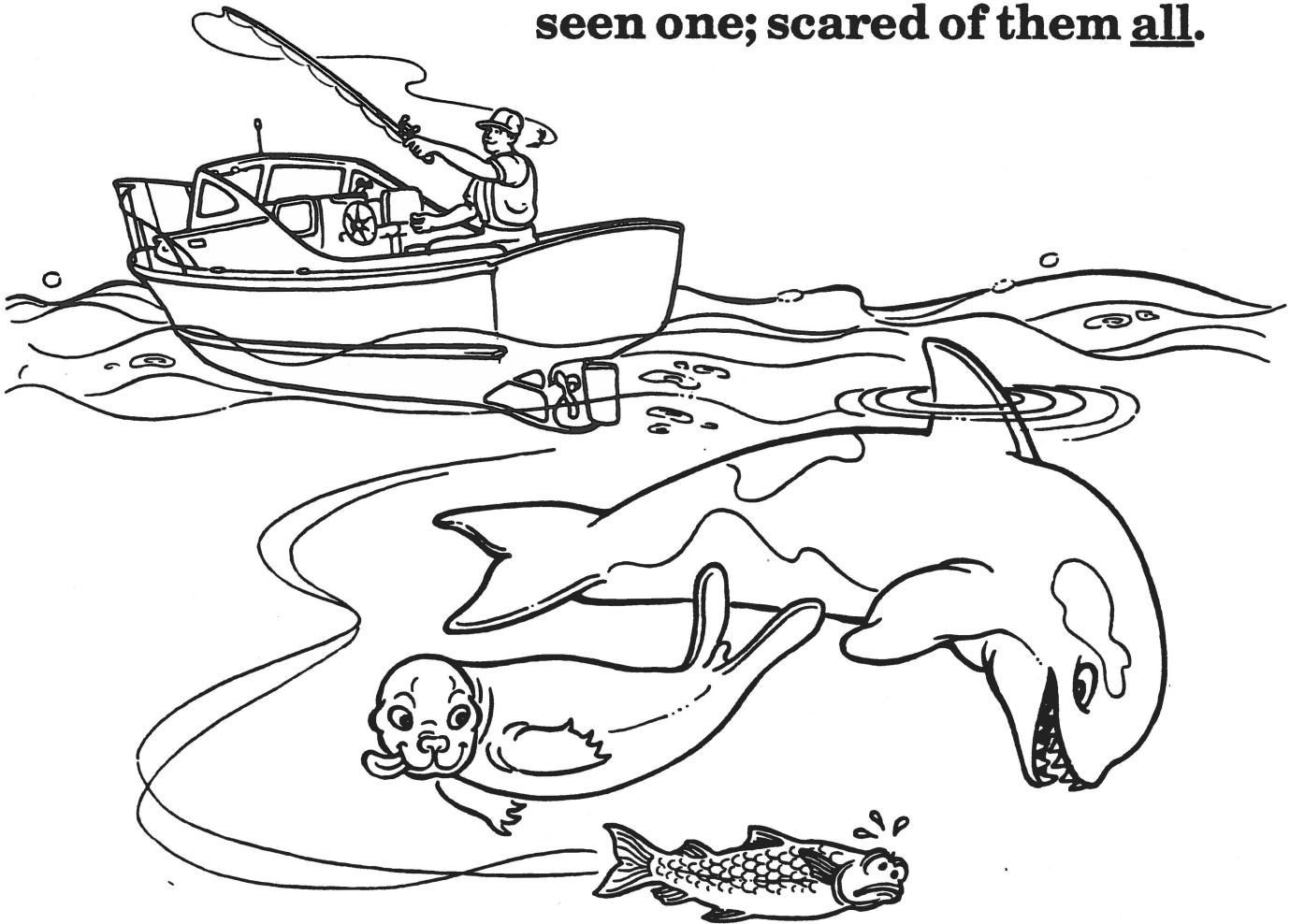
The tagged salmon told us that tagging didn't hurt. In fact, they said it was a very interesting experience. While they were in the scientists' containers getting marked and weighed they really got an ear full about what some humans think about salmon.

According to these people, we chum, (in fact all of us salmon) are very mysterious creatures. People have a whole lot of theories about why we journey out into the ocean; how we know where to go and how far; and why we know when it's time to return to the B.C. coastline. It seems the mystery remains unsolved.

One thing for sure. There is plenty of food out here. And it certainly isn't crowded. Comparing our stream or our estuary to the ocean, is like comparing Campbell River to Vancouver. The ocean is full of more fish, more plant life and much, much more activity!

Life in the ocean is interesting and I am growing at quite an astonishing rate. BUT it is also extremely hazardous!!! Predators; you name them, we've got them. My new revised motto for survival is . . .

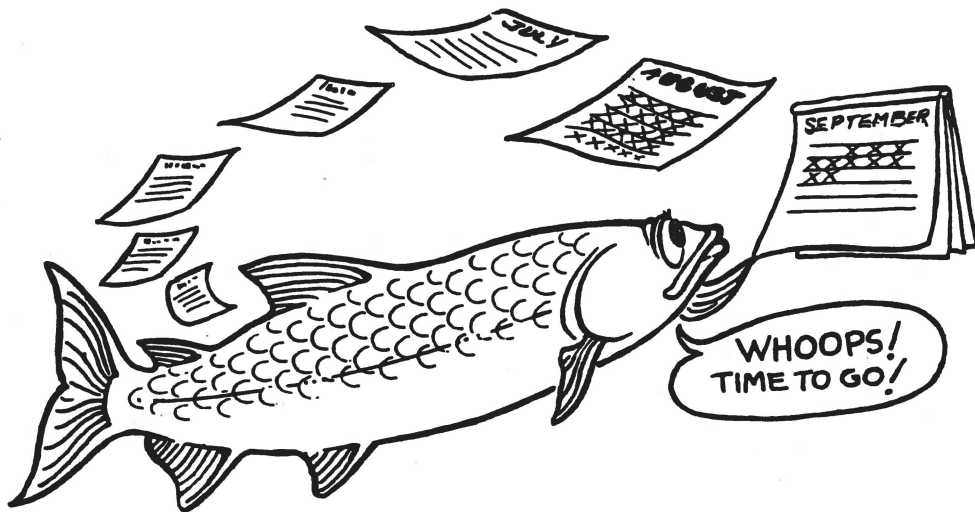
seen one; scared of them all.



COMING HOME

Some sort of inner clock seems to be ticking away inside me during this long journey I'm currently taking. (I'm currently on a current.) For the last couple of days the ticking has slowed down. When I questioned some friends about it, they assured me it was perfectly normal. It just means that its time to use the return portion of my round trip ticket.

I remember, way back when I was a fry, having a hunch that all the imprinting or programming that we experienced in freshwater would come in handy some day. Well, for three years now I've travelled about in the ocean, and it's beginning to feel like its time to get back to freshwater.



Two things I have observed about life as a salmon are: you very seldom do anything alone; and your actions are timed and directed by water conditions. Now that I am reaching maturity, I feel qualified to spout words of wisdom. (A third lesson in lifemanship was to stop looking around to count how many – whoops – how few of us seem to survive each stage of our development.) My inner clock is sending signals that all add up

to 'go back', 'go home', 'return to your home stream'. This homing urge seems to follow the same regulated pattern as everything else. I wonder how in the world I'll ever get back to the coast, or even to the same river I left three years ago. But, according to my sources of information, a few of us do.

For some species the journey upstream to the spawning grounds will take weeks. These salmon will encounter many hazards. For others of us, the trip will be short because our streams are so close to the ocean.

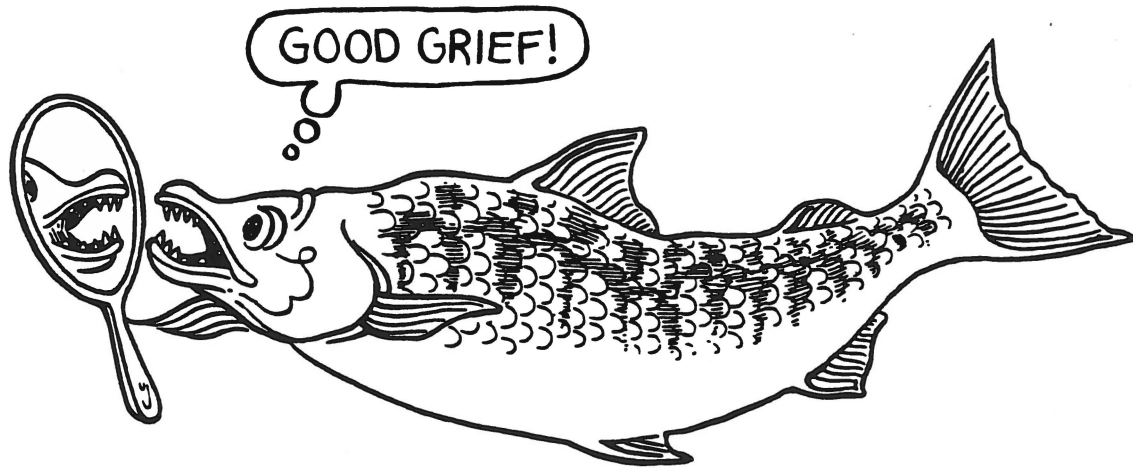
We all stop eating when we enter freshwater. We are too busy swimming and trying to avoid predators. The energy we have stored in our bodies must last until we reach our spawning grounds.

Some fish stray or miss the turn off to their home stream. No big deal. In fact, there are some advantages to us as a species if we take slightly different routes.

There were only a dozen or so really familiar faces among the hundred of chum at the mouth of our river. At the first waterfall two of my relatives just couldn't make the leap up and over. Our numbers are declining rapidly along this river route. I'm breaking my own rule about fretting over how few of us survive.

As we advance further upstream our bodies are changing. I have developed a very hooked snout. I look pretty ferocious, as if I'm expecting a fight. I have also changed colour. I've got reddish-brown vertical bars covering my body. We chum don't





have the most spectacular SPAWNING colours. That distinction is reserved for sockeye salmon. They really stand out. They become bright red with green heads.

This morning a pal of mine (a chum!) was right beside me just swimming away when, SWISH, she disappeared. I didn't stop for a second; I could see by the shadow above me that a big brown bear was prowling around looking for more dinner.

I'm worn out. I keep on swimming but I'm weary. Every day my body bashes against the strong current. I'm always leaping over or swimming around some minor obstruction. Fortunately, my route home is relatively free of major obstructions.

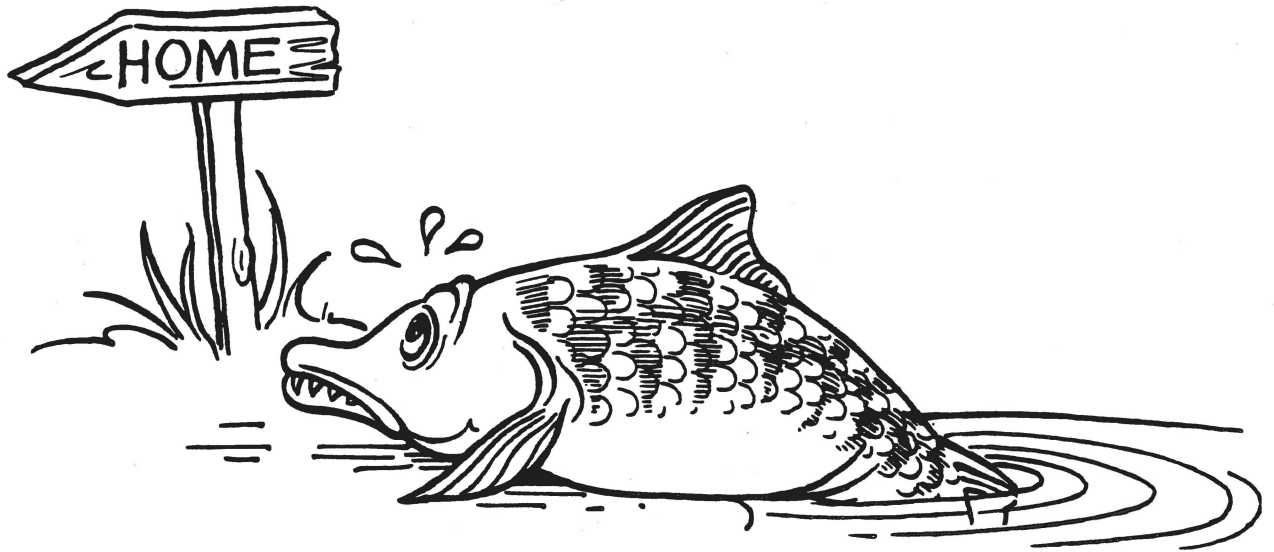
Better push on, Chuck, I keep reminding myself. What are the fancy words you humans use for surviving. Conservation. Escapement. Some of us must make it. The more you over fish and the more you use our rivers as dumping grounds, the less chance we have. The natural hazards such as changes in water level, temperature, predators, beaver dams and log jams are tough enough to overcome without people adding to our problems.

I'm back to talking to myself. I need to keep up my spirits. Come on Chuck, old boy, look on the bright side. You haven't got much farther to go. The spawning grounds are just around the next....or maybe the next bend in the river....I hope.



SPAWNING

Well, I made it. I, Charles E. Chum, survived all the hazards of life as an egg, an alevin, a fry, a smolt, and an adult. Now, Chucky, old boy, you really are an old boy.



I can hardly believe I actually made it. I'm back to the stream where it all began, but this time I'm back as a SPAWNER. I feel like celebrating!

I've never seen so much activity in all my life. Some female chums are still busy selecting their nesting sites. Other early arrivals on the spawning grounds are already digging nests. One day it seemed as if we were all swimming quietly about in our home stream after our long trip, and the next day there was so much going on it was hard to keep track. I watched two fights between a couple of males in just the last hour. It seems that establishing territory and selecting a mate are very important.

When I first began telling this story, I kept mentioning how lucky I was to be living in such an ideal stream. Remember when I pointed out to you how important loose, unsilted gravel and clean, cool, flowing water were to our survival as eggs and

alevins? Well, you should know that now that we're spawners we also need cool, flowing water and porous gravel. Ever since I arrived back in my familiar home stream I am once again thankful for the right water and gravel conditions.

My stream is very productive. In other words, it produces lots of salmon. Like I said, it's crowded now because we've all grown so much since the last time we were here. Remember, way back when I was trying to learn how to float as a swim-up fry.

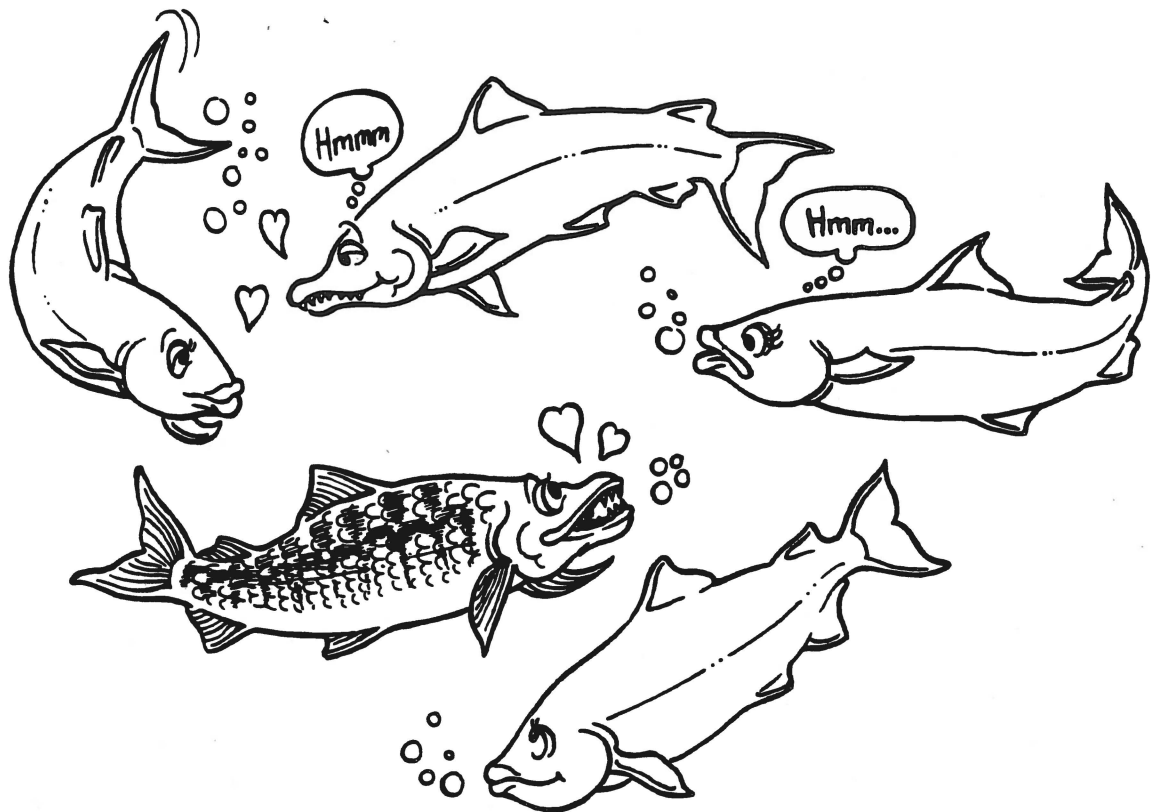
There are only about 2 survivors from each pair of spawners. Since our stream is so ideal there are almost two hundred adults in this small area busy selecting mates and digging redds.

Throughout most of my life the words male and female didn't mean much. There seemed to be more differences between the different species of salmon than between male chum and female chum. Now, on the spawning grounds it's different. There are very specific things that females do and other specific things that males do.

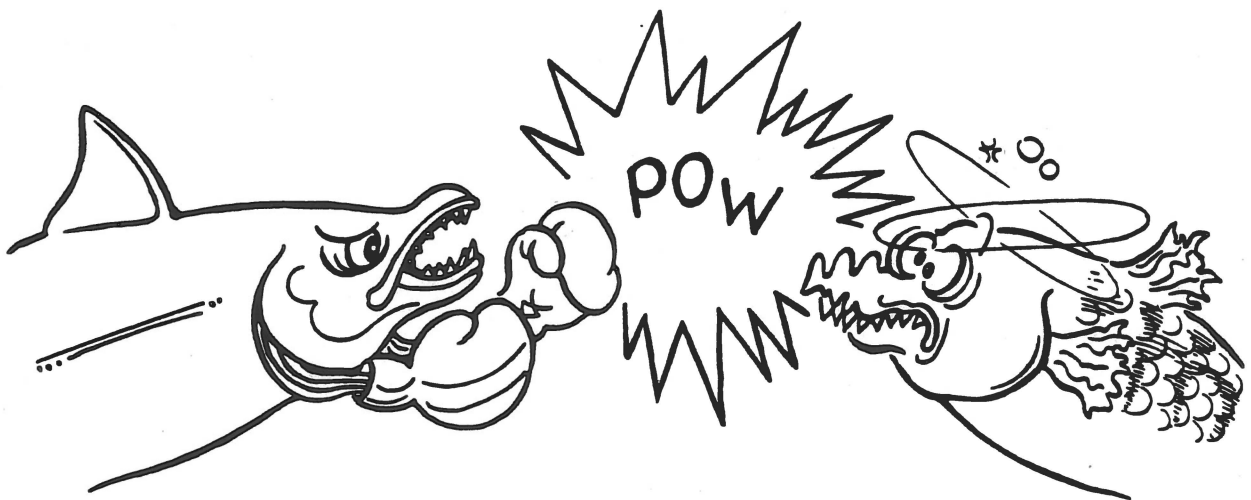
The females must select a nesting site, dig a redd, and then probe around in the newly created nest for a spot to deposit their eggs. Their battered, tired bodies are full of eggs.

I began to realize that since I was as big and as tough as any of the other male chum on the spawning grounds, I should start searching for a female to be my mate.



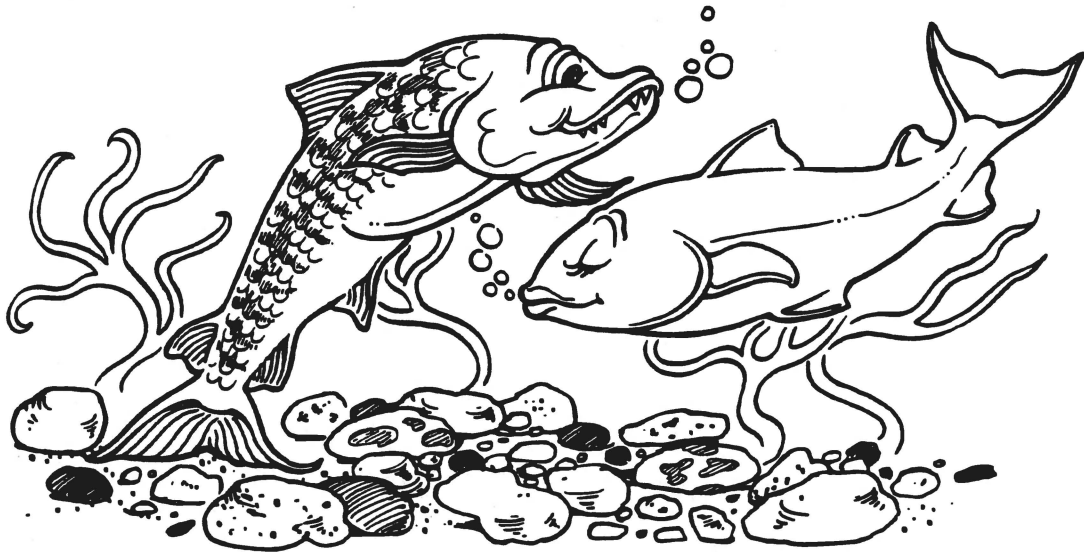


I swam up to one female who was busy concentrating on making an indentation in the gravel. She had a powerful tail and she certainly was intent on what she was doing. I circled around for awhile and then all of a sudden a very big and very ferocious looking male came right at me. Whew! Did he ever know how to deliver a knockout punch.



I got the message and left "Rocky" to his mate. For awhile I couldn't see any unattached females. Then as I explored a quiet pool under some overhanging branches, I noticed a female about half-way finished digging her nest.

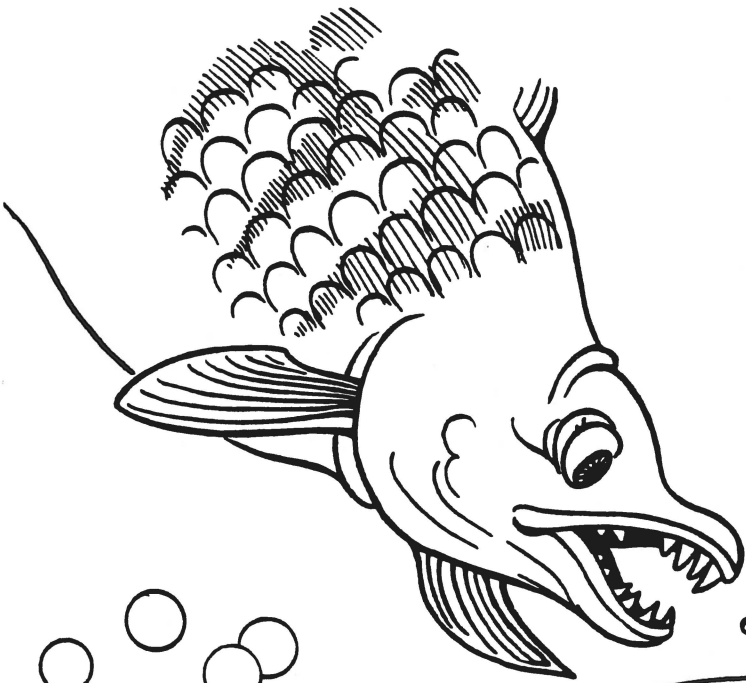
I swam near her. Then I held a position, against the gentle current, beside her. She completed her digging and then she began to probe the nest gravel with her snout. I remained very close to her. We both drifted backwards a little with the current and then returned to a position directly over the newly dug redd. I don't exactly remember what 'signal' passed between us but she began to quiver and I moved closer.



The next thing I knew the water below us was all cloudy and thousands of eggs were gently floating down into the redd. They were covered with the milt I had released when my mate laid her eggs. The eggs were round and sticky. Most of them were immediately covered by my milt.



She had spawned and I had fertilized the eggs.



WOW!

Wow!
There were thousands of eggs! All kinds of little round orange-pink eggs began to nestle in our redd. I remained swimming beside the redd. My mate, however, did not rest. She began swishing her tail and covering the eggs with gravel. She still seemed to have such energy. When she had provided a gravel covering for our eggs she joined me above the nest.

Together, we are holding against the current. I'm exhausted. We will continue to guard these newly deposited eggs. We will protect them as long as we can. We will remain on guard so that no other spawning salmon will disturb the fragile life that we have just begun. Life, and a new generation lies just beneath the gravel.

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Parts of my body have begun to decay. My mate, also, is no longer able to hold her position above the nest. We will both die soon and drift with the current, like the falling leaves that cover the surface of our stream. But under the gravel, away from the cold air of winter, thousands of our eggs wait for spring and the cycle to begin again.



CHUCKY - Chapter 10

A NEW GENERATION

My name is Charles Chum the second. Some of you may remember my father, Charles E. Chum. You probably knew him as Chucky.

I think I'll break away from family tradition and not allow myself to be called Charlie, Chuck or worse still, Chucky. No, I've made up my mind. I'm going to be called Charles. My father probably would have objected, he would say Charles sounds like a name for a Duke or a Prince. I'm sure there are many things my father and I would have disagreed about. But I bet we would have the same feelings about this gravel.



I am almost a week old and I am living in rather cramped quarters under a lot of gravel in a very nice little stream. I am sheltered and I will live in this nursery or nest over the winter. I am not alone. There are over two thousand other little eggs in this redd with me. This is the only world I know just now. I'd like to be able to see what is going on up above me this very minute.

Probably, the leaves are falling from the trees and floating on the surface of the water. There are, I suppose, a lot of other animals in or near this stream. Some animals are roaming around in search of food. Some animals are migrating or preparing to hibernate. Some fish are dying and floating on the surface of the water.

I am safe down here. I am protected. If the larger animals find food around the stream they will not dig down into the gravel. They will not need to disturb me and the other eggs. Soon the cold weather will make the water in this stream freeze over.

I will have plenty of time next spring to explore the streambed and participate in the action at the surface. For now, I will stay put in this cozy, safe little redd under the gravel in this stream — my stream.

