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HISTORY OF THE BRISTOL BAY INVESTIGATION —

1938-1956

George J. Eicher,

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This manuscript is an unedited narrative account of the author's personal recollections of the history of the investigations of the biology of salmon in Bristol Bay by the Bureau of Commercial Fisheries from 1938 to 1956. It is subject to considerable revision before formal publication. Permission must be obtained from the author before any part is cited in another manuscript.

# HISTORY OF THE BRISTOL BAY INVESTIGATION

1938-1956

George J. Eicher

Although sporadic one-man collections of data, such as those with respect to scales and other items were made by individuals such as Frances Clark, Alan Taft, Willis Rich, and others after the fishery began, the first activity which became part of the continuity of studies up to the present started in 1938 when George Kelez and Tom Barnaby made preliminary reconnaissance surveys of the area pursuant to Congressional directives to investigate the salmon resources of Bristol Bay. This resulted from Japanese off-shore fishing in the Bristol Bay area in the late 30's and a considerable amount of controversy and protest from American fishermen. Barnaby was to conduct off-shore work consisting mainly of tagging and marking of fish in the ocean areas, while Kelez was to conduct the fresh-water work. The five main river systems to be included were the Ugashik, Egegik, Naknek, Kvichak, and Nushagak systems. Barnaby spent the major part of 1938 making arrangements to recruit men and vessels for the work. Initially two purse seiners, the Western Flyer and the Anna A. Kelez, spent the entire season of 1938 in the inland areas of Bristol Bay working with the local fisheries agent, Fred Lucas, to become familiar with the area, make plans and arrangements for charter, housing, and general operations.

## 1939

In 1939 things got into full swing. Barnaby took his boats to Bristol Bay and commenced operations, mainly of an exploratory nature to determine the feasibility of capturing and tagging fish in the off-shore areas. Kelez took fifteen temporary men to Bristol Bay by various means. Six went to Chignik on the U.S.F.S. Eider commanded by George Skarbo and helped warden Charley Petrie install the Chignik weir before proceeding to Bristol Bay on a Woodley Airways charter aircraft. These six were Wendell Pike, Wendell Metzger, George Eicher, Fred Cleaver, Gomer Hilsinger, and Bert Williams. Several of the men made the trip from Seattle to Naknek on the Western Flyer, one of Barnaby's ships, and the remainder made the trip on a Columbia River Packers Association ship. At that time, Bristol Bay packing firms operated their own fleet of steamships to Bristol Bay, bringing men and material up and the salmon back down in the fall. The crews were deployed as follows:

Ugashik River--Forrest Merriett in charge, with Wendell Pike and Wendell Metzger.

Egegik River--George Eicher in charge, Alan Moomey and Lyle Burt.

Naknek River--Fred Cleaver in charge, George Collier and Chuck Weil.

Kvichak River--Dick Schuman in charge, Bert Williams and Paul Ferrier.

Nushagak (Wood River)--Gomer Hilsinger in charge, Custer Wake and Don Farrel.

The initial operation was to be a mass marking of seaward migrant red salmon. Unfortunately, due to still-unknown vagaries of weather, biology, or other causes, the 1939 downstream migration proved virtually non-existent except for small captures on the Nushagak and Naknek systems. The Kvichak crew had one successful haul and caught no more fish that season. Scale samples were taken by one man on each of the major systems at a cannery through the fishing season. Foot stream surveys were made on all of the major spawning grounds of the Wood River, Naknek, Kvichak, Egegik, and Ugashik systems. Evacuation in December involved taking part of the group to Iliamna Portage by No. 7 patrol boat, piloted by Fred Lucas. The Kvichak party was already on the scene and the remainder of the men were flown to the area by Woodley Airways. Most of the men walked over the ten-mile portage to Iliamna Bay where the U.S.F.S. Crane met the group. A heated controversy took place when the Crane made its appearance on departure day, inasmuch as the skipper Ole Elveness, refused to come inside the bay, claiming it was too shallow. Eventually, all of the men were ferried by speedboat in rough water to the open ocean anchorage, and put aboard the Crane. All were seasick in a stormy night trip to Seward. Two or three men were put ashore there to take Alaska Steamship passage to Seattle, inasmuch as the Crane was overloaded. Captain Crawford took command of the Crane from Juneau to Seattle.

In the four prewar years of investigation, contracts for air charter were provided by Woodley Airways. Art Woodley, president of the organization, did much of the flying himself. A favorite pilot was Roy Holm, a young and somewhat inexperienced man who learned fast and did a good job. He joined Pan American Airways in 1941 and at last report was still flying for them on the Seattle-Honolulu run. Another pilot was Don Glass, who was killed in a test flight of a Stinson Tri-Motor at Juneau in 1941. Merle Sasseen also did much of the flying for Woodley, who employed six-place Travelair monoplanes, for the most part, but had one five-place Waco in 1938 and 1939, as well as the Stinson. After World War II, Woodley founded Pacific Northern Airlines and became its president.

#### 1940

In 1940, appropriations were greatly reduced, permitting only a skeleton operation. It was decided in that year to plan a field laboratory at Brooks Lake and initially build a weir across the outlet of this lake in order to use it as a study area representative of Bristol Bay. Unfortunately, not until years later was it found that Brooks Lake was

probably one of the least typical spawning and nursery areas of Bristol Bay. The nucleus of men going to Bristol Bay in 1940 included, besides Kelez, two permanent men, Robert Hacker, at last report with the BCF Branch of Reports in Washington, D.C., and Albert Collier, later to become mayor of Rockport, Texas, and much later to return to the BCF in the Texas area. Temporary men included Fred Cleaver, George Eicher, Paul Ferrier, Gomer Hilsinger, and one other.

The permanent men traveled to Bristol Bay on Alaska Steamship Lines to Seward, then Woodley Airways to Naknek. The temporary men except Cleaver, who traveled on the U.S.F.S. Crane, went from Seattle to Naknek on the U.S.F.S. Scoter, Eleveness skipper, a 21-day trip at 6 knots. Initial work involved primarily freighting of materials up the river from the old Bureau of Fisheries ways near Savanoski to a landing area below the Naknek rapids, where the Cletrac tractor was used to transport material by sled overland some 15 miles to the corner of Naknek Lake. There the material was rafted and towed by small power dory to the mouth of Brooks River. Most of the freight consisted of a small amount of camping gear plus a large quantity of material from the old Naknek weir in the form of 20-foot 4x4's and large quantities of wooden pickets. Much material was dragged in small, one-man rafts from the mouth of Brooks River to the outlet of Brooks Lake. When it became obvious that this procedure was too time-consuming and could not beat the arrival of salmon, Woodley Airways was called upon to freight most of the material to Brooks Lake. The pickets were sawed to 9-foot maximum length and placed inside the aircraft after all seats had been removed. Four 20-foot 4x4's were carried at each trip tied to the top of the floats. Some of the 4x4's were carried by two men with ropes thrown over their shoulders. A two-man crew was able to carry two thusly; however, it was back-breaking work. Tripods, or "horses," to carry the stringers were built from spruce logs and weighted down with rocks, which were gathered from near and far, mostly far, inasmuch as there were not very many large rocks in the immediate area of the outlet of Brooks Lake. These "horses" proved to be quite heavy, probably weighing in the neighborhood of 250 pounds each before weighted with rocks.

By frantic efforts, the weir was in place, and a temporary chicken wire closure of the last breach held the first red salmon when it arrived.

With the start of the fishing season, men were deployed to the river mouths to collect scale samples, and after the fishing season, two-man parties were dispatched to the spawning grounds. Because of insufficient numbers of men, the Ugashik was not covered in 1940 on foot, although Kelez did make aerial surveys of this area as well as the rest of the Bristol Bay grounds. Two local residents, Jerry Atkinson and Bill Baird, were hired to assist with the Egegik surveys.

At the end of the season, the party again left Bristol Bay by means of Iliamna Portage and were again picked up by the Crane in Iliamna Bay and taken to Seward. George Kelez left later after going to Anchorage by Woodley Airways. The rest of the crew waited five days in

Seward for the Alaska Steamship Lines, S.S. Columbia, on which they returned to Seattle.

### 1941

A slight increase in available funds permitted an increased effort in 1941 over that of the previous year. A great deal of equipment was purchased for the purpose of setting up a permanent field station at the Brooks Lake location, which was to be headquarters for the Bristol Bay Investigation, as well as serve as a laboratory for local operations and studies.

In advance of the full scale operation, George Eicher left Seattle on April 19th on the S.S. Columbia for Seward, where he joined Norman Gunderson who had been in Kodiak. They proceeded by Alaska Railroad to Anchorage and 4 days later went to Igiugig at the outlet of Iliamna Lake via a Woodley Airways Travelair, piloted by one Curly Martin, who did the bulk of the flying for Woodley in Bristol Bay in 1941. Gunderson and Eicher, on arriving at Igiugig, manufactured fyke nets and other equipment for the capture and preservation of fingerling samples. The first of the traps were placed in the water on May 8th. Trapping was continued until May 28th and fairly good catches made. On the latter date, George Kelez arrived with permanent biologists Howard Baltzo and Robert Hacker. The main body of the temporary group arrived on the Crane in early June. In addition to those mentioned previously, temporary men included Robert Hill, Gomer Hilsinger, Fred Cleaver, Phil Nelson, and Paul Ferrier. A small amount of downstream-migrant sampling was conducted on the Wood River by Eicher and Hilsinger in early June. Marking of downstream migrants was accomplished on a fairly large scale at Brooks Lake and at the Naknek weir site below the Naknek Rapids.

The greatest effort in 1941 was directed toward starting construction of the laboratory and headquarters building at Brooks Lake. The cat-trail haul, initiated in 1940, was reinstated, and the first item hauled over the sled trail from Naknek Rapids to Naknek Lake, was a knocked-down portable scow. Gomer Hilsinger and Norman Gunderson immediately set up camp at the Naknek Lake terminal to assemble the scow, which took about ten days. This scow was initially built by George Kelez' father in Seattle. It was 16 feet long by 8 feet wide, and was powered by a 9 hp. Johnson outboard motor, occasionally augmented by a 3-1/2 hp. Evinrude. Eicher and Hill conducted the operation of transporting the large amounts of supplies and materials from below the rapids to Naknek Lake. These were stockpiled at the Naknek Lake terminal, awaiting completion of the scow. Because of the lateness of the hour and necessity of building the weir again at Brooks Lake, before arrival of the salmon, activities were quite hectic. A typical log-book entry for this operation reads as follows, "left the river at 6:40 a.m. with load of material; reached the lake at 10:35 a.m.; left the lake 11:30 a.m.; reached the river 2:25 p.m.; reloaded the sled with materials; left the river 5:20 p.m.;

reached the lake 9:15 p.m.; left the lake 9:40 p.m.; reached the river 12:40 a.m." The same crew of two men worked on this operation from June 2 to June 22 without a day off. On the latter date, Hill and Eicher broke camp on the river, loaded their sled with camping supplies and gasoline, and took off overland for Brooks Lake. On the second day, they drove the tractor and sled over the top of the mountain next to the southwest end of Brooks Lake, now known as Eicker Peak, and descended to Brooks Lake. The last day, entirely through the timber, was the most difficult of all. They arrived at Brooks Lake at 8:10 p.m. of the third day with three gallons of gasoline left. There they immediately plunged into hauling the supplies from the corner of Naknek Lake, where they had brought them with the tractor, to the mouth of Brooks River, where they again hauled them by tractor to Brooks Lake. This again was a frantic operation.

A typical log entry is as follows: "left Brooks camp at 4:10 a.m.; left the mouth of Brooks River 5:00 a.m. with the scow; arrived at Naknek Lake freight terminal 10:00 a.m.; loaded the scow and left 12:00 noon; reached Brooks River 6:00 p.m.; loaded the scow and sled; left the mouth of the river 7:00 p.m.; reached the weir camp 7:20 p.m." The entire crew at Brooks Lake took July 4th off, the only day of rest taken in a period of over two months. The hauling of materials was completed on July 12th. Work was started on the foundation for the laboratory while biological work was being performed. Again, scale samples were collected at the mouths of the rivers, and surveys were conducted on foot on four of the major systems. Hilsinger and Baltzo surveyed the Wood River system, Hacker and Ferrier the Iliamna, Cleaver and Hill the Naknek, and Eicher and Nelson the Egegik.

On completion of the spawning-ground survey season, full effort was thrown into the laboratory, and all hands worked on this project. The entire foundation was completed and some of the bottom logs installed, including some on the south wing which were later removed because they became unsound before they could be added to. The temporary and permanent men returned to Seattle from time to time by way of Woodley Airways to Anchorage and Alaska Steamship Lines to Seattle. The last to leave Brooks Lake on October 9 were Kelez and Eicher. In Naknek, they were joined by Cleaver and Hilsinger for the trip to Anchorage. After five days there, the group went to Seward by Woodley Airways and thence to Seattle on the S.S. Denali of Alaska Steamship Company.

#### 1942

World War II had started by 1942; however, it was proposed to complete the central section of the headquarters cabin at Brooks Lake, as well as to carry on continuity of scale sampling and other biological work in Bristol Bay. George Kelez entered the Navy at this time, and Tom Barnaby took over the fresh-water investigation work. No permanent men were available; however, a temporary force consisting of Gomer Hilsinger, Willard Hilsinger, Bob Parker, William Peck, Jud Nelson, Dick Mullineaux, Arva Joula, Larry Witt, Ray Reed, Art Zyllstra, and Gene Maltzeff, went



to the area. Widespread work in Bristol Bay was impossible that year because of extreme difficulty in obtaining air transportation. The war effort had most of the local charter services tied up with more lucrative work most of the time. In addition, pilots, mechanics, and others were difficult for the operators to keep. Some help was obtained with aircraft from the Alaska Game Commission, which was then a part of the Fish and Wildlife Service. The lack of transportation, however, pretty much forced concentration of efforts in the Brooks Lake area, although scale samples were obtained at the river mouths. Foot surveys were not conducted on any of the spawning grounds with the exception of a few in the Brooks Lake immediate vicinity.

The entire crew went to Seattle in September on the S.S. General Corgas, Libby McNeil and Libby Steamer.

#### 1943

Tom Barnaby again directed the minimal operations, which were reduced to little as possible with four temporary men, who were William Peck, Bob Parker, Eugene Bridge, and Wendell Metzger. This was the only year that the Brooks Lake weir was not installed. The crew arrived too late on the scene and was too small in number to attempt to do this. Work was concentrated on a minimum of activity in finishing much of the central section of the headquarters building. Scale samples were collected at the canneries, and a very small amount of stream survey work was completed. A novel evacuation in the fall found the crew going from Anchorage to Great Falls, Montana on M.A.T.S., thence to Seattle by Trailways bus.

#### 1944

Barnaby did not go to Alaska this year, having been put in charge of the North Pacific Fishery investigations, which included the Columbia River and other Washington and Oregon streams.

Again a small holding operation was performed. Temporary men included William Peck, Eugene Bridge, Wilbur Ashcraft, and Willis Dunbar. The weir was installed, and counts continued at Brooks Lake. This, aside from scale collections at some of the river mouths, principally the Naknek-Kvichak area, constituted the only work performed. At this time, Navy Commander George Kelez was stationed in Kodiak and from time to time flew over to Brooks Lake in a navy plane and helped perform various odd jobs, among them erection of the water tower, which stood for many years on its original foundations before it was necessary to replace them.

#### 1945

Only a force of temporary men, including Bill Peck, Eugene Bridge, and two others were maintained at Brooks Lake alone to install and operate the weir with the help of Commander Kelez when he could get there from Kodiak. It was possible to continue collections of scale data from the commercial fisheries in the Naknek and Kvichak River mouths. At this time also, Kelez managed to secure a surplus aircraft, a YKS Waco, and had it rebuilt in Anchorage, partially under his supervision.



1946

With the war over, George Kelez returned to command as Chief of Alaskan investigations and turned his personal supervision to the Bristol Bay investigations. The crew in this year consisted of Eugene Bridge, Les Ensign, William Peck, Bob Lander, Chester Mattson, Larry Knapp and Warren Nystrom, who piloted the Waco, put into operation in this year, together with George Kelez, also a pilot. Expansion of the effort was planned. A tagging study on Brooks River was performed to determine the destination of fish passing through the Brooks Lake weir with respect to time of passage. Aerial spawning ground surveys of the entire Bristol Bay watershed were reinstated by Kelez, and plans were made for an expanded program of investigation. Scale samples were taken at various canneries, and foot stream surveys were conducted on Brooks Lake and on the Naknek system.

Spawning ground crowding studies were made through the use of pens.

1947

Funds were available in this year for a larger scale investigational effort. George Eicher, a temporary during prewar investigations, left his position as chief biologist of the Arizona Game Department, to take charge of the Bristol Bay investigation, assisted by Bill Peck, who became a permanent employee in that year. Pilot Warren Nystrom also continued to fly the Waco, although Eicher was also checked out in this operation. Dr. Willis Rich, of Stanford University, spent approximately a month in the field in Bristol Bay as a consultant. Other permanent men partially assigned to the Bristol Bay work were Bob Hacker and Lester Scattergood. Hacker made a brief field visit. Temporary men included Harold Hagen, now a professor at Colorado State University, Harry Brockley, Richard Sheridan, Alonzo Pruter, Eugene Bridge, Les Ensign, Larry Knapp, and Al Eirno.

Tagging work to attempt to identify races of fish passing through the fisheries was pursued on the Naknek and Kvichak Rivers. Tagging camps were set up at Igiugig and at the weir site on the Naknek. Additional tagging was also performed at the Brooks Lake weir. Tag recoveries were performed on Iliamna Lake and the various spawning grounds of the Naknek system. Downstream migrations were sampled on the Naknek system. Eicher and Peck participated in the visual aerial surveys, with some assistance from George Kelez. A system of photographic aerial surveys was worked out by Eicher with the assistance of Kelez and Dr. Rich. A Norduyn Norseman aircraft was used for this purpose with a hole cut in the after belly to receive an F56 Fairchild aerial camera. Photographs were made of spawning concentrations on index areas of each of the main river systems. The purpose was to cover such index areas at the same time in each ensuing year so that the fish could be counted from the photographs and indices developed for each year.

Rich and Eicher also collaborated on development of a system of counting fish moving upstream in the lower rivers from towers placed in these areas. Dr. Rich had been originally struck with the feasibility of this in 1928, when he noted the red salmon's proclivity for following the river margins in narrow bands, which could be easily observed from the high banks. It was decided that the use of towers at the water edge would provide even better vantage points. A detailed system and proposal was worked out which was submitted for funding as a program in ensuing years; however, it was never possible to obtain money, and it remained for Dr. William F. Thompson of the Fisheries Research Institute of the University of Washington to initiate this system of salmon run monitoring in 1952.

Spawner crowding studies through the use of spawning ground pens were again conducted in 1947.

Two minor mishaps occurred in 1947. Bridge and Ensign, conducting spawning ground surveys on Coville Creek (later renamed American River), struck a sweeping tree going downstream and overturned, losing the dory, two outboard motors and much additional equipment. It was two days before they were discovered and rescued from the mouth of the creek. Knapp and Hagen overturned in a skiff in the same manner on Headwater Creek, tributary to Brooks Lake and lost much equipment, but they were able to recover the boat and return under their own power.

An extra-curricular activity of some interest was the visit of General of The Armies Dwight D. Eisenhower to Brooks Lake on August 10. He was accompanied by General Alfred Gruenther, then Commandant of the Army War College, and General Craig, then Commander of the Alaskan Theater. They spent the better part of the day fishing, relaxing, and inspecting research operations.

#### 1948

The effort again suffered a reduction in funding, resulting in a reduced force. Permanent men included Eicher and Peck. Temporary men included Merrill Spence, Bill Rees, Al Pruter, Howard Sanders, Bob Heg, John Luft, and Dick Smith. Tagging studies initiated in 1947 were continued in 1948 in order to establish racial distribution of fish passing through the fishery. Crews were maintained for this purpose at Igiugig and Naknek weir site.

Crowding studies through the use of pens were again carried on as were fingerling sampling and enumeration of the run at Brooks Lake and allied routine work. A twin engine Beechcraft, model 18S, newly acquired by the Fish and Wildlife Service, was modified to take the vertical aerial camera used previously in the Norseman. From this, the aerial photographic surveys initiated in 1947 were continued. Midway in the season, pilot Warren Nystrom was called away to fly for the Management Agent at Cordova, and Eicher piloted the Waco the remainder of the season personally. Aerial

surveys of the spawning grounds were conducted by Eicher, Peck, and management biologist Bert Johnson.

Two minor mishaps involving aircraft occurred in 1948 at about the same time. Nystrom and Eicher, landing in the Egegik Rapids to inspect downstream-migrant fyke nets, struck a rock and damaged a float on the Waco so that it was unflyable. They spent two days there before making enough repairs and other arrangements to fly out and return to Brooks Lake, where they found that in their absence a CAA airplane taking off towards the weir so that a CAA man could get a motion picture of it moving towards the camera, flew directly into the weir causing extensive damage to both it and the airplane. Frantic efforts were required to repair the weir before the arrival of the first salmon, momentarily expected at that time. This aircraft was also the subject of later field repair, which enabled it to fly out.

After the season's end, Eicher was pressed into duty at the request of the Alaska Game Commission to perform the first poisoning of an Alaska Lake recorded. Sundi Lake, near the present Anchorage International Airport was treated with rotenone on September 20 in anticipation of rainbow trout plants, which were, however, not made at that time. Fish killed were mainly sticklebacks.

#### 1949

Permanent employees in 1949 included Eicher, Peck, and Al Pruter. Peck left the investigation prior to the field season to take a position with River Basin studies in Oregon. Temporary employees included Merrill Spence, Bill Rees, Larry Knapp, Dick Weaver, George Kaydas, Dick Smith, Gene Deschamps, Vernon Hacker, William Saltzman, John Hurst, Mike Michel, Mike Wold, and Jerry O'Neil. The latter four men were detailed almost exclusively to construction of a fish ladder over the falls in Brooks River. Virtually the same operations were undertaken in 1949 as in 1948. Two aircraft were employed in this season. Waco 16210 was retired, and Grumman Widgeon 703 took its place. A Fairchild 24, number 28540, was also used on loan from the Alaska Game Commission. The aircraft were piloted by Eicher and Knapp. The fish ladder over the falls was hewn or blasted from the solid rock in order to make it as natural-appearing as possible. It was 10 feet in width with seven pools, each 1 foot above the other. Water was metered into the topmost pool through two orifices in a headgate. It was completed with the exception of the bottommost weir in 1949.

Photographic surveys using the Beechcraft 18 were again pursued. Piloting was by Harvey Hedlund, as in 1948. Freighting by the aircraft division was done by Grumman Goose airplanes, flown principally by Walter White, Harvey Hedlund, and Theron Smith. The cleared-off airplane pull-out and parking strip was prepared this year early in the season.

## 1950

In this year, the hierarchy of the Fish and Wildlife Service in Washington, D.C., decided that all funds and effort in Alaska investigation should be concentrated on the various aspects of pink salmon in southeastern Alaska, and all other investigations were to revert to a standby basis, merely maintaining a continuity of records. Eicher was assigned the task of leading a project concerned with the ocean mortality of pink salmon in southeastern Alaska. Continuity in Bristol Bay was maintained on the weir counts at Brooks Lake, scale sampling in the fishery, some spawning ground surveys, and the aerial, visual, and photographic surveys. Dick Weaver, assistant to Eicher, headed up most of the field work during the season. His crew also completed the fish ladder at Brooks Falls. In this year Northern Consolidated Airlines established its fishing camp at the mouth of Brooks River as well as at the narrows of Grosvenor and Coville Lake, and at the outlet of Kulik Lake. Assisting Weaver were temporary men George Kaydas, Richard Adams, and Hal Boles. Tom Costello, of the fisheries management division, assisted on foot stream surveys. Eicher came to the Bay in time to make the visual and photographic surveys. Visual surveys were made in a Cessna 170, number 748, piloted by Jay Hammond. Eicher and Bert Johnson, fisheries management agent, collaborated on the visual surveys. The Brooks Falls fish ladder was put into operation late in the season and proved successful. Photographic surveys were again performed with the Beechcraft 18, piloted by Graham Mower.

## 1951

This was again a curtailed program year for Bristol Bay, with emphasis continuing on pink salmon in southeastern Alaska. Dick Weaver continued in charge of field operations, with temporaries Hal Boles, Alton Roppel, and Steve Lee. Because of some interdepartmental differences of opinions, aircraft were not available for photographic surveys and nearly not for visual aerial surveys. These were finally performed by Eicher and management agent Bert Johnson in Grumman Widgeon 703, piloted by Bob Smith. Minimal research activities were much the same as in 1950 including weir operation at Brooks Lake and collections of scale samples in the fishery.

## 1952

This year saw a somewhat revived program in Bristol Bay, although work continued in the southeastern Alaska field. Direction at the Washington level indicated some renewed interest in Bristol Bay, and more funds were available. Eicher spent more time on the scene and a larger force of temporaries assisted Dick Weaver. These included Bob Stokes, Dale Becker, Steve Lee, Al Roppel, and Hal Boles. This year saw the first installation of the permanent weir at Brooks Lake utilizing aluminum pickets in bipods fitted on jackhammer bits sunk in the rock at the bottom of the river. Other work included collection of scale samples.

A predatory fish study was initiated on the Wood River system. Photographic surveys were reinitiated in this year using Beechcraft 79911 as in the previous years. Aircraft supervisor Theron Smith piloted on this operation. Eicher flew himself and Bert Johnson in Cessna 748 on the visual aerial surveys. This airplane was rented from the Game division. This year saw the first installation of Leupold and Stevens longplaying temperature recorders at various locations. These were set up to record the nine months without attention. During the ensuing winter, at Eicher's request, Bob Mahaffey, Game Management Agent, and George Kaydas, then winter supervisor for Fisheries Management at King Salmon, went to Brooks Lake to check on operation of a temperature recorder, went through the ice with the airplane in shallow water and were three days getting out. They managed to get the power plant and radio in operation so that they could notify others of their plight.

### 1953

The vagaries of headquarters allocations from Washington, D.C., ebbed severely this year and Bristol Bay operations were cut to a bare minimum. Except for the times when Eicher was in the area, only one permanent man, Charles Hunter, and one temporary, Robert Eckwall, were on salmon studies. Their work was confined pretty much to weir operation at Brooks Lake, collection of fingerling samples, and the maintenance of records. The predatory fish investigation was carried on in the Lake Aleknagik area under the supervision of Dick Weaver, assisted by Steve Lee and Bill Ozoroff. This was the year that a four-wheeled rubber-tired trailer was taken to Brooks Lake for the first time to replace several sleds which had worn out in the course of tearing up the landscape over several years.

Photographic surveys were again made in Beechcraft 79911, piloted by Theron Smith. Most of the visual aerial surveys were made in a Piper Super Cub, number 757, borrowed from Game Management, flown by Eicher, accompanied by Management Agent Bert Johnson. Later surveys were made with a Piper Pacer number 740, borrowed from agent Bob Mahaffey, and again operated by Eicher, accompanied by Johnson. About this year, the fireplace at the Brooks Lake headquarters cabin was completed. This particular part of the building was built almost entirely by supervisory personnel working in odd moments of bad weather and other opportune times. It was started in 1942 and continued at a fairly reasonable pace until it reached a stage wherein the fireplace could be operated, after which interest in its completion to the design stage lagged; however, persistence finally paid off, and it was completed this year. Dick Weaver had the honor of placing the last stone at the top.

### 1954

Operations were increased in 1954, as interest at the Washington level came back to Bristol Bay. Under Eicher, two permanent men,

Richard Straty and Dick Weaver, carried on most of the field operations. Weaver continued with the predatory fish study at the Agulawok River on Lake Aleknagik, assisted by Richard Thompson, John Crawford, and briefly, Tom Duncan. Straty was assisted by Gordon Peltonen and Richard Hansen in the maintenance of normal records on the rest of Bristol Bay operations including operation of the weir at Brooks Lake, a collection of fingerling samples there and collection of scale samples from the fishery at the mouth of the river. Meteorological data were also collected. During the summer, Eicher went to Woods Hole, Massachusetts, to receive consulting help from George Rounsefell with respect to a pending publication on Bristol Bay. On his return, Eicher picked up a new Piper Pacer number 716 in Pennsylvania and ferried it to Anchorage, establishing a record of 3-1/2 days for ferrying of FWS aircraft from the east coast to Alaska. The photographic airplane was piloted by aircraft supervisor Theron Smith.

### 1955

Interest at the Washington level in Bristol Bay expanded greatly in this year and a significant increase of funds became available. A large-scale tagging operation in Bristol Bay to determine the destination of fish by rivers from the various fishing grounds was undertaken, using fishing boats under charter. Tagging was also undertaken on the Ugashik River at the weir and at Brooks Lake. Work commenced on the establishment of index streams of each of the watersheds, with the objective of determining mortality between egg deposition and fry stage in each of the systems. Fish were counted into the streams and fry were to be counted out. Initially, the streams chosen were "F" Creek on lower Ugashik Lake, Cleo Creek on Becharof Lake, and Hidden Creek on Brooks Lake. Plans were made to later expand this to include index areas on the Kvichak and Wood River. Small, permanent living quarters were established, except at Brooks Lake. A marking-and-recovery pilot program to determine the magnitude of downstream smolt migrations was initiated in Brooks River, utilizing fyke nets and marking by tattoos. Work was completed on the predatory fish study on the Wood River system. Foot surveys, principally to recover tagged fish, were conducted on Ugashik Lakes and Brooks Lake. The normal photographic surveys were again performed by Eicher in Beechcraft 540. Piper Pacer number 704 was permanently attached to the study in 1955 and was piloted by Eicher, who spent most of the season in the field. This aircraft was lost for a 4-week period in the middle of the season when the engine failed on take-off out of Nystrom Lake and considerable damage ensued. The wreckage was flown partly out of Nystrom Lake, and partly after transportation to Brooks Lake, to King Salmon and thence to Anchorage for repair. While it was being rebuilt, Piper 728, another Pacer, was rented from Game Management Division. The visual aerial surveys of the entire Bristol Bay region were made by Eicher in collaboration with Bert Johnson, management agent, in Piper 704.

In addition to Eicher, permanent men in 1955 included Dick Straty and Dick Weaver. Temporaries included Wendell Peterson, Pat McGunnigle, Dick

Rowland (drowned some years later while on BCF duty), Craig Magnuson, Dick Anderson, Howard Westfield, Otto Florschutz, Bert Ewing, Dick Hansen, John Winther, Bjorson, Jean Dunn, Bob Lewis, Dick Allen, and Bernard Simonsma.

In 1956 a complete turnover of personnel, objectives, field operations and general Alaska Investigations headquarters occurred. Those who had participated in the area in the previous 10-year period left the scene, and a new era began.