Rehabilitation Training Plan

for Lolita, aka *Tokitae*, a captive orca.
Prepared for Orca Network
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This document has been prepared in consultation with the following people:

- Ken Balcomb – More than four decades conducting field work on cetaceans, including continuous longitudinal field studies of Southern Resident orcas - Lolita's extended family - since 1976.
- Dr. Ingrid Visser - More than two decades of field experience working with wild orca, including rescue and transportation. Experience transporting multiple species of cetaceans.
- Howard Garrett – Advocate for orcas and educator in orca natural history and conservation.

Much of this document was adapted from the DETAILED STEP-BY-STEP Plan for REHABILITATION TRAINING for Morgan the orca, prepared for the Free Morgan Foundation (September 2011).

Lolita ia a female killer whale approximately 20 feet long and 7,000 pounds, estimated to be approximately 45 years old. She was captured in Penn Cove, Whidbey Island WA on August 8, 1970 and was delivered to the Miami Seaquarium on September 24, 1970.

This Plan begins from the day an agreement is reached with the Miami Seaquarium and/or other responsible parties to begin the first steps, apply the techniques and instruct the people involved in each step of the process.

Phase 1. Preparations for transport from Seaquarium

Stretcher

The details regarding the orca-specific stretcher are given in the Lolita Transport Plan.

Preparation for Lifting

To test that there are no unforeseen complications before transportation (which involves logistics that cannot be easily rescheduled), a test run of Lolita's accomodation to the stretcher should be conducted before actual transportation is conducted.

The crane will be in place in the same manner as if the transportation was to actually occur. The water level in Lolita's pool will be lowered to the level so that Lolita is not able to move around easily, but is not completely prone on the bottom of the pool. This will allow personnel to ‘walk’ Lolita over the stretcher which has been positioned on the tank floor.

The lifting poles are then inserted through the pockets of the stretcher, manually lifted and cables secured. These cables are then attached to the crane. There will be at least one rope attached to each corner of the stretcher, at the same points where the crane cables are attached. These ropes are used to manoeuvre the stretcher while it is being manoeuvered with the crane. They prevent the stretcher from spinning when in mid-air. They are also of assistance when removing the stretcher when Lolita is lowered back into the water.

Instructions to the crane operator will come from only one designated person in the pool. The crane operator should be very clear who this individual is and be instructed to ignore instructions from any non-designated individual. The designated person and the crane driver will have conversed prior to the test and to the final move, to ensure that both is aware of any signals to be given and the possible threats. A second-in-command will be present during this dialogue. Other personnel will be instructed to not give any directions to the crane driver.

The crane will then lift Lolita slightly to ensure that she is positioned correctly. This will also to ensure that her pectoral fins have been correctly positioned into the pectoral cut-outs on the stretcher. If repositioning is required, the crane is lowered to the point Lolita can be moved in the water to be correctly aligned and the lift re-attempted. For the test, Lolita should be lifted just above the surface of the water and all the rigging re-checked. Once the position is verified and all riggings are secure, Lolita will be lifted above the height of the water in the pool. As soon as she is lifted from the pool, the water level should start to be returned to the normal level. Scuba-divers will also be prepared at this point to be in the water for Lolita's return (to deal with any unforeseen complications e.g., rope entanglement, etc, so they can cut away rope or the stretcher if necessary or to assist Lolita). The dive team will be comprised only of personnel with appropriate qualifications.

Although this is only a test, Lolita will then be lowered into the cradle (shipping container). Once in the container, any final adjustments can be made to the securing points. This test lowering allows the transport container to be checked (including securing points) as well as the stretcher.

Once all the checks have been made and the water level returned to normal in Lolita's tank, Lolita will be lifted out of the cradle and lowered back into the tank, so she is at the point where she is neutrally buoyant.

If Lolita starts to move too much while being lowered into the water, but still suspended in the stretcher, she should be raised until she reduces her movements. Once stable she will be lowered into a water depth that will allow Lolita to float. At this point the crane cables form the crane are lowered immediately and the ropes used to 'open' the stretcher so Lolita can swim free. If required the Scuba divers can assist Lolita. Once Lolita is clear of the stretcher, the crane will lift the empty stretcher out.

Shipping container (cradle)

A cetacean-specific shipping container (termed a 'cradle'), (see Figure 1), will be supplied or built to Lolita's size specifications (see separate document: Lolita Transport Plan for details). Total weight including Lolita and water/ice combination is expected to be approximately 31,751kgs.

Lolita will not have to be trained to enter the cradle as she will be lifted by crane and lowered into it.

Phase 2. Transportation from Miami Seaquarium to Eastsound, Orcas Island, Washington.

A separate document – **Lolita Transport Plan** – details this Phase.

On arrival at the sea pen, Lolita will be lowered into the sea pen in the same way she was returned to her tank for the test in Phase 1, this document. After she is released in the sea pen, a trainer will be available to feed her at a platform if she is interested.

Phase 3. Acclimatisation to the Sea-Pen

Given that Lolita had a very regimented life-style while in captivity in the Seaquarium, she will be given time to gradually acclimatise from this regime to a more flexible, varied and stimulating training period, in anticipation of Phase 4.

It is not possible to ascertain exactly how long this Phase will take with Lolita, as it will depend on how quickly she can recover from the damage inflicted during her time in the Seaquarium. However it is anticipated that this would be no longer than four weeks and may be possibly completed in a little as one week.

Phase 4. Re-establishment of behaviors required for survival in the wild

There are a number of behaviors which will be "trained" using standard accepted operant conditioning techniques (as opposed to habituation). During this Phase, the number of trainers working with Lolita will be kept to a minimum and one supervisor will be assigned to oversee that all aspects of the training adhere to strict guidelines. These guidelines include:

- Very specific rules for what are acceptable levels of established behaviors
- Establishment before any session as to what behaviors are to be worked on, what the goals of each session are, and expected results
- Documentation after each session of exactly what was trained and the exact responses to the cues

The supervisor will perform or directly supervise (i.e., be present) while anyone is working with Lolita to ensure an absolute consistency in what gets reinforced and what doesn't. Only after the supervisor is confident in an individual trainer's ability to adhere strictly to given guidelines, will the trainer be allowed to work with Lolita without the supervisor. However, at least one other trainer must be present when no supervisor is present. During "no supervisor" sessions, new or "in progress" training cannot be continued. The reasoning behind this strict trainer regime is to ensure that Lolita's behavior progresses consistently and does not regress.

The following behaviors will be trained (not necessarily in this order):

- Training Lolita to hunt and consume her own food
- Training re-call signal
- Desensitization for application of satellite and radio tags
- General fitness training, to ensure Lolita can 'keep up' with wild orca
- Husbandry training to monitor her health

Phase 5 – Extinguishing of human contact & irrelevant behaviors

INTRO: A series of behavioral criteria must occur consistently as part of Lolita's reintroduction, in her normal home range and habitat, to ensure that this rehabilitation is successful. There is an important distinction between biological factors and human-induced factors. This means that we can establish a list of expected behavioral criteria that can serve as a checklist of Lolita's suitability for release, in addition to her natural social conditions such as her interactions with her pod and home range conditions.

The areas of classification for this behavioral criteria are;

1. Return to live feeding schedule

2. Disassociation of humans being part of the food gathering cycle
3. Limited direction control to initiate foraging initiations as well as contingency guaranteed provisioning
4. Reinitiating self-provisioning

Through the clear establishment of the mandatory set of behavioral criteria in the preceding list we can ensure that the process is insulated from outside influences such as; political/industry pressure, principle driven success, or other influences unrelated to Lolita's actual behavior.

THEORY: Three intricate behavioral processes will influence the assessment of success toward rehabilitation goals. Each process will be considered secured upon reversing Lolita's dependence on artificial sources of food. The redirection of the actions back to naturally occurring stimulus that lead to self-provisioning. All three processes contain the same overall steps.

The Steps:
1) The Signals
Prior to any behavior occurring there is usually an event that occurs to stimulate it. For example before answering the telephone, the telephone needs to ring. This is considered a stimulus since the event directs a certain action.

2) The Actions
After a subject receives these signals a selected behavior will occur; in our example the phone will be answered. The behavior that will follow the "signal" is determined by the history of the consequence of the behavior.

3) The Results
If the consequence to the action is continually positive than that action will continue, but if the consequence to the behavior is continually negative than the action will tend to decrease.

The application of these steps depends on the desired process.

The Processes:
Operant Conditioning simply states that each action or reaction occurs based on the consequences of the behavior. If something good happens after an action occurs that action will typically repeat itself. If something negative occurs then that action will typically decrease. It also states that signals can trigger these actions to occur.

1. Classical Conditioning is driven by more instinctual series of stimulus (signals) that illicit a predetermined natural execution of an action. i.e., dog-salivating is initiated by the introduction of food. Pig-foraging (rooting) is initiated through the presence of a stimulus that results in a primary result (food).

2. Operant Conditioning simply states that each action or reaction occurs based on the consequences of certain behavior. If something good happens after an action occurs, that action should repeat itself. If something negative occurs, then that action should decrease. It also states that signals can trigger these actions to occur.

3. Habituation is the acceptance of outside influences (stimulus) through the subconscious process of becoming accustomed (in some cases ignoring the stimulus, e.g., regularly occurring traffic noises in the city) to a set of signals that illicit no set action. This is often through the acceptance of a fixed result with no influence on

the organism's primary need.

APPLICATION:

(i) Return to live feeding schedule - re-establishment of naturally occurring feeding behavior.

History:
Pre-Capture – Lolita was probably 4-6 years old at time of capture – fully weaned for several years – and had established natural food foraging ability.

Post- Capture – Lolita displayed natural classic condition of an identified food source through her acceptance of hand-feeding of dead prey.

Objective:
Pre-Release – Lolita displays complete foraging competence being accomplished through the stimulus of live food – return to live fish as a source of the primary need.

Post-Release – Lolita returns to her previously successful and established complete dependence on foraging. Evidence is supported through witnessing foraging behavior as an individual as well as in association with wild orca during foraging. Additionally, fecal matter will be collected where possible and analysis conducted on remains (such as fish scales) to ascertain species of prey captured.

Process:
Lolita accepts dead fish species being fed by the Seaquarium staff. Lolita is able to discern non-food items such as the floats introduced to her tank.

Proven trials of live food being delivered in a saltwater sea-pen will create confidence in her return to pre-capture foraging patterns. Scattered and direct live food introduction in large contained natural seawater pen will induce 'searching' behavior. Fish which are 'skipped' across the surface will produce 'surface active' noises similar to live fish jumping at the surface, encouraging active investigation of potential prey. Lolita's daily requirements of food will be delivered through scattered feeding technique. This is to replicate as closely as possible the feeding activity of her past and simultaneously encourage physical activity.

While still at the Seaquarium, stunned live food prey could be mixed in with current regular (dead) food sessions. It is anticipated that Lolita will accept stunned live food as quickly as she has accepted dead fish. However, it has been illustrated that captive cetaceans, upon being held in captivity for extended periods (as has been the case for Lolita), will become habituated to dead food and will need to be reintroduced to live prey gradually.

As the live food is more commonly accepted the sea-pen habitat will be stocked with live food. Then, as Lolita is observed to initiate foraging activities orientated towards the live prey, a gradual reduction in the volume of dead fish will begin. An underwater sweep of the sea-pen to monitor food wastage will allow her food intake to be monitored.

A small amount (less than 1 kg) of dead fish will still be administered directly to Lolita as these fish will contain vitamins and health supplements and any necessary medication.

Duration:
This process can begin immediately in the Seaquarium. Alternatively it can begin as soon as Lolita is settled into the sea pen. Live food will become the initiating stimulus for her eating response to forage and she will be allowed to feed to meet her hunger satisfaction. This process is behaviorally demonstrated to occur within four weeks of initiation.

Equipment Required:
Live food prey, underwater camera points of capture, diver support apparatus.

Number of Personnel Required:
Care-givers for irregular feed schedule (2)

Water quality technician (1)

Per feed-Video footage observers (3)

Food intake observers (6)

Indicators of Success:
Lolita self-initiates all food foraging activities through the presence of live feed.

(ii) Disassociation of humans from the food gathering cycle - removal of human initiated feeding.

History:
Pre- Capture – Humans were not part of Lolita's natural foraging process.

Post- Capture – Provisioning records will be requested from the Seaquarium.

It should be noted that presence of people is not necessarily associated with food. This because Lolita has been habituated through the public access to her tank area. The arrival of the trainer (i.e., food) has now became something anticipated and easily discerned from other human activities.

Objective:
Pre-Release – As human presence is able to be discerned by Lolita through the clear distinction of training staff and the general public, the further removal of the trainer's involvement in food delivery is more readily attained. Trainer's presence will be associated with the same disregard as the arrival of the general public.

Post-Release – Humans are not part of her natural foraging process.

Process:
Currently Lolita discerns and understands that not all humans are associated with food delivery. She also recognizes the delivery techniques of a limited amount of training staff. Clear identification of current precursors to actual arrival of trainer driven food delivery will be analyzed and listed. Actions such as entry/exit into Lolita's habitat, utilization of buckets and physical objects currently associated with food will at first be limited and then removed from delivery schedule.

Live prey will no longer be significantly paired with human arrival, positioning or introduction. Human presence

will no longer be associated with food delivery and thus Lolita's temporary dependence on trainer initiated processes will revert back to her natural foraging behaviors.

Duration:
Again the process can be initiated immediately upon the introduction of live prey. The process simply needs to be followed for the natural process of association to be achieved.

Within three weeks of strict adherence to non-human food introduction, disassociation of human presence will be demonstrated.

Equipment required:
None directly.

Personnel required:
None directly – although human presence will still be required to conduct husbandry checks.

Demonstration of success:
Lolita ignores trainers and demonstrates no foraging activities during the introduction of human contact.

(iii) Limited Directional Control - to initiate foraging activities and contingency logistical guarantees.

History:
Pre-capture – Little is known of Lolita's responses prior to or during her capture.

Post-capture – Lolita was moved from her natural habitat to a sling, then to a transport unit, then to a carrier truck, then to a mobile crane, then to a holding tank in Puget Sound, then the process was repeated for her transport to the Miami Seaquarium to her unnatural holding tank. During this complete process humans initiate decisions. Unlearning this 'capture syndrome' is imperative to ensure disassociation with humans.

Objective:
Pre-release – Part of the training process involves Lolita being guided through a 'rescue gate' channel in the sea pen. This 'rescue-gate' ensures that any outside influences can be accommodated through the reintroduction phases. Whether it be physical indications, weather-related, or of a political nature, Lolita may have to be recalled. Such 'recall' situations would be conditioned in her gate training. A home base for 'wild side' transfers would reduce time and distance associated with such a recall, facilitating the release program.

Post-release – Lolita's behavior would be modified so that a more independent and self-directed response on her behalf will deliver more guaranteed food delivery opportunities, i.e., self-provisioning. This would eliminate and extinguish the reason or initiation to cross back to 'home base'. This would ensure that the sense of independence and self-control supersedes any pre-conditioned human responses of the past.

Process:
A unique media 'recall tone' would be created to condition Lolita to a 'safe feed', self-initiated, food foraging cycle. This cycle would be initiated first at a 33% daily food delivery pattern. Therefore, upon delivery of the third food cycle introduced to her habitat, the recall tone will precede the arrival of set food source. This recall tone would be expanded around all points of the 'home base' as well as erratic positioning to the 'wild side'

being conditioned as self-exploratory. A series of A to B's (on a completely variable set schedule) will be scheduled in a decreasing ratio of executions in order to balance a phase-out extinction of the recall response established through the A to B's, paired with the tone recall signal.

Duration:
Normal acceptance and comprehension of live food source A to B's is typically less than one week. Distance swimming and similar toning techniques will be used.

Equipment Required:
Underwater recall tone generator. Underwater recording apparatus (video and audio) to measure the effectiveness of the response time. Multi-position platforms that can facilitate the A to B's series (e.g., boats or anchored platforms that consisted of recall tone generators and food delivery system).

Personnel Required:
Regular food delivery crew. Service engineers for sound generators and recording devices. Observation crew (volunteers such as students and researchers).

Proven Success:
Lolita will be able, in the early phases, to be 'guided' between two specific points which pass a secured gate channel (in case of political or disruptive situations). Initially 100% success is expected for 33% food trials. Eventually the amount of trials would be reduced to zero with a 100% expected response. Eventually behavior initiation is phased out and held for future necessity interests.

(iv) Reinitiating self-driven stimulus control – assuring Lolita's will and ability to determine her own actions.

History:
Pre-capture – Lolita grew up in a social setting that prompted her behavioral reactions by family members. Lolita also initiated her own behavior.

Post-capture – Humans are directly associated with food delivery within her social context. The continual offering of food led to Lolita's acceptance of her social position within the confines of her holding tank.

Objective:
Pre-release – All activities as associated with social positioning and food-related activities must be initiated and controlled by Lolita's own actions. Regular trainer-initiated actions will be extinguished with a cessation of expected food delivery.

Post-release – Lolita will procure her own food. Her responses will now be pre-determined by her will and not imposed artificially.

Process:
Continual observation of self-driven foraging will establish food delivery opportunities. Initially food delivery will be consistent to condition more and more self-determined behavior. This process has been proven with rehabilitation of bottlenose dolphins. Allowing Lolita to initiate food delivery will ensure that her independence to explore the natural habitat will continue.

Duration:
In unexpected sessions, a majority of Lolita's food delivery will occur immediately upon her own independent exploration of the 'wild' habitat. Expected training sessions to secure Step 3 of Continual Directional Control will begin to phase out upon the 100% success rate of A to B's completion, which should be completed within three weeks.

Equipment Required:
Underwater recording apparatus (video and audio)

Personnel Required:
Regular feeding personnel and scientific researchers for recording behavior.

Proven Success:
Lolita explores 'wild' areas on an increasing rate of exploration. Reliance of predetermined maintenance feeding will be replaced with reduced use of the recall tone. Eventually 100% of provisioning takes place only upon Lolita's initiation of foraging activity.

SUMMARY OF TIMEFRAMES
TABLE 1. Timeframes of each step. All time frames are given in weeks, except where noted.

PHASE	TIME FRAME (range in weeks)	RUNNING TOTAL (post relocation to Eastsound)
1. Pre-transport: Introduction of trainers	**1-2**	**0**
1. Pre-transport: Introduction to stretcher	**1**	**0**
2. Transportation from Seaquarium to seapen	**1 day**	**Day one**
3. Acclimatisation to seapen	**1-4**	**4**
4. Re-establishment of behaviors needed to survive		
4. (i) Return to live feeding schedule	**4**	**8**
4. (ii) Disassociation of human provisioning	**4**	**12**
4. (iii) Limited directional control	**1**	**13**
4. (iv) Reinitiating self-driven control	**3**	**16**
Total weeks post-relocation to Eastsound		**16**