

# Strategies for Successful Gibbon Introductions



Gibbon introductions run the gamut from “love at first sight” to extremely challenging. It is important that animal care teams are proactive in planning for all eventualities while knowing that these efforts may ultimately not be needed. The Gibbon SSP is always available to help formulate or review introduction plans or troubleshoot difficult introductions.

## **Planning**

It is important to create a comprehensive introduction plan before attempting to put gibbons together. The development of this plan should include contributions from all stakeholders, including keepers, curators, and veterinary staff, to create buy-in from all levels.

It is useful to consider the history and behavior of the animals being introduced. Answering the following questions may help staff choose strategies and anticipate issues:

- Were the animals parent-reared or hand-reared?
  - Hand-reared animals may have difficulty interpreting behavior and may behave atypically.
- Was either animal recently removed from its natal group?
  - Socially-inexperienced gibbons may have difficulty negotiating social relationships with new partners at first, regardless of their rearing history.
- Has either animal had challenges integrating with previous partners?
  - If so, what were the issues? Were there strategies that were helpful in previous introductions?
- Does either animal have a history of directing atypical aggression toward a previous mate?
- Do the animals have experience with training?
  - Do they take food by mouth, cooperatively feed, separate, shift?
- Are there safety issues with the facilities (e.g. dead ends, limited space, no mechanism for conducting tactile phase)?

## **Location of introduction**

One of the first decisions that must be made when developing an introduction plan is to determine the most appropriate location for the introduction. Most zoos successfully introduce animals in the gibbons' permanent enclosures. If alternative space is available or previous introduction attempts have been challenging, it can be useful to move the

gibbons to a neutral location, such as quarantine enclosures, to reduce territorial behavior from the resident gibbon during the initial introduction process.

Typically full physical introductions are conducted inside holding stalls so that staff can more successfully monitor and intervene, if necessary. If indoor space is being used, it should contain most of the following features:

- Suitable space: Ideally gibbons should be allowed to have as much space as possible during a full-contact introduction. Having adequate space can decrease aggression and stress since animals can avoid each other, if desired, until they are more comfortable.
- No dead-ends: The enclosures should have multiple doors into each stall to prevent a gibbon from getting cornered.
- Stall furniture: All stalls should be thoughtfully perched to allow for maximum use of vertical space and provide aerial pathways for brachiation and escape.
- Visual barriers: Furniture or browse can be strategically placed to allow for visual barriers in case animals need psychological breaks.

If your indoor enclosures do not meet these criteria or pose a different safety risk, introductions can be conducted in an outdoor enclosure or exhibit. There are potential benefits to using exhibits since space, including vertical space, is typically more plentiful. However, staff loses some ability to intervene during an emergency since animals can't be as readily separated and intervention tools may be less effective from a distance.

### **Criteria for intervention**

Prior to starting the full-contact phase of the introduction, stakeholders should agree on criteria for intervention should serious issues occur. While this can be difficult to put in writing, having previously-agreed-upon criteria will help minimize unnecessary separations that might slow down the introduction process. When reasonable, it is important to give gibbons time to work out differences, so criteria should only be applied to more significant wounds or behavioral issues.

Though it is extremely rare, aggressive interactions during introductions can lead to severe injuries or death. Most forms of aggression, however, do not result in injuries or only result in mild or moderate injuries. Criteria for intervention typically are grouped into medical and behavioral categories. Some examples of criteria are:

Medical:

- Bite wounds resulting in excessive blood loss
- Bite wounds resulting in lameness of a limb, hand or foot

- Bite wounds that threaten the permanent functioning of a body part
- Gibbon is struggling to breathe due to persistent chasing

Behavioral:

- Gibbon is being pursued relentlessly without the chance to rest
- Gibbon is exhausted and no longer defending itself
- Gibbon is constantly fearful and stressed due to attention from partner

It is important to understand that all questionable wounds should be evaluated as soon as possible, however, it may be sufficient to briefly separate the animal for a visual inspection and then resume the introduction. A veterinarian should be consulted if there are significant medical concerns about an individual. Wounds that can be managed safely with periodic, brief separations should not be grounds for stopping an introduction unless there are qualifying behavioral concerns.

If the decision is made to stop an introduction based on agreed-upon criteria, the animals can typically be returned to a tactile phase in an attempt to diffuse tension and rebuild rapport. If injuries are serious enough to impair a gibbon's ability to locomote, it may be necessary to separate the individuals for the duration of the healing process so one gibbon isn't at a disadvantage when the full-contact introduction resumes.

### **Impact of staff on gibbon behavior**

Staff attitudes and behavior can significantly impact gibbon behavior, especially during times of stress such as introductions. It is important for staff to remain neutral in their views towards the animals and take care not to respond negatively toward animals based on aggressive or atypical behavior they may exhibit. This is especially true for hand-reared animals who may be more sensitive to human behavior. Staff should be cognizant of giving equal attention to both gibbons and make an effort to reward desirable behavior while ignoring negative behavior. The use of negative reinforcement in non-life-threatening situations may cause an animal to take out their confusion or frustration on their partner, thus exacerbating an already tense introduction. Instead, management strategies should be adjusted to minimize the undesirable behavior (see below for strategies). If particular staff members appear to be negatively impacting gibbon behavior, they should not participate in the introduction process.

### **Preparation for introduction**

#### **Training behaviors**

It is helpful to establish a training rapport with new animals before an introduction begins. Allowing the primary care staff to interact with the new gibbon during the

quarantine period can facilitate building a bond prior to introduction. This could include the gibbon approaching the mesh on cue, taking food from keepers, shifting, and sitting on a scale. If time allows, it would be useful to begin shaping body part presentations if they haven't been trained previously. This helps the gibbon build a rapport with the keepers and facilitates body and wound inspections, administration of medications, and separations should there be challenges during the full-contact phase of the introduction. If the gibbon was trained at its previous institutions, all previously-learned behaviors should be maintained to facilitate care.

### **Maximize vertical space in enclosures**

Enclosure complexity and space will reduce pressure during the introductory period. Exhibit furniture should allow for complete brachiation on multiple levels. Resting platforms and visual barriers can be used to help the newly-introduced animal feel somewhat shielded, if desired. If available, gibbons should have access to adjacent holding areas so they have a choice of where to go and to facilitate separation, if necessary.

### **Enclosure set-up**

Some caregivers believe that enrichment and diet should not be present during introductions since they may create competition or aggression. To the contrary, enrichment and diet can be used strategically to improve the outcome of introductions. Preferred foods and activities can divert attention or remove negative focus from an animal. It is important that there is enough diet or enrichment items to prevent one animal from dominating or blocking its access by the other animal. If an individual is prone to food aggression, staff should weigh the benefits and drawbacks of having food present during the introduction process and should be prepared to remove food, if necessary. Visual barriers, in the form of furniture, hanging sheets/blankets, or browse can be set up to diffuse tension. Staff should be careful not to block escape routes with these barriers.

### **Gather materials**

- It is important to have at least one keeper who is familiar with the individual gibbons and gibbon behavior present at the start of each phase of the introduction.
- Notebook or tablet to record observations.
- Video camera: It is helpful to record interactions, especially if consultation is needed due to challenges.
- Preferred food items: Use food to reinforce positive behaviors or to distract or separate if persistent aggression is occurring.

- Hose: Hoses should be used only in cases of severe aggression that could result in permanent injury or death.
- CO2 extinguishers can distract an animal if severe aggression occurs.
  - Be cautious not to spray the extinguisher directly on animals and be aware of how reduced visibility caused by the discharge may impact a critical situation.
- An air horn can be used to momentarily startle gibbons during severe aggression to facilitate a separation. Air horns have the advantage of not being directly associated with animal care staff like hoses and CO2 extinguishers can be.

## **Conducting the introduction**

Phases of primate introductions typically involve acclimation of the new animal to the enclosures, followed by visual/tactile contact and then full-physical contact. A wide range of behaviors may be observed during the introduction process. It is important for staff to carefully observe the animals to interpret patterns and trajectory of behavior and use these observations to determine when the next phase should begin.

### **Affiliative Behavior:**

- Proximity with relaxed body postures (especially important during the tactile phase)
- Grooming
- Food sharing
- Duet calling
- Presenting to expose genitals
- Affiliative vocalizations
- Breeding behavior
- Shifting, feeding together
- Play (play face; relaxed chasing or wrestling; light, reciprocated hitting and grabbing)

### **Aggressive Behavior:**

- Open-mouth threats
- Rapidly displaying on or kicking mesh/furniture
- Repeatedly swinging above and kicking the other gibbon
- Teeth chomping producing a loud, audible clicking
- Grappling or wrestling (not in play context)
- Aggressive contact with other animal, including shaking, kicking, jumping, pulling, or hitting
- Biting and mauling
- Fast chasing that elicits a fearful response including fleeing, squealing, open-mouth threats, crouching, or loose stool

## 1. Introduce gibbon to new enclosures

Each new animal should be allowed time to become comfortable in the holding area and exhibit before an introduction is conducted. This allows them to become confident with the facilities and to learn escape routes, resting locations, and water sources. If facility design prevents this, the new gibbon should at least be allowed to become familiar with the area in which the initial full-contact introduction will take place, even if it is done incrementally. This familiarization may help reduce aggression or fear during the full introduction. When possible, it can be helpful to remove the resident gibbon from the holding area during this acclimation process to increase the new gibbon's confidence and decrease the resident gibbon's territoriality. It may also be helpful to exchange soiled substrate or fabric so the gibbons have an idea that another gibbon is nearby before they are in the same holding area.

## 2. Tactile introduction

Introductions should begin as early in the day as possible to allow the animals time to settle in while still being observed. The initial introduction should be through a mesh barrier that prohibits full contact. This can be a mesh door or mesh wall. The size of the mesh should ideally be no bigger than .5 by .5 inches to prevent gibbons from reaching hands or fingers through the mesh. The gibbons' reaction to one another will determine the length of time this protected-contact step lasts. If all observed behaviors are positive, it is possible to move to full contact in a short period of time. It is crucial that observers are very confident in their ability to understand normal gibbon behavior, both affiliative and aggressive. Do not feel rushed to move to full contact introductions. Mesh introductions can last hours, days, weeks, or months depending on interactions.

During the tactile phase of the introduction, it can be helpful to create a positive dynamic by cooperatively stationing both animals at the mesh in adjacent stalls for food rewards. This ensures that the resident gibbon continues to get positive attention and creates a positive association with the new gibbon. It also rewards calm behavior while in proximity to the other gibbon and encourages gibbons to remain responsive to care staff.

## 3. Full-contact introduction

Once positive behaviors are consistently seen at the mesh and negative behaviors have subsided, full contact can be given. Full contact introductions should be given priority over other daily responsibilities. It is important that there is sufficient staffing to allow the introduction to continue as long as is behaviorally appropriate because gibbons that are arbitrarily separated and reintroduced may take longer to bond than those who remain together. Gibbons should be fed prior to being put together to reduce food-based

aggression. Setting up enclosures with a variety of enrichment and food items could also aid in a smoother introduction by providing activities and distractions for the gibbons. If an individual gibbon is known to exhibit food aggression, staff should weigh the value of having food present. Gibbons should be given as much space as possible. If the gibbons choose to remain far away from each other for an extended period of time, staff may choose to gradually decrease the available space to encourage interaction while recognizing that it may need to be returned if aggression occurs.

It is not uncommon for aggression to occur the moment the door is opened. Make sure you have enough staff to monitor the entire holding area and assist with separations, if needed. Do not be alarmed if some negative behaviors take place at the start of the full contact phase; this is normal and will typically decrease with time. If undesirable behavior persists and is negatively impacting the outcome of the introduction, adjust management strategies (see below).

### **Separate or leave together?**

Once gibbons have been fully introduced, it is important to carefully assess their behavior to determine if it is safe to leave them together without supervision. If it is safe to do so, it is preferable to leave the gibbons together overnight after they have fully integrated. If there are legitimate concerns about unsupervised aggression, the gibbons should be separated overnight, preferably with tactile access. If the decision is made to separate, it is important that the pair is given the opportunity to socialize in full contact daily for as long as possible until they can remain together overnight. Prolonged separations during an introduction process can negatively impact the outcome.

### **Understanding and mitigating aggression**

During initial full contact gibbon introductions, it is possible that aggressive behaviors could be exhibited. An aggressive behavior for gibbons can be defined as aggressive displays or hostile physical contact, often involving actions such as slapping, pulling, chasing, biting, grappling, or open-mouth threatening. 70% of aggressive interactions of newly-introduced gibbons result in no injuries or mild to moderate injuries. 50% of aggressive events happen in the first day of full contact, so it is very important for keepers to stay present and document interactions during the first day. There can be a number of factors that contribute to aggressive behavior during full contact introductions.

**Compatibility:** In the wild, gibbons will court for several weeks or months, leaving the choice to pair up to the individuals themselves. In managed care, SSPs choose mates based on genetic compatibility, behavior, age, or availability. Removing choice and decreasing courting time could be a factor in aggression and long-term compatibility.

**Atypical socialization:** If one or both individuals have had limited socialization, the chance of a difficult introduction will increase. Knowing the history of the individuals can help staff be more prepared and can inform management strategies. Staff should be particularly cognizant of their impact on animals who may be overly bonded with caregivers, as focus on the new animal may create competition for attention. Staff should be strategic with the attention they offer the gibbons, making sure to reassure the resident gibbon while building rapport with the new gibbon. It may be beneficial for particular staff members to refrain from participating in the introduction if their close relationship with the gibbon is causing a distraction.

### **Managing dominance**

Gibbons do not exhibit gender-based dominance. They can exhibit codominance, female dominance, or male dominance based on the personalities and backgrounds of the individuals. Dominant individuals might be more aggressive in the early stages of the introduction to establish their dominance with their new partner. It is important that staff is careful not to exacerbate tensions by attempting to give treats or attention to a subordinate animal without appropriately acknowledging the dominant animal. It may be necessary to briefly separate the gibbons to gain safe access to a subordinate individual to avoid causing aggression from the dominant animal.

### **Food-based aggression**

Food-related conflicts are common, both in the wild and in managed care. Food displacement during introductions can be a component of aggressive or dominant behavior. While the presence of food and enrichment can reduce hostile behavior in the first stages of introductions by providing distractions and positive rewards, it is important to weigh the benefits with the drawbacks if a food-aggressive animal is involved in an introduction. If food is a consistent trigger for aggression, the following steps can be taken.

- Feed gibbons before a full-contact introduction so hunger is not a factor in aggression.
- Set up entire introduction area with more food than is typically offered to the gibbons to prevent competition.
- If food or enrichment trigger aggression, keepers can separate individuals and remove food from enclosures before restarting the introduction.
- Cooperatively feed gibbons, with a dedicated keeper for each gibbon. Proximity can be increased as they become more tolerant.

- Offer multiple feeding locations at different heights. Do not put food and enrichment in one place for gibbons to fight over.
- Increase feeding time by offering more feedings throughout the day to decrease boredom and allow for positive interactions involving food.
- Increase the number of enrichment items keepers are placing food in.
- Attach some enrichment items to mesh or furniture so one gibbon cannot prevent the other from getting access.

### **Strategic use of separations**

Timeouts or temporary separations are a good way to give the gibbons a break if aggressive behavior is not tapering or animals are not tolerating one another well. Gibbons can be separated for hours or days depending on the situation. If behavior allows, it is preferable to return the animals to a tactile-contact set-up instead of disrupting the introduction with complete isolation. Once affiliative behaviors are regularly observed at the mesh, a full introduction may resume.

If daytime behavior is generally improving but the animals aren't safe to remain together overnight without supervision, the gibbons can be separated each night and reunited each morning. As the staff becomes more confident in the pair's behavior, the animals can be left unsupervised for increasing periods or monitored with camera systems during the day to get an idea of how they will behave without staff present. This will inform decisions about when to leave them together permanently.

### **Use of holding space**

Aggression can sometimes be mitigated by adding furniture, ropes, firehose, or hammocks to improve pathways and escape routes. Additional visual barriers may help, as well. Once the gibbons' behavior is more predictable, it can be helpful to give the pair access to their outside exhibit for more space and distractions. This step should only be taken if the pair is stable enough not to require significant intervention. Leaving them the choice to go outside or stay inside may help decrease stress, as well. Space should not be reduced until the pair is stable.

### **Use of medications to improve outcomes**

Psychotropic medications can be extremely useful in cases of persistent aggression or excessive fear that doesn't improve over time. While it is typically inadvisable to begin

administering these drugs before initial behavior has been observed, selective and thoughtful use of these medications can greatly improve introductions in which intractable negative behaviors have already been established. Consult with the Gibbon SSP for more information of types of drugs and dosing.

**Sedatives:** Drugs such as diazepam or midazolam can be used short-term to calm animals prone to aggression or anxiety. These drugs can dull the animals' senses, so careful attention should be paid to the animals' safety while on these drugs.

**SSRIs:** Mood stabilizers such as sertraline and fluoxetine can be used for a longer period to lower anxiety or aggression. These drugs can take several weeks to reach a full loading dose, so advanced preparation is required.

**Contraceptives:** If the pair has a breeding recommendation, consult with the SSP to determine if it would likely be better to have the female contracepted or uncontracepted for the initial introduction attempt. In some cases, estrous cycles can hasten the bonding process. In other circumstances, a cycling female can cause heightened agitation and excitability in the male, particularly if he is poorly socialized. In general it is preferable to allow the pair time to bond completely before allowing them to breed in order to improve maternal care outcomes.

### **Long-term aggression and compatibility issues**

Compatibility of gibbon pairs is not guaranteed. On rare occasions, it is necessary to re-pair gibbons due to undiminished aggression, persistent wounding, or excessively fearful behavior that does not decrease with time. It is important to contact the Gibbon SSP if you are having challenges integrating your gibbons. The Small Ape Advisory Group (SAAG) is another excellent resource for introduction issues. Gibbons will be re-paired only after the institution has worked closely with the Gibbon SSP or SAAG to adjust introduction strategies.